Managing the Control/Autonomy Dilemma: From Impossible Balance to Irregular Oscillation Dynamics*

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ABSTRACT

Organizations functioning in complex turbulent environments cannot be completely centralized nor can they consist of autonomous units. Top-down control is required for efficient exploitation of existing markets, technologies, and assets. Autonomy is required for effective adaptation to change and differentiated local conditions. Most authors call for “balance.” Drawing from seven diverse sources including classic literature, two current cases, and a recent computational model, we argue for managing control and autonomy in terms of irregular oscillation dynamics. We summarize our arguments by reducing them to propositions.
One might think that the top-down hierarchical organizational form dominating history has become extinct. Hierarchy, the hallmark of bureaucratic form and a fabled source of inertia, of rigidity and of centralization, and long dominant during the standardization era—has been largely criticized since the pervasiveness of organic forms (Scott, 1998) and emergent networks in firms (Nohria & Eccles, 1992) were recognized. Halal and Taylor (1999) suggest that recent changes, such as Internet communication technology, global competition, and customer-demand differentiation, along with higher employee education, make the traditional corporate hierarchy obsolete. Halal (1999: 57) asks: “What replaces the Hierarchy?” Our review uncovers four proposals:

1. Crozier (1989) suggests that the only efficient solution to increasingly complex hierarchies is to return to simpler structures and procedures.

2. Peters (1992) argues for liberating firms from the hierarchy altogether, calling for the creation of a completely new non-hierarchical organizational form.

3. A complementary mix—rather than mutual exclusivity—of hierarchy with new organizational concepts such as, Nonaka and Takeuchi’s (1995) “task force” form, or Halal’s (1999) “enterprise” form, for example.

4. Miles et al. (1999) propose cellular network designs but do not explain how to control, orient, or regulate a cellular network of autonomous units.

Paraphrasing Mark Twain, we note that the death of top-down hierarchical control is greatly exaggerated! As Pettigrew and Fenton (2000) observe, control is recast as efficiency, stability, centralization, accountability, standardization, and continuity, whereas autonomy now reappears as networks, empowerment, decentralization, customization, and change. March (1991) characterizes the tension between control and autonomy as the exploitation vs. exploration dilemma. The varying shades of the basic control–autonomy dilemma surely complicate matters for managers. For every new autonomy-based addition to management theory we see a parallel recasting of the basic control concept. Appearing in many colors, yes. Gone away? Hardly. Throughout all of this duality elaboration, one theme stays the same: Balance. Managers are advised to balance or pursue simultaneously both ends of the duality (Doz & Prahalad, 1986; March, 1991; Pettigrew & Fenton, 2000; Cardinal, Sitkin, & Long, 2004).

Going further than the idea of balance and simultaneity, some argue that the problem is not hierarchical
control, per se, but the way it has been used (Jacques, 1990; Carley, 1992; Romme, 1996). Picking up on this alternative perspective, we elaborate the concept of hierarchy in a different way: Control and autonomy forces flowing up and down organizational hierarchy are best characterized by an image of entangled ropes or conduits. Hierarchies take on various forms, depending on the different ways of managing the control–autonomy duality. We contrast the prevailing emphasis on balance with attention paid to some kind of rhythmic oscillation between control and autonomy—e.g., the French writers, Dumont (1966) and Dupuy (1992), along with early interest by Ackoff (1981), and Endenberg’s (1988) “circular organizing.” Instead of balance and simultaneity, and following Dupuy, we argue that the poles of the duality actually oscillate with an irregular rhythm. We tease out nuances in Dupuy’s focus on rhythms by extracting pertinent details from a twelve-year case demonstrating all of the various rhythm dynamics, as well as the underlying organizational processes giving rise to the various rhythms. The foregoing concerns translate into propositions about how to manage duality dynamics.

We develop our propositions from insights drawn from several research bases. One stems from various elaborations of basic control–autonomy duality. Another is the “balance” literature, including a very recent case analysis by Cardinal, Sitkin, and Long (2004). A third source of insight is the growing literature on “circular organizing.” A fourth draws from a forty-year long development in the French sociology literature. A fifth basis is a recent book on “knowledgeable” organizations (McKenzie and van Winkelen, 2004). A sixth platform is a recent agent-based computational model by Siggelkow and Levinthal (2003) offering some intriguing insights when artificial firms go through a period of decentralization before recentralizing. Finally, we present some findings from our tracking of a cosmetics firm that cycles through all of the rhythm dynamics discussed in the literature. From these seven foundations we propose a series of propositions taking management theory from its current preoccupation with static balance toward focus on irregular oscillation rhythms.

**CONTROL & AUTONOMY: WHAT WE KNOW ABOUT THE BALANCE DILEMMA**

Despite 50 years of controversy about “control from the top” in organizations, it persists (Halal, 1999). Perhaps it is time to recognize that there are good reasons why so—and not just because top executives
have overwhelming control needs, as the recent book by Bossidy and Charan (2002) implies. This said, we still have the problem of CEOs out of touch with galloping technologies, markets, and competitive conditions; control-controlled CEOs, micro-managing CEOs, snail-paced chains-of-command, and hierarchies working at cross-purposes to cellular network learning when the latter may be more in tune with maximizing shareholder value. “The Slade Company” is a classic case about an informal group that, unknown to management, kept the firm alive (Lawrence & Seiler, 1965). In the modern era, a cellular network at Intel produced the processor chip in the shadow of the firm’s preoccupation with DRAMs (Burgelman, 2003).

**Control vs. Autonomy: The Hierarchy Debate**

**A. Top-Down Control.** Management literature tacitly associates hierarchy with centralization, control, standardization, stability, order, continuity, homogeneity, constraints, and so on. These mental associations take root in classical Taylorist conception of hierarchy, and are an obstacle to developing a new vision on hierarchy vs. autonomy. We accept the need for hierarchy as a basic form of coordination, but we reject the notion that it implies centralization. We are going to take a fresh look at notions of hierarchy and autonomy.

Discussion of causal influence on organizations via top-down control has been present for a long time (Weber, 1924/1947; Wren, 1972). Over 100 years ago the French mining engineer, Henri Fayol, (English version 1916) began what emerged as Classical Management Theory (Koontz & O’Donnell, 1959). Its emphasis was on planning, organizing, leading, and controlling—all from the top. Hierarchies built by the division of labor were to be controlled from the top. Though criticized for 50 years (Argyris, 1957; Morgan, 1997), bureaucratic form remains ever present in most firms. Top-down control by CEOs remains the dominant causal force in organization theory (Jones, 2000) and strategy (Besanko, Dranove, & Shanley, 2000). Top-down control is ever present in the popular press books aimed at CEOs (Bossidy & Charan, 2002). Bureaucratic control clarifies authority relations, role definitions, interaction patterns, and who’s responsible for what. Jones (2000) reviews various negative consequences. Strong control orientations tend to produce tall hierarchies. In a classic study, Carzo and Yanouzas (1969) show they are slow to respond. In
a changing world, this can be deadly.

**B. Emergent Autonomy.** The action–reaction effects of strong control vs. emergent informal organizations and networks date back to Roethlisberger and Dixon (1939). They observed that formal organization follows the “logic of cost and efficiency” whereas informal organization follows the “logic of sentiment” (pp. 563–564). Bottom-up causality appears in all complex systems (Le Moigne, 1990). It began with reports about rebellious informal organizations, rate-busting norms, and emergent group dynamics (Roethlisberger & Dickson, 1939; Dalton, 1950, Roy, 1954). On the positive side, Trist and Bamforth (1951) discovered innovative, autonomous work groups, and Gross (1953) noted improved trust and communication. Breed (1955) discussed bottom-up social control. Sayles (1957) found emergent coordination. Woodward (1958) found a different kind of mix between control and autonomy, dependent on kind of technology. Burns and Stalker (1961) observed both mechanistic and organic organizational forms. Golembiewski (1961) found emergent staff units. Lawrence and Lorsch’s (1967) contingency theory argues that firms first differentiate to match environments, and then re-integrate from the top down, thus combining the effects of bottom-up and top-down forces. Burgelman (2003) describes the emergent processor chip unit at Intel that eventually became the focus of Andy Grove at the top.

**Defining Hierarchy and Autonomy**

It is not just control vs. autonomy; it is control vs. *variety, innovation, self-organization,* and *rate of change* dynamics. In their case studies of eight innovative European organizations, Pettigrew and Fenton (2000) mention additional dualities such as: (1) *hierarchies vs. networks*; (2) *accountability vs. horizontal integration*; (3) *holding the ring vs. empowering*; (4) *centralizing vs. decentralizing*; (5) *standardizing vs. customizing*; (6) *identifying vs. sharing knowledge*; (7) *continuity vs. change*; and (8) *stability vs. innovation*. They stress “balance” and “simultaneous.” We underline the poles that line up with control and efficiency. It boils down to hierarchical control vs. some twelve more or less different alternatives. After a short comment on hierarchy, we focus on the first four alternatives.

