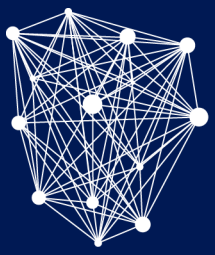

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SPECIAL ACKNOWLEDGEMENT TO REVIEWERS

With the publication of Vol. 4, Issue 3, JOD completes its fourth year of publishing articles on organization design. We are very proud of the 43 articles published in the last six issues of the journal, and we look forward to seeing JOD grow and expand.

We want to take this opportunity to recognize and thank the reviewers of the papers submitted to Volumes 3 and 4.

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TABLE OF CONTENTS

Journal of Organization Design
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INTRODUCTION

Beginning in this issue, *Journal of Organization Design* is introducing a new feature called the Research Primer Series. The purpose of this series is to introduce readers to a particular research stream or literature and articulate its implications for the theory and/or practice of organization design. The first research primer to appear in the series is by Metin Sengul and Stefan Dimitriadis on the topic of multimarket competition.

The Research Primer Series is under the overall guidance of Associate Editor Metin Sengul. He has prepared a set of guidelines for writing a research primer which appear below. Metin has approached several of his colleagues about writing a research primer on a particular design-related topic, but we encourage you to contact Metin if you are interested in writing one yourself.

We are pleased to be launching the Research Primer Series and hope that it will stimulate useful new research and articles on important topics in the field of organization design.

Børge Obel
Charles Snow
Co-Editors

GUIDELINES FOR JOD RESEARCH PRIMER SERIES

1. **Audience**: Researchers and PhD students looking for a concise introduction to a particular research stream.
2. **Purpose**: Introducing readers to a particular research stream/literature and articulating implications for organization design.
3. **Content**: The primer should cover the following matters:
    a. Logical structure of the argument, including
        i. Causal mechanisms (including definitions and main predictions)
        ii. Assumptions
        iii. Unit (or units) of analysis
        iv. Key constructs
    b. Research design
        i. Illustration: research design, setting, operationalization, and estimation (include functional form, if relevant)
        ii. Common pitfalls (e.g., inappropriate unit of analysis, operationalization, identification) and, if applicable, tips to avoid them
        iii. Data sources
    c. Correspondence of theoretical predictions and empirical findings
    d. Positioning in the field, link to other theories/literatures
    e. Relevance to organization design
    f. Potential future directions, overall assessment of the literature
4. **Design principles**
    a. It is an introduction to a research stream not a review of it.
    b. The structure resembles a (text)book chapter rather than a review article.
    c. Understanding is more important than depth of coverage; avoid too much information.
    d. Give clear examples throughout.
    e. The title should be short and direct (e.g., “Institutional theory” rather than “A review of institutional theory in field of management” or “Institutional theory: A review and assessment”).
    f. Keep citations to a minimum in the text. Refer the reader to recent reviews (if available).
    g. Future-looking claims should be farsighted so that they don’t quickly become outdated.

Journal of Organization Design
JOD, 4(3): 1-2 (2015)
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h. Format: The manuscript should be typed in a 12-point, Times New Roman font and must be double spaced throughout. The length of the manuscript should be about 20 pages or less (excluding the title page, abstract, tables, figures, and references).
i. In the spirit of the Series, we encourage co-authoring in professor-PhD student pairs.

A NEGLECTED ROLE FOR ORGANIZATIONAL DESIGN

SUPPORTING THE CREDIBILITY OF DELEGATION IN ORGANIZATIONS

DIEGO STEA • KIRSTEN FOSS • NICOLAI J. FOSS

Abstract: Managers delegate the right to make decisions to employees because delegation economizes on scarce managerial attention, fosters the use of local knowledge, and positively impacts employee motivation. This is particularly important in knowledge-intensive organizations that operate in uncertain environments, where employees have specialized knowledge and need to be responsive to local changes. Managers, however, often renege on delegation, particularly in high-uncertainty contexts, because they are tempted to adjust past decisions based on new information. We argue that employees' knowledge that management may renege on delegated decision rights has negative motivational consequences that are costly in knowledge-intensive organizations. As a consequence, making delegation credible is essential for sustaining the advantages that flow from delegation. Organizational design can play a key role in making delegation credible, supporting the value creation caused by delegated discretion. Our theoretical argument sheds new light on relationships among organizational design, credible delegation, and firm-level value creation.

Keywords: Delegation, managerial decision-making, knowledge-intensive firms, organization design

Research has long recognized that delegating discretion to employees can foster organizational value creation through various mechanisms. For example, delegation facilitates efficient decision-making in changing and complex environments, economizing on scarce managerial attention and allowing for the efficient use of local knowledge (Aghion, Bloom, & Van Reenen, 2014; Galbraith, 1974; Jensen & Meckling, 1992; Radner, 1993). Organizational value creation can also be fostered by delegation because it increases the autonomous motivation of employees (Spreitzer, 1995; Thomas & Velthouse, 1990), resulting in increased behavioral effort and persistence, higher levels of helping behaviors, and more creative problem-solving (Gagné & Deci, 2005; Ryan & Deci, 2000; Weinstein & Ryan, 2010). Organizational research increasingly highlights the importance of motivation in leveraging the value-creation potential of human resources (e.g., Bridoux, Coeurderoy, & Durand, 2011; Coff, 1997; Gottschalg & Zollo, 2007; Lindenberg & Foss, 2011).

Delegation is particularly important for organizations operating in uncertain environments because it reduces the costs associated with information transfer, hence increasing the organization's responsiveness to local changes. Moreover, if the organization is knowledge-intensive it also benefits from delegation because knowledgeable employees are expected to perform tasks (such as creative idea generation or problem solving) which are known to be sensitive to motivational forces (Deci & Ryan, 2000). Delegation, however, must be *credible* to employees in order to ensure its motivational benefits. That is, employees must trust that managers do not renege on the delegated discretion in order to realize immediate gains from intensive control or the routinizing and planning of employee activities. The question we address in this study is: What is the contribution of organizational design to create and

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sustain motivation-based value creation in knowledge-intensive organizations that face environmental uncertainty? In posing this question, we link up with a tradition of research on employee participation, involvement, and empowerment which has long recognized that the formal organization can be designed to motivate employees by empowering them or granting them decision authority (e.g., Harley, 1999; Labianca, Gray, & Brass; 2000; Liao et al., 2009). The contribution of our research lies in proffering different, and more oblique, reasons why organizational configurations matter for employee motivation and, hence, overall value creation.

THEORETICAL ARGUMENT

When employees have discretion delegated to them, they have the formal right to choose which actions they prefer within specified limits. The organizational design – and, in particular, the way in which coordination is carried out – influences the limits of the discretion delegated to employees. Delegation of discretion fosters feelings of competence and autonomy in employees (Bénabou & Tirole, 2003; Liao et al., 2009). Such feelings have been shown to be supportive of autonomous motivation which, in turn, leads to increased effort, behavioral persistence, and overall value creation (Gagné & Deci, 2005; Ryan & Deci, 2000). However, delegated decision rights are loaned not owned (Aghion & Tirole, 1997; Baker, Gibbons, & Murphy, 1999). Thus, employees usually understand that delegated decisions can be overruled and discretion can be permanently reduced (Coyle-Shapiro & Kessler, 2000; Williamson, 1996). From a motivational perspective, this raises problems. Autonomous motivation is highly sensitive to perceived control (Deci & Ryan, 2000; Gagné & Deci, 2005; Ryan & Deci, 2000). Employees who believe that managers' explicit or implicit promises of delegated discretion are not credible will fear that, after having mobilized a high degree of motivation in carrying out their tasks, they may face a reduction in the level of delegation, perhaps amounting to opportunistic reneging on the part of managers. A loss of autonomous motivation may be the result, leading to smaller contributions of effort and creativity in work and problem solving. This is particularly problematic in knowledge-intensive organizations, where motivation has consistently proven to be a fundamental driver of performance (Ryan & Deci, 2000). For this reason, making delegated discretion credible is important to value creation that is driven by the motivational effects of delegation.

While the relation between organizational design and delegation has been widely discussed in contingency theories of organizations (Burns & Stalker, 1961; Galbraith, 1974, 1977, 1995; Grandori, 2001; Lawrence & Lorsch, 1967; Mintzberg, 1983; Thompson, 1967; Woodward, 1965), little is known about the relation between organizational design and the credibility of delegation. This is problematic because the lack of understanding of how organizational design contributes to credible delegation deprives managers of an important instrument for protecting the employee motivation that fosters value creation. The question therefore is: How does the organizational design impact on the credibility of delegation? That is, how can managers make it credible to employees that they will not renege on agreements to delegate discretion to those employees?

We focus on cross-level influences of organizational systems on individual employee perceptions and behaviors associated with motivation. A key argument in contingency theory is that there is a positive relationship between organizational performance and aligned configurations of organizational elements (Child, 1975; Galbraith, 1977). This argument seldom includes employee motivation. We add this missing element by considering issues of credibility, delegation, and organizational design through multiple lenses (Okhuysen & Bonardi, 2011). Specifically, we argue that organizational configurations that reduce the probability of managerial intervention increase the credibility of delegated discretion, supporting the motivation-driven value creation that may be caused by delegated discretion.

In building our argument, we rely on related streams of the organizational literature. Classical contributions to the contingency theory of organizational design supply the fundamental understanding of the fit that must be created between the particular coordination mechanisms in use, the extent to which employees will be delegated discretion in the way they carry out their job functions, and the structure of the organization (Burton & Obel,

2004; Galbraith, 1974, 1995; Lawrence & Lorsch, 1967; Meyer, Tsui, & Hinings, 1993; Mintzberg, 1983; Thompson, 1967; Van de Ven & Drazin, 1985). Organizational economics offers a basic framing of the notion of credible delegation (Baker et al., 1999; Dessein, 2002). Organizational behavior research provides insights into the relationships among psychological factors, work motivation, and employee effort (Gagné & Deci, 2005; Osterloh & Frey, 2000; Rousseau, 1989; Ryan & Deci, 2000).

DELEGATION, MOTIVATION, AND VALUE CREATION: THE PROBLEM OF CREDIBILITY

Delegation of discretion obtains when a set of choices is left to the employee. Two distinct theoretical perspectives – namely, contingency theory and organizational economics – offer important insights regarding the determinants of discretion delegated to employees in organizations. Contingency theory suggests that the amount of discretion that potentially can be delegated to employees who carry out the primary functions of the firm depends on job design and technology. For example, increasing the number of tasks in a job potentially increases employee discretion (Blau, 1970, 1972; Mintzberg, 1983). Moreover, production technology may impact the potential level of discretion as, for example,, highly automated technology leaves little to be delegated (Edwards, 1979; Perrow, 1967).

Contingency theory also suggests that the mechanisms used to coordinate tasks performed by different employees constrain the delegation of discretion to employees. Coordination mechanisms are used in organizations to deal with interdependencies among employees who carry out their tasks. Coordination mechanisms specify how interdependencies are dealt with while control mechanisms are ways of ensuring that employees follow job descriptions, guidelines, and procedures and that they exert an adequate level of effort in the tasks to which they are assigned. Our focus is on coordination as it is more fundamental in determining the amount of discretion delegated to an employee.

Research proffers several classifications of coordination mechanisms (e.g., Astley, 1985; Grandori, 2001; Thompson, 1967; Van de Ven, Delbecq, & Koening, 1976). We rely on Mintzberg's (1983) classic distinction between mutual adjustment, direct supervision, standardization of work processes through planning, and standardization of output by means of goals. Clearly, some coordination mechanisms allow for more delegation of discretion than others. While detailed plans, strict rules, and standardization of processes circumscribe employee discretion by defining legitimate boundaries of decision-making responsibility (Perrow, 1967), goal planning and mutual adjustment leave it up to the employee to decide how to carry out the task itself (Astley, 1985).

Goal planning is coordination of activities by defining the desired output. For example, knowledge workers in product design may be directed in their search for new designs by goals set for the performance of the product. In this case, goals serve as guidelines for directing the discretionary activities of employees. Goals may also be used to set standards for the effort put into a job as may be the case when employees in sales are rewarded on the amount of sales they have generated. The latter use is a control mechanism that may negatively impact intrinsic motivation. For this reason, we focus on goal planning as a coordination mechanism, that is, as a means of directing employees' discretionary activities.

Mutual adjustment implies a delegation of discretion to those employees who hold important complementary knowledge and information allowing them to directly consult one another and make decisions independently. This differs from direct supervision, where employees communicate their information or decision criteria to a manager who decides on actions or resource commitments (Casson, 1994; Mintzberg, 1983). Based on this distinction, we argue that mutual adjustment leads to higher levels of delegation of discretion precisely because employees are left to autonomously decide, or search for new projects or new ways of sequencing activities. Similar to goal planning, however, mutual adjustment can imply more or less discretion to employees – for example, employees can be delegated rights to make decisions only on a narrow and well-defined set of activities, or their decisions may be limited by lack of access to resources. Here we discuss mutual adjustment where employees have a real choice of actions. Often mutual adjustment is used as a way of coordinating activities

to reach defined goals within a group of employees. Organizations where coordination is achieved by broadly defined goals, and perhaps supplemented by mutual adjustment across a large set of activities, allow for high levels of delegation of discretion.

In sum, organizations that have achieved a fit between their environment and configurative elements vary systematically with respect to the kind of coordination mechanisms they use for coordinating employees in the primary functions.

Organizational economics emphasizes how knowledge conditions play a key role in determining the extent of delegation. If an employee possesses superior knowledge, this speaks in favor of delegating decision rights to the employee, because he or she (and not the manager) will have the correct knowledge about which action should optimally be taken in response to a contingency (Aghion & Tirole, 1997; Jensen & Meckling, 1992). In principle, knowledge can be communicated from the employee to the manager (divisional management, corporate headquarters, etc.), but at a cost. Part of the cost is the slowing down of decision-making that such communication inevitably implies (Casson, 1994; Radner, 1993). Knowledge and information may be utilized more efficiently by letting those who possess the relevant local information make the local decisions (Jensen & Meckling, 1992). This is in line with contingency theory which predicts that high environmental uncertainty and/or complexity favors delegation (Burns & Stalker, 1961; Casson, 1994; Galbraith, 1977; Lawrence & Lorsch, 1967).

Delegation, Autonomous Motivation, and Value Creation

Discretion may be delegated for motivational reasons (Conger & Kanungo, 1988; Liao et al., 2009; Sliwka, 2001). Motivational psychology, and in particular self-determination theory, highlights that motivation differs in kind and not just intensity, depending on its degree of autonomy (Deci & Ryan, 2000; Gagné & Deci, 2005; Ryan & Deci, 2000). Autonomously motivated agents perceive themselves as originators of their behavior. That is, what gives rise to the behavioral effort of an autonomously motivated agent (in other words, his or her perceived locus of causality) is internal. For this reason, autonomously driven behaviors tend to be self-endorsed and consistent with personal values and attitudes (Weinstein & Ryan, 2010). On the other hand, controlled motivation is associated with an externally perceived locus of causality. Thus, an agent that is motivated in a controlled way does not feel as the originator of his or her behavior but rather feels pressured to engage in it (Deci & Ryan, 1985).

