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**BUSINESS MODEL INNOVATION AND STRATEGIC FLEXIBILITY: A STUDY OF THE
EFFECTS OF INFORMAL AND FORMAL ORGANIZATION**

ADAM J. BOCK
IMPERIAL COLLEGE LONDON
Business School,
South Kensington,
London SW7 2AZ
+ 44 20 7594 1438
adam.bock07@imperial.ac.uk

TORÉ OPSAHL
IMPERIAL COLLEGE LONDON
+44 20 7594 3035
t.opsahl@imperial.ac.uk

GERARD GEORGE
IMPERIAL COLLEGE LONDON
+44 20 7594 1876
g.george@imperial.ac.uk

Corresponding Author: Gerard George

BUSINESS MODEL INNOVATION AND STRATEGIC FLEXIBILITY: A STUDY OF THE EFFECTS OF INFORMAL AND FORMAL ORGANIZATION

Business model innovation is often discussed in tandem with structural change that allows the firm to adapt to disruptive technological and product market environments. Using structured interviews with CEOs of 556 large firms, this study examines how organizations achieve strategic flexibility by enacting business model innovation. While executives find that an innovation-oriented culture enhances strategic flexibility, inter-organizational dependence is perceived as constraining it. Further, changes in formal organizational structure can be unpacked into those activities that focus managerial attention on core activities and those that reconfigure existing activities. The implications of these findings for the theory and practice of organizational design, business model innovation, and strategic flexibility are discussed.

Organizations aspire to achieve strategic flexibility, a term often used by executives to refer to a firm's capability to be responsive to its external environment (Hamel and Prahalad, 1994; Sull, 2009). Strategic flexibility has been defined in the literature as an organization's capability to identify major changes in the external environment, to quickly commit resources to new courses of action, and to act promptly when it is time to halt or reverse such resource commitments (Shimizu and Hitt, 2004). While organizational adaptation to its competitive environment has attracted attention from several theoretical perspectives, recent paradigms attribute the success of such adaptation to a firm's capabilities (e.g., Eisenhardt and Martin, 2000; Lavie, 2006; Nelson and Winter, 1982) and its structural design (e.g., Ethiraj, Levinthal and Roy, 2008; Sanchez and Mahoney, 1996; Puranam, Singh and Zollo, 2006). These literatures have evolved independently but rely on the central premise that organizational structures affect the firm's capacity to respond to the complexity of its environment, or as managers refer, to be flexible.

Organizations can achieve strategic flexibility through renewal and structural change (Burgelman, 1983). Practice-oriented literature has expressed enthusiasm for business model innovation as a mechanism for increasing strategic flexibility with extraordinary results (Markides, 2008; Osterwalder, Pigneur and Tucci, 2005). For instance, "11 of the 27 companies born in the last quarter century that grew their way into the *Fortune* 500 in the past 10 years did so through business model innovation" (Johnson, Christensen and Kagermann, 2008). Although managers instinctively understand their business models, academic research refers to business models as the design of organizational structures to enact a commercial opportunity (George and Bock, 2010; Teece, 2010; Amit and Zott, 2001). As few empirical studies have addressed these issues, our study seeks to clarify the relationship between organizational design change and strategic flexibility when firms transform their business models.

We examine the relationship between informal and formal organization (e.g., Gulati and Puranam, 2009) in firms enacting business model innovation and strategic flexibility. Organizational design mirrors the complexity of the firm's competitive environment and the attendant threats and opportunities (Ethiraj and Levinthal, 2004; Gilbert, 2006). First, a core informal organization attribute that influences innovation is its culture (Teece, 1996). A resilient organizational culture that embraces

innovation responds more flexibly by redirecting resources to solve unfamiliar problems (Amabile and Conti, 1999; Amabile and Khaire, 2008; Fiol, 1991; Weick, 1993). Second, firms simplify formal organization design to enhance competitive focus, reduce coordination costs, and accelerate responsiveness. Formal organization changes are often implemented via modifications to existing structures, including spinning-out, partnerships, and outsourcing specific activities (e.g., Prahalad and Hamel, 1990; Siggelkow and Levinthal, 2003; Tiwana, 2008). Despite the current lack of systematic large-scale studies, business model innovation is gaining prominence as an important link between strategy and firm performance (Johnson *et al.*, 2008; Teece, 2010; Zott and Amit, 2008). To address this gap, we analyze a novel, proprietary dataset comprising structured interviews of 556 CEOs from large firms spanning multiple industries and geographies. As business model innovation may be an important mode of structural change linked to strategic flexibility, we explore the underlying mechanisms employed by organizations that improve adaptation to turbulent environments through structure and design changes.

