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Environmental change and organizational transformation

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Focusing on the special case of changes triggered by profound economic reforms in emerging economies, we suggest a new perspective from which to explore the relationship between environmental and organizational change. This research setting is used to explore and propose enhancements to existing theory that take into account how organizations respond to extreme forms of change. We propose a typology of environmental change that helps to interpret our findings and position our study vis-à-vis existing research.

1. Introduction

Organizational adaptation to environmental change has long been an important research concern for management scholars. In the absence of an appropriate response, changes in the contextual forces surrounding organizations can cause a firm to lose an important customer segment, a cost advantage in its operating process, and, if left unattended for too long, can even threaten the firm's survival. Of particular interest have been the cases where major—often called "radical" or "discontinuous"—environmental change occurs, as it is under such circumstances that organizations are most challenged to adapt. During the 1980s and 1990s a significant body of empirical and theoretical literature emerged on organizational adaptation to situations of major environmental change such as deregulation (Haverman, 1992), privatization (Keisler and Sproull, 1982; Johnson *et al.*, 2000), technological change (Christensen, 1992), or change in customer preferences (Kraats and Zajac, 2001). Tushman and Romanelli (1985) refer to this type of organizational change as a "process of reorientation" and provide theoretical insights into the ways in which it is undertaken. Most of the existing research, however, deals with major changes that are specific to a particular environmental layer (or dimension), while the "broader" institutional context remains unchanged. For example, while deregulation of a particular industry is undoubtedly a significant environmental change for the industry's incumbents and for potential new entrants, the broader institutional environment surrounding the industry in question (e.g., financial sector practices, labor market restrictions, and macroeconomic policies) typically remains quite stable.

Firms are also affected by changes in the broader, "general" environment (Bourgeois, 1980) that encompasses social, political, and macroeconomic dimensions. Some of the most extreme forms of environmental change, such as when environmental change is not only rapid and profound but simultaneously affects multiple dimensions of the broad institutional environment, have generally been overlooked by the literature—with a few exceptions noted below. In this article, by focusing on the special case of changes triggered by profound, country-wide economic reforms in emerging economies, we suggest a new perspective from which to look at the relationship between institutional change and organizational adaptation. Although a few recent studies have focused on the effect of large-scale environmental changes, particularly those produced by structural economic reforms, most of those papers have concentrated on specific issues, such as the change in labor wage schemes (Keister, 2002); the change in a firm's outward orientation (Toulan and Guillen, 1997); and the change in firm performance after privatization (Cuervo and Villalonga, 2000). The type of institutional change we observe after economic reforms is more "extreme" since the rapid and broader changes in the institutional environment also affect industry-specific conditions and organizations are presented with a much larger adaptation challenge than has been previously studied (Ginsberg and Buchholtz, 1990; Bacharach *et al.*, 1996; Fuentelsaz *et al.*, 2002).

By studying a sample of firms in four Latin American countries that have undergone major, economy-wide reforms, we investigate firm-level adaptation processes and use this research setting to explore a few basic propositions and advance existing theory. Our findings lend credence to some of the existing theories of organizational adaptation (Tushman and Romanelli, 1985) while challenging other frameworks. Specifically, where existing literature describes organizational adaptation to "radical" change as a gradual process that encounters significant internal resistance and takes several years to unfold (Levinthal and March, 1981; Ginsberg and Buchholtz, 1990), we find that faced with extreme environmental change, organizations apply a "swift and painful" treatment in order to accomplish major transformations in a very short period. We find no evidence to support the Newman (2000) proposition that "too much" institutional change hinders organizational transformation.

We start by reviewing the existing literature on environmental change and organizational adaptation and, building on the literature review, propose a typology that helps to position our observations relative to those studied by other researchers. We then present our setting, data, and methods, discuss the extent to which our findings are consistent with existing literature, highlight the main differences we observe in firms' adaptation processes, and provide alternative propositions to reconcile our findings with existing theory. We close the article with suggestions for further research.

2. Literature on environmental change and organizational adaptation

2.1 Environment and environmental change

The concept of the "environment" in management has been approached from a variety of perspectives. Strategy scholars typically divide the environment into dimensions or forces that affect the firm's performance. Andrews (1971) defines the environment of an organization as "the pattern of all the external conditions and influences that affect its life and development" (p. 48) and identified five environmental dimensions: technological, economic, physical, social, and political. Subsequent strategy research concentrates on describing the environment in terms of its potential effects on firms' performance. Porter's (1980, 1990) framework, for example, depicts the environment as being composed of five forces whose net effect determines for firms the attractiveness of a particular context (attractiveness is measured as the ability to obtain rents, other things being equal). Similarly, Khanna and Palepu (1997) describe how the environment in which a firm operates affects the breadth of its activities.

From the perspective of organizational theory, the environment has been classified according to its structural layers or constituent elements. Organization ecologists (Dill, 1958; Bourgeois, 1980) distinguish two environmental layers: the task environment—the layer closer to the organization that includes sectors such as customers, suppliers, and competitors having direct transactions with the organization—and the general environment—comprising sectors such as the social, demographic, and economic that are further removed from the organization and affect it indirectly. Alternatively, institutional theory defines the environment as an "interorganizational field" that includes actors and their actions (DiMaggio and Powell, 1983), where actors are defined as organizations or agents that interact with a given firm directly through exchange or indirectly through competition (Leblebici *et al.*, 1991). In order to assess the impact of the environment on a firm's performance, organizational theorists have attempted to characterize the environmental attributes that affect the firm (see Sharfman and Dean, 1991 for a historical perspective of this literature). Empirical work by Dess and Beard (1984) reduced these multidimensional approaches to three basic environmental attributes: munificence, dynamism, and complexity. They defined munificence as the extent to which an environment can support sustained growth; dynamism as the unpredictability or instability (volatility) of an environment; and complexity as the range of skills, knowledge, and information-processing capabilities managers need if they are to be successful.