Autonomous motivation can be disrupted by more or less overt manifestations of control, such as extrinsic rewards, the exercise of managerial authority, and deadlines (Amabile, DeJong, & Lepper, 1976; Deci, Koestner, & Ryan, 1999; Frey & Oberholzer-Gee, 1997). Similarly, autonomous motivation can be stimulated and maintained by signals of trustworthiness and competence affirmation (Deci & Ryan, 2000). Delegation of discretion stimulates an employee's perceived personal efficacy. By delegating discretion, the manager demonstrates confidence in the employee – delegation of discretion signals that the manager regards the employee to be competent and trustworthy enough to be given the right to make his or her own decisions and choices (Bénabou & Tirole, 2003; Liao et al., 2009). Perceptions of autonomy and competence affirmation are the main determinants of the emergence of autonomous motivation (Ryan & Deci, 2000). Autonomous motivation, in turn, makes it more likely that the employee exerts effort. Specifically, autonomous motivation has been shown to be conducive to interest, confidence, and excitement, and, in turn, creativity, persistence, effort, general well-being, and, ultimately, performance (Deci & Ryan, 2000; Gagné & Deci, 2005). This relation has been shown to be particularly significant in the context of complex tasks that require creativity in problem-solving and in the context of certain types of sharing behaviors, such as knowledge sharing (Baron & Kreps, 1999; Hill & Amabile 1993; Osterloh & Frey, 2000).

Costs of Delegation

Along with its positive implications, delegation of discretion comes with costs. For example, Jensen and Meckling (1992) argue that organization-level costs caused by the agency problem

vary positively with delegation. Additional costs of delegated discretion include costs stemming from reduced coordination of interdependencies within the organization (Galbraith, 1974; Roberts, 2004) and in coordination problems such as product cannibalization, overuse of common pool resources (Vining, 2003), and, more generally, reduced flexibility (Sengul, Gimeno, & Dial, 2011).

Delegation of discretion makes sense as long as the organizational benefit in terms of reduced information costs, improved use of local knowledge, and employee motivation exceed the costs in terms of agency costs, coordination costs, and costs resulting from attempts to remedy these problems. Thus, the efficient amount of delegation in a firm is determined where the (discounted) marginal costs are balanced against (discounted) marginal benefits of delegation of discretion. Managerial perceptions of diminishing benefits and/or increasing costs from delegation may prompt managers to intervene and change the level of delegation.

Managerial Intervention

Managerial intervention can be directed both at increasing and at reducing delegated discretion. Given the positive effect of delegation of discretion on autonomous motivation (and motivation-driven value creation), however, we are here concerned with those managerial acts that reduce the discretion that is delegated to an employee, and thus may compromise autonomous motivation. Such intervention may take two forms. First, it can amount to overruling employee decisions and, second, it can reduce the level of discretion that is delegated to employees (e.g., by substituting or complementing mutual adjustment and goal planning with direct supervision or detailed work plans). Both types of intervention are instances of reneging on an implicit contract to delegate discretion. Managerial intervention can take place for "good causes" (i.e., it is intended to benefit the organization) or for "bad causes" (i.e., managerial opportunism) (Williamson, 1996). The former refers to intervention that is intended to benefit the organization. For instance, intervention may be exercised in an attempt to eliminate or reduce the costs that may arise from coordination failures (Foss, 2001; Malmgren, 1961). The latter refers to harmful sub-goal pursuits (Williamson, 1993). While relatively clear-cut in practice, it may often be difficult to place actual managerial practice unambiguously in one of the two categories, not the least for those employees that are subject to intervention. For example, managers may delegate substantial discretion to employees in an attempt to rejuvenate the organization. Employees, happy with their newly increased discretion, come up with profit-improving ideas, and many of these ideas are implemented. Management then decides that the organization is now fully occupied with implementing the ideas. As a consequence, the level of delegated discretion is reduced, because the need for costly idea-generation is smaller (Foss, 2003). Both "good" and "bad" intervention (Williamson, 1996) introduces a problem of credibility regarding delegated discretion.

Credible Delegation

Organizational economics (Aghion & Tirole, 1997; Baker et al., 1999; Milgrom, 1988; Miller, 1992; Williamson, 1985, 1993) offers a basic framing of the issue of credible delegation. Consider, for example, Baker et al.'s (1999) game theoretic framing. In their model, delegation of discretion gives employees the informal right to search for and initiate projects. Delegation of discretion is "informal" in the sense that the formal right to ratify remains in the hands of the manager and cannot be allocated to the employee through a court-enforceable contract. The effort that an employee will expend on searching for and starting projects depends on expected benefits. Those benefits are influenced by the probability of being overruled. Whether overruling takes place depends on the value that employees and managers place on their reputation and on what the manager knows about the projects. Thus, the manager may have all information necessary to ratify a project but may still decide to delegate discretion to employees, even if this is not always in the best interests of the manager (or the firm). If this promise is believed, it induces superior effort on the part of the employee with respect to searching for and starting projects. The snag, however, is that while the benefits of increased search may outweigh the costs of bad projects, the manager has the

information to assess a particular project and may be "tempted to renege on the promise by rejecting a project that is not in her (or the firm's) interest" (Baker et al., 1999: 57). Credible delegation obtains when the employee knows that it is a dominant strategy for the manager not to intervene in the discretion that has been delegated to the employee.

Motivational Implications of Credible Delegation

By delegating decision rights, managers strengthen employees' autonomous motivation. However, this type of motivation is easily disrupted. Specifically, perceived control has been repeatedly shown to "crowd out" autonomous motivation (Deci et al., 1994; Frey & Jegen, 2001; Frey & Oberholzer-Gee, 1997; Grolnick & Ryan, 1989). For instance, managers may use broadly defined goals as a coordination mechanism but in effect overrule the decisions that employees take or introduce direct supervision. Reductions in an employee's delegated discretion increase that employee's perception of being controlled and decrease his or her perceived autonomy. Thus, low perceived credibility regarding delegated discretion should negatively moderate the positive influence of delegation of discretion on autonomous motivation.

Much research evidence supports this line of thought. For instance, Heath, Knez, and Camerer (1993) argue that employees develop implicit and explicit expectations to the contract governing the relationship, and particularly to the benefits that they believe they deserve under the implicit contract – that is, their perceived entitlements. In general, negative motivational consequences can be expected to follow from managerial intervention that interferes with employee entitlements. As the discretion that is delegated to employees becomes part of their perceived entitlements, reneging on delegation is arguably an instance of such interference.

Similar conclusions may be derived from the literature on psychological contracts, which also predicts negative motivational effects of managerial intervention that is perceived as being unfair, arbitrary, or that in other ways breaks with established psychological or implicit contracts. For example, Rousseau and Parks (1993: 36) argue that "contract violation erodes trust [and] undermines the employment relationship yielding lower employee contributions (e.g., performance and attendance) and lower employer investments (e.g., retention, promotion)." Empirical research has reached similar conclusions (Foss, 2003; Robinson, 1996). In sum, serious organizational harm may be caused by low credibility regarding delegated discretion to the extent that a lack of credibility reduces the positive motivational effects of delegation on overall value creation (Labianca et al., 2000; Liao et al., 2009).

Autonomous motivation is compromised whenever managerial intervention reduces the degree of delegated discretion (Gagné & Deci, 2005). Thus, even if an employee recognizes the potential intervention as being undertaken for the sake of the organization (i.e., "good" managerial intervention), we expect that he or she will still suffer a loss of autonomous motivation because of the concrete reduction in autonomy.

Given the complexity of the causal chain between delegation of discretion, credibility regarding delegation, motivation, and organizational value creation, we argue that organizations that want to foster value creation via delegation of discretion need to take measures to make delegation credible. In fact, it is exactly because the causal connections among intervention, motivation, and value creation are complex and unpredictable that it is crucial to make delegation credible. Assume as a thought experiment that management had perfect knowledge of these connections. It would then be possible to precisely assess the motivational consequences associated with any intervention and to calculate the impact of credibility on organizational value creation. Given this, only value-increasing intervention would be performed. In fact, intervention could be "fine-tuned" to reach the maximum organizational value creation.

However, such a "first-best" situation is generally not attainable, because of the problem of predicting the effects of intervention on employee motivation. An important implication is that at least some opportunities for value-creating intervention that would obtain in a situation of full information must be forsaken (some inefficiency is unavoidable). While the "first-best" solution cannot be reached, organizations may aim at reaching a "second-

best" solution where intervention is reduced to a level where value creation is maximized subject to the constraints represented by motivation loss and the need for adaptability. In other words, under conditions of delegated discretion, organizations that want to maximize the motivation-driven value creation potential of delegation of discretion need to safeguard employee motivation by making delegation credible.

MAKING DELEGATION CREDIBLE THROUGH ORGANIZATIONAL DESIGN

Managers may be defined as employees that are given decision rights to take actions that support internal coordination, in the sense of ensuring the consistency of internal plans and actions (Barnard, 1938; Coase, 1937; Malmgren, 1961; Simon, 1951). Thus, much of the rationale of management is coordination (Mintzberg, 1973). Since managers are responsible for coordination, a likely reason for them to intervene and reduce delegated discretion is coordination failure (Heath & Staudenmayer, 2000).[1]

Coordination failures can be rooted in delegation of discretion. For instance, the discretion that management has delegated to a given employee may turn out to be too much (e.g., because management underestimated the extent to which discretion interferes with a need for strict scheduling) or too little (e.g., to ensure smooth adaptation to changes in internal or external contingencies). Whether this results from an initial mistake or from changing circumstances, a coordination failure is the result. There are two main ways of making delegation of discretion credible and thereby minimizing coordination failures: (1) increase the cost of managerial intervention aimed at reducing delegation and (2) reduce the incidence of coordination failures that may result in managerial intervention. In the first case, delegated discretion is credible because the employee knows that intervention is unlikely to be a cost-efficient strategy for the manager. In the second case, it is credible because the employee knows that intervention is unlikely to be needed. We discuss both options below.

Making Delegation Credible by Increasing the Costs of Intervention

As indicated earlier, a simple way to increase the credibility of delegated discretion is to design decision procedures and information structures that increase the costs of managerial intervention. Clearly, knowledge of these costs will make it easier for an employee to believe that the delegated decision rights will not be reneged.

Formal decision procedures. Formal procedures that allow employees to influence decisions are an important means of supporting credible delegation. For instance, creating committees and procedures that allow employees to influence planning and control processes (Milgrom, 1988) may make decisions to be considered legitimate by the employees because they are seen as procedurally just. To the extent that employees care about procedural justice, it becomes more costly for managers to circumvent these processes in order to overrule employees' decisions or implement new projects – that is, to overrule or renege on delegated decision rights.

Informational distance. Managers' information about the need for coordination and about the solution to coordination problems is also a factor that influences their incentive to intervene. In other words, designing the information and reporting procedures in the organization to create informational distance between managers and employees makes it less likely that managers will find it rational to overrule (Aghion & Tirole, 1997). Informational distance can be created by having reporting systems that only allow managers to gain access to limited information, by having information pass multiple hierarchical layers, or by increasing the span of control (the number of employees for which a manager is responsible), which in turn will create a heavy work overload for the manager (Galbraith, 1995). In sum, under such conditions credible delegation of discretion is reinforced by informational distance.

1 Clearly, managers may also intervene for other reasons, such as observing that employees lack the required skills to perform their individual tasks or do not deliver the expected effort. However, we focus on managerial intervention that is aimed at solving coordination failures, as distinct from interventions that may be aimed at solving problems driven by employee-specific behaviors.

Making Delegation Credible by Reducing the Need for Intervention

A second way to increase the credibility of delegation is to design the organization such that it is less likely that managerial intervention is needed. We focus on how coordination mechanisms that are more consistent with the delegation of decision rights, goal planning and mutual adjustment, can be aligned with the kind of coordination required in the organization.

Contingency theory broadly suggests that the effectiveness of an organization depends on the achievement of a fit between the contingency factors (e.g., the degree of task-related uncertainty and interdependencies) and organizational variables (e.g., coordination mechanisms and organizational structure) (Mintzberg, 1979, 1983; Siggelkow, 2001; Van de Ven & Drazin, 1985). Contingency theory suggests how managers can create a fit between those coordination mechanisms that allow for a great deal of delegation of discretion to employees (i.e., goal planning and mutual adjustment), the external contingencies, and the organizational structure in which the coordination mechanism is implemented. Creating a stable fit between the coordination mechanisms of goal planning and mutual adjustment and those contingencies that influence coordination needs reduces the likelihood of coordination failures, and, in turn, managerial intervention. Among the important factors that influence the choice of coordination mechanisms are interdependencies, task uncertainty, and organizational structure (here the focal design variable is job specialization).

Interdependencies. Thompson (1967) proffers a widely used classification of interdependencies as pooled, sequential, and reciprocal.[2] *Pooled interdependencies* occur when employees can carry out their job tasks separately and with no need for interaction between employees carrying out other job tasks. The interdependency arises only because the tasks that employees carry out build on a common, limited pool of resources (funds, employees, equipment, etc.). *Sequential interdependencies* imply that one employee's job tasks need to be finished (or a decision taken) before another employee can carry out his or her job tasks. *Reciprocal interdependencies* are characterized by the fact that employees need to adjust their efforts simultaneously and/or in similar directions in order for them to coordinate on their job tasks. Central to our argument is that the different types of interdependencies require different modifications of organizational members' behaviors and therefore different types of coordination mechanisms (Grandori, 2001; Thompson, 1967). Pooled interdependencies allow a great deal of delegation of discretion to employees who can engage in independent experimentation and learning-by-doing without the organization having to suffer costs from lack of coordination. Coordination at the organizational level can be handled through the use of goal planning to ensure that common pool resources are used optimally. For example, employees can be delegated discretion to identify new products but they will be constrained by budget goals to ensure that financial and other common pool resources are not excessively used. Pooled interdependencies may exist at many different levels in the organization or in different functions. For example, product development firms can create a setting of pooled interdependencies when product designs can be made modular. Employees then can be delegated discretion to work independently on optimizing component functionalities within some broadly specified limits defined by the product architecture.

With sequential interdependencies, delegation of discretion to employees is constrained by the need for timely sequential exchanges of items or information in order to achieve coordination. Plans such as deadlines or specific flow diagrams and direct supervision (direction based on observation of employees' activities in different job tasks) are means of handling coordination of sequential interdependencies. Both plans and direct supervision imply managerial intervention in the activities that employees carry out. However, plans can be more or less detailed and deadlines can be more or less strict, allowing for some employee discretion.

Finally, if there are strong complementarities between tasks as in the case of reciprocal interdependencies, only reciprocal exchanges of items and information result in coordination (Milgrom & Roberts, 1990). Employees can be delegated discretion to handle reciprocal interdependencies through the use of mutual adjustment as a coordination mechanism.