HYPOTHESES

Scholars have examined strategic flexibility from multiple theoretical lenses in industrial economics, innovation, and strategy literatures. For example, Sanchez (1995) applied the resource-based perspective to suggest that strategic flexibility is an organization's "ability to respond to various demands from dynamic competitive environments" and developed a model of product-based competition in which organizations co-evolve opportunities. Harrigan (1980) assessed capital investments and commensurate exit barriers within an industrial economics framework to identify limiters of strategic options. Observations of changes to organizational characteristics following novel technology uptake led to Evans' (1991) typology of strategic flexibility modes based on timing and reactivity.

Recent studies frame strategic flexibility more directly as organizational adaptation. A study of small and midsize Thai firms found that strategic flexibility improves firm response to intense rivalry (Grewal and Tansuhaj, 2001), and as an adaptive capability especially relevant in high velocity industries (Nadkarni and Narayanan, 2007). A product-focused perspective links strategic flexibility attained through product and process modularity to improved firm performance (Worren, Moore and

Cardona 2002). These studies provide evidence that strategic flexibility co-evolves with a complex set of endogenous and exogenous factors in turbulent environments (Ilinitch, D'Aveni and Lewin, 1996).

Since business model innovation is commonly represented as a firm-level process to exploit new opportunities, frameworks that assess strategic flexibility in the context of opportunity identification and exploitation are of particular interest (e.g., Sanchez, 1995). Formal organization plays an important role in this type of strategic exploration (Burgelman, 1983), while characteristics of the opportunities themselves, whether novel or radical, influence the firm's resource commitments (Ettlie, Bridges and O'Keefe, 1984). Despite substantial progress linking innovation to organizational design (e.g., Ethiraj and Levinthal, 2004), few studies assess which informal and formal organization attributes improve strategic flexibility.

We posit that firms engage in business model innovation to gain strategic flexibility by enhancing capabilities to respond to environmental complexity while decreasing formal design complexity. In practice, managers enact business model innovation primarily via adjustments to formal organization. Therefore, we aim to examine the changes that are brought about by business model innovation efforts and their impact on the likelihood of achieving strategic flexibility. Specifically, we argue that organizations manage adaptation to complex environments through business model innovation in three ways: (1) developing an internal culture that is innovation-oriented, (2) implementing formal organization design changes that focus managerial attention, and (3) decreasing inter-organizational dependence or reliance on partners in their business model change efforts.

Informal Organization (Culture) and Strategic Flexibility

Before discussing the impact of formal organization changes on strategic flexibility, it is vital to consider the role of informal organization. We know that work climate and organizational culture jointly influence innovation outcomes (Abbey and Dickson, 1983; Teece, 1996; Tellis, Prabhu, and Chandy, 2009), while creativity, leadership, and an organizational climate for innovation facilitate innovative solutions to competitive threats (Amabile and Khaire, 2008). But resource-based interpretations of business model innovation predominantly focus on how firms leverage tangible resources, such as capabilities, technologies or products (Teece, 2010; Zott and Amit, 2008). We know much less about how

intangible resources, such as managerial cognitive maps, leadership and organizational culture, help firms achieve flexibility (Fiol, 1991; Nadkarni and Narayanan, 2007; Plambeck and Weber, 2009).

Gulati and Puranam (2009) argued that a strong informal organization can compensate for formal organization during re-organization. Culture is the “essence of informal organization” (Teece, 1996), and of particular relevance during framebreaking or radical organizational change evident in business model innovation, especially with regard to value systems that embrace or resist changes to organizational identity (Dutton, Dukerich and Harquail, 1994). Entrenched views of strategic orientation or routines increase resistance to radical change and inhibit change efforts (Fosfuri and Ronde, 2009; Fox-Wolfgramm, Boal, and Hunt, 1998). Since business model innovation challenges the organization to re-organize and renew activities, people and processes tuned to innovation should serve as a valuable lubricant. Firms with a culture that encourages creativity are more likely to embrace change in desired outcomes, intermediary processes, and resource configurations. We expect that an innovation-oriented, creative culture improves strategic flexibility during business model innovation by ensuring that feedback from structural change outcomes is not suppressed by procedures, identity resistance or political coalitions. Therefore, we hypothesize that:

Hypothesis 1: In firms engaging in business model innovation, an innovation-oriented culture will be positively related to whether a firm achieves strategic flexibility.