It is, however, environmental change that is a core interest of management scholars. Environmental variation is a key element in several management theories dealing with a range of issues and processes, including firm survival, competitiveness, innovation, and executive turnover (Christensen, 1992; Tushman and Rosenkopf, 1992; Utterback and Suarez, 1993; D'Aveni, 1994). Despite this fact, and in sharp contrast with the attention paid to understanding and classifying organizational change, relatively little effort has been put into the understanding and classification of environmental change. Terms such as "radical" or "profound" to characterize environmental change (Ginsberg and Buchholtz, 1990; Wade, Swaminathan *et al.*, 1998) and "turbulent" versus "stable" to contrast environments (Miller *et al.*, 1996) have been used by many authors with no particular precision as to their meaning. Organizational ecology researchers have adopted Dess and Beard's (1984) concept of environmental "instability" as their construct for environmental change and have measured it by calculating the coefficient of variation in sales (Tosi *et al.*, 1973; Keats and Hitt, 1988). Wholey and Brittain (1989) have looked at the pattern of longitudinal change, building upon Child's (1972) and Hannan and Freeman's (1977) work to distinguish three attributes of environmental change: frequency, amplitude, and predictability. Finally, some authors have used the effect on organizations to classify the degree of environmental change; in this view, the further away from its existing competencies or orientation a firm is required to move, the greater is the degree of environmental change being experienced by that firm (Miller, 1982; Tushman and Anderson, 1986; Johnson, 1987; Christensen, 1992).

2.2 Environmental change and organizational adaptation

Organizational adaptation and learning have been extensively studied in the management literature. The behavioral theory of the firm (Cyert and March, 1963; March and Olsen, 1976; Levinthal and March, 1981; Mezias and Glynn, 1993) sees firms as adaptive learning systems in which much behavior unfolds through standard operating procedures. Nelson and Winter (1982) assert that organizations use "routines" that are developed through time and change constantly, but gradually, to adapt to changing conditions: actions that appear to produce results tend to become incorporated as new routines. Most of this research implies that learning and adaptation are slow, gradual processes, and that new capabilities are difficult to create and costly to modify (Argyris and Shön, 1984); some authors going so far as to suggest that existing capabilities may become "core rigidities" that can hinder an organization's ability to change (Gersick and Hackman, 1990; Leonard-Barton, 1991). Although recent research remains consistent with the notion of adaptation as a gradual process by which a firm converges toward a reasonable "fit" with the environment (Siggelkow, 2002) and actors in an organizational field make sense of and manage new phenomena (Leblebici *et al.*, 1991; Holm, 1995), an increasing number of researchers is studying firm adaptation in the presence of significant environmental change (Ginsberg and Buchholtz, 1990; Haverman, 1993; Bacharach *et al.*, 1996; Kraats and Zajac, 2001).

On the theoretical front, organizational change and adaptation have been extensively studied and classified. Greenwood and Hinings (1996) distinguish between radical and convergent organizational change by introducing the concept of an archetypal template—an organization's interpretive scheme shaped by underpinning ideas and values: "Convergent change occurs within the parameters of an existing archetypal template. Radical change, in contrast, occurs when an organization moves from one template-in-use to another" (p. 1026). They also make the distinction between revolutionary and evolutionary change: the former happens swiftly and affects all parts of the organization while the latter is gradual. Similarly, Tushman and Romanelli (1985) distinguish between "convergence"—a process of incremental change consistent with existing internal activities and strategic orientation—and "reorientations"—simultaneous and discontinuous shifts in an organization's strategy, structures, and control systems. Moreover, they posit that "*re-creations* are reorientations which also involve a discontinuous shift in the firm's core values and beliefs" (p. 179), and they propose a punctuated equilibrium model of organizational evolution, where periods of convergent progress are punctuated by reorientations that set the direction of the next convergent period. The propositions of the above two papers have been revised and extended by different researchers (Johnson *et al.*, 2000).

We argue that further development of theory relating to organizational change and adaptation requires a finer understanding of the different types of environmental change than we have today. The current taxonomies of environmental change are insufficiently sensitive to all the granularity of the relationship between environmental and organizational change and, as we elaborate below, this theoretical limitation hinders our ability to realize the full potential of empirical research. A more careful description of the various types of environmental change will help improve our understanding of organizations' specific responses to differing environmental stimuli.

3. A typology of environmental change

Different types of environmental change are likely to prompt or require different organizational responses. Consider, for instance, the punctuated equilibrium model of organizational change (Tushman and Romanelli, 1985). Other things (e.g., firms' resource endowment) being equal, we should expect more extreme forms of environmental change to be associated with more extreme forms of organizational response. However, a scan of the existing literature on organizational adaptation raises several important questions about the consistency of the findings vis-à-vis existing theory and suggests that a more fine-grained classification of environmental change is necessary. For instance, most colleges in Kraatz and Zajac's (2001) study, when faced with what the authors call a "profound environmental change" (p. 633), do not experience "short periods of discontinuous change" (even after controlling for organizational resources) as Tushman and Romanelli's (1985) theory suggests. Kraatz and Zajac actually find that colleges' adaptation to environmental change differs widely and unfolds gradually. Similarly, Haveman (1993) finds that despite the "abrupt discontinuity" (p. 28) brought about by industry deregulation, savings and loan firms show a significant degree of stability and inertia, which grows with organizational size.