2 As Puranam, Raveendran, and Knudsen (2012) point out, Thompson (1967) conflates task and agent interdependence (the latter is neither sufficient nor necessary for the former). In the following, the relevant interdependence is task interdependence.

Alternatively, mutual adjustment can be handled by plans and direct supervision. Managers may delegate discretion to employees on how to best adapt mutually interdependent activities when it is relatively easy to set goals for and measure the outcome of the mutually interdependent activities as opposed to supervising the input that employees put into the activities. Thus, the extent to which employees are delegated discretion to mutually agree on actions and activities depends on whether interdependent tasks can be grouped in ways that create a measurable outcome.

Another factor that influences the choice of coordination mechanisms is the level of uncertainty facing managers – in particular, whether managers have relevant knowledge of the interdependencies to intervene or to create contingent plans that address the relevant interdependencies. Direct work planning requires that most interdependencies are relatively well known, whereas mutual adjustment only requires that employees know whom to coordinate with. As sequential interdependencies are more easily identified than reciprocal interdependencies, the use of work planning is more likely to be effective with sequential interdependencies whereas the use of mutual adjustment is more likely to be effective with reciprocal interdependencies.

Organization structure. The organization structure reflects the grouping of tasks and employees into different units. Organizations can contain functional as well as process-based units. We speak of *functional structures* when the permanent supra-units (i.e., departments) are formed on the basis of functional criteria (e.g., marketing, production, research and development) and of *process-based structures* when the permanent supra-units are based on work-flow interdependencies (e.g., permanent units are formed around the production of a well-defined output such as a particular product). Organizations differ with respect to whether most emphasis is put on groupings based on functions or on outputs. Matrix organizations represent a mix of the two principles for grouping activities. The grouping of activities in either functional or process-based units influences at what level of the organization different types of interdependencies emerge (Astley, 1985).

Organizations with functional units typically have pooled or sequential interdependencies within units allowing for different degrees of delegation of discretion to employees within functions. However, such organizations often have tight rules to regulate inter-unit interactions, as there are likely to be strong sequential or reciprocal interdependencies across units. Thus, the discretion delegated to employees within units is constrained by the need for coordination between units. Organizations that mainly rely on process-based units typically have contained most of the complex or sequential interdependencies within the process units. This allows for the delegation of discretion to employees to handle the within-unit interdependencies through mutual adjustment. Moreover, such organizations will typically have fewer interdependencies among different units such that there are few constraints on how employees exercise their discretion within units.

Making Delegation Credible Through Organizational Fit

The perspective just outlined implies that delegation of discretion to employees can be most extensive when employees perform tasks where there are only pooled interdependencies and when managers can define and measure relevant goals that allow them to use goal planning to ensure effective use of common pool resources. Employees who are grouped into functional units are more likely to find themselves in a setting of pooled interdependencies compared to employees who are grouped into process-based units. However, the extent of the delegation of discretion to employees in functionally based units is circumscribed by the need for coordination among units.

Employees who face reciprocal interdependencies can be delegated discretion if they are grouped into units that contain the most relevant reciprocal interdependencies, such that employees can be granted discretion to mutually adjust their activities. This is most likely in organizations that group activity into process-based units. Moreover, units need to be defined such that relevant and measurable goals can be used to guide the discretionary employee behavior in ways that ensure coordination with the overall goals of the organization.

Contingency theory takes interdependencies among tasks as a given and asks how organizations can be designed to fit the contingencies they face. However, managers can to some extent influence the nature of interdependencies. For example, firms that change from highly integral product designs to modular product designs change the kind of interdependencies product developers face. Likewise, firms that move from production buffered by large stocks of inputs to lean production change interdependencies from pooled to sequential.

Making delegation credible in organizations thus depends on how managers influence the nature of the interdependencies among tasks carried out by employees. Managers who wish to make delegation credible should seek to use production technologies and buffer activities in ways that create more pooled interdependencies. Moreover, managers should group interdependent tasks to ensure that units contain reciprocal interdependencies.

DISCUSSION

Delegation is particularly useful when employees are highly informed/knowledgeable and/or the organization needs to quickly adapt to high levels of environmental uncertainty. Knowledge workers tend to perform activities that are very sensitive to motivation, such as creative idea generation and problem solving. Autonomous motivation is an important determinant of value creation that can emerge from delegation. However, such motivation is also fragile and needs to be protected by making delegation credible. In this study, we have developed novel theory on how organizational design can support credible delegation. We focused on managerial reneging on promises to delegate, and on how the temptation to renege can either be made more costly or less likely to be needed. Restraining the urge to intervene serves to maintain employee motivation. Research suggests that it is inherent in the nature of the firm that a promise to delegate discretion from managers to employees is not in itself credible because such promises are not likely to be court-enforceable and because non-formal mechanisms are imperfect (Baker et al., 1999; Williamson, 1996). For this reason, firms that want to protect employee motivation should be designed in ways that add credibility to the promise to delegate discretion.

Our analysis implies that, in general, some of the opportunities for value-creating intervention that would obtain in a situation of full information must be forsaken, because the effects of managerial intervention on employee motivation are partly unpredictable. The resulting hands-off recommendation implies that inefficiencies are unavoidable, and this adds a new dimension to Williamson's (1985, 1996) argument that efficient "selective intervention" is generally not attainable. Similarly, Baker et al. (1999) analyze credible delegation in terms of self-enforcing, relational contracts. However, their treatment is rather abstract. In particular, it is not obvious to which organizational phenomena such contracts relate nor how they can be influenced by managers. We proffer two alternative and, arguably, more operational ways of making delegation of discretion credible. The first one is to choose design variables such as information structure and decision procedures so that the managerial cost of (and resistance of employees to) intervention is increased. The second one is to create a stable design configuration. This reduces coordination failure in the organization and diminishes the incentive for managers to intervene.

LIMITATIONS AND FUTURE RESEARCH

The Designer's Perspective

Throughout our discussion we have assumed that the organizational designer is in fact motivated to not only choose a level of delegation that fits complex or knowledge-intensive settings but also to make that level of delegation credible by means of certain design choices. The organizational design literature seems to assume that designers are benevolent (and often that they are so well-informed and powerful that they can pick and implement the efficient organizational design). However, this assumption contrasts with our point that managers/CEOs may be tempted to intervene under situations of uncertainty when the organizational

configuration is no longer characterized by fit – which may be destructive of employee motivation. Clearly, if managers/CEOs are the relevant organizational designers, our argument entails that they recognize the need to exercise self-control by means of committing choices of organizational designs that hinder their own acts of intervention. Research shows that many individuals have difficulties doing this (Brocas, Carillo, & Dewatripont, 2004). A partial solution is to have other decision-makers involved in choosing the kinds of organizational designs that make delegated decision-making credible such as, perhaps, the board of directors. Another solution is to rely on market forces (cf. Alchian & Demsetz, 1972). Our theory predicts that knowledge-intensive firms with organizational designs that serve to make delegation credible will outperform knowledge-intensive firms without such design (all else equal). In any case, this problem points to the more general issue in organizational design theory that extant theory is virtually silent about the motivation, ability, and opportunity of organizational designers to actually implement the designs our theories identify and recommend.

Individual-Specific Factors and Perceived Discretion

For the sake of simplicity, we did not include individual-specific factors in our model. In line with self-determination theory (Gagné & Deci, 2005), we argued that constraints placed on any employee's discretion lessen his or her autonomous motivation. However, research suggests that individual-specific and situational characteristics interact to affect the discretion that employees perceive themselves to possess (Carpenter & Golden, 1997). Furthermore, some employees may actually want or need some form of boundary on their discretion – for example, so that they can clearly define their work roles, appropriately structure their daily activities, or establish an identity at work. Such arguments are prevalent in role theory and in work on empowerment climates, a key dimension of which has been defined as "autonomy through boundaries" (Seibert, Silver, & Randolph, 2004). This suggests that, under person- and context-specific circumstances, some degree of managerial intervention might be harmless or even appropriate relative to motivation. For instance, employees who do not perceive that they have discretion in the first place (regardless of what their managers or the organization might say) cannot feel that they have been overruled (although they might be unhappy that they have never been given any discretion). Those who believe they have, and should have, substantial discretion will be more sensitive to that discretion being overruled. Future research should incorporate an analysis of how much discretion specific employees may expect and how they differentially interpret that discretion and reductions in it.

Sub-Domains of Discretion

In line with the standard empirical definition of discretion, we have treated the construct as a single domain encompassing multiple aspects of an individual's work (Finkelstein & Boyd, 1998; Karasek, 1979; Morgeson, Delaney-Klinger, & Hemmingway, 2005; Spreitzer, 1995). Recent research, however, suggests that specific sub-domains of discretion – specific aspects of work with respect to which an employee may have discretion such as effort or goals, staffing, etc. – may have unique relationships with some antecedents and consequences, and should thus be distinguished (Caza, 2012). Consequently, our model may be further developed by considering whether organizational design differentially impacts the credibility of specific sub-domains of discretion.

The Process Perspective

This study is not a comprehensive analysis of all relevant aspects of making delegation of discretion credible. Our focus has been on some salient characteristics of an organization in which delegated discretion is credible. In contrast, the process by which an organization reaches such a state – including issues of management rhetoric and how employees perceive the process of persuasion they are subject to – has been downplayed. A limitation is that we have neglected the way in which an intervention is motivated and communicated to employees. Instead of refraining from intervention, it is conceivable that managers can

motivate and communicate an act of intervention to employees in such a manner that loss of motivation may be lessened.

This notwithstanding, our model also has implications for a process perspective. The analysis implies that, when firms make delegation credible at a certain level of the organization, it becomes much more costly for managers at higher levels to reallocate discretion to different levels. This has implications for the ability of firms to react to changes in their environment. For example, sudden changes in the environment may call for top-down coordination of many activities simultaneously. When discretion has been made credible at low levels of the organization, firms will not only lose motivation from such top down coordination, they will also face high costs in terms of greater employee resistance to the intervention, costs of re-designing the organization, etc. Similarly, the analysis also harmonizes with process analyses of the growth strategies of firms in terms of engaging in mergers and acquisitions. Often, firms need to make great alterations in business practices and in organizational structure in order to realize potential synergies in mergers and acquisitions. Firms that have invested in making delegation credible may find it more costly to engage in such activities.

Empirical work. There is as yet no empirical work on the model that we have presented. However, empirical evidence speaks to some of the causal mechanisms we have postulated. For example, there is evidence for the negative impact that managerial intervention has on employee motivation (Robinson, 1996; Rousseau, 1989). The perhaps most directly relevant empirical work is Foss et al. (2006). They show that delegation improves motivation and managerial intervention harms overall firm performance. However, mechanisms such as managers staking their personal reputation, employees controlling important assets, and strong trade unions can keep managerial proclivities to intervene at bay. However, they concentrate less on organizational design. We take this to be first indications that the line of inquiry that has been pursued in this article is a promising one.

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MULTIMARKET COMPETITION

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Abstract: This article provides an introduction to multimarket competition and the research stream that examines it. Multimarket competition occurs when firms meet their competitors in multiple markets and compete with them by coordinating their strategies across those markets. In this article, we present a concise exposition of the theoretical foundations of the literature on multimarket competition and illustrate how empirical research projects are typically designed in this literature. We also provide some directions for future work in this area and discuss implications for research in organization design.

Keywords: Multimarket competition, multimarket contact, mutual forbearance, competitive intensity

It is common for large firms to operate in multiple markets. Multinational firms operate in numerous countries, diversified firms operate in several industries, firms with branch structures operate in various cities, and so on. One consequence of multimarket operations is that firms tend to face the same rivals in a number of markets. Consider, for example, the market overlap between Ford and Renault in multiple countries, Unilever and Procter & Gamble in multiple consumer product categories, or Bank of America and Citibank in multiple cities. These overlaps can be intentional (e.g., to follow a leading firm into a new market) or a consequence of other, unrelated strategic choices (e.g., mergers and acquisitions). Regardless of their origins, multimarket overlaps increase firms' range of possible competitive actions and responses. For example, Ford can respond to a price cut by Renault in Poland with a price cut in Hungary, or Unilever can respond to an aggressive advertisement campaign by Procter & Gamble in toothpastes with a campaign in shampoos. When this is the case, firms may have an incentive to coordinate their competitive actions (e.g., pricing, capacity, marketing) across markets. Consequently, multimarket operations give rise to multimarket competition.

Multimarket competition has increasingly been subject to theoretical and empirical analyses in antitrust, industrial organization, and strategy research due to its important implications for both theory and practice. Antitrust research has pointed out that "extended" strategic interdependence among large firms can lead to collusion, which diminishes consumer surplus to the benefit of firms. In addition, industrial organization economists have acknowledged that multimarket competition can affect firms' optimal choices and market equilibria. Strategy and management scholars, on their part, have been interested in the implications of multimarket competition for firm competitive behavior and performance. The theoretical and practical relevance of multimarket competition has undoubtedly increased in the past decades as more businesses compete across industries, geographies, and product markets.

This article is a primer on multimarket competition (see Jayachandran, Gimeno, & Varadarajan, 1999 and Yu & Cannella, 2013 for reviews). In the following sections, we first describe multimarket competition, the outcomes associated with it, as well as the mechanisms linking multimarket contact to these outcomes. We then discuss the assumptions that underlie existing theory, the unit of analysis, and the key constructs. Building on this foundation, we then illustrate how to design and implement an empirical research project on multimarket competition. We conclude by outlining implications for organization design as well as directions for future research.

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HISTORICAL DEVELOPMENT OF THE LITERATURE

Multimarket contact and its potential effects on competition were first discussed in a 1955 paper by economist Corwin Edwards, who previously held senior positions at the Justice Department and the Federal Trade Commission. Edwards studied the rise of large conglomerates, the market power that accrued to them, and the potentially negative consequences this could have on competition. One of the phenomena he described was that when large companies come into contact in multiple markets they may, in response to fear of retaliation, avoid pricing below their competition. Building on Edwards' insight, antitrust economists in subsequent decades began analyzing the consequences of multimarket contact between large firms for economic conduct and social welfare. Specifically, they posited that multimarket contact could lead to reciprocity (i.e., preferential treatment and buying agreements) and extended interdependence (i.e., recognition of strategic interdependence beyond a focal market) between large firms, both of which may have dampening effects on competition (e.g., Adams, 1974; Areeda & Turner, 1979; Mueller, 1971; Stocking & Mueller, 1957).

This research in antitrust laid the foundation for further work by industrial organization economists in the 1970s and 1980s. Their main goal, beyond some elaborations of the theory (e.g., Kantarelis & Veendorp, 1988; Porter, 1984), was to empirically detect whether multimarket (or multipoint) competition led to lower levels of competition as Edwards and others had predicted. The ensuing work on bank holding companies and diversified firms, which was mostly cross-sectional, found mixed support for Edwards' thesis (e.g., Feinberg, 1984; Heggestad & Rhoades, 1978; Scott, 1982, 1991; Solomon, 1970; Strickland, 1985).