**A. Hierarchy and Nearly Decomposable Subunits.** In his classic paper, “The Architecture of Complexity,” Simon (1962) noted that the emergence of hierarchy in systems is a general phenomenon
observed in very diverse domains, from physical to life to social sciences. Tracing the evolutionary development of complex system properties, he highlights the relation between the structure of a complex system and the time it needs for evolutionary advancement. The fundamental lesson is that an evolving system that is organized into “nearly decomposable” subunit modules integrated in hierarchical levels has a tremendous adaptive advantage. Simon defines “nearly decomposable” systems as those in which

“…Interactions among the subsystems are weak but not negligible. [Furthermore:] (1) In a nearly decomposable system the short-run behavior of each of the component subsystems is approximately independent of the short-run behavior of the other components; (2) In the long run the behavior of any one of the components depends in only an aggregate way on the behavior of the other components” (p. 474).

The presence of “nearly” autonomous subunits is essential for the long-term adaptation and survival of organizations (Sanchez, 1993; Lorino, 1995). These islands of knowledge considered as temporarily satisfying, stabilize intermediate cognitive forms and allow the cognitively limited actors to orientate themselves, decide and delimitate the boundaries of a too complex system. Therefore, according to Simon (1969: 87), the near-decomposability into stable sub-units explains the frequency with which complexity takes a hierarchical form. “By…hierarchy, I mean a system that is composed of interrelated sub-systems, each of the latter being, in turn, hierarchic in structure until we reach some lowest level of elementary sub-system.”

However, nothing is said about the sub-unit degree of autonomy, the degree of centralization, and the way in which the different sub-systems on the different levels interact. Simon shows the necessity of (1) decomposing a system into stable sub-units and (2) aggregating the sub-units into a hierarchal structure but does not deal with the problem of the exact form that a given hierarchal structure should take: “Subparts belonging to different parts only interact in an aggregative fashion—the detail of their interaction can be ignored” (1969: 107).

In a firm, decomposition into stable sub-units introduces the problem of autonomy and coordination. Interactions among sub-units and levels and the degree of subunit freedom are essential and can result in a variety of hierarchical forms. In all cases sub-system autonomy introduces the problem of control by the superior hierarchical level.
**B. Different Kinds of Autonomy.** For the most part, the varying shades of autonomy characterized in the eight dualities mentioned by Pettigrew and Fenton (2000) can be reduced to the following four elements:

**Variety.** Ashby’s (1956) *Law of Requisite Variety* holds that successful adaptation requires a system to have an internal variety matching environmental variety. Thompson (1967) argued that firms cope best in uncertain environments if higher-level managers systematically wring out as much environmental variety as possible. This reduces the uncertainty lower-level managers face, making it easier for them to efficiently run their machine-like subunits. McGregor (1960) called this approach to management “Theory X,” a throwback to Taylorism. Whereas, in Thompson’s view, upper layers of management exist so as to wring out environmental variety, going from top to bottom, Simon (1962, 1999) and Mélèse (1991) see it oppositely. Simon (1999: 237) observed that “…dynamic events at each level will be one or more orders of magnitude slower than the events at the level below.” Thus, the lowest level absorbs the highest rate of variety, the next level less so, leaving fewer but more troublesome environmental variations to be resolved by upper management. Mélèse (1991) also observes that variety increases, going down levels. But, reversing Thompson’s logic, Mélèse argues that part of the variety of each sub-system must be absorbed locally so that variety is not transferred to the superior level, which is unable to control it. How is variety not transferred to a higher level? Only by having autonomy and innovation capabilities at lower levels for resolving variety into fewer ideas, specific products, strategies, directions, etc., leaving fewer (but more strategic) dimensions for higher level managers to consider.

**Innovation.** Miles and Snow (1986) present the network form as a new organizational design facilitating flexibility and individualized responses. They build on the autonomous group, organic forms, and differentiation to match technological and/or market conditions; they parallel the emergence of network theory in sociology (Nohria & Eccles, 1992). March adds his now famous *exploitation vs. exploration* duality in 1991. Now, Miles et al. (1999) argue that the emergent form of today is the “cellular network.” A cellular network is based on the principle of a cluster of self-organizing components collaboratively using their knowledge for product innovation to develop existing markets and create new ones. It is composed of
independent units (self-managing teams, autonomous business units, etc.) continuously interacting with other “cells” and: “It is this combination of independence and interdependence that allows the cellular organizational form to generate and share know-how that produces continuous innovation” (Miles et al., 1999: 162).

**Self-Organization.** Complexity scientists focus on causes of order creation rather than traditional science’s focus on equilibrium (Prigogine & Stengers, 1984). They focus on how structures emerge from the self-organizing behaviors of autonomous, heterogeneous agents, which may be atoms, molecules, organisms, individuals, groups, firms, or populations. Building on seminal work by Nicolis and Prigogine’s (1989), McKelvey (2001) emphasizes environmentally imposed adaptive tensions confronting organizations. Agents self-organize to create learning, novelty, and new social structures (including new levels of organization) by interacting with, and learning from, each other, coevolving in reaction to each other, revising their behavior continually (Arthur, Durlauf, & Lane, 1997). Coevolution among heterogeneous agents (Kauffman, 1993) starts from very small instigating events (Bak, 1996). Positive feedback effects (Arthur, 1990) magnify the instigating causes. For complexity scientists it is the autonomous, self-organizing agents—defined as individual employees or subunits—that take on the adaptive challenge.

**Adaptive Change Rate.** Fisher’s (1930) Theorem holds that the higher the rate of genetic variance the more likely species will evolve into new niches and increase their chances of survival. In a changing world an organization has to evolve faster than competing firms to have sustained competitive advantage. There is a general tendency for adaptive rates to speed up (Barnett & Hansen, 1996). Therefore, it appears that sustained competitive advantage, especially in a world of changing taste, technology, and globalization, is fundamentally a function of advantage resting on being able to speed up subunit adaptation. A major critique of bureaucracy is that its rate of adaptation is slow—tall, control dominated firms have trouble adapting quickly. Recent writing on competitive strategy calls for organizational designs that: help firms see industry trends before their competition (Hamel and Prahalad, 1994); win in hypercompetitive environments (D’Aveni, 1994); keep pace with high-velocity environments (Eisenhardt, 1989b) and value
migration (Slywotzky, 1996); and stay ahead of the efficiency curve (Porter, 1996). Dynamic, ill-structured environments and learning opportunities become the basis of competitive advantage if firms can be *early* in their industry to unravel the evolving conditions (Stacey, 1995). Prusak (1996: 6) says:

“The only thing that gives an organization a competitive edge—the only thing that is sustainable—is what it knows, how it uses what it knows, and how fast it can know something new!”

**Managing the Control-Autonomy Duality: The Balance Approach**

As noted, several authors have recognized “emergence” or “autonomy”, but for a long time they provided no operational propositions for managing the mix between control and autonomy. Such a mix is not easy to achieve. For example Lawrence and Lorsch, (1967) never told us how to implement and manage an organic form. However, Lindblom’s (1959) “science of muddling through” contains some of the first proposals for achieving a mix of control and autonomy. Next came Cohen, March, and Olsen’s (1972) “organized anarchy” and “garbage can” model, and then March’s (1991) quest for an “optimal mix” of exploration and exploitation. On the one hand, the new message was simple. It’s not either—or; it is both; it is balance. But “balance” is problematic. March (1991) stresses balance, even though in 1988 Levitt and he pointed to difficulties. Follow-on researchers mostly bought into the balance theme and forgot the “difficulty” part (Powell, Koput, & Smith-Doerr 1996, Henderson 1999, Lewin & Volberda 1999, Marcus & Nichols 1999, Luo 2002, Beckman, Haunschild & Phillips 2004, Holmqvist 2004). What’s a manager supposed to do? That March (1999: 5) states that “balance” is “…difficult or impossible” offers little help.

**A. Balance Approaches.** There is long history of attention to managing the *balance* between control and autonomy: global control vs. local sensitivity (Doz & Prahalad (1986), efficiency vs. learning (Bartlett & Ghoshal 1989), exploitation vs. exploration (March 1991), along with follow-on studies by Bradach and Eccles (1989), Tushman and O’Reilly (1996), Bradach (1997), Brown and Eisenhardt (1997), Sutcliffe, Sitkin, and Browning (2000), Tushman and Smith (2002), and Warglien (2002).

March (1991) focuses on the tradeoff between *exploring* new possibilities (searching new development opportunities) vs. *exploiting* certainties (improving their existing technology). The fact that organizations have scarce resources forces choices between the two objectives. *Exploration* includes “…search, variation,
risk taking, experimentation, play, flexibility, discovery, innovation,” all of which call for autonomy. 

Exploitation includes “…refinement, choice, production, efficiency selection, implementation, execution,” things that call for more specialization, managerial focus, and control. He says, “maintaining an appropriate balance between exploration and exploitation is a primary factor in system survival and prosperity” (p. 71). March does not really define just exactly what “balance” means. Even as recently as 1999, he calls for “…an optimum mix of exploration and exploitation” (p. 5). To us, his use of the word “optimum” means that managers can study the conditions at hand and then “design” a stable or static optimum. And yet, he says, “Defining an optimum mix…is difficult or impossible.” (p. 5). We would add, “especially so in a changing environment!” In this perspective a “balance” means a static equilibrium between two opposite forces.