We argue that a more precise description of environmental change can help sort out these apparent inconsistencies with existing theory. Wholey and Brittain's (1989) characterization of environmental variation—frequency, amplitude, and predictability—provides a comprehensive treatment of environmental change, but these dimensions do not appear to provide all the required granularity for sorting out the different types of environmental change discussed in the literature (e.g., the all-encompassing nature of the change brought about by profound economic reforms). We build on this framework and our own research on emerging economies to propose four dimensions of environmental change as follows:

Frequency: The number of environmental disturbances per unit of time.
Amplitude: The magnitude of the deviation from initial conditions caused by a disturbance.
Speed: Rate of change of the disturbance (deviation/time).
Scope: The number of environmental dimensions that are affected by simultaneous disturbances.

We have added "speed" and "scope" to Wholey and Brittain's framework and dropped "predictability." The importance of speed of change is well documented in management literature (e.g. Fine, 1998), while the scope of change has obvious implications on the complexity that organizations may face. We drop "predictability" for two reasons. First, in our view, "predictability" is a function of the pattern of variation along the four proposed attributes; environments with relatively low change in frequency, amplitude, speed, and scope are less complex and easier to predict. Second, the notion of predictability may involve subjective perceptions and projections, and we have preferred more objective measurements of change.

The four basic attributes combine in a variety of ways to create different types of environmental change, which in turn require different degrees of sophistication and depth in a firm's response to the resultant situations. Variations in these four attributes provide a more comprehensive typology of environmental change. Table 1 illustrates this with five cases of particular interest. The first type, regular change, corresponds to environments that regularly experience a low-intensity, gradual

Table 1 Attributes of change and resulting typology

Frequency	Amplitude	Speed	Scope	Type of environmental change
Low	Low	Low	Low	Regular
High	Low	High	Low	Hyperturbulence
Low	High	High	Low	Specific shock
Low	High	Low	Low	Disruptive
Low	High	High	High	Avalanche

change. The second type, hyperturbulence, corresponds to environments that feature a high frequency of high-speed change in one dimension (or a few)—e.g., environments portrayed by proponents of "hypercompetition" and time-based competition (D'Aveni, 1994). In these cases, new dynamics have altered the industry pace and imposed on firms the need to take new and frequent steps to adapt to the fast-changing conditions. Although the accumulated effect of these perturbations after a long period may be quite substantial, the intensity of each perturbation is modest.

The third type, specific shock, corresponds to environmental changes that are rapid and high in intensity, come rarely and are relatively narrow in scope; a typical example is industry deregulation. The fourth type, disruptive change, corresponds to changes that occur infrequently, develop gradually, and, although they typically emerge in a confined layer of the environment, they have a high-intensity effect and can pose serious adaptation challenges for organizations. Disruptive technologies (Christensen, 1992) are an example of this type of change; they typically require new sets of skills and tend to go unnoticed by industry incumbents for a while.

Finally, a most extreme form of environmental change, avalanche change, occurs very infrequently but is of high intensity, of high speed, and simultaneously affects multiple dimensions of the environment. An example of avalanche change is the implementation of profound economic reforms in developing economies and former soviet-style countries. In countries where such radical reforms have been implemented, the pre-reform period was characterized by a gradual deterioration of economic conditions such that a swift, profound change was seen as the only way out. Our concept of avalanche environmental change is analogous to Newman's (2000) "institutional upheaval." We prefer the term "avalanche" as it seems better to do justice to the major adaptation challenges imposed on organizations by this type of change.[1]

The typology in Table 1 can assist the interpretation of some empirical and theoretical contributions to date since it acts as a fine-tuning device to sort different cases in the literature. For instance, Haveman's (1993) paper on the effects of deregulation in the savings and loan industry and the Ginsberg and Bucholtz (1990) study of deregulation in the health industry are clear instances of a specific shock, while Kraatz and Zajac's (2001) example of US colleges seems to correspond to disruptive change—a high-amplitude change in one environmental dimension that develops gradually and goes unnoticed by many organizations. Table 2 provides examples of studies of organizational change and adaptation; it places emphasis on the way each author describes the particular environmental change experienced by the organizations under study, and then provides a re-classification of the environmental change based on our proposed taxonomy. Table 2 highlights the potential benefits of a more granular description of environmental change. Following Tushman and Romanelli's (1985) classification, for instance, one would expect "convergent" organizational change to be associated with

[1]Collins Dictionary defines avalanche as "a sudden or overwhelming appearance of a large quantity of things." Upheaval is defined as "a strong, sudden, or violent disturbance."

Table 2 Types of environmental change in selected studies of organizational adaptation

Study	Environmental change experienced by organizations in the study	Authors' description of environmental change	Environmental change classification
Haverman (1993)	Loosening of regulatory constraints in California's saving and loan industry	"abrupt discontinuity;" "quasi experiment" (p. 28)	Specific shock
Ginsberg and Bucholtz (1990)	Deregulation in the US health maintenance organization (HMO) industry: change in their not-for-profit status	"radical change;" "radical environmental shift" (p. 445)	Specific shock
Holm (1995)	Regulation changes in the Norwegian fisheries industry (mandated sales organization—MSO—reform)	No specific description	Regular change
Kraatz and Zajac (2001)	Demand changes in the enrollment to US liberal arts colleges during the 1970s and 1980s	"profound environmental change" (p. 633) "environmental turbulence" (p. 632)	Disruptive change
Siggelkow (2002)	Market changes and evolution around Vanguard mutual funds, 1974–1997	No specific description	Regular change
Audia *et al*. (2000)	Deregulation in the US airline and trucking industries	"discontinuous environmental change" (p. 842); "radical environmental change" (p. 837)	Specific shock
Bacharach *et al*. (1996)	Deregulation in the US airline industry	"massive environmental shift" (pp. 477, 485)	Specific shock

regular environmental change, "reorientations" to be associated with specific shocks or disruptive change, and "re-creations" (reorientations with a shift in an organization's core values and beliefs) to be associated with avalanche environmental change. Each specific type of environmental change in Table 1 may be associated with a specific pattern of organizational response.