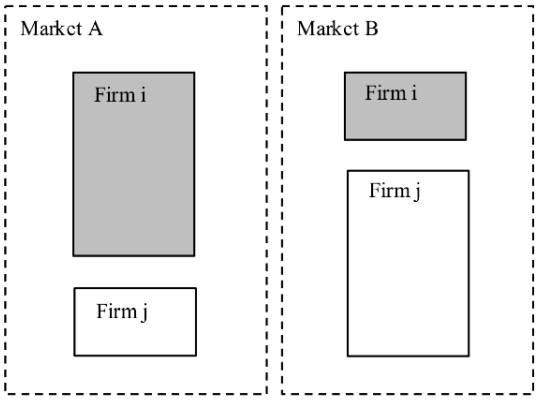
Bernheim and Whinston's (1990) study was a turning point in multimarket competition research. It paved the way for research to go beyond a direct cause-effect relationship between multimarket contact and competitive behavior and to explore the antecedents, consequences, and boundary conditions of multimarket competition. Their game theoretic study showed that multimarket competition resulted in collusion when firms' discount rates were low enough (such that they took into consideration the effect of their actions today for outcomes in the future) and there existed some asymmetry with respect to the firms or the markets (such that firms had an incentive to exercise market power in one market to affect outcomes in another). A stream of work soon flourished around testing the predictions of Bernheim and Whinston's model (e.g., Evans & Kessides, 1994; Gimeno, 1994; Parker & Roller, 1997).

Strategy research began examining multimarket competition in the mid-1980s due to its implications for firm competitive behavior and performance (Karnani & Wernerfelt, 1985; Porter, 1985). Multimarket competition, however, only became a central topic of interest in strategy and management in the mid-1990s, after a series of empirical studies began exploring the effects of multimarket competition (e.g., Gimeno & Woo, 1996; Smith & Wilson, 1995). Since then, an increasingly sophisticated literature has emerged around the empirical examination of the antecedents and consequences of multimarket competition, as well as the factors that moderate the relationship between multimarket competition and firm competitive behavior and performance, such as economies of scope (Gimeno & Woo, 1999) and the degree of strategic similarity between firms (Fuentelsaz & Gómez, 2006).

MULTIMARKET COMPETITION AND THE MUTUAL FORBEARANCE HYPOTHESIS

In its simplest form, multimarket competition can take place when two firms (Firm i and Firm j) compete with each other in two markets (Market A and Market B). If Firm j takes a competitive action in Market A and, for instance, cuts its price, Firm i can respond in Market A, in Market B, or both. In the example of Ford and Renault described earlier, Ford could respond to a competitive action by Renault in Poland by taking an action there or in any of the other markets in which it competes with Renault. Yet, for such competitive spillovers to occur, the appropriate incentives for the firms must exist. More specifically, a multimarket firm is likely to respond to competitive actions by its rivals in a focal market with actions in another market, only if the cost of the response is lower and the damage to the competitor is higher than responding directly in the focal market.

This is especially likely to be the case when the focal market is important to the firm. Then, escalating competition in the focal market can be particularly detrimental to the firm's performance. On the other hand, if there are other markets that are important to the firm's multimarket rivals, but relatively less central to the firm itself, escalating competition in those markets will be less costly for the firm but particularly detrimental to its multimarket rivals. Consider, for example, multimarket contact between Firm i and Firm j as depicted in Figure 1. Firm i has a dominant market share in Market A, which accounts for a large amount of its revenues. Similarly, Firm j has a dominant market share in Market B, which accounts for a large amount of its revenues.



This figure shows two firms, i and j, competing in two markets, A and B. The rectangles depict the size of each firm's market share in terms of sales volumes, such that Firm i is the dominant player in market A while Firm j is dominant in market B.

Fig. 1. A simplified depiction of multimarket competition with asymmetric and reciprocal market positions

Suppose, in this setup, that Firm j lowers its price in Market A. If Firm i responds by cutting its price in that market, leading to an escalation in competition in Market A, it risks losing a large amount of revenue due to the large stake it has in that market. If, however, Firm i responds by cutting its price in Market B it does not risk losing as much revenue because it has a smaller market share there. Furthermore, cutting the price in Market B will particularly hurt its rival, Firm j, because Firm j obtains most of its revenues there. Therefore, it is optimal for Firm i to respond to Firm j's price cut in Market A by cutting its price in Market B. As a result, competitive behavior 'spills over' from Market A into Market B, resulting in higher competition in both markets to the detriment of both firms.[1] In anticipation of this sequence of actions, multimarket firms are likely to refrain from acting competitively (e.g., they avoid undercutting their rivals) in markets where they meet other multimarket competitors. This leads to an overall reduction in the intensity of competition and an increase in average profitability. This outcome of multimarket competition is a form of tacit collusion, known as 'mutual forbearance.'

It is worth stressing that the mutual forbearance hypothesis predicts a decrease in the intensity of competition, which leads to an increase in profitability. In a loss-making industry, this might mean that mutual forbearance leads to lower losses, not necessarily to positive profits. High multimarket contact alone, therefore, does not make a structurally challenging industry profitable. Otherwise, industry-wide losses would be incorrectly interpreted as an absence of mutual forbearance.

1 Suppose that Firm i (instead of Firm j) initiates the competitive action in Market A and lowers its price there. Firm j could respond by cutting its price in Market A, in Market B. or both. However, it has no incentive to cut its price in Market B because that would be more costly, since Market B is where Firm j obtains more of its revenues, and it would not elicit intended competitive reaction from Firm i, because the effect on Firm i would be small. Therefore, Firm j's response will be confined to Market A. As a result, although in this scenario Firm i and Firm j compete with each other in multiple markets, there will be no competitive spillovers across those markets.

Assumptions

Research on multimarket competition, and in particular the mutual forbearance hypothesis, rests on a set of assumptions. First, *firms are assumed to sell competing products and/or services in oligopolistic markets*. If firms do not sell competing products, they will not be affected by each other's competitive actions and will not be direct rivals in the same market. Moreover, it is important that the markets in which they compete are oligopolistic. In oligopolistic markets firms can affect and are affected by each other's competitive choices (such as price, quantity, or quality). By contrast, in a perfectly competitive market (i.e., a market in which a large number of firms with equal market shares sell identical products), mutual forbearance will not take effect because no firm will be able to affect the market's equilibrium price and thus affect the profit maximizing choices of other firms. This is why, in some early works, multimarket competition was aptly referred to as 'linked oligopoly.'

Second, *firms are also assumed to be able to observe each other's competitive actions*. This is because, for mutual forbearance to take place, firms should be able to detect and punish (i.e., cause financial damage to) rivals that take aggressive competitive actions. This ability to respond to a rival's action depends on being aware that the action took place. Although some actions (such as market entry or exit) are easily observable to rivals, other actions (such as pricing) may not be. The observability of competitive actions is affected by a number of factors, including the lumpiness of orders, number of buyers, and volatility of demand. Multimarket overlaps can also help detection because the more firms interact with each other across markets, the more information they will have about each other and, due to increased familiarity, the better they will be able to interpret the available information.

Third, *firms' positions and interests differ across the markets in which they compete*. Multimarket operations give rise to multimarket competition when cross-market retaliation is more effective (i.e., as we discussed above, it is less costly to the focal firm and more damaging to the rival) than within-market retaliation, or when collusive outcomes in some markets can be achieved only by the pooling of competitive actions across the markets.[2] Therefore, for multimarket competition to take place, firms should have an incentive to transfer enforcement power from one market to another.

Fourth, *firms must be able to coordinate their strategic actions over markets*. If firms could not coordinate competitive decisions across multiple markets, but rather made decisions based only on within-market dynamics, they would be unable to recognize the potential for competitive spillovers across markets. Consequently, they would fail to optimize multimarket objectives, which could result in suboptimal performance. For example, by pursuing an attractive opportunity to increase its share in a given market a firm might be profit-maximizing at the market level, but the net benefit to the firm may actually be negative if this action also causes competitive escalation in other markets in which it operates. For mutual forbearance to take place, firms must possess the ability to act in a coordinated fashion over multiple markets.

Unit of Analysis

In studies of multimarket competition, the link between multimarket contact and outcomes (typically competitive intensity or performance) can be analyzed at one of three possible levels: (1) the firm-dyad level, which conceptualizes the variables of interest as properties of the relationship between two firms; (2) the firm-in-market level, which conceptualizes the variables of interest as properties of each individual firm within a market; and (3) the market level, which conceptualizes the variables of interest as aggregates for a market (Gimeno & Jeong, 2001). For example, the intensity of competition can be conceptualized at the firm-dyad level (e.g., entry and exit of dyads of firms into each other's markets, as in Baum & Korn, 1999), the firm-in-market level (e.g., number of competitive actions taken by a firm

2 Cross-market retaliation becomes more effective than within-market retaliation when differences in market positions, costs of production, or technology give rise to "spheres of influence." Firms' incentives to collude in some markets may increase when variation in factors such as growth rates, response lags, or demand fluctuations across markets may cause firms to give more weight to future outcomes in other markets (e.g., potential future losses in high-growth markets may outweigh short-term gains from increasing competition in slow-growth markets). See Bernheim and Whinston (1990).

in a market, as in Yu et al., 2009), or the market level (e.g., industry price-cost margin, as in Strickland, 1985).

In deciding the unit of analysis of a study, the general rule of thumb is to pick a unit of analysis that allows a reliable estimation of the dependent variable while capturing the causal effect theorized. Although any of the three levels of analysis described above can be used, they imply different theoretical mechanisms. Defining multimarket competition at the market level implies mechanisms that vary across, but not within, markets, whereas defining it at the firm-in-market level implies that the effects of multimarket competition can propagate differently across firms within a market. Thus, the research question dictates the unit of analysis. This choice then affects the conceptualization and measurement of explanatory factors.

In parallel, the granularity of available data determines the unit of observation. Therefore it would be improper in an empirical study to theorize at the firm-dyad or the firm-in-market level if the data is only available at the industry level. This implies, for example, that it is appropriate to test the hypothesis that 'industries dominated by multimarket firms tend to be less competitive' at the industry level but not that 'firms tend to be less competitively aggressive when they compete with multimarket rivals.'

Key Constructs

Studies of multimarket competition build on three key constructs: the market, multimarket contact, and the intensity of competition.

Market. Multimarket competition is predicated on the existence of multiple distinct markets. Therefore, it is important to study markets that have a defined product or service and clear boundaries, so that participating firms can be identified. Past operationalizations of markets in multimarket competition research include city-pair airline routes, geographic areas (e.g., cities, counties, or countries), and products or industries as defined by standard classifications.

Multimarket contact. Multimarket contact (or multimarket overlap) captures the extent to which firms meet the same competitors in multiple markets. In its simplest form, multimarket contact is the number of markets in which a focal firm *i* meets its competitor *j*. This conceptualization is at the dyadic level because it approaches multimarket contact as a property of the relationship between two firms. However, it can also be aggregated to the firm-in-market and the market levels. Multimarket contact, at the firm-in-market level, is the average number of markets in which focal firm *i* meets its competitors from a particular market (i.e., the average of the dyadic multimarket contacts with rivals in a market). Market-level multimarket contact is the average of firm-in-market multimarket contact for all firms in the market. These baseline measures of multimarket contact can be improved by scaling them or incorporating weights.[3] Gimeno and Jeong (2001) provide a comprehensive description and evaluation of measures of multimarket contact.

Outcome: intensity of competition. Studies of multimarket competition are typically interested in explaining the effect of multimarket contact on the intensity of competition (although there are studies that explore other outcomes, in particular firm performance or industry profitability). Intensity of competition refers to the extent of competitive actions, such as price cuts, new product introductions, advertising campaigns, and service improvements, that firms in a market engage in. Three approaches have been used in the empirical literature on multimarket competition to measure the intensity of competition: entry or exit, pricing, and, more recently, the number and type of competitive actions (or reactions). Alternative operationalizations of the intensity of competition include measures such as expenditure on marketing or R&D, but use of these measures is often constrained by data availability.

3 Scaling the number of contacts by the total number of markets in which the firm is present allows the measure to capture the relative salience of multimarket contacts to the focal firm. In addition, introducing weights allows for contact in certain markets to matter more than in others. Typically, market sales or share are used to weight contact. That is, contact in markets that account for a large share of the focal firm's revenues would be given more emphasis.

DESIGNING EMPIRICAL RESEARCH ON MULTIMARKET COMPETITION

In this section, while keeping in mind the theoretical foundations laid out above, we turn to a more practical question: how to design and implement an empirical research project on multimarket competition. To illustrate this process, we use as the basis of discussion an early paper by Evans and Kessides (1994), along with the work of Baum and Korn (1999), Gimeno (1999), Greve (2008), Sengul and Gimeno (2013), and Yu, Subramaniam, and Cannella (2009).

The Research Question

What constitutes a legitimate research question in a research stream depends on the timing of the study and the state of the literature, which continuously evolves as new studies address one gap or another. Nevertheless, we can identify three broad approaches to crafting an empirical research question on multimarket competition.

The first approach is to test the main theoretical model of multimarket competition. Early empirical studies on multimarket competition focused on testing the effect of multimarket contact on performance. After successive studies had explored the link, the attention shifted to testing and verifying the underlying causal mechanism. In principle, the model can be tested by focusing on different slices of the causal chain linking multimarket contact to performance. It is possible to explore, for example, whether multimarket contact increases the degree of mutual awareness among competitors, or, as in Evans and Kessides (1994), whether multimarket contact weakens price competition.

The second approach is to assess the validity and boundary conditions of the assumptions that underlie the theory and which were outlined in the previous section. For example, building on the assumption that firms' positions and interests differ across the markets in which they compete, Gimeno (1999) explored whether airlines use their presence in markets that are important to their rivals to reduce the intensity of competition with those airlines in their own important markets. Another example of this approach is Sengul and Gimeno (2013), who explored the boundary conditions of the assumption that firms can coordinate their strategic decisions over markets by studying how firms manage multimarket competition when full centralization of decisions is not feasible, as is the case with multi-industry firms.

The third approach to conducting research projects involves extending the theory beyond its traditional boundaries. This can be done by bringing in alternative theoretical lenses (e.g., decision-making theory), by exploring the antecedents of multimarket contact (e.g., intentionality), by reconsidering how key constructs are conceptualized (e.g., focusing on R&D or service quality as the outcome variable), or by introducing unexplored but consequential contingencies. Yu et al. (2009), for example, studied multimarket competition across national borders and explored how factors that would be present and visible only in a cross-border setting (such as home-host cultural distance and host-country regulatory restrictions on activities of foreign firms) would affect firms' motivation and ability to mutually forbear.

Setting

Once the research question has been set, the crucial next step is to find a 'suitable' setting, a setting in which it is possible to test the research question posed. For an empirical study of multimarket competition, this implies two conditions. First, the assumptions of the theory (e.g., oligopolistic markets, competing products) should hold in the setting. Or, if the aim is to test the validity and boundary conditions of any of the assumptions, there should be enough variation related to that dimension while other assumptions hold. Second, the relevant data should be available at the market level for each firm across multiple markets. Given the heterogeneity across these markets, ideally the observations will be over multiple periods of time in order to be able to tease out the causal effects.

