Internal Organization Choice and Performance

Nicholas Argyres
Boston University School of Management
595 Commonwealth Avenue
Boston, MA 02215
phone: (617) 353-4152

PRELIMINARY DRAFT

Chapter 7 in *The Economic Institutions of Strategy*

Edited by Jackson Nickerson and Brian Silverman

Internal organization was for many years a central topic for transaction cost economics (TCE). In Williamson's (1975) *Markets and Hierarchies*, for example, the chapter on the multidivisional form (M-form) appears just after the chapters on vertical integration. In that chapter, Williamson stated the "multidivisional hypothesis": the M-form is more efficient than the U-form (unitary or functional form) for complex organizations,. Soon afterward, Armour and Teece (1978), Teece (1981), and others provided statistical evidence supporting the M-form hypothesis. Williamson (1985) further elaborated his theory of the M-form in *The Economic Institutions of Capitalism*. Since then, however, research on internal organization using transaction cost theory has been largely eclipsed by research on vertical integration, contract structures, and other phenomena.

Internal organization has also been a central topic in strategy research. Rumelt's (1974) seminal work focused on types of diversification and their relationships with firm financial performance. However, Rumelt (1974) also studied the relationship between diversification and internal organizational structures such as the M-form and U-form. This research led to a number empirical studies relating various aspects of internal organizational structure and control to diversification and R&D choices, firm financial performance and other outcomes (e.g., Hoskission 1987; Hill 1988; Hill, Hitt & Dubofsky 1991; Hoskisson, Hill & Hitt 1993). Research on internal organization in the strategy literature, however, has slowed in the last 15 years or so.

There appear to be several reasons for the slowdown in research on internal organization in the TCE and strategy literatures. Research in the TCE tradition may have been stymied by a lack of sufficiently detailed data on internal organizational structures,

especially relative to the accessibility of contract or make-or-buy data. Such research may also have been perceived as fitting less comfortably within the tradition of industrial organization research in economics than research on contract structure or vertical integration, for example. Research in the strategy literature, on the other hand, may have been slowed by a saturation of empirical studies and little new theory to generate new research questions.

These possible obstacles have not been totally overcome to date. Nevertheless, the critical importance of internal organization to firm performance demands a healthy stream of research in this area, despite the empirical and theoretical challenges. In this chapter, I aim to show that recent developments in the strategy and economics literatures on internal organization suggest fascinating new research questions, and open up important new research opportunities for the intrepid scholar. I do not attempt to be exhaustive in discussing these new research opportunities, but instead focus on three very specific but related topics where I think interesting opportunities lie: (1) internal hybrid forms, and (2) internal reputation mechanisms, and (3) efficiency vs. power in the design of hierarchies. These are by on means the only three topics in which research opportunities on internal organization lie, but I do think that the soil around them is fertile.

Internal Hybrid Forms

Williamson's (1975) original treatment of the M-form was of course inspired by Chandler's (1962) classic study of the adoption of the M-form by several major firms in the early 20th century. Williamson (1975) provided an economic interpretation for the

efficiency advantages of the M-form that Chandler had emphasized. Chandler had explained that an M-form organization is one that is divisionalized along product or geographical lines such that each division manager is made responsible for the division's "net receipts" and is given significant authority to make decisions affecting those net receipts. Williamson (1975) argued that divisionalization, by decomposing a firm's activities, reduces complexity so as to aid decision-making by managers whose rationality is bounded. In addition, divisional managers in an M-form are less likely to pursue their own personal or parochial goals when making decisions than if they were assigned roles as functional managers with little accountability for the financial performance of a division's product or service, as in the U-form (unitary or functional form). In *The Economic Institutions of Capitalism*, Williamson (1985) added the point that the M-form structure involves a commitment by top management not to intervene in divisional managers' day-to-day operating decisions, which serves to further strengthen divisional managers' incentives to exert effort to run their divisions efficiently. The U-form, on the other hand, involves no such commitment.