As discussed above, some researchers have looked at firms' responses to changes in one or at most two of the four environmental attributes—e.g., responses to deregulation (Bacharach *et al.*, 1996; Audia *et al.*, 2000) or changes in customer demand (Kraats and Zajac, 2001). To date no study has addressed organizational adaptation to environmental changes that involve high amplitude, speed, and scope simultaneously. We believe that detailed analyses of organizational response to avalanche change may help us improve and/or extend existing adaptation theory. While most theory development has been drawn from the relatively stable context of developed economies (Newman, 2000), more extreme forms of environmental change tend to occur in emerging economies and this alone provides a new and interesting opportunity to test and validate existing theoretical propositions. In the remainder of this article, we start to explore organizational responses to avalanche change.

4. Data and methods

4.1 Research setting

Latin America represents an interesting case for analysis of avalanche change because most structural economic changes in the region have been radical and have occurred within the span of a few years or even a few months. A long-term change in development policy—beginning in Chile in the mid-1970s—occurred in Latin America over the last 25 years. By the second half of the 1980s several countries in the region had initiated radical economic reforms to replace the old models of state-directed industrialization aimed at substituting imports: a period of reform, growth, and opening to world markets was initiated (Edwards, 1995). The new development strategy had four fundamental components: macroeconomic stability, trade openness, a reduced role for government through privatization and deregulation, and implementation of poverty-reducing strategies (Iglesias, 1992).

Figure 1 illustrates the amplitude, speed, and scope of the changes in key dimensions of the economy experienced by the different countries. The figure is based on Morley *et al.* (1999) who calculated an index to measure 17 governments' efforts to implement reform packages in five key areas: trade reform, domestic financial liberalization, liberalization of external financial transactions (capital), privatization, and tax reform. For each country in our sample, we identified the 2-year period where reforms were most aggressively implemented and estimated the average value of each index for the 3 years prior to and the 3 years post-reform efforts. While these aggregate measures

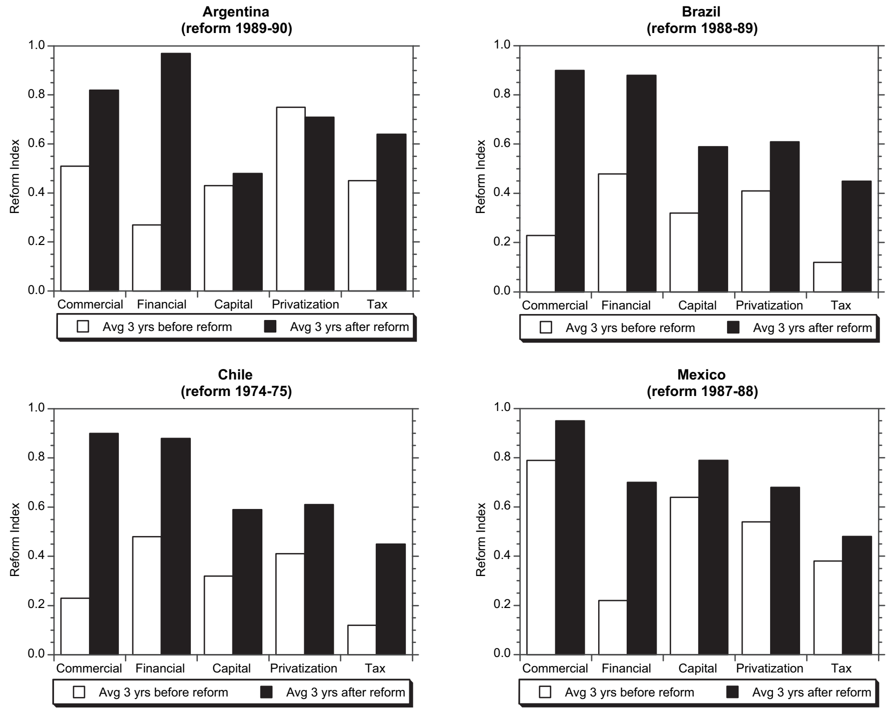

Figure 1 Reform index—average of 3 years pre- and post-reform period.

clearly show the extent of the drastic changes experienced by the four countries, a few specific examples convey the dramatic new realities firms had to cope with: (a) in Brazil and Argentina respectively the wave of privatization reached as high as 15 and 11 state companies per year, with Mexico and Chile following a similarly aggressive privatization policy; (b) these four countries implemented a drastic liberalization of the financial markets that resulted in huge changes in interest rates (e.g., from 4821 to 53% in Brazil between 1994 and 1995) and greater access to credit; (c) foreign direct investment (FDI) increased by a factor of at least three during the three post-reforms years, with some countries achieving an eightfold increase—increases made possible by drastic changes in the law regulating capital flows; (d) import tariffs were reduced overnight in the four sampled countries—typically around one-third of their pre-reform levels; (e) in all four countries, the economy achieved much greater stability, evidenced by the inflation rate reductions—from 3,080% in 1989 to 25% in 1992 in Argentina, from 2,948% in 1990 to 433% in 1991 in Brazil, from 505% in 1974 to 40% in 1978 in Chile and from 114% in 1988 to 20% in 1989 in Mexico. It goes without saying that these changes had a major impact on all aspects of firms' activities from the labor market, through to competitors, financial markets, government regulation, and institutional systems.

There are important similarities between the changes experimented by Latin American countries in our research setting and countries in Eastern Europe that also experimented profound economic transitions. In both cases, countries moved from a state-driven economy to a market-driven one. But there are also interesting differences. Although Eastern European transitions apparently exhibit greater amplitude than Latin American transitions (as they moved from a 100% state-controlled economy), many of the Latin American cases score higher in terms of speed and scope of the change, as we argue below. For this reason, we view both cases as examples of comparable avalanche change.