Formal Organization (Structure) and Strategic Flexibility

The formulation and implementation of strategy depends on formal organization (Chandler, 1962). During business model innovation, firms engage in two main sets of structural design changes. First, firms reconfigure activities that allow for greater focus on their core product or managerial capabilities (Prahalad and Hamel, 1990); and second, firms improve organizational design that enhances efficiency of internal processes and innovation (Puranam *et al.*, 2006; Rothaermel, Hitt and Jobe, 2006). Although changes that increase focus or improve efficiency may overlap, we unpack the underlying drivers to more carefully distinguish between the two sets of internal structural changes.

A reduction in structural design complexity is likely to increase strategic flexibility in two ways. Business model innovation, which improves organizational design by dismantling internal organizational structures and barriers, is likely to reduce structural complexity and its attendant internal coordination costs. Puranam, Singh and Chaudhuri (2009) found that structural integration is necessary when large firms acquire smaller firms and there is a high degree of mutual dependence. Such integration reduces coordination costs and positions firms to be more responsive. Consequently, structural design changes that reduce coordination costs and enhance cooperation among organizational units are more likely to increase firms' ability to respond to changing market needs. Further, changes in organizational design by outsourcing non-core transactive activities can focus managerial attention on solving problems and spotting opportunities arising from changing environments (Ocasio, 1997; Roathermael *et al.*, 2006). Therefore, we expect that formal organization changes that reduce internal design complexity will enhance managerial attention to exogenous change and augment strategic flexibility.

Conversely, during business model innovation, internal structural change that reconfigures an existing set of activities to improve competitive focus rather than managerial attention focus, is likely to decrease strategic flexibility. It is important to differentiate between the effects of competitive focus on performance vis-à-vis strategic flexibility. Whereas competitive focus could improve operational performance at the division, unit, or firm-level (Huckman and Zinner, 2008), it is unlikely to yield flexibility in changing tasks, products, or markets (Kekre and Srinivasan, 1990). If strategic flexibility is the ability to respond to changing environments, then increasing competitive focus through reconfiguration of existing activities is unlikely to improve managerial agility. In a study of 225 firms from 14 industries, Nadkarni and Narayanan (2007) found that managerial cognitive maps that emphasized strategic focus had lower strategic flexibility in high-clockspeed industries. While strategic focus was linked to strategic persistence, its effects were beneficial only in less dynamic industries. Consequently, we would expect that firms enacting business model innovation are responding to radical

threats or opportunities symptomatic of dynamic and turbulent industries, where strategic focus would only hinder strategic flexibility. Therefore, we posit that:

Hypothesis 2a: In firms engaging in business model innovation, internal structural changes that reduce structural design complexity will be positively related to whether a firm achieves strategic flexibility.

Hypothesis 2b: In firms engaging in business model innovation, internal structural changes that emphasize reconfiguration of existing activities will be negatively related to whether a firm achieves strategic flexibility.

Inter-organizational Dependence and Strategic Flexibility

A critical attribute of formal organization is the firm's connectedness to other organizations. Collaboration with external partners represents an important tool for exploration and accessing knowledge. When firms operate in turbulent environments, access to knowledge potentially improves the accuracy of managers' strategic decisions. In fact, exogenous uncertainty tends to increase collaborative activities with similar and familiar partners (Podolny, 1994) and network and collaboration effects generally improve innovation and performance (Gulati and Sytch, 2007; Stuart, 2000). Generally, inter-organizational partnerships are perceived to benefit firm performance.

Nevertheless, structural design changes during business model innovation present a unique context for collaboration. Fundamental change in turbulent environments involve unknown and unforeseeable elements, which suggest that business model innovators "muddle through" progress and adjustment rather than lock-step implementation of explicit change plans. This would reduce the benefits of collaboration because partner-driven asset investment and exploitation of complementarities would be limited by uncertainty and lack of market knowledge specificity (Dyer and Singh, 1998; De Luca and Athuahene-Gima, 2007). The complex and potentially costly alignment of managerial goals and capabilities associated with partner dependence may increase coordination problems that reduce flexibility. Therefore, we expect that:

Hypothesis 3: In firms engaging in business model innovation, inter-organizational dependence will be negatively related to whether a firm achieves strategic flexibility.