B. Crisis Response—Balance, Imbalance. Cardinal, Sitkin, and Long (2004) point to the predominance of cross-sectional studies of formal vs. informal control in large, mature organizations. To counteract, they study a start-up firm using an extensive 10-year case study. They also begin with a short review of the “Dynamics of Balance” literature, with most focus on March’s work and a prior study by Sutcliff, Sitkin, and Browning (2000).

Cardinal et al.’s case is about a start-up company that goes through four organizational phases:¹

1. “Founding”—hired permanent employees instead of spot contracting day labor; focus on service to clients;

¹ Readers need to know that our very brief summary in no way captures the depth of analysis and care that the authors have taken to tell the story of this start-up firm.
family-like atmosphere; one co-founder (Miller) exercised control via his personal presence and direct contact with all employees; he “seemed to be everywhere” (p. 415); role modeling; verbal feedback open-door policy; “Miller lives life with movers” (p. 416).

2. “Creating a culturally driven company”—solidified family-like culture; culture-driven hiring; Miller directly involved in everything; revenues increase; first crisis: Miller burns out from over work and takes a sabbatical.

3. “Formalizing company operations”—decoupled control from Miller; formal hiring procedures; added middle-management layer; strict hierarchy; management physically separated from movers; standardized budgeting; cost containment; company becomes overly legalistic; leadership via memo; second crisis: mutual distrust & hostility, movers stage walkout, office staff caught stealing.

4. “Financial jeopardy”—cofounders “fire each other” and hire professional managers to stop bleeding; hired professional moving operations manager; retained HQ control over all activities; formal customer relations training; friendlier operations manual; reestablished standards, monitoring, guidelines; reinstated open-door policy; institutionalized Miller’s knowledge; more attention to financials, computerized accounting; expanded vision statement; formal budget approval process; beer parties; people fired for theft.

The authors conclude that the company achieved balanced control in Phase 4. They see the crises as “dialectical evolution” (Van de Ven & Poole, 1995) and “punctuated change” (Romanelli & Tushman, 1994). They see that “overzealous rebalancing efforts can simply create new imbalances” (p. 425). On the one hand, Cardinal et al. see “competency traps” (Levitt & March, 1988) where the cofounders, when facing crises, fell back on styles they were most familiar with. On the other, they point to “latency” (Zucker, 1997) and “latent controls” (p. 427) as managers remember previous control approaches that, when brought together in Phase 4, result in balance, saying “managers may effectively resolve control problems by re-adopting previously successful forms of organizational control” (p. 427). They conclude by noting that “our work highlights the degree to which past cross-sectional treatment of control has limited our theoretical advances in control theory” (p. 428). Cardinal et al. say, “…some form of the balance–imbalance pattern exists in all organizations” (p. 428). They say competence traps accelerate this tendency and can produce striking imbalances; but they also note that this process may be limited to new organizations.
THEORIES FAVORING IRREGULAR OSCILLATION DYNAMICS

March (1999) says that “balance” is impossible, yet he still advocates designing toward an “optimal mix.” “Balance” advocates advocate balance but offer virtually nothing that managers can do “on Monday morning” to achieve it. While still holding to the balance principle, Cardinal et al. (2004) study a newly founded firm only to find that “balance” is really extreme oscillation from control imbalance to autonomy imbalance. It shows nothing approaching “balance,” finding instead that the search for it results in only gross imbalance. Yes, the average is “balance,” but reality is one crisis after another.

Aiming for static balance is also ill suited to a fast-paced world (Brown & Eisenhardt, 1997). At some point, the time it takes to arrive at an optimal design is slower than the rate at which competitive conditions change (Schön, 1971). Optimum designs (“balance”) slow firms down as they become more global, more dispersed, more integrated into multiple local cultures that change at varying rates, more hooked into leading-edge technologies, more dependent on rapidly changing consumer tastes (Sanchez & Mahoney, 1996; Halal & Taylor, 1999), or as products change from things that clank to things that change at the whim of a software programmer (Prusak, 1996; Jennings & Haughton, 2000). We advocate irregular oscillation dynamics in line with the notion that most organizations need to be changeable, not just knowledgeable ones (McKenzie and van Winkelen (2004).

Unlike Venus and Mars, which are either too hot or too cold, Earth has a rotation rhythm that fosters life (as we know it) — there is night (cool) and day (warm) on a regular basis. It is not “balance” that counts; nor is it just random oscillation; it is rhythm. We now turn to a different tradition and literature that emphasizes control–autonomy rhythms rather than balance. We draw from three theory bases and two time-based investigations. We begin with “circular organizing” which takes the form of rhythmic oscillation (pendulum model) and progress towards the notion of irregular oscillation.

Circular Organizing.

Romme (1999) notes that scholars have been struggling with the problem of balancing top-down vs. bottom-up power and control for over fifty years (Weber, 1947; McGregor, 1960; Likert, 1961). Dynamic circling between top-down, and bottom-up control appears in business firms in the U.S. (Ackoff, 1981,
1989), Holland (Endenburg, 1988), and Japan (Nonaka, 1988). Bartlett and Ghoshal (1990) describe a firm that creates a “…constant ebb and flow in the centralization and decentralization of various responsibilities.” Schoonhoven and Jelinek (1990) report on firms switching structures to cycle between efficiency and flexibility. In some circles this is referred to as “circular organizing” (Romme, 1996, 1999).

Based on his research in a Dutch company, *Endenburg Elektrotechniek*, Romme shows that the trade-off between teams and hierarchy can be solved by a circular organizational design involving “the ability of the organization to switch between teams and hierarchy processes” (Romme, 1999:806). Circularity is based on the principle of “double linking,” which implies “that a team is linked to the next higher team in the hierarchy by means of its functional leader appointed by the next higher team, and a democratically elected representative or spokesman” (Romme, 1996: 415). In the decision-making process, functional leaders and spokespersons play completely different roles. The double link favors open discussion inside teams at each level until the consensus emerges. This model proposes a new perspective on the control and autonomy dilemma in which these two modes of coordination are not seen as in dichotomous stasis, but rather in dynamic oscillation.

**Contributions from French Anthropology and Sociology.**

* A. Tangled Hierarchies. The notion of “tangled hierarchy” describes the interactions between two opposite forces that are not symmetric and not regular. Studying Hindu society, a well-known French anthropologist, Louis Dumont (1966), proposed a new concept of social order comprised of an “entanglement” of individualism and holism. He indicates how the relationship of hierarchical opposition between the “englobing” level (the whole) and the enclosed level (the element) called “enclosing of the contrary” constitutes a formal model of social structure. Dumont shows that in holistic systems, such as Hindu society, an “inversion of the hierarchy inside the hierarchy” exists. For example, Hindu society is characterized by a continuing conjunction between religious and political power. The *Brahman* represents the sacred. Most of the time the englobing level (that is, the religious organization) dominates the political one. However, on the occasion of an economic or social disturbance, the hierarchy of Hindu society is inverted, with the *Rajah* (representing the political), dominating the *Brahman*. Eventually, the hierarchy
reverts to its original form. In fact, Dumont says, social systems are always composed of entangled components that vary in their relative dominance.

The epistemologist, Jean Pierre Dupuy (1992), sees in the Dumontian model an illustration of a logical form he terms a “tangled hierarchy.”\(^2\) Applying it to Hindu society, he proposes the schematization presented in Figure 1. He shows, in Figure 2, that the undoing (“deconstruction”) of a tangled hierarchy is still a tangled hierarchy but oriented differently. The englobing level of the initial hierarchy becomes the enclosed level of the new hierarchy. In Figure 1, in the H1 form, sacred is the englobing level and dominates political. Figure 2 shows the inversion of the H1 form into the H2 form in which political becomes the englobing level and dominates sacred. Building on Dumont, the French economist, Benedicte Reynaud (1987), defines three formal conditions for the existence of a tangled hierarchy. They are: (1) recognition of distinct levels of social organization; (2) asymmetry in relations between those levels; and (3) their inversion.

>>>Insert Figures 1 and 2 about here<<<

**B. Rhythm Dynamics.** Dupuy (1992) also discusses the rate of oscillation between the englobing and the enclosed levels by differentiating between oriented and symmetric tangled hierarchies. Oriented means that the oscillation rate is slow enough for an observer to easily tell which hierarchy is englobing and which is enclosed. As the inversion–reversion cycle speeds up, the dominance of one hierarchy (influence system) over the other recedes. Symmetric means the rate of oscillation between englobing and enclosed levels is so high that their separate influence effects can’t be identified.

**C. Legitimization via Joint Regulation.** For application to firms we draw on the regulation theory of Jean-Daniel Reynaud (1993), a French sociologist. For him, the regulation process consists of the creation and maintenance of the various rules structuring a firm. There are many different sources and domains of regulation in firms. Two principal sources of regulation are: management and organizational groups.