4.2 Methods

To explore firms' responses, we used an interdisciplinary research approach that included detailed longitudinal assessments of organizations' responses to environmental change prompted by economy-wide reforms. Our sample includes sufficient variation to allow us to explore adaptation mechanisms in different settings: we select energy, steel, and food and beverages firms in Argentina, Brazil, Chile, and Mexico. These four countries not only represent economies where the effects of economic reforms can already be seen, but are also the wealthier and more advanced economies in the region, with business practices and institutional contexts resembling those in developed countries. Industry selection was done with the goal of maximizing variance in two dimensions: the number of firms in the industry and initial government participation and control of the industry. These two criteria placed the energy sector at one extreme (few players, a high concentration of government-run organizations and a high level of regulation) and the food and beverages sector at the other. Within these industries and countries, we selected firms with a long enough history of operation for them to have had first-hand experience of the reform years. Since the purpose of this study was to identify the transformation patterns followed by firms that had survived avalanche change, we were discriminating in our initial sampling (Strauss and Corbin, 1990) and selected firms within these sectors if they met at least two of the following criteria: if the local business community—e.g. executives, press, associations, and scholars—considered these firms to be vibrant and forward looking; if these firms engaged in a major transformation process, resulting from a change in ownership, governance, or innovative financing, or if they engaged in a process of internationalization by opening new markets or investing abroad. Firms were sampled until a theoretical saturation for the adaptation process could be achieved, that is, until a recurring pattern for the adaptation to country-wide reforms emerged from our interviews (Glaser and Strauss, 1967). Of the 14 firms we contacted we were able to obtain access to 11. Table 3 provides basic information on the firms in our study.

Basing our approach on grounded theory development from case study research (Yin, 1984; Eisenhardt, 1989), we endeavored to understand the precise firm-level impact produced by avalanche change and the full extent and timing of the organizational

Table 3 Basic data of firms in the sample

Company (country)	Main business activity	Sales ('000 $)	Employees
Siderca S.A.I.C. (Argentina)	Manufacturing, sale, and export of seamless steel tubes and welded steel tubes. Co. used primarily in the oil industry	1,154,827 (2001)	3,481 (2001)
YPF S.A. (Argentina)	Exploration, development, and production of crude oil and natural gas. Refining, marketing, transportation and distribution of oil and petroleum products and its derivatives	8,162,000 (2001)	9,500 (1998)
Gerdau S.A.(Brazil)	Production, sale, and export of steel products for civil construction, industrial and agricultural sectors, including long rolled and drawn steel products	2,382,000 (2002)	11,998 (2001)
Sadia S.A. (Brazil)	Processing and sale of poultry and pork meats; frozen ready meals; pizza; pasta; hamburger and margarine.	1,219,000 (2002)	30,371 (2001)
ENDESA (Chile)	Production, sale, and distribution of electricity in Chile	1,522,000 (2001)	1,623 (2002)
Enersis S.A.(Chile)	Distribution, generation, and transmission of electricity in Chile, Argentina, Brazil, Colombia, and Peru	3,480,223 (2002)	10,957 (2000)
Gener, S.A. (Chile)	Production, transmission, and distribution of electric energy in Chile and Argentina	751,000 (2000)	1,121 (2000)
Cía. Cervecerías Unidas S.A. (Chile)	Production and distribution of beers, soft drinks, mineral water, and wines. Operations in Chile, Argentina, and Croatia	485,542 (2002)	5,613 (2002)
CTC, S.A. (Chile)	Provision of fixed, long distance, and cellular telephony services and data transmission services. Subsidiary in TV cable	1,211,641 (2002)	9,250 (2000)
Grupo Modelo, S.A. de C.V. (México)	Production and distribution of beer and malt, locally and internationally (brand name "Corona")	3,624,000 (2002)	48,474 (2002)
Hylsamex, S.A. de C.V. (México)	Production of value-added finished steel products for use in the construction, auto parts, and home appliance industries. Subsidiaries produce wire derivatives and steel insulated panels	1,348,000 (2002)	6,966 (2001)

adaptation response. As well as interviewing the CEO or president of each firm we additionally sought out and interviewed three or four mid- to high-level managers who had been with the company long enough to have witnessed the transformation process. Interviews lasted 60–90 min, were conducted according to a basic, semi-structured interview protocol, and were supplemented with archival data on each firm and its industry in order to avoid retrospective biases. All interviews were done in the summer of 1999 and our analysis of the firms' evolution stops at that point in time.

5. Avalanche change and organizational adaptation

We set out to explore the ways in which organizations respond to extreme forms of environmental change, contrasting our findings with existing theory and empirical evidence. Although avalanche environmental change is evident to firms given its unusual combination of speed, intensity, and its all-encompassing nature (unlike disruptive change that often unfolds in remote spaces out of sight of industry incumbents), the very fact that so much is changing at once and so rapidly makes it a suitable case for the study of organizational adaptation.

While our study does not permit us to map the complete sequence of organizational responses prompted by avalanche environmental change, this initial exploration of the topic reveals several aspects of organizational response that differ from those previously reported in empirical findings and theoretical propositions. In order to highlight these differences—and to investigate the similarities—we focus on three aspects of organizational response to environmental change that appear to permeate much of the literature to date namely, the depth of organizational response vis-à-vis the degree of environmental change; the swiftness of organizational response to environmental change; and the importance of leadership during times of organizational adaptation. For the first two aspects, our observations of the response to avalanche change were not fully consistent with existing propositions and could therefore be considered "anomalies" (Kuhn, 1970) to current theory. While the third aspect, the role of leadership, is largely consistent with existing theory, insights from our research lead us to suggest that there is a fourth aspect of crucial importance when responding to avalanche change.