Later research on the M-form in the strategy literature, however, has suggested that there is considerable variance in the organizational structures of M-form firms that still needs to be understood and explained. Hill's (1988) survey revealed that headquarters units in some M-form -- in particular, those pursuing related diversification strategies -- intervened regularly in the day-to-day affairs of the firm's divisions. He called this kind of organization the "centralized M-form" (CM-form) -- a kind of hybrid of the M-form and the U-form -- and suggested that it was an efficient choice for related diversifiers. Chandler (1991) also noted that the headquarters units in different M-form

firms can vary in their interventionist tendencies, depending on their strategic goals. I suggested that one can apply transaction cost reasoning to explain these various types of M-forms (Argyres 1995). I hypothesized that CM-forms are more efficient than M-forms when certain divisional investments are subject to increasing returns across the firm's divisions because the CM-form can capture these increasing returns at lower organizational cost. The trade-off that emerges from this analysis is that centralization enhances the firm's capacity for coordination decisions across divisions, but must come at the cost of weakening the intensity in the incentives faced by division managers.[1]

On an empirical level, we have yet to understand how this trade-off is resolved in firms with different kinds of technological, geographic and marketing profiles. For what kinds of firms do the coordination gains achievable from a CM-form outweigh the losses in incentive intensity? What kinds of empirical regularities do we observe? For example, do firms whose divisions share distribution channels but little technology tend to use M-forms or CM-forms? What about firms with divisions that share technology but not distribution?

We also have yet to fully understand the conditions under which other kinds of hybrids within the M-form category are efficient. Many firms appear to maintain an M-form or CM-form, but also to centralize certain functions or parts of certain functions such as sales and marketing, manufacturing, or R&D, but not others. For example, surveys by the Industrial Research Institute (IRI) show that most of their members (large,

[1] This fundamental trade-off between coordination and motivation regarding centralization and decentralization with in the M-form actually derives from Williamson's (1975, 1985) theoretical comparison of the M-form, and U-form and market organization. The U-form ranks first in terms of coordination capacity and third in terms of incentive intensity. The M-form ranks second in coordination and second in incentive intensity, while market organization ranks third coordination and first in incentive intensity.

prominent R&D firms from several industrial countries) maintain hybrid R&D organizations: i.e., organizational forms containing both centralized R&D organizations reporting to corporate headquarters, as well as R&D units that report to division managers. In an empirical study using the IRI and other data, Argyres and Silverman (2004) found that the choice of R&D organization matters for the kinds of innovation firms produce. They found that firms with centralized R&D structures tend to produce more basic R&D than firms with decentralized structures, as measured by patent citations. Perhaps more interestingly, however, they found that hybrid forms did not produce "intermediate" levels of basicness in R&D, as one might predict. Indeed, the most decentralized hybrids tended to produce R&D that was less basic than firms with purely decentralized R&D. Argyres and Silverman (2004) were not able to explain this non-intuitive finding.

Another type of hybrid organization that emerges in the Argyres and Silverman (2004) study is the organization that is divisionalized along product or geographic lines, but includes a centralized R&D organization that is partially funded by divisions from their own R&D budgets. Alternately, organizations sometimes decentralize their R&D units to the divisional level, while retaining whole or partial funding of the units at corporate headquarters. Thus, the locus of budget authority is a second instrument, along with reporting structure, which is available to organizational designers. Argyres and Silverman (2004) found that the two instruments appear to substitute for each other in their data; for example, centralized budget authority substitutes for centralized R&D reporting structure in contributing to innovation basicness. But the *interactions* between various formal means of centralizing or decentralizing decisions, such as reporting

structure, budget authority, and transfer pricing rules, have been little explored in the strategy literature.

Under what conditions, then, do firms centralize certain functions, or retain some centralized budget authority for them, in an organization that is otherwise divisionalized by product or geography? What are the trade-offs involved, and how are the available organizational instruments combined to points along the trade-off curves? These fundamental questions are still not fully understood. Recently, however, Dessein, Garicano and Gertner (2006) have attacked aspects of them using an economic modeling approach. In their model, two activities may benefit from standardization, which requires integration (centralization) to be achieved. Even if standardization is efficient for the firm as a whole, however, division managers may not be willing to coordinate if their compensation is strongly linked their division's performance. Achieving efficient coordination therefore comes at the cost of weakening the intensity of incentives facing division managers, implying that centralization of a function is efficient when the benefits of standardization are high relative to the costs of lower incentive intensity. The model thus formalizes the basic trade-off between coordination and motivation discussed above. It adds insight beyond the formalization, however, by incorporating the idea that information about the benefits of standardization may reside with division managers more than with corporate headquarters. When this is the case, a division manager may engage in self-serving communication about the levels of such benefits for her own division. Ensuring truth-telling under these conditions requires greater incentive intensity. On the other hand, when standardization benefits are large and well-known, truth-telling is less important, and incentive intensity can be efficiently reduced.