Although these are well-defined conditions, they are also demanding. Finding a suitable setting has long been a challenge in empirical multimarket competition research. Due to its

exceptional fit and availability of high-quality data, the airline industry has emerged as the most commonly studied setting in this literature (including Evans and Kessides, 1994). The industry is characterized by a limited number of oligopolistic firms, which are powerful enough to affect market prices, and these firms meet each other in multiple markets. They sell nearly identical products (i.e., flying from A to B), and the supply (flights, seats) and price of these products are largely observable to rivals. Importantly, there are good records of these choices, activities, and characteristics – even the price – in a number of sources. The best known of these sources is the U.S. Department of Transportation's Origin and Destination Data Bank, which contains data on a ten percent random sample of all tickets sold in the U.S. The data on domestic flights are publicly available, along with rich supplementary data (on service quality, traffic, etc.). What also adds to the allure of the airline industry is anecdotal evidence indicating the practice of mutual forbearance in it. As Evans and Kessides (1994: 341) noted, industry experts had long claimed that airlines lived by the 'golden rule', according to which "they refrained from initiating aggressive pricing actions in a given route for fear of what their competitors might do in other jointly contested routes." In Table 1 below, we provide a list of the most commonly studied settings in the multimarket competition literature, along with corresponding data sources.

Table 1. Commonly studied settings and corresponding data sources in multimarket competition research

Setting	Selected Data Sources	Representative Studies
Airlines	Official Airline Guide (North American Edition); US Department of Transportation: Origin and Destination Survey (DB1A), Service Segment Database, Form 41 Reports	Evans & Kessides (1994); Gimeno & Woo (1996); Baum & Korn (1999)
Automobile manufacturing	Automotive News; Mergent; Ward's Automotive Yearbook; Ward's AutoWorld	Yu & Cannella (2007); Yu et al. (2009)
Banking	Directory of Members of the Federal Home Loan Bank of San Francisco; Federal Deposit Insurance Corporation's Summary of Deposits; Office of Thrift Supervision's Branch Office Survey	Heggestad & Rhoades (1978); Haveman & Nonnemaker (2000)
Cement	Portland Cement Association's Plant Information Summary; U.S. Department of Interior Minerals Yearbook	Jans & Rosenbaum (1997)
Telecommunications	Cellular Business; Cellular Market Data Book; Cellular Price and Marketing Letter, Information Enterprises	Parker & Roller (1997)
Diversified firms	Enquete Annuelle d'Entreprise; Federal Trade Commission's Line of Business Program; Fortune's Plant and Product Directory and Surveys	Scott (1982); Feinberg (1984); Sengul & Gimeno (2013)

Operationalization

The unit of analysis depends on the research question because that defines what is to be analyzed. Evans and Kessides (1994), for example, aimed to explore the effect of multimarket contact on the intensity of price competition, so their study required a unit of analysis at which price competition between firms could be reliably assessed. This could be done by looking at either the market (equilibrium) price or the price charged by individual firms in each market. The former, which would be at the market level, is a reliable unit of analysis when firms sell homogenous products and is less demanding in terms of data needed. The latter, which would be at the firm-in-market level, allows for a more granular analysis and precise prediction when it is possible to control for (observable and unobservable) firm characteristics, even with differentiated products. Thus, the unit of analysis in Evans and Kessides (1994) was the airline-route (i.e., firm-in-market).

As we discussed earlier, every research project on multimarket competition is predicated on three key constructs. The *market* boundaries affect how multimarket contact and market-level controls are measured and hence have to be defined explicitly and carefully. In the

airline industry, markets are conveniently defined as routes between pairs of cities (e.g., between Boston and Philadelphia). This is an appealing measurement of markets because of its clear (geographic) bounds, ease of identification of firms competing in the market, and comparability (substitution) of the products offered by them. The level at which *multimarket contact* is measured depends on the mechanism at which it is hypothesized to influence the outcomes. Evans and Kessides (1994), for example, assumed that multimarket contact affects pricing by changing how the market clears (i.e., how the equilibrium price is set) and measured it at the market level: for each route they calculated the average contact between airlines in that route across all routes. At the same time, it is advisable to choose a measurement that matches the unit of analysis. Subsequent studies of price competition in the airline industry have done so by measuring multimarket contact at the firm-in-market level. Finally, the *outcome* of interest (typically competitive intensity or performance) depends on the research question and the unit of analysis adopted. Evans and Kessides' (1994) dependent variable, for example, was the average price set by an airline on a city-pair route per year because they studied price competition, and their unit of analysis was the airline-route.

Estimation

Evans and Kessides' (1994) study was partly motivated by their improvement over earlier studies in their model specification, which included controls for market share and concentration, as well as firm and market fixed effects. More specifically, using the log of average flight prices as the dependent variable, which helped interpret coefficients as a percentage change (in response to marginal changes in the explanatory variables), they estimated the following model:

$$ln(price_{ijt}) = multimarket\ contact_{jt}\gamma + X_{ijt}\delta + \mu_i + \varphi_j + \rho_t + \epsilon_{ijt}$$

where i is the airline, j is the route, t is the time period (year), and X_{ijt} is the set of control variables (such as percentage of direct flights, airport and route market shares). The other terms capture airline (μ_i), route (φ_j), and year (ρ_t) fixed effects. Their results showed that multimarket contact had a positive, statistically significant, and qualitatively important effect on price.

The estimation strategy, as in any regression analysis, depends on the nature of the data and the dependent variable analyzed. Categorical and limited dependent variables, for example, are fairly common in the study of multimarket competition. Consider Baum and Korn (1999), who studied the number of entries into and exits from rivals markets (as a measure of competitive intensity), or Greve (2008), who studied firms' sales growth rate in excess of that of the market (as a measure of deviation from the collusive equilibrium). The former study calls for Poisson or negative binomial regression (as the dependent variables are integers truncated at zero) or the latter study for Tobit (as the dependent variable is a ratio truncated at zero). It is also necessary to take into account other methodological complications that may arise, such as heteroskedasticity, multicollinearity, or autocorrelation.

Beyond these general concerns, there are three issues that any empirical examination of multimarket contact should address. First, the effect of multimarket competition on outcomes in a given market should be evaluated in addition to the effect of the structure of that market. Multimarket competition and mutual forbearance are second-order effects that influence outcomes in a given market through their effects on other markets with common rivals. Although this effect has been shown to be salient in certain settings, market structure has a direct and significant effect that should not be ignored. Research designs that do not incorporate market structure variables, such as market concentration, are underspecified and have been shown to produce misleading results on the effects of multimarket contact.

Second, firm scope should be incorporated into the research design. Several studies have documented that multimarket contact is highly correlated with firm scope (e.g., Gimeno, 1999; Gimeno & Jeong, 2001). Therefore, it is necessary to account for possible economies of scope, either by adjusting the measure of multimarket contact for scope or by including a control variable in the model specification.

Third, studies of multimarket competition should be able to account for unobserved heterogeneity in the data through the inclusion of fixed effects, the use of first difference

models, or other model specifications. Although unobserved heterogeneity is a common issue, it is particularly pronounced in multimarket competition studies because of the structure of the data, which capture multiple firms in multiple markets, generally over multiple periods of time. Consequently, results of empirical analyses tend to be sensitive to accounting for this structure. It's for this reason that Evans and Kessides (1994) included firm, market, and year fixed effects in their model specification. When feasible, in studies at the firm-in-market level it is advisable to include firm-in-market fixed effects (see, for example, Gimeno, 1999). Even though the increase in number of fixed effects is taxing in terms of degrees of freedom, it allows for a more conservative estimate that controls better for unobserved heterogeneity at the level at which dependent and independent variables are measured.[4]

IMPLICATIONS FOR ORGANIZATION DESIGN

As multimarket competition entails coordinating competitive actions across markets, a central question of interest is how that coordination takes place. Traditionally, the multimarket competition literature, like most theories of competition in strategy and economics, overlooked this question by treating firms as unitary actors and assuming that all of their strategic decisions were coordinated by a central decision maker. Although this assumption might be valid in some settings (e.g., airlines, banks), in most other settings, such as diversified firms, it is necessary to acknowledge that organizational units in each market should have some degree of autonomy and flexibility to adapt to their local environments. As a result, when designing the relationship between headquarters and subsidiaries, firms must strike a balance between the need to delegate decisions to subsidiaries and the need for coordination of competitive strategies across markets. This tension highlights the importance of organization design in managing multimarket competition.

Evidence of the importance of this tension can be found in Sengul and Gimeno's (2013) study of multi-industry firms and their subsidiaries in France. They found that these firms delegate business-level decisions to subsidiaries while constraining resource commitments by limiting the decision rights and the available resources of subsidiaries. Further, when the organization design was such that subsidiaries' resource allocation was more constrained (i.e., subsidiaries had less discretion and fewer financial resources), the dampening effect of multimarket contact on competitive aggressiveness was stronger.

More broadly, multimarket competition has three main implications for the study of organization design. First, organization design parameters should be assessed at the firm-in-market level when intrafirm negative spillovers, such as those from multimarket competition, are significant. Although it is true that firm and market characteristics affect choices about organization design, each particular unit within a firm and market will have a unique identity, which also affects the design. For example, Universal Music Group's autonomy from its corporate headquarters will be affected not only by its parent firm (Vivendi) and its industry (music publishing), but also by characteristics specific to Universal Music, including its exposure to multimarket rivals.

Second, organization design should embrace the multidimensionality of both design parameters and firm activities. Sengul and Gimeno (2013), for example, showed that headquarters of multi-industry firms imposed varying degrees of control over the decisions of their subsidiaries: some decisions were delegated, some were centralized, and others were negotiated (i.e., the headquarters had punctual control over them). In parallel, Anand, Mesquita, and Vassolo (2009) showed that the effect of multimarket contact differed across exploration and exploitation activities: unlike exploitation, multimarket contact did not lead to mutual forbearance in exploratory activities due to the uncertainty involved in those activities and, as a result, entry and exit were more intense in the presence of multimarket contact. Consequently, it is important to avoid broad-brush assessments of firm activities and one-to-one mappings between them and organization design. Rather, research should discern between different kinds of decisions.

4 For example, ten airlines operating in ten city-pair routes over a period of five years implies that a total of 22 fixed effects should be included (10+10+5, minus benchmark airline, route, and year) in the regressions in the former approach and 103 fixed effects (10x10+5, minus benchmark airline-route and year) in the latter.

Finally, it is necessary to take multimarket competition into account when studying organization design in settings where multimarket competition's effect would be pronounced, such as in diversified companies and multinational firms. Studies have only begun examining these effects, thus far demonstrating the importance of multimarket contact in the allocation of decision rights (Sengul & Gimeno, 2013) and managerial characteristics (Stephan et al., 2003). The theoretical and empirical exploration of the link between multimarket contact and other dimensions of organization design, such as organizational structure, compensation, and implicit incentives, however, remains an open area for future research.

MULTIMARKET COMPETITION IN PERSPECTIVE

There is now compelling evidence, thanks to longitudinal research designs that control for sources of unobserved heterogeneity, that multimarket contact tends to lower competition, whether measured as prices, quality, action-response dynamics, or market share stability, and to increase profitability. Existing research has also shown that the relationship between multimarket contact and firm behavior and performance is moderated by a number of contingencies at the firm level (e.g., financial strength, CEO tenure, strategic similarity with competitors) and the market level (e.g., market concentration, government regulations, market growth rate). Yu and Cannella (2013) provide an extensive discussion and a comprehensive review of this literature.

Beyond specific predictions, such as the mutual forbearance hypothesis, a broader contribution of multimarket competition research has been to highlight that firms' operations in different markets might be linked because of competitive reasons.[5] The study of multimarket competition, therefore, complements established explanations of the connections between firms' operations in different markets. Among others, prior research has elucidated the role of economies of scale and scope (in production, procurement, advertisement, etc.), coordination costs, and internal capital markets.

Future research directions

Several questions remain for future research to address. One area for new research is whether multimarket competition differs qualitatively when it occurs in markets that are horizontally or vertically associated. More broadly, extant research has not considered in detail the relationship between the different markets firms operate in. Further, there is need for more work on multimarket competition across industries or product categories. Unlike the majority of research on multimarket competition that defines markets geographically (such as city-pair airline routes), each industry or product category is idiosyncratic and therefore requires some level of autonomy and delegation (Sengul & Gimeno, 2013). Further research in such settings will shed new light on how multimarket competition affects firm behavior.

Another promising area for research is the cognitive mechanisms of learning and signaling across markets. Similarly, issues related to status or non-market sources of power (e.g., ties to the government) have been largely absent from studies of multimarket competition. Examining these factors may provide insight into which firms are more effective in deterring aggressive actions by competitors.

5 Competition across markets can be linked not only by opportunities for collusion but also by cost- and demand-based conditions. If the markets in which a firm operates exhibit joint (dis)economies, its choices in one market can affect rivals' strategic choices in other markets (see Bulow, Geanakoplos, and Klemperer, 1985).

Table 2. Different methodological approaches to the study of multimarket competition

Methodological Approach	Representative Studies
Computational modeling	Chang & Harrington (2003; 2004)
Econometric analyses	
Cross-sectional studies	Heggestad & Rhoades (1978); Strickland (1985)
Categorical or limited dependent variables	Baum & Korn (1999); Greve (2008)
Error components (panel data)	Evans & Kessides (1994); Gimeno & Woo (1999)
Event history	Haveman & Nonnemaker (2000); Yu & Cannella (2007)
Experimental designs	Phillips & Mason (1992); Clark & Montgomery (1998)
Game theory	Bernheim & Whinston (1990); Spagnolo (1999)
Network studies	Shipilov (2009); Lomi & Pallotti (2012)
Qualitative analyses	Genesove & Mullin (2001); Ghemawat & Thomas (2008)

Alternative methodological approaches have the potential of contributing to our understanding of the microfoundations of multimarket competitive behavior and its ramifications for firms. Although various approaches have been used in the multimarket competition literature (see Table 2 for an overview), to date some approaches, such as computational models and experiments, have been used only sparingly. For example, Chang and Harrington (2003) used computational models to examine how organizational structure affects learning by the organization and in turn multimarket competition, while Clark and Montgomery (1998) used experiments to study signaling dynamics in multimarket competition. Further, qualitative evidence of multimarket competition has thus far been confined to only a handful of studies that either used case studies to substantiate quantitative analyses (e.g., Ghemawat & Thomas, 2008) or are primarily focused on tangential phenomena such as the formation of cartels (e.g., Genesove & Mullin, 2001). However, qualitative approaches to multimarket competition, whether through the analysis of historical archival data or ethnographic participant observation, hold promise in elucidating the processes through which firms take competitive actions in a multimarket context.