DATA AND METHOD

To test these hypotheses, we utilized data from the IBM Global CEO Survey conducted in 2006. The survey respondents were 762 CEOs of primarily large, multinational organizations representing a wide array of industries and countries. The sample is not random; participants are current or potential IBM customers, or organizations of specific innovation interest to IBM. From this sample, we excluded public sector organizations to ensure consistency in reporting organizational outcomes. In addition, we excluded 104 organizations due to missing data. The final sample included 556 organizations from diverse sectors (communications, 15%; financial services, 23%; distribution or other services, 32%; and manufacturers, 29%) and geographies (Americas, 25%; Europe, 36%; Asia and Australia, 39%).

The purpose of the survey was to inform managerial practice of organizational innovation (Giesen *et al.*, 2007). In the first part of the survey design, the interviewees identified the relative importance of three innovation types: product/market, business model, and process/operational. Respondents were then asked detailed questions related only to the highest-priority innovation type. As the survey design uses a self-selection mechanism to capture data specific to innovation processes and outcomes, we applied a two-stage regression model (Heckman, 1979; Shaver, 1998) to test our hypotheses.

Dependent variables

The first stage of the model is a selection model. This stage assesses the drivers that led respondents to select business model innovation as their main innovation type. Specifically, the dependent variable in the first stage model is a binary indicator of whether or not the respondent identified business model innovation as the firm's primary type of innovation effort. We refer to the respondents that did so as business model innovators. In the second stage, we use a binary variable that captures whether or not the interviewee deemed the organization to have achieved strategic flexibility through its business model innovation efforts. In so doing, we are able to examine the associations between the theoretical variables of interest and strategic flexibility for the business model innovators.

Independent variables

Innovative culture. Prior studies have linked elements of informal organizational structure to strategic flexibility in which creativity serves as a complementary capability to strategic planning and selection (Tellis *et al.*, 2009). Since a creative environment is closely linked to innovation generation and adoption, we use the climate of creativity inside an organization as a proxy of its innovative culture. Respondents were asked whether a climate for creativity existed within their organizations on a five-point Likert scale, ranging from “limited” to “very strong”.

Internal structural changes. Business model innovation is new-to-the-firm changes in the design of organizational structures. Formal structural change is a direct mode of adaptation available to managers enacting business model innovation. The survey instrument contained a selection of internal structural change formats, including spin-offs, major project-based contracting, major strategic partnerships, offshore and onshore outsourcing, organizational structural changes, shared services, and use of third-party operating utilities. Binary indicators for each format were selected based on the respondent’s identification of structural initiatives that were adopted as part of the business model innovation effort.

Inter-organizational dependence. Boundary-spanning or transactive structures are an important component of business model analysis (Amit and Zott, 2001) and have been linked to strategic fit and performance outcomes (Zott and Amit, 2007; 2008). Dependence upon partners for innovation resources and processes increases the coordination cost and time of innovation, representing a source of organizational inflexibility. The survey instrument included a question on the importance on collaboration and partnering for driving business model innovation with a five-point Likert scale. The minimum value on the scale identified partnering as “of no importance” and the maximum to “of critical importance”.

Control variables

Discontinuous change. While most firms enact continuous or incremental change (Brown and Eisenhardt, 1997), discontinuous change associated with business model innovation represents one possible endogenous response to exogenous disruptions (Romanelli and Tushman, 1994). We control for perceived need of discontinuous change by a five-point Likert response to a question on the level of effort

needed to implement key elements of innovation strategy, where 1 is “no change” and 5 is “extensive change.”

Prior success with change effort. A possible driver of organizational innovation is prior success of managing fundamental change. We control for this type of learning effect with a question on the success of managing fundamental change in the past with a five-point Likert scale, where 1 is “unsuccessful” and 5 is “very successful.”

CEO formally responsible for business model innovation. Research has demonstrated the links between senior leadership involvement and innovation adoption (Kimberly and Evanisko, 1981) and the role of managerial leadership in structural changes associated with strategic flexibility (Goodstein, Boeker, and Stefan, 1996). To control for the direct oversight of the CEO, we use a binary indicator variable of whether or not the CEO was formally responsible for business model innovation efforts.

Product / Market innovator: The survey design assesses two other types of innovation activities: product innovation, and operational innovation. Although little research has considered resource and activity trade-offs associated with simultaneous innovation initiatives, it seems reasonable to assume that disparities between the more traditional innovation modes could influence business model innovation efforts. To control for this effect, we created a variable measuring the firm’s proportion of non-business model innovation effort associated with product/market innovation. The measure varies from 0, representing no effort directed towards products, services, and market innovation, to 1 representing no effort directed towards operational innovation.