This kind of result suggests potential empirical implications that could be further explored in qualitative fieldwork or survey research. For example, how important is information asymmetry about standardization benefits in predicting the level of incentive intensity and centralization in a firm's organization structure? This kind of question goes to the heart of the fundamental issue in strategy regarding how to organize to realize cross-divisional synergies. It begs a second question, however: Are there other organizational instruments for dealing with internal information asymmetry besides formal organizational structure that can deliver better coordination at the same level of incentive intensity? It is to this question that I know turn.

Internal Reputation Mechanisms

The knowledge-based view of the firm has sparked interest in the strategy literature on the challenges and hazards associated with internal information transmission with organizations, and with the role of organizational structure in mitigating them. Nickerson and Zenger (2004), for example, argue that what they call "consensus hierarchies" can better facilitate the horizontal transfer of knowledge across an organization than can authority-based hierarchies or markets because consensus hierarchies use informal social mechanisms to relieve opportunism in knowledge search and transfer processes. These social mechanisms include the development of shared organizational "language", norms, and other socialization processes. It has been argued in the strategy literature that firms are uniquely suited (more so than markets) at developing these kinds of mechanisms (e.g., Arrow 1972; Kogut & Zander 1996; Nahapiet & Ghoshal 1998). Nickerson and Zenger (2004) argue that consensus hierarchies are

particularly suited for the kinds of deep knowledge-sharing required to solve highly complex (non-decomposable) problems. Recently, Garicano, Crémer and Prat (2007) have developed a theory of firm structure and scope based on the organization's adoption of technical languages. Among other things, the theory provides an explanation for the recent increase in information centralization in firms combined with a reduction in hierarchical centralization (Rajan & Wulf 2006), based on the idea that information centralization involves the specification of technical languages that allow coordination without centralization of decision authority.

Recent literature in strategy and economics has thus been quite concerned with the role informal organization in complementing formal organization structure to enhance horizontal coordination within the firm. By and large, however, this literature has yet to incorporate incentives, and this opens up an important set of research questions. What ensures that managers will *adhere* to a language or a set of norms promulgated higher up in the hierarchy? In some cases, managers might find that the status quo language or norm is inappropriate for his/her local conditions, and will ignore it or seek exception. How are the exceptional cases to be managed by superiors? In other cases, managers might have strong personal or parochial incentives to disregard the status quo language or norm. Further complicating matters, such disregard may or may not be easily observable to (or verifiable by) other organization members. How to manage adherence to an organizational language or norms while minimizing the of costs inherent in ensuring compliance with them (e.g., costs of onerous and subjective management evaluation systems, etc.) To paraphrase Schelling (1960), how to achieve coordination with

minimum control? How to deal with the incentive challenges so as to create an effective consensus hierarchy?

A similar set of issues arises with respect to the question posed earlier regarding information asymmetry across vertical layers in the hierarchy regarding the level of available cross-divisional synergies. While greater incentive intensity might improve truth-telling by lower level managers about such synergies, what if such truth-telling puts past decisions by top management in a bad light, tempting them to punish the truth-tellers? That is, what if the problem is one of double- rather than single-sided moral hazard? What kinds of mechanisms can ensure efficient vertical information flow under these conditions? This kind of problem has been addressed by Baker, Gibbons and Murphy (1999)'s analysis of an environment in which a subordinate makes proposal to a superior who decides whether to accept or reject it. Committing to accept all projects regardless of their quality constitutes delegation of authority to the subordinate, which can enhance the subordinate's incentives to develop proposals so much that delegation becomes the efficient choice (as in Aghion & Tirole 1997). But sustaining such delegation is only possible if the superior cares about his reputation for not rejecting proposals, otherwise he will give in to his temptation to reject bad ones (and thereby weaken incentives). On other hand, if the superior delegates authority only until a proposal is accepted whose results prove to be poor, then delegation is only sustainable if the subordinate cares sufficiently about his reputation for using his authority responsibly.

Argyres and Mui (2007) offer a model of organizational dissent in which a subordinate can offer either a constructive or a self-serving proposal that a superior may or may not find threatening to his own position in the firm. The superior must decide

whether to suppress the proposal it is threatening, and whether to encourage subordinates to make proposals in the first place. One implication of this model is that efficient information flow can occur under these conditions when the superior faces a large enough reputational cost from suppressing constructive dissent. This damage to the leader's reputation might be initiated by informal leaders in the organization who have credibility with other organization members.