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SUBSTITUTES FOR SILICON VALLEY

THE CASE OF THE ROUND HOUSE STARTUP FACTORY

DAVID J. KETCHEN, JR. • KYLE SANDLER

Abstract: Taking a startup from creation to success is notoriously difficult. Many entrepreneurs gravitate to hotbeds such as Silicon Valley in order to enjoy high levels of intellectual and financial support that in turn make success more likely. This case examines an attempt to launch startups in the absence of 'big city' resources: the Round House Startup Factory. Founded in the small town of Opelika, Alabama by a former Google employee, the Round House contains three types of startups: co-working firms, incubator firms, and accelerator firms. With more than thirty companies under its roof, the Round House is trying to realize big entrepreneurial dreams by leveraging strategic and non-strategic resources, developing an innovative business model, and making astute choices about governance, culture, and structure.

Keywords: Business incubator, business model, entrepreneurship, startup, startup factory, strategic resources

A recent story in *Wired* magazine heralded the emergence of a new organizational form called a startup factory (Lapowsky, 2014). A *startup factory* is an organization that creates, houses, and nurtures startup companies. As *Wired* noted, "some of these businesses generate all their ideas internally. Others invest in and acquire other companies as part of their portfolio. But the common goal among all of them is to experiment with lots of projects, welcome failure, and hope for a hit—or two or three. These are businesses started explicitly to start other businesses" (Lapowsky, 2014). By surrounding startups with infrastructure, mentoring, networking opportunities, and other support, a startup factory seeks to increase each startup's chances of being successful.

The startup factory organizational form is unique in that it brings together under one roof many of the entrepreneurial tools and resources – infrastructure, mentors, investors, and other startups – that new businesses need. Much as companies like Intel, Microsoft, and Cisco have become technological platform leaders (i.e., they deliver a high-tech foundation upon which other products, services, and systems are built – Gawer & Cusumano, 2002), startup factories attempt to provide an entrepreneurial platform upon which startups can be developed.

Most startup factories locate in high-technology areas such as Silicon Valley and New York City because such locations provide excellent access to resources, creative people, and funding. Can startup factories operate successfully in areas that lack the traditional support systems offered in big cities? If so, what organizational factors might facilitate this success? These questions are considered by examining the creation of the Round House Startup Factory (http://www.roundhouseoa.com/) in Opelika, Alabama, a town of roughly 29,000 people located a few miles from Auburn University.

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ORGANIZATIONAL RESOURCES AND THE ROUND HOUSE

According to resource-based theory, organizations that possess "strategic resources" – resources that are valuable, rare, and difficult to substitute for or copy – can leverage those resources to create sustained competitive advantages and enjoy superior performance (Barney, 1991). The future of the Round House is tied to two main resources, one that appears to fit all four criteria of a strategic resource and one that does not.

Kyle Sandler is the visionary behind the Round House. As a child in Baltimore, Maryland, Sandler suffered for several years from leukemia. He was granted a wish through the Make a Wish Foundation – meeting a local disc jockey. This led Sandler to become a radio personality himself as a teenager. Rather than sidetracking his DJ career, Sandler skipped college and began moving to bigger radio markets. He eventually found himself in San Francisco living in a tiny apartment above an ice cream shop. Coincidentally, this shop was frequented by the founders of Google. Sandler soon joined Google, which had about 250 employees at the time, and was paid less than $30,000 a year.

Fast forward a few years and Google was a high-tech powerhouse. Sandler had risen through the ranks and was in a supervisory role at a new Washington, DC office. When the lobbyists in the office eventually outnumbered the creative people, Sandler knew it was his time to leave. From there, he started and later sold two news websites devoted to technology and startups: thedroidguy.com and nibletz.com. Through these ventures, he built an impressive network of personal contacts in the tech world including Apple CEO Tim Cook, Yahoo CEO Marissa Mayer, and Atari founder Nolan Bushnell.

Allie Fox, one of Sandler's writers at thedroidguy.com, became his wife. Although Sandler tried to sell Fox on moving to a big city, she insisted on living in her native Alabama. They settled in the town of Auburn, and Sandler joined a business incubator on the campus of Auburn University as an entrepreneur in residence. From there, Sandler decided to set up the Round House in an adjacent town, Opelika.

Opelika had one big advantage over the town of Auburn and other local municipalities. In 2011, forward-thinking city officials presented voters with a plan for the city to provide lightning-fast 1 gigabyte per second Internet in order to fuel economic development. Voters approved the build-out plan, and in 2013 Opelika became just the seventh city in the United States to enjoy 1 gig of Internet speed. In 2014, Sandler opened the Round House in a building that had been Opelika's train depot. Most of the startups that would populate the Round House were technology based, making the availability of 1 gig Internet an important asset. As an incentive for locating in Opelika, the Chamber of Commerce agreed to cover the cost of the Internet access (USD 1,500 per month).

Kyle Sandler appears to be a strategic resource for the Round House. Sandler's history as a child facing a life-threatening illness, an early Google employee, the founder of successful startups, and a very connected person is highly unusual and has provided him with a uniquely empathetic perspective and set of entrepreneurial insights. On the other hand, Opelika's 1 gig Internet is not a strategic resource. This advanced fiber network is valuable and rare but it can – and will be – duplicated by other cities. As of October 2015, Opelika was the only Alabama location with 1 gig Internet, but plans were in place to build a 120-mile loop of high-speed fiber optic cable around Huntsville and Madison in north Alabama. Meanwhile, Atlanta, located less than 100 miles from Opelika, was also in the process of a fiber optic build-out.

ROUND HOUSE BUSINESS MODEL

Figure 1 depicts the Round House business model. Simply put, a business model is the process through which a firm intends to make profits. A well-constructed business model can be a source of competitive advantage and can play a key role in shaping a firm's performance. As shown in the figure, the Round House has three main sources of revenue: co-working firms, incubator firms, and accelerator firms. These startups are collectively referred to by the acronym CIAs (co-working, incubator, accelerator). In turn, the Round House provides the CIAs with resources and tools to help them succeed. The Round House business model is both proactive and reactive: some CIAs are actively recruited to join while others independently find their way to the organization.

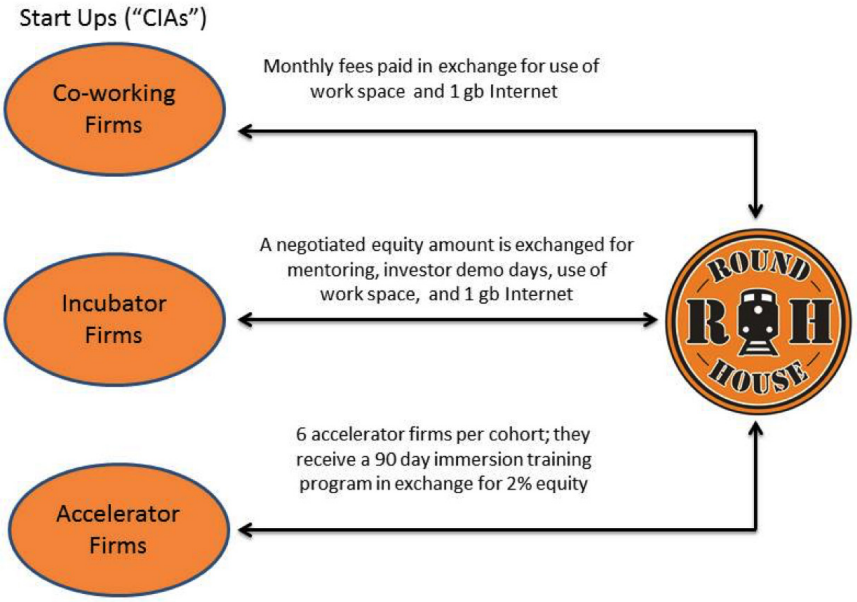

Fig. 1. Business Model of the Round House Startup Factory

Co-working firms pay a monthly fee to in order to access the Round House's resources. As of October 2015, community members pay $50 per month and receive in return access to the facility during normal business hours, use of the 1 gig Internet, and use of a conference room. "Blue Line" members pay $75 per month to receive 24-hour access to the facility and its infrastructure, consulting with an expert every two weeks, and a business address that can be used to receive mail and packages. "Green Line" members pay $125 per month. They receive the same services as Blue Line members plus they enjoy a reserved work station. As of October 2015, there were roughly forty co-workers spread across these three categories. One is Abby Knight, a reporter who covers east Alabama for the nearest CBS station, WBRL in Columbus, Georgia. The 1 gig Internet helps Knight efficiently file her stories electronically. Her presence at the Round House gives her early access to news on the various startups, and it provides the startups with the opportunity to pursue free publicity.

Incubator firms are housed full-time at the Round House. Rather than paying rent, incubator firms exchange equity for the space they use. The amount of equity is negotiated based on each firm's state of development, potential, and need for support but typically is six percent or more. In addition to Internet access and dedicated work space, incubator firms receive in-depth mentoring and the opportunity to pitch their businesses to angel investors at "investor demo days." As of October 2015, the Round House owned equity in sixteen startups that were incubated in its facility. One is RecMed First Aid, a company led by a teenager that is developing Red Box-style vending machines to dispense first aid items at amusement parks and other recreational areas. A prototype is being built by the same company that makes Red Box machines. In late 2015, Inc. Magazine named Rec Med's founder as one of twenty "teenage entrepreneurs set for success."[1]

Accelerator firms travel from other parts of the country to visit the Round House for a 90-day immersion training program. The goal is for these firms to advance their ideas much more quickly in a short period of time than would normally be possible. Accelerator firms give the Round House two percent equity in exchange for participating in the program. These firms can receive additional funding from angel investors, including a bonus level of funding if they decide to relocate to Opelika. The accelerator program has been dubbed "Locomotive" in order to reinforce the Round House's railroad theme and to reflect the goal of moving fast and powerfully.

From a financial perspective, each of the CIAs plays an important role in the Round House's plan for making profits. One goal is to generate enough revenues from co-workers to cover the Round House's rent and utilities. This would remove any temptation to prematurely

1 http://www.inc.com/drew-hendricks/20-teenage-entrepreneurs-set-for-success.html

exit any of the incubator and accelerator firms in order to have adequate cash flow. Not every incubator and accelerator firm will be successful, of course, but the aim is that enough of them will do well that the Round House will have a stream of new capital to support future startups, and the Round House's owners will receive a return on their investment.

GOVERNANCE, CULTURE, AND STRUCTURE

The Round House is organized as a limited liability company. The articles of incorporation vest full authority for day-to-day decision making with Sandler. Shares in the Round House were sold at a $1 million valuation which allowed people of modest means to take a stake. Sandler owns the biggest stake, but he is not a majority owner. This provides other owners with assurance that no one individual can make high-stakes decisions such as whether to accept an offer to purchase the Round House.

Six business professors – four from Auburn University, one from Samford University (located roughly 100 miles north in Birmingham, Alabama), and one from out of state – collectively own just under one-half of the shares. Enlisting these professors provides Sandler with Ph.D.-caliber advice, offers a pool of credentialed instructors for the accelerator program, and confers legitimacy to the Round House with the public at large, many of whom are unfamiliar with the world of startups.

Ties with Auburn University have been important since the Round House's inception. Sandler serves as a mentor for student teams entered into the "Tiger Cage" – a business plan competition inspired by the television show "Shark Tank." Of twenty teams that started the 2014 competition, Sandler mentored eight. When the field was trimmed to ten semi-finalists, all eight of these teams remained. Of the four finalists, three were Sandler's mentees. After the competition ended, one of these teams, SimplyProse.com, quickly moved into the incubator. In August 2015, SimplyProse.com won $40,000 in a statewide startup competition called Alabama Launchpad. A month later, the company's student founders showcased their company at TechCrunch Disrupt, a leading startup conference in Silicon Valley. SimplyProse.com is believed to be the first ever Alabama-based startup to participate in this prestigious and highly competitive gathering.

Meanwhile, the connection with Samford provides the Round House with a foothold in Birmingham, Alabama. This is valuable because that city has an active startup culture – especially medical startups emanating from the University of Alabama at Birmingham's nationally ranked research hospital – as well as an active venture capital community.

Locating the Round House in a train depot helped create a strong startup culture. The depot was built in 1922, and it has a very industrial feel that fits well with the creative thinking that underlies startups. By February 2015, the Round House had outgrown its space in the train depot and moved into a former antique mall a few blocks away. The new location offers a great deal more space. A portion of the space has been segmented into rooms with facades that look like individual houses along a small town street in order to accommodate different antique vendors. These areas can be readily converted into attractive offices for incubator firms. One challenge was that the facility lacked the industrial funkiness of the original location. In response, Sandler commissioned a giant railroad-themed mural just inside the Round House's front door.

Other elements of the Round House culture drew heavily from Sandler's experience at Google. One of the 'houses' was converted to a game room that offers foosball, video games, and comfortable seating. Free snacks and energy drinks are provided to fuel creative juices. A DJ booth was installed for social events and for when Round House members need to enjoy some musical recreation.

Structurally, the Round House has just two full-time employees: Sandler (who does not collect a salary) and his managerial assistant, Emily Baas. Because many of the Round House's startups are technology-based, a large group of software developers is needed. The Round House shares a pool of developers with Future Tense Central (FTC), a cybersecurity firm that occupies the largest office within the Round House. FTC is owned primarily by anti-virus software pioneer John McAfee and his partner Tom Gusinski. The two firms are intertwined in other ways as well. The Round House owns a small stake in FTC. Sandler

performs marketing for FTC, and Gusinski acts as chief operating officer for the Round House. The two firms also co-own a third firm that is devoted to online identity protection, Autonomous Armour.

IMPLICATIONS FOR ORGANIZATIONAL DESIGNERS

One takeaway message from the Round House case for organizational designers is to build multi-organization arrangements around a theme. Although not every startup housed at the Round House is high technology-based, most of them are. This theme fits well with Sandler's background at Google and with the presence of very fast Internet access, thereby increasing the Round House's chances of success. Building around a theme also creates better possibilities for synergy among the startups and fosters a more distinctive identity. One example of high-tech based synergy at the Round House is that SimplyProse's website was created by the pool of developers that are shared by the Round House and FTC. The website might never have been created otherwise given that SimplyProse's founders do not have the needed technical skills to create a sophisticated website or the resources to outsource the work at market rates.

A second takeaway is that deciding what not to do is as important as deciding what to do, especially for nascent organizations that lack slack resources. Indeed, sometimes traps appear in the form of apparent opportunities. The building that currently houses the Round House was once a Woolworth's department store. The remnants of that store's lunch counter remain in place and are a connection to Opelika's history. In mid-2015, a local ice cream startup approached the Round House about re-opening the lunch counter as an ice cream parlor. This was appealing on the surface in that it would leverage the building's history and would bring people to the Round House that would not otherwise visit. However, deeper consideration revealed that the noise created by the ice cream operation's customers would be a disruption to the startups. Moreover, an influx of ice cream customers would present a security threat because the entrepreneurs routinely left expensive computers and tablets unattended. In the end, the likely risks of hosting the ice cream parlor far outweighed its potential rewards. It is tempting for fledgling organizations such as the Round House to embrace every revenue-generating opportunity that comes along, but the likely result of such an approach is a diluted focus. This implication is related to the first one in that an ice cream parlor would not be consistent with the high-tech theme around which the Round House is built.