Technological integration. Given IBM’s embedded interest in information technology adoption and utilization, the non-random sample may associate innovation with efforts to improve integration of technology with business processes. We control for the importance of technology integration and business processes using a five-point Likert scale where 1 is “of no importance” and 5 is “of critical importance.”

Sector. The respondents were drawn from a variety of industrial sectors presenting potentially distinct exogenous drivers of change and varying industry life cycle issues associated with innovation efforts. We control for industry sector by including a set of binary variables.

External forces. The survey contained binary variables related to external forces likely to impact respondents' organizations in the next two years. This enabled us to control for specific exogenous drivers including market forces, globalization, macroeconomic forces, geopolitical issues, and environmental issues.

Organization size. Organization size may affect innovation efforts (Damanpour, 1992). We define size by the number of employees. Due to survey confidentiality requirements, we received aggregations of size in six categories of 5,000 employee increments: firms with fewer than 5,000 employees were assigned a value of 1, and those with greater than 25,000 were assigned a value of 6.

Global firm. Multinational firms span geographic and sector boundaries, potentially accessing opportunities not available to organizations that operate solely within a national or regional market. We include a dummy variable to control for the effect of multinational reach on strategic flexibility.

EU firm. Organizations with headquarters within the European Union (EU) operate in a common market, but with socio-culturally diverse facilities. The unusual institutional nature of nationally-disparate but economically-linked states creates the potential for unique organizational features that could affect innovation and change. We include a dummy variable if the firm's headquarter is inside the EU.

Survey source. The survey was designed by IBM's Institute for Business Value; however, it was administered by both IBM and an independent research organization, the Economist Intelligence Unit (EIU). To account for any bias due to survey administrator entities, we included a dummy variable if the survey was conducted by EIU.

ANALYSIS

The eight internal structural change formats (such as outsourcing or spinoffs) were practice-specific, but suggest underlying design commonality. We explored the dimensionality of the eight binary structural change indicators using a principal component factor analysis, which revealed three factors (Table 1), which correspond to 'delegation', 'consolidation', and 'reconfiguration' of activities.

---Table 1 about here---

First, organizations can ‘delegate’ business functions by using third-party operating facilities, establishing shared services agreements, and contracting-out major projects in order to externalize peripheral functions while maintaining control and access to innovation. Although these organizations ensure that managerial attention focuses on core value creating activities and opportunities, delegation extends the formal structure to utilize boundary-spanning transactions as an alternate lever of control. Moderate coordination costs and asset specificity require arms-length oversight rather than complete internalization of functions or separate organizational structures (Williamson, 1991). Second, organizations may ‘consolidate’ activities by spinning-out or outsourcing activities as well as having an aversion to forming major strategic partnerships with others. This process eliminates non-core activities and focuses capability development on perceived areas of high value, commensurate with theories of core competency (e.g., Prahalad and Hamel, 1990). Third, ‘reconfiguration’ alters structures without divestitures, outsourcing, or uptake of novel capabilities, somewhat akin to shuffling and re-dealing a deck of cards without reducing the set. Reminiscent of business process reengineering (Hammer and Champy, 2001), reconfiguration relies on improved use of technologies or decision-making efficiencies to establish new sub-structures. Delegation, consolidation, and reconfiguration of activities correspond to hypotheses 2a and 2b. While reconfiguration matches hypothesis 2b, both delegation and consolidation relate to hypothesis 2a as mechanisms to focus managerial attention by reducing structural design complexity.

To study the effect of organizational changes brought about by business model innovation on the likelihood of achieving strategic flexibility while including information from the non-business model innovators, we applied a two-stage Heckman probit model (Heckman, 1979; Shaver, 1998). Although the second stage includes only the subset of business model innovators (107 firms), this model enables us to test for selection bias by including all 556 observations in the first stage. As we have two stages with different number of observations, Table 2 reports descriptive statistics for the dependent and independent variables for each model stage. The correlations report no particular strong associations among the variables. Table 3 reports the results of the regression analysis. The first model shows the output of the

first-stage selection model using a probit analysis. Models 2 and 3 are two-stage Heckman probit regressions. Model 2 presents the results for the two-stage analysis applying only the control variables in the second stage regression, and model 3 is the full model that includes all theory variables to test the hypotheses.