The existence and kinds of internal reputational mechanisms within an organization would thus seem to play an important role in determining how centralized or decentralized the organization will efficiently be. This is because reputation mechanisms may compensate for the incompleteness in the implicit contracts between superiors and subordinates, allowing for more delegation than without such mechanisms. Yet we know relatively little about whether and how firms might seek to encourage the operation of such reputation mechanisms. Fieldwork and/or survey research could presumably shed light on such mechanisms. Drawing on examples from Intel, Apple Computer and General Electric, Argyres and Mui (2007) suggest several categories of policies firms might use to encourage the development of such mechanisms, including policies regarding staffing, evaluation and promotion, internal communications, and the like.

Reputation mechanisms may be equally important in enhancing horizontal information transmission within organizations, yet here the literature is less developed. Many recent theoretical studies on coordination through horizontal communication within organizations do not incorporate incentive considerations for tractability or other reasons (e.g., Garicano 2000; Nickerson & Zenger 2004; Alonso, Dessein & Matouschek 2007; Garicano, Crémer and Prat 2007). Yet the theory of the M-form suggests that

division managers may have goals that are divergent enough that communication between them is insufficient for coordination (Crawford & Sobel 1982). This suggests the possibility of developing theoretical models that *combine* horizonal and vertical communication challenges together with horizontally and vertically misaligned incentives. If this kind of modeling proves intractable, fieldwork could be useful in highlight the dimensions along which the communications problems are most salient for various types of organizations, thereby guiding model development. For example, Garicano, Crémer and Prat (2007)'s theory of the firm based on technical language finds connection with Argyres (1999)'s case study of the information system used to design the B-2 bomber.

Efficiency vs. Power

The body of research on internal organization in strategy and economics has generally assumed that organizations take efficiency as their goal. Organization structures have been though to reflect choices aimed at improving overall organizational performance. The large literature on corporate governance, however, has recently emphasized that the structure of such important organizational features as Boards of Directors and their committees are influenced by rent extraction as much as by considerations efficiency (e.g., Bebchuck, Fried and Walker 2002). If power considerations can influence a firm's highest echelons, could they not influence the rest of the organization's structure?

Rajan and Zingales (2001) answer in the affirmative, and in so doing pose a challenge to current economic theories of internal organization. In their model, an

entrepreneur's goal in designing the structure of his organization is to prevent employees from stealing the key secrets or assets that generate rents. Flat hierarchies allow the entrepreneur to "divide and conquer" by allowing no employee full access to the key assets. Such hierarchies are chosen when rent appropriation is particularly problematic, such as when the key assets are not physical. Employees are willing to work in such hierarchies if they stand to participate in the rent appropriation some time in the future should they specialize sufficiently. Tall, vertical hierarchies, on the other hand, do less well in protecting access to key assets, because they involve giving subordinates who are one level below the entrepreneur in the hierarchy better access to the assets. Moreover, in vertical hierarchies, employees who are one level below the entrepreneur have their own subordinates with whom they can join in a coalition that can credibly threaten to leave the organization, taking the assets with them and outcompeting the entrepreneur. Thus vertical hierarchies are expected when the key assets are more difficult to expropriate, as when they are physical in nature. This kind of organization is built gradually, with initial subordinates specializing, and therefore becoming loyal, before a next level of subordinates is added. Promotion is to reward loyalty, not to capitalize on talent.

The Rajan and Zingales (2001) research is important and warrants empirical exploration. The authors report some large sample research finding that in environments where property rights are poorly protected, firms tend to be smaller, consistent with their theory. Fieldwork, on the other hand, would be valuable in exploring the mechanisms that the theory proposes. How important does access to key assets seem to be in explaining a given organization's structure? Will entrepreneurs admit that protecting access to key assets motivate their choice of a flatter hierarchy? Can evidence be gathered from other

organization members that bears on this issue? One beauty of the Rajan and Zingales (2001) theory is that is can be explored in small organizations where it is that are easier for the researcher to take account of other possible influences – particular influences from efficiency -- on the firm's structure.

Fieldwork

It seems clear that there is an important role for qualitative fieldwork – case studies – in assessing the economic mechanisms at work in economic theories of internal organization. This is not to say that such theories cannot also be tested on large sample data, but that the two types of empirical research are complementary. For a long time, it seemed that research based on qualitative fieldwork was not publishable in the strategy literature, but that appears to be less and less the case. In addition to the several studies already cited n this chapter, there are several others that have recently used qualitative fieldwork to explore economic theories of the firm (as opposed to theories of internal organization) (e.g., Mayer & Argyres 2004; Jacobides and Billinger 2006).