A third takeaway is that organizational designers must effectively exploit the assets that they have available in their location. They can do so by being mindful of the concept of bricolage, which refers to creating by leveraging whatever is at hand. The concept comes from the art world wherein skilled sculptors take materials that the layperson might consider to be junk and turn the materials into meaningful and evocative sculptures. Instead of lamenting the absence of many factors that would be found in big cities, such as ample venture capital, Kyle Sandler built the Round House by leveraging what is available — his own contacts, the 1 gig Internet speed, business school faculty, and the proximity of a major research university. Had Sandler focused on gaining what he lacked rather than on leveraging what he had, the Round House would never have been launched.

UPCOMING CHALLENGES

This case began by positing two questions: Can startup factories operate successfully in areas that lack the traditional support systems offered in big cities? If so, what organizational factors might facilitate this success? To date, the Round House Startup Factory has been successful even though its small town location lacks many of the advantages that fuel Silicon Valley success stories, such as easy access to ample investment capital and large entrepreneurial firms. The Round House has leveraged its founder's background and connections, a diversified business model, the availability of 1 gigabyte per second Internet speed, and connections to nearby Auburn University in order to effectively create, house, and nurture startups.

The Round House example suggests that startup factories can succeed in other non-traditional locations. The mix of organizational factors that can be leveraged will no doubt vary by location. However, some combination of highly motivated and skilled people, physical infrastructure, a sound business model, and allied organizations certainly are important.

As with any new organization form, daunting challenges will arise for startup factories. In the case of the Round House, Kyle Sandler's status as a strategic resource (one that is valuable, rare, and difficult to substitute for or copy) provides significant value to the Round House, but also is a source of vulnerability. An entrepreneurial venture should be able to survive the loss of its founder. Sandler is just 39 years old and highly committed to the Round House, but if he were to disappear for some reason, the Round House would struggle. One implication is that Sandler should groom an heir apparent. Doing so is time consuming, however, and Sandler already devotes most of his waking hours to mentoring startups. Meanwhile, Opelika's 1 gig Internet provides the Round House and other local businesses with a temporary advantage over other locations, but this window of opportunity needs to be exploited before it closes. This places additional pressure on Sandler to develop his startup factory quickly and to constantly stay attuned to the mix of resources needed to sustain it.

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HOW TO GET THE MATRIX ORGANIZATION TO WORK

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Abstract: Many organizations, both public and private, are changing their structure to a complex matrix in order to meet the growing complexity in the world in which they operate. Often, those organizations struggle to obtain the benefits of a matrix organization. In this article, we discuss how to get a matrix to work, taking a multi-contingency perspective. We translate the matrix concept for designers and managers who are considering a matrix organization and argue that three factors are critical for its success: (1) *Strong purpose*: Only choose the matrix structure if there are strong reasons for doing so, (2) *Alignment among contingencies*: A matrix can only be successful if key contingencies are aligned with the matrix's purpose, and (3) *Management of junctions*: The success of a matrix depends on how well activities at the junctions of the matrix are managed.

Keywords: Matrix organization, matrix structure, contingency theory, organization design, junctions

More and more organizations are changing their organizational structure to a matrix, or structures that have matrix elements, and this is expected to continue in the future (Galbraith, 2012). Microsoft, for example, is changing from a divisional structure to a matrix structure. Microsoft introduced the matrix to integrate its product platforms so that Microsoft services and the new Windows 10 can run across all platforms (Burton, Obel, & Håkonsson, 2015). Within healthcare, many hospitals are changing from a traditional functional organization based on medical specialties to a more patient-centered matrix organization (Axelsson et al., 2014). Because of changes in Danish municipalities in 2007, Medtronic found that hospitals were no longer its customer. Purchasing moved to regional purchasing offices. The regional purchasing offices bought supplies for all hospitals and disciplines within a region, creating a mismatch with Medtronic's business unit organization. This forced Medtronic to change its country structure to a matrix-like cross-functional structure to fit the new environment.

An increase in environmental complexity and uncertainty drives the need for the matrix and its complexity. The introduction of a matrix structure thus follows the Law of Requisite Variety (Ashby, 1956): complexity in the environment must be matched with complexity in the organization's design. Matrix organizations are usually chosen for strategic reasons, but the matrix strongly affects individuals and teams working in the matrix, as information flow and decision-making are different in a matrix configuration compared to a traditional hierarchical organization. Many organizations that have moved to a matrix structure have found that they were not able to obtain the benefits anticipated from the matrix structure (Malloy, 2012). Ford and Randolph (1992: 290), in their review article on matrix organizations, concluded: "An organization simply cannot plug a matrix into its existing structure and expect success. Matrix structures should be uniquely developed for a particular application in a particular organization…There is also evidence to suggest that there are contingencies based on the structural, system, behavioral and cultural context of the organization in general and the matrix structures in particular, which have positive and negative influences on the effectiveness of the cross-functional structure."

In this article, we examine the benefits and challenges of designing and managing a matrix organization, using the multi-contingency theory of organizational design as our analytical framework (Burton et al., 2015). We discuss three factors that are critical to matrix success:

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(1) having strong reasons for choosing a matrix structure, (2) aligning key contingencies with the matrix and its purpose, and (3) carefully managing the junctions at which dimensions of the matrix come together.

MATRIX CONFIGURATION

The basic matrix configuration is a cross-functional organization with product/service/customer and functional dimensions. There is a functional hierarchy and a divisional/project hierarchy for the same organization (see Figure 1). The matrix configuration has many two-dimensional names in practice: function and product, function and project, specialty and customer, product and customer, product and region or country, technology and product – to name a few. There are three-dimensional matrices, as many multinational firms have function, product, and country or regional dimensions. Procter & Gamble has a four-dimensional matrix of global functions, global business units, regional products, and global customers (Galbraith, 2008).

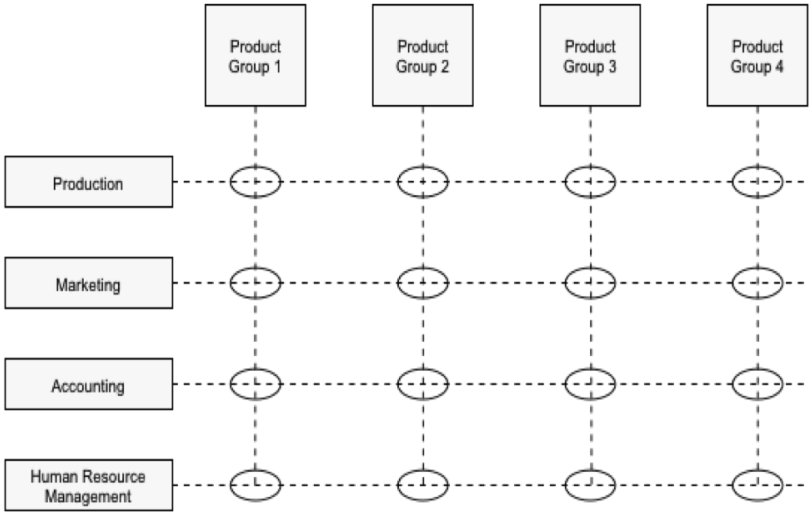

Fig. 1. The Matrix Configuration (Source: Burton, Obel, & Håkonsson, 2015)

A three-dimensional or international matrix organization has been called a transnational organization (Bartlett & Ghoshal, 1998), suggesting that there has to be a balance among all the dimensions of a matrix. Unilever, Procter & Gamble, and NEC are examples of companies that have adopted transnational designs (Bartlett & Ghoshal, 1998). Consider the detergent business within Unilever. Research and product development activities are located based on optimal sourcing. Basic research facilities are located in the U.S. and Europe, in centers close to universities or where there are many chemists and chemical engineers. Product development groups, on the other hand, are located close to the business units they serve, wherever that may be in the world. There are manufacturing facilities in Asia and Latin America, where natural resources are available and labor costs are relatively low, but sales, distribution, and service operations are localized, in some cases by country or even a region within a country, to respond to the needs of particular customer groups.

How many dimensions can a matrix have? IBM has a six-dimensional matrix which seems to work successfully (Galbraith, 2008). The big Swedish-Swiss multinational firm ABB at one time had a matrix configuration where there were over 100 separate SBUs along one dimension. ABB used an additional middle level of management in the matrix to support the complexity of the interdependencies that had to be coordinated. Still, the ABB matrix was too complex to manage and was eventually dismantled and replaced with a simpler configuration. It is easy to see that the number of junctions in a matrix grows non-linearly with the number of products and functions. So, in ABB's case, the limit was reached.

The matrix configuration requires simultaneous coordination of the functional specialties across the projects, products, services, and/or customers in the firm's domain (see the circled junction points in Figure 1). Contrary to a divisional organization and to some extent the

functional organization, everything is connected in a matrix organization. A matrix can be flexible, processing new information and adjusting to new situations quickly in order to utilize limited resources to meet firm priorities. A matrix can also transmit best practices from one division to another through the functional junction. In general, a matrix organization can handle much more information than other organizational configurations. The advantage is that the matrix can realize both the efficiency of the functional form and the effectiveness of the divisional form.

When a matrix organization works well, both efficiency and effectiveness result. However, when the matrix is not well set up or managed, it can be neither efficient nor effective. The main challenges of managing a matrix include reconciling conflicts between the lateral and vertical subunits, information overload, excessive planning and resource allocation meetings, and decision delay (Galbraith, 2008). The matrix configuration requires managerial skills that include a focus on the entire firm as well as one's own function or division, the acceptance of uncertain environments, and the willingness to consider complicated tradeoffs and negotiate realistic solutions with a focus on results. These benefits must exceed the additional costs of control and coordination if the matrix is to be justified as an alternative to the functional or divisional configurations.

For individuals and teams, many things are challenging at the cross-functional junction points: too much information or lack of correct information; heavy workloads; conflicting goals and superiors; time orientation differences; incentives incompatibility; and so on. Additionally, if a problem occurs at any junction point, it has the potential to spread throughout the organization. When there is a change in the timing of an activity at a junction, it may ripple across multiple functions and product groups – called the "jello effect" (Burton et al., 2015: 83).

NEED FOR A STRONG PURPOSE

The matrix organization is complex, costly, and difficult to manage. One should choose the matrix only if there is a strong need for and potential benefit from such an organizational arrangement (Davis & Lawrence, 1977; Ford & Randolph, 1992). Following the multi-contingency model of Burton et al. (2015), the main reasons for implementing a matrix organization involve the organization's goals, strategy, and environment.

With a dual goal of focusing on both efficiency and effectiveness, the matrix configuration is an appropriate choice. In most cases, efficiency and effectiveness are needed when the environment is unpredictable and complex. In a turbulent and complex environment, the ability to both explore new things and exploit current resources and capabilities is important (March, 1991). Some firms are good at being quick followers by observing what other firms do successfully and then moving quickly to do the same (or something very similar). Exploration may go beyond just looking at what others do, and instead involves surveying technologies and markets more widely to identify opportunities that can be developed into new products and services. Some firms have a market-driven approach to innovation as they look at market or customer needs and then try to innovate to meet those needs. They may limit themselves to markets they know well, or they may look for new markets. Other firms take a technology-driven strategy in which they invest in promising technologies in order to capitalize on radically new products. With a matrix organization, you can combine the two strategic approaches. To have a dual focus on defending your firm's position in its markets while at the same time innovating with new products and services is a difficult balance requiring organizational capability and managerial expertise.

One significant environmental driver for a matrix organization is when internal silos become an obstacle to deal with environmental change and complexity. The cases of Microsoft and Medtronic mentioned above are good examples. For both Medtronic and Microsoft, the purpose of the matrix has to pervade the organization. The idea of Windows 10 has to be known to the sales and marketing people, to the development group, and to all management levels. If it is just a management exercise, it will not work. In hospitals moving to a patient-centered organization, a matrix is often the solution. If nurses and doctors still think that they are working within a narrow specialty, however, the benefits of the matrix do not come through

– just the costs (Moellekaer et al., 2014). Burton et al. (2015) describe the case of Aarhus University. It changed from a divisional structure to a matrix structure with the purpose of strengthening interdisciplinary teaching and research, using a top-down decision process. The purpose of the matrix met the demands of the environment, but its potential benefits were not adequately explained below the level of the deans. There was some success with respect to interdisciplinary research, but the idea of interdisciplinary teaching programs never took off, mainly because the old disciplinary silos were too dominant. Aarhus University has now returned to its previous divisional structure.

A strong purpose is a necessary condition for the success of a matrix configuration. The benefits of enhanced coordination must outweigh the extra costs of additional skilled managers in a more complex set of organizational contingencies.

ALIGNMENT AMONG CONTINGENCIES

Multi-contingency theory states that to obtain a well-functioning organization design, there has to be an alignment or fit among 13 contingencies (Burton et al., 2015). Earlier, Håkonsson et al. (2012) found that fit is more important in uncertain environments than in stable environments. A matrix organization is needed only if the environment is uncertain. Thus, once a matrix configuration is chosen there are a number of design elements specified in the multi-contingency model that have to be aligned with the matrix (Burton et al., 2015). A successful matrix goes beyond the configuration itself: the matrix requires its own leadership, culture, knowledge sharing, information technology, and incentives. We discuss those alignments below.

In designing a matrix structure, you create close inter-relationships among the activities in the organization. You must invest in ways to coordinate work among repetitive tasks and at the same time support the non-repetitive work of other tasks. We call this workflow "knotty" (Burton et al., 2015). Knotty task design requires a focus on divisibility and repetitiveness. This approach to task design encourages those responsible for subtasks to develop innovative ways to do their work, accommodating the unique demands of each customer, while at the same time integrating their work with other units in the firm, often following overall organizational standards. Knotty tasks are likely to lead to the greatest customer satisfaction since production is customized as well as being efficient due to overall company use of best practices. However, a knotty task design is the most demanding type of workflow to manage. Given a non-repetitive approach to some tasks, the information-processing demands increase greatly. To bring those demands to a manageable level, repetitive tasks have to be routinized.

The matrix organization requires "producer" leaders (Burton et al., 2015), individuals who are able to delegate and who have a tolerance for uncertainty. Top management cannot direct the entire organization and must rely heavily upon the functional and divisional managers in the matrix for detailed, ongoing coordination adjustments in order to meet the firm's priorities. Yet, the top executives must set priorities, resolve differences among the subunits, and generally oversee the firm. Hence, effective management of a matrix requires that managers can manage around at least two dimensions simultaneously. Top management needs to know what is going on and assign work to others, but it does not need to make every decision the organization confronts. The matrix organization has both a "high-tension" and "high-readiness to change" climate that we call a "rational goal climate" (Burton et al., 2015). In a high-tension climate, employees must have adequate resources to deal with change, and their attitude must be open to change. Individuals are a bit on edge as tension is high, but it cannot be allowed to become so high that it becomes detrimental to performance. In fact, tension helps to drive performance as people deal with fluctuations in trust and conflict. People are willing to change and accept new challenges and opportunities if they believe goals can be met. They need to know and understand the purpose of the matrix organization. The rational goal climate is a very competitive environment to work in. It is also to be expected that individuals who do not like such a competitive climate will choose to leave the matrix (Burton et al., 2015). With high-readiness to change, reorganization of personnel can be expected, with tough competition for matrix jobs. The organization must work hard to keep people who are skilled at operating in a matrix.