---Tables 2 and 3 about here---

The results from the first-stage selection model identify drivers of business model innovation. The practice literature has generally suggested that managers use business model innovation to address higher-level and longer-term challenges where incremental process and product innovation may lag exogenous discontinuities. The results support this across numerous variables. The analysis shows that business model innovation is inversely related to product/market innovation activities and positively associated with the need for discontinuous change. In addition, there is no significant relationship between prior change success and business model innovation efforts, suggesting that learning effects do not influence business model innovation efforts. This may support practice community claims that business model innovation is a novel transformation process distinct from other modes of organizational innovation, but may also suggest that business model innovation is idiosyncratic and resistant to routinization. Executive leadership is associated with increased business model innovation, but global and EU firms are less likely to initiate business model innovation.

Organizations with a creative climate for innovation are more likely to achieve strategic flexibility through business model innovation efforts ($b=.50$, $p<.001$, Model 3). We find that informal organization influences strategic flexibility alongside formal organizational structure. Hypothesis 1 is supported.

Internal structural change that attempts to reduce structural design complexity is disaggregated to reflect two underlying factors: delegation and consolidation. Delegation is positively associated with strategic flexibility ($b= .30$, $p<.05$, Model 3). By delegating activities through use of third-party facilities and shared services, an organization can maintain some degree of control over outputs. In turn, this allows an organization to rely on the culled activities while focusing managerial attention on core value-added

activities and responding with agility to change. Consolidation, however, does not have a statistically significant relationship with flexibility. Finally, internal structural changes that emphasize reconfiguration of existing activities are negatively associated with the likelihood of achieving strategic flexibility ($b = -.25$, $p < .05$, Model 3), consistent with our prediction that reconfiguration does not improve managerial focus. While hypothesis 2a only receives partial support, hypothesis 2b is supported.

Inter-organizational dependence is negatively related to strategic flexibility ($b = -.23$, $p < .05$, Model 3). Although collaboration and network effects are associated with improved performance, business model innovators that develop partner dependencies appear to achieve lower strategic flexibility. Hypothesis 3 is supported.

DISCUSSION AND CONCLUSION

In this study, we address a narrow, well-defined relationship between business model innovation and a firm's achievement of strategic flexibility. While the practice literature has encouraged managers to expect that organizational design changes enacted during business model innovation will yield higher flexibility, our findings suggest a more subtle relationship between design transformation and improved adaptability to turbulence. The results of this study show that certain changes in formal organization are associated with flexibility. In addition, the study reveals that the informal organization, such as a climate for creativity and innovation are associated with strategic flexibility, while dispelling the notion that flexibility can be attained through strategic partnerships. Taken together, this study makes three contributions to the theory and practice of business model innovation.

Although organizational design and structure are critical features of business model innovation, it is important to understand how such structural changes influence managerial attention and control. We argued that attempts to reduce design complexity will increase flexibility. Delegation increases the probability of achieving strategic flexibility from 6.8% (at one standard deviation below the mean; $-1sd$) to 12.1% ($+1sd$). During structural delegation, managers retain control of structural change while delegating responsibility and costs of coordination to third party service providers via outsourcing and shared services. This has a dual effect of reducing structural design complexity and concomitantly

increasing managerial attention to evolving competitive environments. Alternately, when firms consolidate by completely relinquishing control of non-core activities, the benefits of strategic flexibility are not obtained, perhaps because important sources of market and opportunity information are lost.

In contrast to delegation, reconfiguration of existing activities has a negative effect on achieving strategic flexibility. Here, managerial attention is still constrained by non-core process activities that do not disappear during reconfiguration of activity sets. We find that the probability of achieving strategic flexibility drops from 11.5% to 7.4% when reconfiguration increases (-1sd to +1sd). This result is consistent with Nadkarni and Narayanan (2007) who found a negative effect between firms trying to create strategic focus and flexibility. Our results add to this literature by suggesting that reconfiguration does not necessarily provide the benefits of focused managerial attention, and is associated with a lower probability of achieving strategic flexibility.

Taken together, our factor analysis shows that the eight most common structural change formats used during organizational change reflect commensurate differences in the degree of managerial control exercised and managerial attention or 'bandwidth' available. To achieve strategic flexibility, managers must blend issues of control and attention to ensure flexibility to competitive environmental changes.

Further, the culture of an organization has a positive relationship with achieving strategic flexibility. A two standard deviation increase in the climate for creativity around the mean changes the probability of achieving strategic flexibility from 5.4% to 13.5%. While managers tend to focus on structural adaptation, a significant element of achieving flexibility stems from the innovative culture of the organization's employees. The magnitude of effect is substantial, and comparable to other structural changes enacted during business model innovation. The results bolster claims for the strategic advantage of informal organization such as culture (Fiol, 1991; Gulati and Puranam, 2009; Teece, 1996). Having an innovative culture helps avoid employee resistance to organizational identity changes that arise during transformation processes (Dutton *et al.*, 1994) such as business model innovation.