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\(^2\) The English translation of the French word, “enchevêtrée,” is “…tangled, entangled…” in this order, with no further distinction made. Dumont talks about opposing hierarchies (plural). Dupuy seems to refer to a tangled hierarchy (singular). In French the two terms, tangled and entangled, are used interchangeably. We will begin with Dupuy’s “tangled hierarchy,” but then talk about entangled control and autonomy forces as we progress.
Managers define “official” rules that constitute control regulation. At each organizational level, these rules fix or orient the activity, organization, and objectives of groups at lower levels. At the same time, these groups define for themselves rules concerning the same processes. These autonomous regulation processes can either reinforce or inhibit control regulation. They also exist between different organizational levels and/or different functions and services. Also, a firm’s regulation processes may focus on various objects such as work methods, promotion and access to managerial positions, remuneration, or the adoption of new production techniques. If many sources and levels of legitimate regulation exist in a firm, the main problem is to understand the way they are created, combined, or interact.

When the interests of two parties are in opposition, a compromise may result; what Reynaud and Reynaud (1994) call “joint regulation.” Different types of compromise may be observed in every-day practices between opposing autonomy and control regulations. Effective joint regulation happens when regulation processes mutually reinforce one another. The more autonomy develops, the more need there is for joint regulation. Indeed, autonomous regulation in the knowledge era becomes an organizational means of flexibility and innovation (McKelvey, 2001, 2005). We emphasize two kinds of regulation:

1. Control-dominated exploitation regulation: official rules defined by management, and
2. Autonomy-dominated exploration regulation: informal rules defined by one or more groups.

For firms, the applicability of the concept of “tangled hierarchies” may be summarized as follows Thomas, 1999) (see Table 1 for a glossary of key French terms):

1. Two opposing regulatory forces structure a firm: control regulation and autonomous regulation. This results in hierarchical opposition. Because these forces are not separated, their interaction is a source of continuous tension.
2. In this configuration, a firm is defined as a space of articulation between these two forces. Reynaud and Reynaud (1994) call this meeting place the space of “joint regulation.” The effectiveness of the joint regulation process comes from the firm’s capacity to maintain a clear separation between these two types of “regulation.” Regulation-separation may be achieved by giving priority to either control or autonomy and by delimitating the conditions under which this priority may be inverted or, in other words, by introducing a tangled hierarchy.
3. Hierarchical opposition in control regulation may also occur when a problem of competence sharing arises between different services (i.e., engineering, production, or sales), or between functions and projects (such as
when a firm adopts a matrix form where horizontal and vertical coordination hierarchies interact.

Effective joint regulation appears in Japanese firms (Aoki, 1994; Nonaka & Takeuchi, 1995). Aoki shows how Japanese firms use “conventions” distinguishing between responsibilities of operational units (including their degree of autonomy in the decision making process) and higher-level managers. They describe conventions determining conditions under which the hierarchy between control and autonomous regulations may be inverted. Aoki notes further that new conventions structuring the exchange of information between different services appear. They may concern, for example, the nature of events that need to be communicated or the media that should be used. Conventions facilitate the relationships between different functions and services. Similarly, Nonaka and Takeuchi note that in a “hypertext” form, in contrast to a matrix structure, an organizational member is involved in only one regulation process (vertical or horizontal) depending on the context and the type of a decision. In a hypertext form there is no equality of structural forces and their regulation processes—the inversion–reversion of one opposing structure over another depends on the task and its context. In circular organizing, Romme (1999) describes the use of “double linking” as the Dutch way of governing by circling between the forces of administrative control and bottom-up consensus.

Handling Paradox.

By focusing in on their phrase “appropriate balance” (p. 2) and their picture of a scale balancing exploration and exploitation (p. 20), we could have placed McKenzie and van Winkelen’s (2004) approach in our “balance” Section. But seven of their graphics (p. 3), show an oscillation tracing, they talk about a “push and pull” process for integrating six paradoxical knowledge flows, and they show figure-ground reversal diagrams that make their approach seemingly more comparable to the inversion–reversion process.

McKenzie and van Winkelen begin with a focus on stability vs. change. They broaden stability into:

3 The McKenzie and van Winkelen analysis covers 326 pages. We have tried to be fair to their perspective, but readers need to recognize that we have reduced their excellent and comprehensive discussion down to a relatively few words.
exploitation, efficiency, cost control, selection, coordination, structure, institutionalization, and standardization. They broaden change into: exploration, flexibility, innovation, variation, specialization, spontaneity, fluidity, and development. This parallels our analysis, except that stability and change are outcomes whereas control and autonomy (in its various forms) are, respectively, the underlying driving and enabling influences. Their analysis starts with three chapters focusing on managing internal knowledge priorities bearing on “Competing,” “Deciding,” and “Learning.” The next three chapters focus on reframing external dynamics, specifically managing knowledge flows from outside into the organization: “Connecting” (to the outside), “Relating” (operating networks), and “Monitoring” (generating foresight via intellectual capital).

They see balanced emphasis on both stability and change setting in motion interconnected knowledge flows that, in turn, create tensions. Each chapter details the paradox of two tensions, totaling twelve—as shown in Table 2. The latter result from trying to balance conflicting pulls—each pole has strengths and weaknesses. They say,

…If we concentrate on exploiting knowledge excessively, we run the risk of becoming narrow minded and possibly irrelevant in a changing world. Whereas, if we concentrate excessively on creating new knowledge, we risk failing to exploit and generate value from the opportunities we have created. Each side of a tension can also be mutually re-enforcing. For example, exploiting best practices can ‘raise the bar’ for knowledge creation with examples of excellent practices stimulating even greater heights of innovation. To harvest the benefits of each, we must choose to pay attention to both sides of a tension.

In their final integrative chapter, the defining heading for McKenzie and van Winkelen is “Handling Paradox.” In each chapter they argue that too much of one pole damages the other and leads to bouncing from one extreme to the other—as is nicely illustrated in the case by Cardinal, Sitkin, and Long. What is most important for our comparison are their “reframing” figures (based on Hampden-Turner, 1990) in which they juxtapose the several variants of stability/exploitation and change/exploration (i.e., each row in Table 2). In the top half of Figure 3, we present their reframing figure (from page 280), in which a firm should oscillate between opposites—i.e., figure–ground reversals—thus, alternating between exploitation-
There are three fundamental differences between their perspective and tangled hierarchy theory:

1. In the latter perspective, the oriented tangled hierarchy is held in place for long periods of time—it is stable. McKenzie and van Winkelen view the englobing process as alternating. Their “alternation” view, would appear as a symmetric $H$ form and, though effective, is also fragile. It would eventually deconstruct.

2. Within the long-term oriented tangled hierarchy there are rhythmic inversions–reversions from $H_1$ to $H_2$ and return. For McKenzie and Winkelen, the rate of oscillation rhythm is undefined.

3. For McKenzie and van Winkelen the resolution of the paradoxes is very much a mental development of “intellectual complexity” (p. 317)—it is a mental reframing activity. They call it “a holistic mental orientation” (p. 278). Though they mention “issues of legitimacy” (p. 278), the term “legitimacy” doesn’t appear in their Table of Contents or Index. We agree that it is important for managers learn to think with “intellectual complexity” but thinking about it complexly doesn’t necessarily enable self-organized emergent autonomous distributed intelligence (McKelvey, 2001, 2005). Establishing culture-based legitimacy supporting the long-term oriented $H_1$ form is highly important as is, then, establishing the legitimacy of the inversion–reversion rhythm.

Many Questions Remain.

There are substantial differences between tangled hierarchy theory, “circular organizing,” and “handling paradox.” The latter two make no mention of a stable englobing form, nor do they talk about an oscillation rhythm of some kind. By contrast, Dupuy (1992) holds that if the englobing form oscillates too rapidly it deconstructs. He proposes a fairly specific rate of oscillation—his “oriented” form. He defines it as “slow enough for an observer to see.” But how fast can the rate be before observers can’t see it? How slow can it be before one runs the risk of over reaction to imbalance? If a good rhythm between control and autonomy exists, how does it come to be? He says that if the oscillation rate becomes too fast—his “symmetric” form—it may be effective. But it is fragile and subject to quick destruction, thereby leading to chaos. Is his view correct? Is it really fragile?

Reynaud and Reynaud (1994) talk about joint regulation. How does this happen? Do managers set it up? Does it emerge, bottom-up? Some of both? Would we recognize the “right” rhythm when we see it? They
focus on legitimacy. But how does joint regulation become legitimate? How do people at various levels of an organization actually get joint regulation to happen? Are there processes required to be in place before it happens?

What happens when organizations become large and complicated? What happens when a firm becomes multidepartmental, multidivisional, or global? Miles et al. (1999) advocate “cellular networks” consisting of entrepreneurial firms partially owned by a holding company. In this case the “nearly decomposable” units are firms rather than departments or divisions. What does control–autonomy rhythm look like in these firms?

As it stands, we have some clues that the balance approach is problematic and that dynamic control rhythms may offer a better solution. To gain further insight we now turn to two recent, but very different kinds of research. The first is a computational model by Siggelkow and Levinthal (2003) that studies an attenuated inversion–reversion dynamic. The second is a twelve-year case study of the building of a global cosmetics firm by Thomas (1999, 2003). Each of these conducts its investigation across time, the only way to gain time-relevant insights.