Knowledge development and sharing is a key contingency in the matrix structure. Interpersonal relationships are critical to knowledge sharing in a matrix. A "relationship-driven" approach to information and knowledge systems design emphasizes capture, processing, and transfer of data that is embedded in the links, or relationships, between people and data. Relationship-driven systems integrate hard (codifiable) data with soft (interpretational) data to yield rich results for organizational decision-making. A relationship-driven knowledge management system would be nearly impossible to create without the use of modern information technology. Information technology is used to link units in multiple directions, not just vertically or horizontally (Boudreau et al., 1998). In this way, the relationship-driven system does not get out of control, creating information overload. Instead, ties are formed and managed intelligently, putting knowledge exchange when and where it is needed (Hansen & Nohria, 2004; Vestring, Rouse, & Rovit, 2004). One well-developed relationship-driven system is called customer relationship management (CRM). CRM systems capture large amounts of quantifiable data about customers but also provide interactive capabilities so that two salespeople, for example, can exchange unstructured observations or comments about their experiences and implications for meeting new customer needs. Videoconferences in which physicians can talk to one another at a distance while both view and interact with a patient's MRI or CT images, is another example of relationship-driven systems. Physicians may add comments or suggestions to the medical record that are then visible, along with the more quantifiable data, later on in the patient-care process.

Profit or gain sharing has to be a significant part of an incentive system in a matrix organization. Profit/gain sharing is group-based, either among a group of individuals or a collection of subunits (Park, Appelbaum, & Kruse, 2010). The basic idea is that people are rewarded on the basis of effective collaboration with others to yield high performance by the group. Profit/gain sharing gives a share in the gains or profits (revenue less costs) to all members of the unit. To estimate the gain, the organization's performance is compared to a budgeted performance. Employees will earn a bonus if there is a gain. Measures are typically based on operational measures (e.g., productivity, spending, quality, customer service). The idea behind a profit-sharing incentive system is that it should enhance group performance in a developmental mode where it is not possible to anticipate or control the actual outcome by controlling behavior. For a gain-sharing scheme to work, people should feel that individual performance can make a difference for the group outcome. The task itself must depend upon the joint efforts of everyone in the target group.

The smaller the target group, the more likely the gain-sharing scheme will have the anticipated effect. If the firm is large, then profit sharing based on the total outcome of the organization is less likely to be effective, since individuals cannot see the effect of their efforts on the organization's performance. A free rider problem can result, with some people relying on the skills and effectiveness of others to carry the group to success. On the other hand, the profit/gain sharing approach can be very effective if people believe their contributions to group efforts "matter," so they are committed to working together with colleagues, and they view the incentive scheme to be fair. Continental Airlines in 1995 introduced a bonus-based incentive plan for all of its 35,000 employees if the company met its overall company goal. The incentive plan, despite the potential free rider issue, did increase individual and company performance (Knez & Simester, 2001). Many matrix organizations fail because the incentive system does not support the complexity of the matrix. In a survey of 279 members of six large companies, Sy, Beach, and D'Annunzio (2005) found that the top five problems in the matrix structure were: (1) misaligned goals, (2) unclear roles and responsibilities, (3) ambiguous authority, (4) lack of a matrix guardian, and (5) silo-focused employees – all of which relates to how employees and managers are evaluated.

MANAGEMENT OF JUNCTIONS

A junction is the intersection of a row and a column (see Figure 1). In the matrix design, we create the junctions; at each junction we manage the detailed matrix processes. As discussed above, the design of the functional and project/product dimensions are driven by the purpose and the potential benefits. At each junction, the individual sees both the product dimension

and the functional dimension. The product dimension focuses on the effectiveness of getting a high-quality product or service to the consumer or client; the functional dimension focuses on the efficiency of using the firm's resources. As we argued above, the matrix challenge is to manage both dimensions simultaneously to obtain both effectiveness and efficiency in a timely fashion.

In the daily life of a matrix organization, it is "what is happening" at the junction points that will make or break the organization. At a junction point, the individual experiences multiple bosses, conflicting goals, and work overload. But, it is also at the junction points that the benefits of the matrix are realized in terms of efficiency and effectiveness (Levinthal & Workiewicz, 2015). The idea is that the matrix should have higher information-processing capacity and easier ways to share information. Figure 1 illustrates how that may work. If in one product or production group a best practice is realized, then there is a communication path from that product group to the production function. If the production function works well, that will enable the best practice to be used in all product groups. The best practice is transferred through the junction point between one product group to production and then from there to all the junction points between production and the other product groups. If the best practice is implemented as a standard across the product groups, it is easier to monitor activities, training will become more efficient, and re-allocation of individuals from one product group to another will be easier and less stressful.

What are the conditions for success? First, the best practice should be communicated to production. The specific communication channel has to exist. It could be done by setting up meetings between the production people working in the various product groups. It could be face-to- face or via IT-systems that enable and facilitate the transfer of knowledge. However, there must be a willingness to transfer the knowledge. Transfers take time and incur costs. The transfer may make the other product groups better, and if resources are allocated to the product groups based on their performance, the willingness to share knowledge may be low. Such situations may bring the individuals working at the junction point into a conflict where the two bosses that the individual reports to have different goals and incentives, thus demanding different responses. At each junction point, it should be clear who makes which decisions.

The incentive system should support the activities at the junction points. At the junction, the incentives affect the trade offs between effectiveness and efficiency and how to handle variations. The functional manager has incentives to be efficient, explicitly keeping costs within budget and keeping to plans and schedules. The product manager has effectiveness incentives to deliver high-quality products or services to a customer or client, on time. Time affects the efficiency-effectiveness trade off, where the functional manager is more sensitive to "get things done quickly" and the product manager is more concerned with "getting things right" rather than just getting them done. Realizing the information in a timely fashion permits the manager to alert others that a variation from the plan has occurred; this is a first level of information. Second, alerting others to the magnitude of the variation and its effect on others requires much more information and an understanding of not only the variation at the junction, but its cascading effect throughout the firm. Managers at the junction can be reluctant to sound the alarm of a variation in a timely fashion, which can be a costly error. The opportunity losses from poor coordination across functions and products can be large as deadlines are missed not only within the matrix but also for customers and clients (the jello effect). Some variations will not ripple beyond the junction itself; at the other extreme, some variations will affect all junction points (i.e., the whole matrix and beyond). Of course, most variations will fall between these two extremes: the greater the connectedness, the greater the required coordination, and the greater the jello effect.

The matrix managers at the junction want both effectiveness and efficiency but are caught in the middle of this potential conflict. The resolution of such conflict involves more than time and cost and includes skills in negotiation and managing emotions (Håkonsson et al., 2008). If conflict management requires regular involvement by top executives, a major advantage of the matrix has been lost. The telltale signs of a matrix in trouble are overload of decisions at the top as the managers are not able to solve problems; problems are not dealt with at all and opportunities are lost; budgets are exceeded; operations are not coordinated;

resource utilization is lost or inefficient; employees are unhappy and confused; subunits are spending excessive time on coordinating with other subunits to the detriment of subunit performance; and opportunities are lost. Taken together, decision-making can be difficult to realize – particularly in a timely fashion – resulting in opportunity losses in implementation (Nissen, 2014; Nissen & Burton, 2011).

There are various strategies for the matrix manager to mediate a solution that is acceptable to both the functional and product manager, but not preferred by either one. One approach is to appeal to higher-level goals which both can support (e.g., the total firm and its profits). Here, the functional manager must be reminded that poor quality is not in the firm's interest; the product manager needs to understand that the higher costs compromise profits. Even with these understandings, the functional and product managers may not agree on the solution.

Besides the incentives and the negotiation process, the firm's climate is not a zero-sum climate where individuals either win or lose on every issue every time. Yet, as discussed earlier, this climate incorporates some tension and readiness to change as a norm. The matrix manager has the challenge of using the tension for the good of the firm where the readiness to change is an asset. That is, the variation with a readiness for change can provide a platform for larger needed change than just solving the problem of the moment. Another approach is to develop an incentive system that does not generate conflict and require compromise. Appelbaum, Nadeau, and Cyr (2008a,b; 2009) found that "employee and management buy in and support of an evaluation system and its goals are crucial to the success of the program."

The matrix manager at the junction requires leadership skills in dealing with uncertainty and ambiguity, sorting out and quickly understanding large-scale data and its implications for decision-making, understanding the bigger picture to enhance total firm profits, negotiating among individuals who have different incentives, understanding the organizational culture, and managing emotions.

CONCLUSION

The matrix can be an efficient and effective configuration, but it should only be used if there is a strong purpose and that purpose can penetrate the whole organization. A matrix can only be successful if a number of important contingencies – climate, leadership, knowledge sharing, information technology, incentives, etc. – are correctly designed and aligned with one another. At the junction level, the success of a matrix depends how you design and manage the activities at the many junction points in the matrix organization. A detailed design of the decision-making process at each junction point is required for a successful matrix organization.

A critical part of making a matrix organization work is that the individuals and teams who work in the matrix understand why a matrix organization was selected. Individuals implement, manage, and run the matrix. If they do not understand the reason for choosing the matrix, they do not have the rationale to deal with conflicting goals, conflicting bosses, time orientation differences, incentives incompatibility, and so on. To manage junction points in a matrix requires a strong understanding and acceptance of the purpose of the matrix by everyone.

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INTERVIEW WITH PROFESSOR GEORGE HUBER

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Professor George Huber holds the Charles and Elizabeth Prothro Regents Chair Emeritus in Business Administration at the University of Texas at Austin. He is a founding member of the Organizational Design Community. He is a Fellow of the Academy of Management and of the Decision Sciences Institute. He is the recipient of multiple international awards for his research contributions.

The interview focuses on Professor Huber's research journey. He explains how he has managed to stay focused while working in many fields, and how his experience in non-academic environments is reflected in his academic thinking. He also explains what moved him into the field of organization design and what he sees as the major challenges for organization design research in the future.

STAYING FOCUSED WHILE WORKING IN MANY FIELDS

The intensity of Huber's research focus is attributable to three factors. First, like almost all researchers, he's curious. Second, and most important, he gets emotionally engaged when he sees an unrecognized threat or important unaddressed issue in the literature. This tendency has been a driving force in his career. Third, he is a problem solving person by nature, as manifested also in his previous occupations as an engineer and as a production manager.

Working in a variety of fields is an unintended consequence of encountering a variety of situations. Besides perceiving interesting problems in other fields and moving towards them, he offered descriptions of three other situations. Sometimes those were situations where he felt that the important issues in the field, and that he was qualified to address, had been effectively addressed. Sometimes they were situations where he felt that, in that field, he'd said all that he wanted to say. Sometimes the situations were ones where he felt that the young researchers moving into the field were more qualified than he, and that he'd be more successful elsewhere.

USING HIS EXPERIENCE FROM NON-ACADEMIC ENVIRONMENTS TO STRENGTHEN HIS SCHOLARLY WORK

Professor Huber used two articles to explain how his non-academic experience[1] has been reflected in his scholarly work. One is his article on the use of cognitive style as a basis for designing management information systems and decision support systems, an article that truncated a very active stream of research.[2] In writing this article, Huber drew on his experience in designing decision-support systems, as well as his research in behavioral decision theory, to argue that the field's then-extensive research focus on cognitive style had not made and would not make significant contributions to the practice of designing MIS and DSS.

Another article drew on his industrial experience to call attention to the fact that it was problematic for designers of knowledge management systems to focus so heavily on

1 Huber has held full-time positions as a mechanical engineer, production manager, and software designer, and has served as a consultant to many corporations and public agencies, including the Boston Consulting Group, Army Research Institute, National Academy of Sciences, and the U.S. Department of Labor.

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hardware and software and the 'inventory' of knowledge at the expense of considering how to get people to contribute their knowledge to the organization's knowledge management system and how to deal with the valuable resources of 'sticky' knowledge.[3]

MOVING INTO THE FIELD OF ORGANIZATION DESIGN

Huber explains that his work in organization design followed from what he saw as important, but overlooked, issues in that field. He highlights four articles in which he has addressed these unrecognized shortcomings in the organization design literature. One article addresses the issue of the lack of understanding about the rate of change in organizational environments and how surviving organizations would respond to this change.[4] In this article, he articulated the need for continually responding to ever-more frequent and novel change-inducing threats and opportunities.

Another article addresses the matter of how organizations should integrate advanced information technology into their decision-making processes and organization structures.[5] In this article, he articulated information technology as a determinant of organization design and developed 14 propositions that described how advanced information technologies would impact design.

Huber's paper on organizational learning was an attempt to map the field of organizational learning broadly, in order to curtail the then-evolving definition of organizational learning as intentional trial-and-error learning in organizations.[6] This article was both a tutorial and a critique.

Finally, Huber and his co-authors published a research paper on fit, equifinality, and organizational effectiveness that addressed the absence in the literature of a large-scale and longitudinal study that compared the effectiveness of multiple prominent theories, relating the fit between structure and environment to organizational performance.[7] Specifically, it compared the effectiveness of Miles and Snow's defender, analyzer, prospector model[8] with Mintzberg's five structures model[9] as bases for designing organizations.

CHALLENGES FOR ORGANIZATION DESIGN RESEARCH IN THE FUTURE

According to Huber, there are two major challenges for organization design in the future. One is widely recognized. It is to design organizational mechanisms that enable very rapid adaptation to changes in the organization's environment. The second relates to properly exploiting cognitive computing in organizations. Cognitive computing is the development and use of computers in a human-machine system where the computer is the lead entity. Simply put, the computer identifies organizational problems, comes to understand them, generates solutions, and instructs humans in how to enact the solutions.

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RESUME OF INTERVIEW WITH RON NICOL, BOSTON CONSULTING GROUP

JOHN JOSEPH

In this interview, Ron Nicol, Senior Partner and Managing Director at BCG and John Joseph, Assistant Professor of Strategy at the University of California-Irvine, discuss BCG's approach to organizational design known as "delayering." Delayering is the process by which the layers and levels in the organization are reduced and aligned so as to provide better decision making and reduce costs. As Nicol discusses, delayering is a multi-step process based on two key concepts: the geometric nature of organizational structure and LeChatelier's Principle. Key success factors include CEO involvement, participation at multiple levels of the organization, and adherence to a carefully crafted set of design principles. Nicol also discusses the optimal structure for Fortune 500 companies and their international equivalents.

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