5.1 Degree of environmental change and depth of organizational response

Contrary to common management wisdom, recent research suggests that less organizational adaptation results from a very high degree of environmental change than is the case when less extreme forms of change occur. On the basis of her observation of the reform processes in Central and Eastern Europe, Newman (2000) proposes a U-shaped relationship between organizational transformation and institutional change; in her view, "too much" environmental change actually disables organizational response. This proposition finds some support in earlier theoretical developments. Greenwood and Hinings (1996) argue that too much change would destroy the "archetypal templates" that have largely been provided by the institutional context and that extreme change would leave insufficient time for firms to create and assimilate a new template. Under such circumstances, organizations would find it very difficult to interpret and make sense of environmental signals, a situation that can often result in erratic responses or inaction. Weick (1993), following a similar line of reasoning, suggests that the presence of profound and unexpected change may result in "cosmoquakes" (a severe difficulty in sense-making that can lead to organizational paralysis or erratic responses).

We do not find such a pattern when studying how firms in our sample responded to avalanche change. According to our interviews, executives perceived the institutional changes—from a state-driven and state-dependent model toward a model where competitiveness and innovation become the drivers of success—to be abrupt and largely irreversible. Figure 1 illustrates the major changes experienced by managers during the reform period; these changes affected multiple dimensions of the environment and were both profound and swift. The old model had been exhausted and replaced and managers clearly perceived a change of "archetypal templates," firms had no option but to try major internal transformation as a means of adapting to the extreme change in the institutional context.

> Argentina decided to reform and privatize the economy. Our industry was completely deregulated. All entry barriers were eliminated, and import tariffs were scrapped. The tariff change was done in one quick stroke…we were already losing money then, and thus had to initiate a major process of internal reform.

The most striking evidence in our sample of the depth of organizational response relates to workforce reduction. The extreme case was YPF, the state-owned Argentine oil company; privatized in 1991, it reduced its workforce from 55,000 employees at the time of privatization to 5,500 by 1993. Hylsamex, a Mexican steel manufacturer, and CSN, a Brazilian steel producer reduced their workforces by 50 and 40%, respectively, and over three quarters of the firms in our sample experienced similar workforce cuts. These dramatic downsizing efforts were possible as a result of simultaneous changes in many layers of the environment—deregulation of labor markets and reforms to national pension systems being key factors—but organizational response was not limited to drastic downsizing. As evidenced by the following quotes from firms in Argentina, Brazil, and Chile most of the organizations we sampled additionally and simultaneously made changes to their structure, scope, internal reporting, and accountability systems.

> The first job was to transform, re-formulate the whole company. We first questioned and then defined what our core business was. We sold everything that did not belong to our core business.

> It was not easy at all to decide to sell some of our large business units after we redefined our core business. But we realized that we were a food company

> and that we had to stop doing other things that we had been doing for five decades. We sold these units and also sold a hotel, a radio station, three supermarkets…
>
> We flattened the hierarchy, eliminated middle managers…indeed, one of the first things we did was to throw away the organizational charts and job descriptions: all that nonsense. From now, promotion would be based on merit, not by conforming to a mold. We broke the molds.

Almost all of our interviewees concurred that firms that did not attempt to transform themselves did not survive the changes; thus, it seems that avalanche change is associated with genuine organizational "re-creation." The difference between our observations and Newman's (2000) theoretical predictions may be explained by the "all out" way reforms that were implemented in Latin America: policy makers showed little or no hesitation about scrapping import tariffs at a stroke, freeing prices to market forces overnight, leaving interest rates to float, and privatizing most if not all state firms over a short period of time.

> [before the Mexican economic reforms] we had very high tariffs and plenty of non-tariff trade obstacles. You needed a special government permission to import steel, which required the consent of the local producers—most of them state-owned. Lobbying government offices was a key role of CEOs. Then we had a sudden sea of change. …First, the import tariffs were drastically reduced and restrictions eliminated—this happened overnight. Then prices were totally freed from government control. Industry dynamics changed completely. …When we faced the new imported products and assessed the new competitors, we realized that much of our equipment was simply junk. It was impossible to compete in the new open markets with the equipment and processes that we had.

By contrast, the piecemeal approach to the implementation of reforms that most Central and Eastern European countries tend to adopt makes it difficult for the new market economy to take off. This is illustrated in Savchenko's (2002) analysis of the problems arising from Byelorussia's incomplete implementation of price liberalization; Estrin's (2002) discussion of how privatization efforts were often incomplete as governments still kept significant share holdings and privatized only a fraction of the state firms; and Peng and Heath's (1996) discussion of how the lack of a well-defined property rights framework undermined the dismantling of the central planning regime in Eastern European economies.

5.2 Swift versus gradual organizational adaptation

To date most empirical studies portray organizational adaptation processes as being gradual and encountering significant resistance from various parts of the organization

(Holm, 1995; Kraats and Zajac, 2001; Siggelkow, 2002). In their study of the ways in which organizations in the airline sector responded to industry deregulation—a "specific shock" in our taxonomy but often referred as a "radical change," in the literature—Bacharach *et al.* (1996) showed that environmental changes were first felt and assimilated at the top of the organization and gradually, through a chain of actor-defined situations and actors' responses, were first resisted by, and then assimilated into, the lower organizational levels. This "gradual adjustment process" took about a decade to unfold, and was characterized by the clashing of different "logics of action," until a new consistency was eventually achieved.

Contrast this to the swift, almost violent way in which organizations experiencing avalanche change seem to adapt; change results from a series of quick, bold, and often painful actions that leave very little room for internal resistance. In all the cases we studied, the new alignment was basically "imposed" rather than being achieved through a gradual adaptation process. The new environmental context had shattered existing templates, created an entirely new series of conditions and threats to which firms had to react and generated a deep sense of urgency throughout the organizations. With the realization that such profound environmental changes threatened the organization's very survival, managers and employees saw swift and bold changes as the only option:

> By June 20, 1993 [less than two years after the implementation of reforms] this was a totally different company. And this was just the beginning; the market was now wide open, and we realized this was no joke: we had to compete.