TIME-BASED INVESTIGATION #1: A RECENT COMPUTATIONAL MODEL

In a remarkable example of how agent-based computational modeling can help management theorizing, Siggelkow and Levinthal (2003) pick up on the foregoing themes to tease out some of the dynamics arising when firms mix centralization–decentralization, exploration–exploitation, and near decomposability. They model performance results stemming from three structural designs: unchanging centralization, unchanging decentralization, and “temporary decentralization with subsequent reintegration”—termed “reintegrator firms”—which parallels the aforementioned inversion–reversion process depicted in Figure 3. They use Kauffman’s NK model (Levinthal, 1997; McKelvey, 1999; Rivkin, 2000), one of the most frequently used in organization studies (Maguire et al., forthcoming). Their statistics are based on averages across 10,000 runs of each landscape design. Typically a “model” firm is decentralized for 25 periods and then becomes centralized. A computational period, in real life, is a time span in which a division can (1) search for profit-enhancing alternatives; (2) evaluate alternatives; and (3) implement a profitable change (only one for a
centralized firm; two for decentralized firms). While periods are split seconds in the computer, one can see that in real life, a “period” could be a fairly long search-decide-and-then-change time span lasting several months or more in a large firm.

Their model does not pursue “rhythm” like Mother Earth—oscillating over some period of time; instead, they “begin,” so to speak, with one period of decentralization (of varying length) followed by centralization. Their key findings are:

- In simple decomposable environments, reintegrator firms perform as well as permanently decentralized firms;
- In complex (nondecomposable) environments, while reintegrator firms suffer during their initial decentralized design, once reintegrated they outperform the other kinds of firms;
- When environments are changing, reintegrator firms outperform centralized firms;
- As firms become more complex—more degrees of freedom and cross-departmental interdependencies—reintegrators offer performance advantages;
- The length of the time of decentralization before reintegration has a strong effect—in the model, performance peaks when decentralization extends to 40 periods and then flattens out;
- Temporary creation of cross-divisional interdependencies—termed “scrambling” in the article—produces the highest performance. The authors don’t mention it, but this seems like temporary creation of weak ties (Granovetter, 1973), which fosters novelty in the short term, while allowing firms to reinstall efficiency objectives once the period of exploration is completed.

This computational modeling study offers a significant additional clue by highlighting the importance of a “period” of decentralization. The real-world meaning of “period” remains vague, however, and only the effects of one period are studied. Still, it is a major departure from balance thinking. The French theorist, Dumont (1966), followed by Ackoff (1981), Endenburg (1988), Nonaka (1988), and Romme (1996), introduced the idea of oscillation. Dupuy (1992) takes the next step in suggesting some kind of rhythm—too slow, too fast, just right. What “just right” means has yet to be determined. Moderating variables of what is “just right” are yet unspecified, though here too, we have clues from the modeling study. Siggelkow and Levinthal conclude: “As interactions across and within divisions increase, the optimal length of decentralized exploration tends to grow.” They also conclude that, “…temporary interdependencies can
prevent divisions from getting stuck low-performing solutions,” but they do not really define “temporary” in any meaningful real-world sense. In contrast to “balance” theory, they conclude: “…exploration and stability are not achieved simultaneously through distinct organizational features…but sequentially by adopting different organizational structures.”

**TIME-BASED INVESTIGATION #2: A RECENT CASE STUDY**

In 1990 a firm, which we call *Omega Group*, decided to diversify into cosmetics via acquisitions. Our description covers the period from 1990 to 2001 during which the Cosmetics Division underwent three distinct phases—outlined in Figure 4. We describe the key developments of each phase below:

>>>Insert Figure 4 about here<<<

**Phase 1 (1990–1996): Innovation, With Autonomous Regulation—H2 Form**

- Strategy of rapid growth by acquiring entrepreneurial firms, but leaving them autonomous.
- Priority clearly given to fostering differentiated lower-level autonomy.
- A production surplus eventually led to a strategy of forcing interplant competition.
- Each production plant was forced to innovate to guarantee its survival.
- Pressure to innovate led to the reinforcement of informal, horizontal links between marketing, R&D, sales, and production.

The tangled hierarchy of the H2 type fostered a climate of exploration that produced many, many innovations—but little profit.

**Phase 2 (1996–1998): A Symmetric Tangled Hierarchy: Oscillating H1↔H2 Hierarchies**

*Stage 1: More Power to Control*

- Stagnation of the custom cosmetics market and rapid growth of the mass market led to concentration of product lines controlled by a few international leaders.
- Because of overproduction and in order to improve profitability, *Omega’s* top management reorganized the Cosmetics Division into an independent *Company* with three Divisions: Custom Products, Mass Marketing, and Operations.
- The “*Company*” attempted to manage the balance between efficiency and autonomy affecting its Operations.

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4 The details of the case are extensively described in Thomas et al. (2004, 2005); methodology detailed in (2004).
Division by creating four top-management “International Committees” (Purchasing, Scheduling, Production, & Quality), making it an H1 form (oriented tangled hierarchy with control regulation englobing).

✔ The committees were to improve coordination across its two Marketing Divisions and the eight production plants in Europe, US, and China, all of which comprised the “Operations Division,”

**Stage 2: Symmetry & Fragility in the Custom Products Division**

At this point top-management:

✔ Launched a “globalization program” to find synergies aimed at cost reductions, while simultaneously keeping flexibility at the local level.

✔ Achieved a subtle mix of control and autonomy (i.e., rapid inversion-reversion between attention to one or the other tangled opposing regulations) via company-wide creation of four International Committees, one of which was the International Purchasing Committee (IPC).

Our analysis of the supply coordination activities of the IPC, shows that:

✔ As organized, it was extremely difficult to identify the englobing regulation system.

✔ Control and autonomy priorities alternated rapidly.

✔ Over time, the IPC evolved from the oriented tangled hierarchy of the H1 type (Stage 1) into a more flexible form giving equal importance to autonomous regulation (Stage 2).

✔ These dynamics resulted in a symmetric tangled hierarchy oscillating very rapidly between H1 and H2, with neither achieving supremacy as the englobing hierarchy.

We now describe the parallel opposing hierarchies during this phase:

**Control Regulation Hierarchy:**

✔ The IPC Officers formed a hierarchy where control regulation corresponded to the englobing influence system of the H1 form—the control half.

✔ The Custom Products Division’s President and the two Division-level International Purchasing Officers met every 15 days. They negotiated next year’s prices with core suppliers, announced bidding for new products (60% new products annually), and resolved temporary problems (quality, delays, price increases, etc.).

**Autonomy Regulation Hierarchy:**

✔ For temporary problems, representatives from the concerned production plant often joined the meetings.

✔ Generally, the President listened to his subordinates, which secured them a very important position in the entire
Local plant managers regained considerable autonomy to innovate in their elaboration and implementation of purchasing strategies.

Even though the control regulation was the **englobing** system, regular **inversions** to the autonomy hierarchy inside the control hierarchy were possible.

Inversions occurred because the local managers, for example, could influence the evaluation of suppliers, retained decision power in contracting with suppliers, and enjoyed considerable legitimacy.

The value system of the plant-level Purchasing Committee, similarly to the IPC, recognized local initiatives. Consequently, over the progression of the *inversion–reversion* cycles, the exploration tradition—the **enclosed** hierarchy—regained its strength, became equal in influence and brought about the rapid oscillation between H1 and H2.

Stage 2 shows that the role of the IPC officers evolved from that of managers-exercising-control to that of also offering support. In short, the H1 tangled hierarchy evolved into an H2 tangled hierarchy. Then, what began as an *inversion* to autonomy within the H1 control form, over time resulted in a rebalancing of autonomy and control. Both H1 and H2 forms achieved equality, that is, the whole became a symmetric tangled hierarchy. What started as *inversion–reversion* within the newly established H1 form in Phase 2, progressed into a rapid oscillation of H1 H2—both control and autonomy operating at the same time. We detailed each half (above) in “slow motion,” but in reality they were alternating so rapidly that one could not say, at any given time, that either control or autonomous regulations really “englobed” the other. This, according to Dupuy (1992) is the only form that corresponds to a true *deconstruction* of hierarchy. It is important to note, however, that this type of an organization—H1 H2 rapidly oscillating between up-and downward forces—is very fragile. The retirement of the IPC President (*Company* VP) at the end of 1997 marked the end of this Stage.

**Stage 3: Taylorist Control** (defined as control without *inversion–reversion*)

- A new *Company*-level VP, replacing the retired VP, also became the replacement President of the IPC.
- He adopted a very centralized approach, giving clear priority to standardization at the expense of flexibility—control regulation dominating.
✓ The organization adopted an **H1** type tangled hierarchy and tried as much as possible to limit the previous opportunities for *inversion*.

✓ This return to centralization destroyed the existing joint regulation.

✓ Consequently, autonomous regulation emerged “under-cover” in opposition to control regulation [as typically is the case of Taylorist-style organizations (Roethlisberger & Dixon, 1939)].

✓ This caused a very conflictual and chaotic situation.

✓ Isolated decisions were taken in plants without involving the IPC.

This “Taylorist” behavior parallels what occurred in the extreme-control phase of the Cardinal et al. case.