Finally, our results show that greater inter-organizational dependence in business model innovation (-1sd to +1sd) decreases the probability that firm's achieve strategic flexibility from 11.4% to

6.9%. This finding runs counter to prescriptive literature that advocate a greater reliance on partnerships to enact business model innovation. Though our data do not allow us to confirm the underlying causal mechanisms, it is possible that reliance on partners for organizational change increases coordination costs and goal alignment problems which inhibit agility. Further research can more clearly delineate the underlying reasons for this negative relationship.

This study is not without its limitations. The interviews were conducted by a private company to evaluate forms of innovation in a non-random sample. In order to preserve confidentiality, certain data including firm size, industry, and national origin were converted to categorical formats. The data are cross-sectional, thereby limiting our ability to infer causality or temporal changes. Nevertheless, access to interviews with 762 CEOs of large firms is an exceptional resource. The survey provides rich data and variables to control for other forms of innovation, organizational attributes, and environmental characteristics. Interestingly, the eight internal structural formats used during change are only now being carefully examined by strategy scholars for its implications on competitive advantage and performance (Puranam *et al.*, 2006).

Limitations aside, this is the first, systematic empirical study of CEOs that links business model innovation and strategic flexibility. Our findings highlight the necessity of both informal and formal organization during renewal and re-organization, and its implications for organizational adaptation to environmental change. Our results on the differences in control and managerial attention offered by changes in structures during business model innovation have implications for theories of organizational design and capabilities as well as the practice of business model innovation.

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Table 1
Factor analysis of internal structural change vehicles

Variable	Internal structural changes			Uniqueness
	Delegation	Consolidation	Reconfiguration	
Use of third-party operating utility	0.7339	0.0443	-0.1312	0.4422
Onshore outsourcing	0.6990	-0.0845	0.3190	0.4025
Shared services	0.4795	0.0923	0.0415	0.7599
Major project-based contracting	0.4651	-0.0245	-0.2067	0.7404
Offshore outsourcing	0.3078	0.5022	-0.3355	0.5405
Spin-offs	0.0098	0.7399	0.0082	0.4524
Major strategic partnerships	0.1498	-0.6314	-0.3842	0.4313
Organizational structural changes	0.0593	0.0689	0.8503	0.2687

Table 2

Descriptive statistics and pair-wise correlations

First stage variables	N	Mean	SD	Pair-wise correlation															
				1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1 Business Models innovator	556	0.19	0.39																
2 Survey source	556	0.24	0.43	-0.13															
3 Distribution sector	556	0.32	0.47	0.01	0.02														
4 Financial services sector	556	0.23	0.42	0.01	-0.10	-0.38													
5 Communications sector	556	0.15	0.36	-0.03	0.03	-0.29	-0.24												
6 Market forces	556	0.73	0.45	0.01	0.10	0.01	-0.12	0.07											
7 Globalization	556	0.34	0.47	0.06	-0.05	0.05	-0.09	-0.22	-0.24										
8 Macroeconomic forces	556	0.25	0.43	0.01	-0.02	0.01	0.01	-0.02	-0.18	-0.10									
9 Geopolitical issues	556	0.07	0.26	0.04	0.05	0.03	-0.04	-0.03	-0.11	-0.07	0.01								
10 Environmental issues	556	0.12	0.33	0.05	0.01	-0.02	-0.18	0.10	-0.03	-0.05	0.02	0.00							
11 Organization size (employees)	556	2.71	1.68	0.02	0.05	-0.03	-0.03	-0.06	-0.03	0.03	0.07	0.06	0.03						
12 Global firm	556	0.40	0.49	-0.08	0.07	-0.02	-0.18	-0.18	-0.10	0.33	-0.06	0.12	0.07	0.30					
13 EU firm	556	0.34	0.47	-0.12	0.01	-0.05	0.01	-0.03	-0.04	0.06	0.08	0.00	0.04	0.14	0.22				
14 Degree of change difficulty	556	3.78	1.08	0.13	-0.23	0.06	-0.11	-0.01	0.01	0.16	-0.08	-0.10	0.02	0.04	0.08	-0.07			
15 CEO responsible for innovation	556	0.32	0.47	0.13	-0.05	0.06	0.09	-0.10	-0.07	0.08	-0.03	0.05	-0.13	-0.13	-0.04	0.04	0.09		
16 Prior success with change effort	556	3.61	0.92	-0.05	-0.02	-0.09	0.07	0.10	-0.04	-0.06	0.06	0.00	0.02	-0.07	-0.08	0.13	-0.20	0.03	
17 Product / Market innovator	556	0.58	0.19	-0.11	0.01	0.05	-0.02	-0.06	0.09	0.03	-0.12	-0.03	-0.02	-0.03	0.08	0.02	0.04	-0.07	-0.08