> [w]e quickly implemented a generous early retirement program to reduce the workforce and accelerate the process. We had no time to interview people one by one and select who had to go first [this was done later, in a second stage]. Many employees took our retirement package; we lost loads of people, good and bad, but we could not afford to do it differently then.

The swiftness with which changes were occurring in most dimensions of the environment gave firms no option but to act, and managers understood that action had to be quick and comprehensive. Our interviewees agreed that the first year or two after the "avalanche" brought about by economic reforms were crucial to the final outcome of the organizational transformation attempt. During this period, the main difficulty arose from the fact that bold changes were urgently needed in multiple facets of the organization: e.g., workforce level and composition, competitive strategy, production processes and practices, workforce motivation and rewards, organizational culture, and corporate financing. Often, there was insufficient time to plan carefully for change and rapid action was considered to be more important than precision. Companies like YPF, which reduced its workforce by 90% in just 2 years, simply could not afford the time for a careful employee performance analysis to determine who should stay and who should go. Indeed, survival dictated that most firms in our sample abruptly reduced their total workforce without trying to "get it right." Similarly, new productivity-based compensation schemes and new quality-oriented production practices were rapidly introduced, often without pilot runs or elaborated *a priori* studies; data collection, fine-tuning, and improvement were left for later. As one interviewee recalled, "a key aspect in the transformation years was the fact that decision making in the [locally owned] company was quick and flexible: we did not have to report to anybody or to ask any overseas headquarter for approval." At the organizational level, the post-reform period was felt as one of fast decision making and action, very long working hours, and much experimentation and "learning on the go" with new ways of doing things in almost all facets of organizational life.

5.3 The role of executive leadership

Tushman and Romanelli (1985) stress that the most extreme forms of organizational change require top management involvement: "Only executive leadership can initiate and implement the set of discontinuous changes required to affect a strategic reorientation" (p. 180). We found this to be particularly true for the firms in our sample; avalanche environmental change shakes-off all existing archetypal templates in use by organizations and requires them to develop an entirely different concept of their role and *raison d'etre* in the new institutional context. The bolder the internal measures undertaken, the more energetic and proactive top management seems to have been. For instance, Mr. Estenssoro, the former CEO of YPF (privatized in 1991), was able to convince all relevant stakeholders of the urgency and importance of engaging in a major, painful turnaround. His ideas and enthusiasm extended beyond his own organization into government circles and, until his death in a helicopter accident while visiting a plant in 1995, he was instrumental in shaping government policy toward privatization and was widely seen as a key force in the competitive transformation of his company. We found similar energetic and proactive leaders in most of the other companies we studied—many of these leaders became true local "icons" of the reform years, whose visibility extended far beyond their own firms. Mr. Yurazceck, for example, who led the transformation of the formerly state-owned firm Chilectra into the largest Latin American electricity conglomerate, Enersis, was able to generate very high levels of commitment among employees despite the painful restructuring taking place.[2] For instance, Chilectra's top management encouraged employees to buy shares of the privatized company—they even granted soft loans to induce employees to take the risk and become "owners." As many as 30% of the employees took advantage of this offer; many of these employees

[2]Many years later, Mr. Yurazceck and several other Enersis executives were sued and fined by the Chilean Justice for the use of privileged information during the sale of Enersis to Endesa Espana, the largest Spanish electricity conglomerate. This fact, however, does not change the role that some of these executives had during the early phases of organizational transformation nor does it affect our argument.

were later made redundant, but all made substantial gains in the stock market as the company experienced rapid growth. The CEO of Enersis at the time of data collection, referring to the period right after Chilectra was privatized, commented:

> Jose's [Yurazceck] vision and ability to work very long hours back then was simply outstanding. He preached and preached until exhaustion; he explained the new situation to employees over and over, and then took bold and consistent steps with unusual energy…the mystique was running so high in the organization that you may even say it was disproportionate. There were people at that time that would have worked for free. We were working not only for the money but also to fulfill a dream: to create a true Chilean multinational firm, a bold and highly motivating dream.

We found similar examples of special periods of proactive, energetic, and innovative top management action in most of the other companies we studied. Gener's President, Mr. Philippi, regularly organized breakfasts for the company CEO and 15 to 20 lower-level workers or employees at a time; these were used to gather feedback and rally support for the swift changes taking place.

5.4 Managerial renewal and organizational re-creation

An organizational re-creation involves profound shifts in strategy, power distribution, internal structure, and the organization's core values and beliefs (Tushman and Romanelli, 1985). But how can all this be achieved in a short space of time without generating the massive resistance to change that has been described in many studies (e.g. Bacharach *et al.*, 1996)? The practical experiences described above support the theoretical prediction that proactive executive leadership is crucial, but our interviewees indicated another key factor, significant renewal of the management layer, as being necessary if the desired changes in strategy, structure, and core values are to be achieved. In many of the firms we studied a new breed of middle and upper-middle managers was rapidly brought into the organization and became vital to the exploration and creation of new routines and a new organizational "mindset." This was additional rationale for downsizing, as well as reducing organizations to "efficient" levels, since many managerial positions had to be vacated so that new people could be brought in. Firms adopting this approach tended to favor young professionals who had graduated from top universities and had not yet been "indoctrinated" by the state-driven mentality of the past. They came with fresh ideas and a willingness to experiment and, in the absence of the old institutional templates—the economy and its institutions had also undergone far-reaching changes—quickly searched for new ways of doing things. They often worked alongside external consulting companies hired by top management to help with specific parts of the internal transformation (e.g., financial structure and quality management programs). This fresh layer of management was also very receptive to the new message from top management as these interviewees recall:

> We [the new professional managers] attempted a very difficult internal change. To speak in technical terms such as earnings per share, etc. was simply foreign to the firm back then.
>
> Another big change was bringing in loads of new people. We probably ended up with 50% new faces in the company as compared to the pre-reform period. The new people were better trained and more professional: they brought many new ideas to the organization and they were given plenty of autonomy.
>
> In order to improve our technology, we looked for people abroad, people from our country that were working or studying in the US or Europe. Nowadays, we even try to bring in foreign nationals with particular expertise.