The firing of the “replacement” VP instigated Phase 3.

**Phase 3 (1999–2001): Control Regulation *Englobing*, **H1** Oriented Form**

Phase 3 began in 1999 when a *matrix* structure was introduced—with control regulation *englobing*. It became necessary because of the:

✓ Fragility of the previous form,

✓ Difficulty of getting the *symmetric* form to spread to other committees, divisions, and plants in the *Company*,

✓ Bad experience with the Taylorist-control oriented succeeding IPC President who was fired, and the

✓ Necessity of reinforcing coordination across different levels.

The matrix form fostered the emergence of multiple tangled hierarchies.

✓ Strong *horizontal* Functional coordination across the eight Plants, matched *vertical* Function-based control within the Cosmetics Division.

✓ The “*englobing*” influence system remained one of top-down control regulation—**H1**.

✓ However, the various plant-level managers regained their autonomy: the *inversion* of the hierarchy within the **H1** form was, therefore, also happening—illustrated in the **H1** half of Figure 2.

✓ The inversion allowed for the emergence of truly interactive *opposed regulations*, as per Dumont and Dupuy.

For managing Operations activities, there were two sets of tangled hierarchies:

✓ **Vertical** ones running up and down between the Division President and the Plant Managers; and

✓ **Horizontal** ones, running left and right between the Operations Executive Vice President and the Plant Managers (envision this as a horizontal hierarchy in the matrix).

✓ Thus, there were two **H1** hierarchies (one vertical, one horizontal) in which control regulation represents the
englobing influence system.

The oriented tangled hierarchy depended on the horizontal functional coordination axis of the matrix structure having very strong involvement by the Executive Vice President Operations and his team, composed of four Senior Vice-Presidents (SVPs) and four corresponding Vice Presidents (VPs) in the Custom Products Division. They coordinated as follows:

- Decision to enhance synergies among the eight Plants, between the corporate level and the local level (production plants) and between the key operational functions: development, purchasing, planning, and quality.
- In two meetings per month, the SVPs & VPs articulated different types of regulation pertaining to control, coordination, and autonomy, that is, they managed the inversion–reversion between autonomy and control.
  - The objective of the first meeting was to monitor results. The objective of the second one was to strengthen coordination between Marketing and Operations, especially as it pertained to launching of new products, which occurred frequently in the Custom Products Division.
  - Some managers were present for meetings at both levels, thus assuring inter-level coordination.
  - Discussions of local and overall costs and performance led to quick appreciation of strategic implications (timing and success of new products, competitors’ actions, changing consumer needs), and to collective corrective actions (interactive inter- and intra-level regulation processes).

Phase 3 supports Simons (1991, 1994) argument that influence systems, when they are used interactively, can be a proactive and dynamic tool to gather information and stimulate discussion in decentralized businesses. Interactive control [influence] systems are “a powerful tool in guiding and energizing the competitive evolution of the firm” (Simons, 1991: 61).

SOME PROPOSITIONS

We have described several approaches in the existing literature from which we derive a number of propositions. The various perspectives range from the classic pyramidal control hierarchy to: control–autonomy balance, crisis-driven imbalances, circular organizing, anthropological perspectives, knowledge-based design, and two time-based investigations. We see a threshold being crossed, from what March (1999) called “impossible” static balance approaches to rhythm dynamics. We outline a range of new control–autonomy management guidelines in the form of propositions that both summarize our perspective
and invite further exploratory and/or confirmatory research.

**Control or Autonomy Englobing**

It should be clear from our review that “balance theory” dominates much current thinking about organizations and management—this was especially true at the 2004 Strategic Management Society Conference in Puerto Rico. “Balance” theorists define “balance” as a situation where both sides exist at the same time in the same weighting, like equal balance on the metaphorical scales of justice. This quickly leads into out of balance thinking—dominance vs. submission, control vs. autonomy, exploitation vs. exploration. The essential ingredient in Dumont’s use of “englobing” is not dominance vs. submission, not control vs. autonomy. Instead, his focus shifts to enclosing vs. being enclosed. With dominance vs. submission, thinking of them moving toward balance makes sense. However, with enclosing vs. enclosed, the concepts don’t make sense if one attempts to “balance” them. How can two things be enclosing and enclosed at the same time?

In music one cannot have major and minor keys playing at the same time—it just doesn’t make sense; it isn’t possible. Consider Grieg’s Piano Concerto in A minor. Clearly A minor is the enclosing key—it is englobing from beginning to end. The first and last chords are in A minor, with many inversions to major keys in between and then with reversions back to A minor. The power of Dumont’s insight is that he forces a shift away from “balance” in talking about the two kinds of hierarchy in Hindu society—one run by Brahmins and one run by Rajahs, depending on circumstances. But, and here is the second key insight, they invert and revert as needed as the society constantly deals with both religious and political needs. Furthermore, it is always legitimate to invert–revert, as necessary.

The first change we suggest is to shift management thinking from “balance” to “englobing.” Therefore, following tangled hierarchy theory and our recent 12-year case study, we posit that either top-down control or bottom-up autonomy has to be legitimated as the englobing, or overarching force, within which legitimacy, then, is also afforded to the inversion–reversion process. Hence:

**Proposition 1a:** Instead of attempting static, equal balance between control and autonomy, managers have to define one or the other as englobing.
Periodically Boards and/or CEOs will conclude that shareholder value is best achieved by re-establishing the opposing orientation as englobing. We think Porter’s (1985) efficiency curve is relevant here. Given the nature of its competitive environment, the relative maturity of its industry, its position in the industry, etc., a firm makes a fundamental decision about which end of the curve to aim for. To compete successfully it has to marshal all of its forces toward one end or the other. It can’t bounce its primary orientation back and forth as whim dictates. And, in Porter’s view (1996) there is no middle strategy. Englobing is a long-term, multi-year orientation. Thus:

**Proposition 1b:** Englobing strategies are necessarily long-term decisions.

CEOs good at driving toward efficiency aren’t usually very good at fostering the kinds of innovative, entrepreneurial cellular networks that Miles et al. (1999) talk about. Think of “Chainsaw Al” (Byrne, 1999) vs. the kinds of self-effacing CEOs that Collins (2001) describes. So too, shifting from $H_2$ to $H_1$—neither can play the role of the other. Eventually, shareholder value is best achieved by re-establishing the dominance of the opposing orientation. Englobing cycles could very well be in the ten-year range, though they could also match business cycles. They could also follow long periods of marginal performance—as in our case. In the sense that they clearly signal a clear change from one end of the efficiency curve to the other, they may be quite rare.

We suspect that Boards can only change the fundamental $H_1$ or $H_2$ competitive orientation, with a CEO (and or other top management) change. After all, shifting from $H_1$ to $H_2$ is a sea change of culture-based legitimacy. We believe that $H_1$–$H_2$ changes also require rather complete makeovers in corporate culture—surely a lengthy process requiring great consistency. For example, even after decades of trying, GM is still a high-cost producer of low quality cars; still stuck in the middle of Porter’s efficiency curve. Consider the following:

**Proposition 1c1:** Changes in englobing strategies may be possible only when associated with business cycles and accompanied by a CEO change.

**Proposition 1c2:** Fundamentally important as they might be, changes from one “H” form to another most likely are long-cycle events, as illustrated in our case.
Proposition 1d: Changes in englobing strategy—that are clearly defined as control or autonomy englobing—will rarely be accomplished effectively absent an accompanying sea change in corporate culture (which legitimizes the joint regulation processes) supporting inversion–reversion dynamics.

Inversion–Reversion Rhythms

Managers have to hold their job long enough to find the right inversion–reversion rhythm within one or the other englobing strategies—if it isn’t already established or legitimated. In our case it took over three years for the firm to establish its H1 form and to find an appropriate coordination rhythm, and included a top management change along the way.

We wish to emphasize that the conjunction of tangled hierarchy theory with our case finding suggests that setting either control or autonomy as englobing without inversion–reversion doesn’t work. That is, getting locked permanently into one or the other pole of the duality surely doesn’t work—we accept this finding from all of the studies underlying the search for “balance” solutions. The driving reason for Dumont’s shift from dominance–submission to enclosing–enclosed thinking is because the presence of a strongly legitimized englobing hierarchy makes it easier to legitimize the temporary importance of the opposite. This gives rise to interaction effects, however. The more solidly stable are the regulations defining decision objectives and responsibilities corresponding to the englobing and enclosed levels (that is, an oriented tangled hierarchy), the faster the rhythm of inversion–reversion and the stronger (and thus more effective) the inversion can be. This because making the latter temporarily more pronounced won’t disrupt (deconstruct) the long-run oriented H1 or H2 (englobing) form. This leads to:

Proposition 2a: The inversion–reversion cycle can’t be so fast that it deconstructs (disrupts, disorients, or undermines) englobing legitimacy; i.e., that it changes the entangled control vs. autonomy influence hierarchies from oriented to symmetric.

Proposition 2b: The more solidly defined and legitimized is an oriented H1 or H2 form, the faster the inversion–reversion cycle can be and the more strongly it can be defined and implemented before it deconstructs the oriented H1 or H2 form.