To explore the kinds of reputation mechanisms and informal structures that have been emphasized in the strategy and economics literatures recently, however, even more in-depth longitudinal studies of firms will be needed. A good model of this kind of research from sociology is Morrill (1995). Morrill was able to study several firms in such detail that he was able to explain how executives' reputations were formed during intraorganizational conflicts in those firms, and how the formal organizational structures shaped those conflicts. Morrill did not explore the roles of incentives or information to any great extent, however, reflecting his background as a sociologist rather than as an

economist. Nor did he explore implications for firm performance, which of course is the main interest in strategy research. All of this adds up to big opportunity for the intrepid strategy scholar.

References

Aghion, P. and Tirole, J. 1997. Formal and real authority in organizations. *The Journal of Political Economy*, 105: 1-29.

Alonso, R., Dessein, W. and Matouschek, N. 2007. When does coordination require centralization? *American Economic Review*, forthcoming March 2008.

Argyres, N. 1995. Technology strategy, organization structure and interdivisional coordination. *Journal of Economic Behavior & Organization*, 28: 337-358.

Argyres, N. 1999. The impact of information technology on coordination: Evidence from the B-2 'Stealth' bomber. *Organization Science*, 10: 162-180.

Argyres, N. and Silverman, B. 2004. R&D, organization structure and the development of corporate technological knowledge. *Strategic Management*, 252: 929-958.

Armour, H. and Teece, D.J. 1978. Organizational structure and economic performance" A test of the multidivisional hypothesis. *Bell Journal of Economics*, 9: 106-

Arrow, K. 1972. *The Limits to Organization*, New York: Norton.

Baker, G., Gibbons, R. and Murphy, K. 1999. Informal authority in organizations. *Journal of Law, Economics and Organization*, 15: 56-73.

Bebchuck, L., Fried, J. and Walker, D. 2002. Managerial power and rent extraction in the design of executive compensation. *University of Chicago Law Review*, 69: 751-846..

Chandler, A. 1962. *Strategy and Structure: Chapters in the History of the Multidivisional Enterprise*. Cambridge, MA: MIT Press.

Crawford, V. and Sobel, J. 1982. Strategic information transmission. *Econometrica*, 50: 1431-51.

Crémer, J., Garicano, L. and Prat, A. 2007. Language and a theory of the firm. *Quarterly Journal of Economics*, 373- 407.

Dessein, W., Garicano, L. and Gertner, R. 2006. Organizing for synergies, manuscript. Graduate School of Business, University of Chicago.

Hoskisson, R. 1987. Multidivisional structure and performance: The contingency of diversification strategy. *Academy of Management Journal*, 30: 625-644.

Hoskisson, R., Hill, C. & Hitt, M. 1993. Managerial incentives and investment in R&D in large multiproduct firms. *Organization Science*, 4: 325-341.

Hill, C. 1988. Internal capital market controls and financial performance in multidivisional firms. *Journal of Industrial Economics*, 37: 67-83.

Hill, C., Hitt, M. & Dubofsky, D. 1991. Capital market evaluation of M-form implementation and diversification strategy. *Strategic Management Journal*, 12: 271-279.

Nahapiet, J. and Ghoshal, S. 1998. Social capital, intellectual capital and the organizational advantage. *Academy of Management Review*, 23: 242-267.

Kogut, B. and Zander, U. 1996. What do firms do? Coordination, identity and learning. *Organization Science*, 7: 502-518.

Morrill, C. 1995. *The Executive Way: Conflict Management in Corporations*. Chicago: University of Chicago Press.

Nickerson, J. and Zenger, T. 2004. A knowledge-based theory of the firm—The problem-soling perspective. *Organization Science*, 15: 617-632.

Rajan, R. and Zingales, L. 2001. The firm as a dedicated hierarchy: A theory of the origins and growth of firms. *Quarterly Journal of Economics*, 116: 805-851.

Rajan, R. and Wulf. J. 2006. The flattening firm: Evidence from panel data on the changing nature of corporate hierarchies. *Review of Economics and Statistics*, 88: 759-

Rumelt, R. 1974. *Strategy, Structure and Economic Performance*, Cambridge, MA: Harvard University Press.

Schelling, T. 1960. *The Strategy of Conflict*. Cambridge, MA: Harvard University Press.

Teece, D.J. 1981. Internal organization and economic performance: An empirical analysis of the profitability of principal firms. *Journal of Industrial Economics*, 30: 173-199.

Williamson, O.E. 1975. *Market and Hierarchies*, New York: The Free Press.

Williamson, O.E. 1985. *The Economic Institutions of Capitalism*, New York: The Free Press.