A significant number of the new professionals brought into management or technical ranks held graduate degrees (Masters or Ph.D.), often from US or European universities. It is interesting to note that in at least two of the four countries we sampled, economic reforms prompted the return of a significant number of professionals who had previously left the country in search of better opportunities. In most of the companies we studied, the percentage of the total workforce holding a graduate degree doubled or tripled in the 3 or 4 years following economic reforms. This was a remarkable achievement for companies whose workforce composition had typically remained quite stable for many decades. But more important than the academic degrees was the fact that the new recruits brought much-needed market-oriented management skills into the companies.

The renewed management layer was instrumental in implementing and even crafting many elements of the new strategy. For instance, the recently open financial markets gave firms access to new sources of funding, but firms had to adapt their accounting procedures and quickly develop in-house expertise in new and sophisticated financial instruments in order to take advantage of these foreign funds. The new breed of forward-looking professionals was vital to the realization of this effort; they spoke English and had some international exposure. In July 1990, CTC, the largest Chilean telecommunications company, formerly state owned and a monopoly in fixed lines, placed $100 million in the US in the form of the first Latin American–American Depositary Receipts (ADRs). CTC started a trend that would rapidly be followed not only by other firms in our sample but also more generally by many firms in emerging economies. Enersis unveiled its ADR operation in 1993; Hylsamex, another of our sample companies, offered Eurobonds for $175 million in 1993 and ADRs in 1994. By 1999, more than 85 Latin American firms had issued ADRs in the US.

6. Final remarks and suggestions for further research

By focusing on an extreme form of environmental change that we have dubbed 'avalanche change', this article sheds new light on the interrelation between environmental and organizational change. The experience of firms in Argentina, Brazil, Chile, and Mexico in the immediate aftermath of their respective periods of profound economic reforms provided a novel data source to test and advance existing theory. In all four countries, the pre-reform period had been characterized by institutional arrangements in which organizations were tightly coupled to the prevailing state-oriented, architectural template (Powell and DiMaggio, 1991). This situation was shattered by drastic economic reforms bringing a new market-oriented economic and institutional arrangement whose influence was felt on most facets of organizational life.

We posit that such extreme environmental change would be associated with similarly extreme forms of organizational change, i.e., radical and revolutionary in Greenwood and Hinings (1996) terms, or true "re-creations" in Tushman and Romanelli (1985) terms. This is supported by data from the firms in our sample all of which underwent swift and painful periods of downsizing, re-structuring, and strategic reorientation during a period of country-level reforms. The extent of organizational change was immense: in a very short period firms laid off a large proportion of their workforce (made possible by nationwide labor market reforms); revamped their operations by investing in new technology and equipment (made possible by the liberalization of trade); renewed the managerial layer by bringing in young professionals (many of whom had been motivated to return from abroad by new possibilities at home); devised new financial and operational strategies (prompted by the opening up of financial markets); and changed the employees' mindset toward a work ethic where personal effort, compromise, and productivity translate into growth and prosperity. As Tushman and Romanelli (1985) predicted, this total "re-creation" of the organization required a high level of executive leadership, during the reform period many of the CEOs in our sample became true "evangelists" whose influence often extended beyond their own firms. Our findings also point to another set of actors critical to the re-creation process: a new breed of young professionals, with a new set of market-oriented managerial skills, who filled key upper-middle positions and played a crucial role in the implementation and crafting of new organizational strategies and procedures—that is, the creation of the new organizational template. Our focus on the importance of renewing managerial capabilities is consistent with Dyck's (1997) finding that managerial capabilities, in the form of western management skills, are an important factor to explain the performance of privatized firms in post-merger East Germany. The impact of the human capital differential is an interesting hypothesis to test in extending this research to other transition economies.

Newman's (2000) theoretical propositions, in particular the reference to a possible U-shaped relationship between institutional change and organizational change, are not supported by our findings. While it is true that our ex-post data collection may have caused our results to suffer from "survival bias," this is not particularly significant since we were not interested in performance differences. The fact that we observed very similar adaptation patterns in organizations operating in different countries and industries lends additional support to our findings as does the fact that most of our interviewees explicitly identified country-level economic reforms as key triggers and enablers of the changes undertaken by their organizations.

Finally, our findings suggest that a finer taxonomy of environmental change may be necessary to distinguish the differing types of organizational responses that might be expected. While other researchers have found gradual adaptation processes in organizations facing what they have termed "radical change" (e.g. Haverman, 1993; Bacharach *et al.*, 1996), we have provided a more refined classification of environmental change in order to highlight the differences between the changes experienced by firms in our sample and those experienced by firms in other reported contexts. The exploration of the types of organizational change that tend to be associated with the different types of environmental change should provide an interesting avenue for future research.

Moving beyond organizational adaptation, our taxonomy of environmental change may also be useful to other streams of research dealing with institutional environments, such as institutional economics (e.g. Nelson, 1993) and comparative political economy (e.g. Hall and Soskice, 2001). Moreover, we believe that the patterns we have identified in Latin America will most likely hold true for firms in other emerging economies that are going through a similar period of intense reform; e.g., Eastern Europe, Northern Africa, China, and India. Understanding firms' reaction to economic reforms may not only help firms themselves to better prepare for the challenges ahead, but it should also provide relevant information for policy makers at the government level. Keeping the firms' perspective in mind may help them improve the timing and intensity of the reforms in order to maximize the benefits for their population.

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