A word of caution, however. If the limits and the nature of the span of decision responsibilities corresponding to the englobing and enclosed levels change quickly and if the rhythm of inversion–
reversion is too rapid, the tangled hierarchy could be permanently deconstructed. The result is a symmetric tangled hierarchy in which rapid oscillation between the $H_1$ and $H_2$ forms occurs—i.e., inversion–reversion cycles measured in days—as opposed to slower but more pronounced inversion–reversions within one or the other oriented tangled hierarchy forms. As “balance” theory implies, and as is illustrated in our case, the symmetric dynamic is indeed the most effective—for a while. But, it is also the most fragile or unstable. Consequently:

**Proposition 2c:** Inversion–reversion cycles in the months range appear optimal (as in our case), though quicker, more surface-level inversions–reversions may be possible if they can be appropriately legitimized, (as happened for a while in our case).

While we question continued adherence to static “balance” theory, we do recognize that managers do have to constantly work at maintaining and/or fostering the joint legitimacy—and definition in the organization’s culture and process dynamics—of these two “force dynamics,” one of which is slower and one faster, so:

**Proposition 2d:** To be effective, managers must take charge of two kinds of dynamics simultaneously: (1) Manage the longer-run stability of the oriented tangled hierarchy, i.e., the englobing $H_1$ or $H_2$ form; while (2) at the same time managing an optimal inversion–reversion rate with clear definition of the opposing orientation within one or the other $H_1$ or $H_2$ form.

The foregoing proposition explains why Toyota and Honda consistently outperform Ford and GM even though the former do not have what Porter (1996) terms “strategy.” This because they do not appear to be at either end of the efficiency curve, but rather meet head-to-head at various price points between the two extremes of the curve—low cost and high quality (Cooper, 1995, calls it Lean Enterprise Management). In fact, they both fall well within the oriented $H_1$ form, that is, control and efficiency englobing, but also with strong legitimacy authorizing frequent inversions–reversions to periodically emphasize autonomy and innovation. This allows them to push costs even lower while at the same time adding amenities to their cars in each model year.

Decades of theory and practice in Organization Development demonstrate that it is much harder to start up autonomous structures and keep them going than is true for control-dominated ones (French, Bell, &
Zawacki, 1989; Mirvis & Berg, 1977). Our case also suggests the idea that dynamic rhythm can be faster inside H1 oriented tangled hierarchies (control regulation englobing) than in H2 oriented tangled hierarchies (autonomous regulation englobing). Two consequences are: (1) Since it appears easier to solidly legitimate and foster the legitimating corporate culture supporting H1 than H2 form, it follows that strategies based on the H1 form can withstand more frequent and stronger inversions to autonomy (the Toyota/Honda approach), than the H2 form can withstand inversions to control. Thus, the overall collective strength of control and autonomy forces is higher with H1 form (with rapid inversion to autonomy dominance) than is true for the opposite, i.e., H2 form with inversions to control. (2) Given a well-legitimated H2 form (autonomy englobing), however, it also follows that it will be easier for managers to quickly invert to temporary periods of control, than it would be for managers to quickly invert to autonomy given control (H1) englobing. Therefore, we suggest:

Proposition 2e1: Given equal levels of legitimacy and supporting corporate cultures, the inversion/reversion rate will always be higher in H1 than in H2 form.

Proposition 2e2: Given H2 form, managers can begin and complete inversions to control-dominance with reversions back to H2 faster and easier than they can carry out an autonomy-dominance inversion–reversion cycle in the H1 form.

The Order–Chaos Traps

There is a considerable downside risk for managers attempting to pursue very rapid or ostensibly simultaneous oscillation between control and autonomy—i.e., attempting to achieve a symmetric tangled hierarchy (one way of attempting “balance”). The risk is prolonged entrapment in periods of either control or autonomy dominance (more likely control dominance since it is a more pronounced top management tendency) when symmetry fails. We illustrate this possibility in Figure 5. McKelvey (1999, 2005), building from complexity science (Cramer, 1993; Kauffman, 1993: Ch. 5) offers the best supporting explanation. As aptly illustrated by Brown and Eisenhardt (1998), the region of emergent complexity lies between the regions of order (bureaucracy) on one side and the region of chaotic behavior on the other. We can display this as follows:
Region of Order (*Control*) $\rightarrow R_{c1}$ $\rightarrow$ Region of Complexity $\rightarrow R_{c2}$ $\rightarrow$ Region of Chaos (*Autonomy*)

>>>Insert Figure 5 about here<<<

In complexity terms this is the consequence of Dupuy’s (1992) observation that when a tangled hierarchy becomes *symmetric* it deconstructs the *englobing* H form, whether H1 or H2—in effect collapsing the complexity region. This leaves an organization no option but to fall into the Order or Chaos “Traps.” In our case we have the initial Phase II phenomena of *symmetric* form with the effective, but fragile, very rapid *inversion–reversion* cycle—which ends with a collapse into control dominance. In the Cardinal et al. (2004) case one also sees an excellent illustration of the foregoing dynamics. Here, an attempted response to the imposing adaptive tension stemming from the two crises first, sends the start-up firm into the region of attempted order—legalistic control—and second, on the rebound, sends it right across the region of emergent complexity into chaos—work stoppage, theft, customer dissatisfaction, etc. We suggest, therefore:

**Proposition 3:** Managers attempting “balanced” control and autonomy, if successful, risk creating a *symmetric* tangled hierarchy, thereby deconstructing the *oriented* H form, and quite possibly collapsing their organization into the control or chaos Traps—opposite of what they want to accomplish.

**Joint Regulation**

It appears impossible to legitimize either H form without the concurrent creation of an appropriate corporate culture supporting joint regulation, as called for by Reynaud (1993) and Reynaud and Reynaud (1994). Needless to say, managers just can’t go out and order the creation of an appropriate culture. However, there are ways in which managers enable or do not enable cultures fostering the necessary emergent joint regulation processes. While CEOs can call for and impose an *englobing* H form, they can only *enable* emergent complexity (Marion & Uhl-Bien, 2001, 2003; Uhl-Bien, Marion, & McKelvey, 2004). In our Case, we see this when top managers take control of purchasing and budgeting in such a way that even though control and efficiency become dominant, ample room is left in meetings for lower-level inputs, such that *inversions* to autonomy dominance take place as necessary, but not so as to deconstruct the englobing H1 form.
**Proposition 4:** While asserting \( H_1 \) or \( H_2 \) oriented form, managers can enable the emergence of the joint regulation processes (and supportive corporate culture) essential to effective inversion–reversion by asserting control over all on-going organizational or business functions such as budgeting, purchasing, production, marketing, and so on, while at the same time legitimating timely periods and processes of autonomy dominance.

**Irregular Oscillation**

Our review of the “exploitation/exploration” literature shows that most of the discussion occurs in the context of balance—like the scales of justice—the idea being to pursue both at the same time in equal measure. The “circular organizing” literature substitutes rhythmic oscillation—pendulum-like—instead of balance. Here and there in our foregoing discussion we have occasionally mentioned the phrase, “irregular oscillation.” This notion of irregularity emerges from a growing literature on the study of heartbeat rhythms in relation to heart attacks and death (Bigger et al., 1996; Huikuri et al., 1998; Bolis and Licinio, 1999; Ribeiro et al., 2002). There are two features of this work:

First, considerable research now shows that heartbeat irregularity is best described by a power law function. Power laws are exponential functions in which the exponent does not vary in a particular setting. These functions produce “fat-tailed” Pareto distributions rather than the normal Gaussian distributions we are most familiar with (for details see Andriani & McKelvey, 2005; McKelvey & Andriani, 2005). The power law function is often characterized as Zipf’s Law, which describes the frequency of word usage; if words are plotted in a double-log graph in terms of rank in frequency of use (i.e., 1\textsuperscript{st}, 2\textsuperscript{nd}, 3\textsuperscript{rd}, 4\textsuperscript{th}, etc.) and by frequency of use at each rank (e.g., throughout a book), the points on the graph appear as a line sloped at \(-1\). The irregular heartbeats of healthy people also exhibit a fractal structure, that is, the most frequent and tiniest irregularities appear the same as larger less frequent ones if they are all magnified to the same scale.

Second, this research also shows that as the fractal structure of heartbeat rate deteriorates, the health of people also deteriorates. In fact, heartbeat regularity has now become one of the best indicators of impending heart attacks, and death (Huikuri et al., 1998). While heartbeat regularity is probably the most obvious indicator of poor health, there is growing evidence of fractal structures in genomic properties (Luscombe et al., 2002), protein networks (Song et al., 2005), cellular substructures (Wax et al. 2002),
circulation (West et al., 1997), and brain functioning (Shin & Kim, 2004). If any of these fractal structures deteriorate, a body’s ability to survive and adapt is impaired.