Second stage variables	N	Mean	SD	Pair-wise correlation									
				1	2	3	4	5	6	7	8		
1 Strategic flexibility	107	0.56	0.50										
2 Innovative culture	107	3.46	1.04	0.34									
3 Factor 1: Delegation	107	0.05	1.05	0.16	-0.14								
4 Factor 2: Consolidation	107	0.03	0.98	0.07	0.02	-0.07							
5 Factor 3: Reconfiguration	107	0.07	0.99	-0.15	0.02	-0.03	0.00						
6 Inter-organizational dependence	107	3.50	1.15	-0.04	0.20	0.12	-0.34	-0.16					
7 Technology integration needs	107	4.21	0.80	0.18	0.06	0.11	-0.06	-0.01	0.12				
8 CEO responsible for innovation	107	0.45	0.50	-0.07	0.05	-0.28	0.00	-0.13	-0.02	0.00			
9 Survey source	107	0.12	0.33	0.16	0.14	0.14	0.08	0.06	0.01	-0.20	-0.28		

Table 3: Heckman probit regression of business model innovation and strategic flexibility

	Variables	M1: Selection model	M2: Two-stage model	M3: Full model
Organizations' engagement in BMI (0/1)	Constant	-0.94 [†] (0.50)	-1.00 [†] (0.58)	-0.95* (0.47)
	Survey source	-0.47** (0.18)	-0.47** (0.18)	-0.48** (0.18)
	Distribution sector	-0.06 (0.17)	-0.06 (0.17)	-0.10 (0.16)
	Financial services sector	0.01 (0.20)	0.00 (0.19)	-0.03 (0.19)
	Communications sector	-0.15 (0.22)	-0.13 (0.25)	-0.12 (0.21)
	External forces			
	Market forces	0.23 (0.16)	0.24 (0.17)	0.22 (0.15)
	Globalization	0.34* (0.16)	0.36 [†] (0.21)	0.39** (0.15)
	Macroeconomic forces	0.10 (0.15)	0.13 (0.22)	0.14 (0.15)
	Geopolitical issues	0.40 [†] (0.24)	0.43 (0.28)	0.50* (0.23)
	Environmental issues	0.40* (0.19)	0.41* (0.19)	0.38* (0.19)
	Organizational attributes			
	Organization size (employees)	0.05 (0.04)	0.05 (0.04)	0.06 (0.04)
	Global firm	-0.37* (0.16)	-0.36* (0.18)	-0.34* (0.16)
	EU firm	-0.37** (0.15)	-0.36* (0.16)	-0.32* (0.15)
	Degree of change difficulty	0.12 [†] (0.07)	0.12 [†] (0.07)	0.12 [†] (0.06)
	CEO responsible for innovation	0.36** (0.14)	0.37** (0.14)	0.36** (0.14)
	Prior success with change effort	-0.05 (0.07)	-0.05 (0.08)	-0.05 (0.07)
	Product / Market innovator	-0.90** (0.31)	-0.90** (0.31)	-0.94*** (0.30)
	Strategic flexibility (0/1)	Innovative culture		
Internal structural changes				
Delegation				0.30* (0.12)
Consolidation				0.00 (0.12)
Reconfiguration				-0.25* (0.12)
Inter-organizational dependence				-0.23* (0.11)
Technology integration needs			0.35 [†] (0.18)	0.27 (0.18)
CEO responsible for innovation			-0.10 (0.35)	-0.27 (0.23)
Survey source			0.90 [†] (0.48)	0.67 (0.41)
Constant			-1.07 (1.83)	-0.92 (1.15)
N	556	556	556	
N - second stage		107	107	
Chi-square	53.71***	7.93*	22.26**	

Robust standard errors are reported in brackets below the coefficients.

[†] $p < .10$, * $p < .05$, ** $p < .01$, *** $p < .001$