While management research is, again, lagging natural science, there is growing evidence of the importance of fractal structure to organizational functioning (Andriani & McKelvey, 2005). Given this platform of research, we take the next step in theorizing that control/autonomy oscillation dynamics are *irregular* in healthy, adaptive organizations. Oppositely, organizations become dysfunctional and maladaptive when they are: (1) locked into periods of prolonged control or autonomy—as is evident in our Case; (2) in static balance between the two (e.g., balanced exploration/exploitation); or (3) oscillate *regularly*, as appears to be the case in the circular organization literature. The need for irregular oscillation stems from the irregular imposition of tensions from the environment. Thus:

**Proposition 5:** To assure effective organizational functioning, managers need to foster joint regulation and legitimization processes that support timely, but *irregular*, oscillation dynamics that over the long run appear fractal in nature.

**CONCLUSION**

Organizations appear rife with dualities. Managers face them all the time. On one pole we have shades of *control*: top down regulation, efficiency, accountability, centralizing, standardizing, continuity, stability, exploitation, and global efficiency; at the other pole we have shades of *autonomy*: networks, horizontal integration, empowerment, decentralizing, customizing, change, innovation, exploration, and country sensitivity (Fenton & Pettigrew, 2000; Thomas et al., 2005).

In 1988 Levitt and March pointed to the mutually destructive tendencies of innovation vs. efficiency. A rather considerable attention in the literature over the years to the overarching duality—control vs. autonomy—has done nothing to alter this gloomy outlook. Even by 1999, March has not recanted on this—balance is “difficult or impossible” he says (p. 5). We think there is a better way for managers to achieve the much-needed advantages of both control and efficiency vs. autonomy and innovation. To add credence to our claim we have drawn from the following:

✓ Early studies of hierarchy, top-down control, emergent informal organization, and contingency theory;
The many studies over the years explicitly focusing on various manifestations of the control-autonomy duality;

Explicit “balance” approaches such as March’s (1991) exploitation and exploration;

A very recent case dramatically highlighting the balance–imbalance dynamic (Cardinal, Sitkin, & Long, 2004);

A range of clues suggesting a possible alternative, specifically irregular oscillation;

• Circular organizing (rhythmic)—dating back to Ackoff (1981);

• Various “tangled hierarchy” theories (irregular)—dating back to Dumont (1966);

• A new book on creating knowledgeable organizations (irregular) (McKenzie & van Winkelen, 2004);

• A very recent computational model offering more complex insights to the sequencing of decentralization and decentralization (unknown) (Siggelkow & Levinthal, 2003);

• Our own 12-year case study of the building of a global cosmetics firm (irregular);

• Recent research findings from cardiology.

From these different research platforms we detail our assertion by stating fourteen propositions.

March is right about the impossibility of static balance. We use the notion of major and minor keys in music to define the impossibility of balance. Kelso (2002, 2004) has discovered that even our brains coordinate functional integration vs. local independence via “coordination rhythms:” “…dynamic links among neural populations [specialized neural regions] can be transiently formed and dispersed as the stream of perception, action and memory flows.” (p. 369). Since organizations are increasingly seen as systems of distributed intelligence, just like brains (Zohar, 1998; McKelvey, 2005), Kelso’s “coordination rhythm” fits very well with tangled hierarchy theory.

We draw on theorizing by Dumont (1966), Dupuy (1992), Reynaud (1987), and Reynaud (1993) to ask that management scholars start thinking in two new directions: First, music-based thinking works better for managers than power-based thinking. It is not a case of dominant and subordinate; it is a case of one enclosing the other. The dominant musical key encloses another; they cannot ever both be present in the same chord. Dumont’s idea about tangled hierarchy is that two influence systems—two hierarchies, one up, one down (or, as in our case, even horizontal)—are interwoven together. They are always intertwined, but one influence system encloses the other. They are never balanced; for best long term functioning one always encloses the other.
Second, tangled hierarchy theory calls for a shift from *static balance* to *irregular oscillation theory*. Organizations should keep focusing (over time) on both control and autonomy, not by static balance, but by dynamic balance—the oscillation rhythm idea. But rhythm may occur at different rates. Dupuy mentions three generic speeds: (1) *Symmetric*, where the duality oscillates so fast that its two poles can’t really be distinguished; it can be very effective but is fragile and apt to end up in the order and chaos traps; (2) *Oriented*, where one side of the duality is always englobing—i.e., enclosing—with the other enclosed; and with a timely and well legitimized *inversion–reversion* rates such that the enclosed pole, say autonomy, becomes the enclosing and more active influence system for some specific period of time; and (3) the motionless order vs. chaos traps (all control or all autonomy) that invariably prove ineffective. We add a fourth idea—that the oscillation rate needs to be *irregular* and fractal for effective organizational functioning.

Though we find tangled hierarchy theory brought to life in a very recent computational model by Siggelkow and Levinthal (2003) and our own 12-year case study of a global cosmetics firm, even so, our propositions are best seen as new ideas in need of further empirical research.
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**Figure 1. Tangled Hierarchy applied to the Hindu society (Dupuy 1992)**

In Hindu Society the sacred (I) dominates the political (II). In the domain of the sacred (I), the Brahman (1) dominates the Rajah (2). But, in the domain of the political (II), which is always subordinate in relation to the sacred, the Rajah dominates the Brahman. This, results in a tangled hierarchy, termed the H1 form.

**Figure 2. Deconstruction of an Oriented Tangled Hierarchy (H1 to H2)**

**Figure 3. Comparison of Reframing with Englobing**

“Exploiting current knowledge is the context for” “Exploring new knowledge”

“Exploring new knowledge” “Exploiting current knowledge”

Englobing H1

Exploitation

Inversion

Reversion

Englobing H1

Exploration
Figure 5. Relation of *Inversion/Reversion* and Exploitation/Exploration

Symmetric tangled hierarchy

H1 region

H2 region

Fragility from the symmetric form

Exploitation Trap

Low

Order

Chaos

Exploration Trap

Exploitation

Exploration

High
Figure 4. Relation of Inversion/Reversion and Exploitation/Exploration
Table 1: Glossary of Key terms

**Tanglement Glossary (Dumont, 1966; Dupuy, 1992)**

<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Englobing of the contrary, or Hierarchical opposition, or Tangled hierarchy</strong></td>
<td>A hierarchy containing two opposing forces or social regulation processes—such as control and autonomy—which exhibits an inversion of the hierarchy, inside the hierarchy.</td>
</tr>
<tr>
<td><strong>Englobing level</strong></td>
<td>The hierarchical level at which the englobing social regulation process/force holds dominance most of the time.</td>
</tr>
<tr>
<td><strong>Enclosed level</strong></td>
<td>The hierarchical level at which a regulation process/force remains subordinate to the englobing force most of the time.</td>
</tr>
<tr>
<td><strong>Inversion or Reversion</strong></td>
<td>Inversion of the hierarchy inside a hierarchy; a situation in which the englobing level inverts to become the enclosed level, and vice versa.</td>
</tr>
<tr>
<td><strong>Symmetric entangled hierarchy</strong></td>
<td>A tangled hierarchy in which the rate of inversion/reversion is so high that it becomes impossible to make a distinction between englobing and enclosed levels.</td>
</tr>
</tbody>
</table>

**Regulation Glossary (Reynaud, 1993, 1999)**

<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Rules</strong></td>
<td>General term that includes formal rules, conventions, norms, routines. Rules set in motion by up- or downward forces that may become entangled.</td>
</tr>
<tr>
<td><strong>Regulation process</strong></td>
<td>Process of creation and maintenance of the rules.</td>
</tr>
<tr>
<td><strong>Top-down control regulation</strong></td>
<td>Rules created by a high-level authority—top management—and imposed in a top-down manner.</td>
</tr>
<tr>
<td><strong>Autonomous regulation</strong></td>
<td>Rules created by a group that are imposed on all group members.</td>
</tr>
<tr>
<td><strong>Sources of regulation</strong></td>
<td>Any entity in an organization that creates rules and asserts their legitimacy.</td>
</tr>
<tr>
<td><strong>Joint regulation</strong></td>
<td>Compromises among different sources and levels of regulation (entangled regulations) that emerge from daily interactions in the joint regulation space where the two processes/forces entangle.</td>
</tr>
</tbody>
</table>

Table 2: Paradoxical Activities*

<table>
<thead>
<tr>
<th>Competing</th>
<th>Excessive Change</th>
<th>Deciding</th>
<th>Excessive Stability</th>
</tr>
</thead>
<tbody>
<tr>
<td>Competing</td>
<td>Explore; all promises</td>
<td></td>
<td>Workhorse; all delivery</td>
</tr>
<tr>
<td>Deciding</td>
<td>Solo musicians</td>
<td>Choir singing in <em>unison</em></td>
<td></td>
</tr>
<tr>
<td>Learning</td>
<td>Specialist climbers</td>
<td>Ploughed feed; no seeds</td>
<td></td>
</tr>
<tr>
<td>Connecting</td>
<td>Overwhelmed &amp; confused</td>
<td>Weak via wasted resources</td>
<td></td>
</tr>
<tr>
<td>Relating</td>
<td>Mess of spaghetti, lo flow</td>
<td>A ‘Gordian knot’; no new views</td>
<td></td>
</tr>
<tr>
<td>Monitoring</td>
<td>Breadth of perspective</td>
<td>Depth of feedback</td>
<td></td>
</tr>
</tbody>
</table>