UNDERSTANDING ENVIRONMENTAL TURBULENCE.
A DYNAMIC MODEL.

Adrián Atilio Caldart
PhD Candidate IESE Business School-University of Navarra.
Telephone: (0034) 93 253 42 00
E-mail address: doccaldart@iese.edu

&

Joan Enric Ricart
Associate Dean for Research and the Doctoral Program
Chairman, General Management Dep.
Telephone: (0034) 93 253 42 00
E-mail address: ricart@iese.edu
Understanding Environmental Turbulence. A dynamic model.

During the last years a debate has raged within the field of Strategic Management between a rational view (IO, Positioning School, Strategic Planning, Cybernetics) and a Complex Adaptive Systems (CAS) view (Emergent strategies, complexity theory, chaos theory) of the field. This paper attempts to shed some light around an issue which must be clarified for the better development of such debate. Being the CAS view a response to the new realities of “environmental turbulence”, we will discuss which are the behavioral sources of such turbulence in order to clarify if such phenomena is a qualitatively new reality of business environments, or simply a contingent but circumstantial feature affecting many industries. For this purpose, we introduce and apply a theoretical model that conceives the strategy of the firm, as a dialectic process in a situation of conflict.

1.- Introduction.

During the last two decades, several parallel and mutually influencing processes have contributed to increase the “turbulence” in the competitive environments of an increasing number of industries. This phenomena has been widely acknowledged in the Strategic Management literature (D’Aveni, 1994; Treacy & Wieserma, 1995; Chakravarthy, 1997; Day, 1997; Conner, 1998; Eisenhardt, Brown, 1999; Eisenhardt, Sull, 2001). Environmental turbulence is attributed to the increasing rate of change and to the drastic nature of many of these changes, specially those related to technology, that make increasingly difficult to identify causes or predict results of competitive initiatives with reasonable certainty (Bower and Christensen, 1995; D’Aveni, 1994).

Classic approaches to Strategic Management based in a rational model of the firm (Scott, 1998), produced static frameworks of the strategic problem of the firm or, in the best case, they assume linear and convergent dynamics. However, in turbulent environments, unpredictability reigns, as environmental dynamics are characterized by the existence of positive, non linear feedback (Stacey, 1993). For this reason, approaches of the strategic problem based in a model of the firm understood as a Complex Adaptive System, of an evolutionary spirit, gave increasing importance to the “emergent” (Mintzberg and Waters, 1985) or “self-organized” aspects of strategy in “chaotic” environments (Stacey, 1993; Eisenhardt and Brown, 1998).

This “macrodebate” will only be resolved shedding light around more concrete aspects around this matter. One of these, is the need to understand more deeply the drivers of turbulence, in order to glimpse if it is a radically new phenomena that “arrived to stay”, as some authors suggest (D’Aveni, 1994; Porter, 2001) or if, instead, it is a specially atypical situation, but contingent to the existence of circumstantial factors.
The purpose of this work is to introduce a dynamic model that proposes to view the strategy of the firm as a dialectic process in a situation of conflict. Following, we will analyze the issue of environmental turbulence under the model’s lenses, in order to provide better answers to the following questions: 1) Which are the determinants of turbulence in the business environments?; 2) Is environmental turbulence a radically new characteristic of competition that will characterize our competitive environments from now on?

This work is divided in two parts. In the first one we introduce our dynamic model. In the second part, we will use the insights provided by the model to discuss the abovementioned questions.

2.- A dialectic view of strategy.

2.1) Strategy as discretionary decision making.

Strategic decisions concern with the way the company chooses to match its resources (Barney, 1991) with the environmental requeriments through a coevolutionary process (Lewin and Volberda, 1999) in order to achieve its long term objectives. To resolve this adaptation problem demands making decisions and implementing courses of action of multidimensional impact. This dimensions include time (short and long term), space (local, national, regional, global) and matter (products and/or services offered). Additionally, it is necessary to satisfy certain essential microeconomic imperatives in order to be competitive (economies of scale, of scope, of growth). Finally, the firm must take into account macroeconomic factors (strenght of the economy, inflation, interest rate), political (regulations, laws, taxes) and socio-cultural (tastes, environmentalism, etc).

Decisions concerning these dimensions are made by the company’s managers, who have limits in their information processing capacity or bounded rationality (Simon, 1946). Moreover, such decisions are made in a context of interdependent rationality with other actors, also subject to limits in their rationality, that interact in the same reality.

This multiplicity of dimensions blunts any attempt to reduce them to a single scale with severe measurement problems (Galunic and Eisenhardt, 2001). Therefore, it is impossible for decision makers to objectivize the comparison of alternatives and the evaluation of consequences at the time of making strategic decisions. Then, top management is obliged to ground this kind of decisions, concerning objectives and courses of action to follow, on subjective or discretionary criteria. Only once this problem is already solved, the company will have a structure of objectives or rationality behind which it will align its efforts.
However, even counting with a “monolithic” rationality, the uncertainty derived from interdependent rationality with other actors, unables us to deal with the environment simply using long-term planning as a tool, as the Strategic Planning movement proposes (Ackoff, 1971). This happens because our forecasts co-create this interdependent rationality we are trying to forecast. As I cannot read other people’s minds, nor predict their forecasts, my own ones become indetermined. The idea, coming from neoclassical economic theory, that we can separate the subject of the economy (in this case the company) from the object (the environment) is flawed (Arthur, 1998). Intense coevolution seems to be an increasingly obvious part of the modern competitive landscape (D’Aveni, 1994; Mc Kelvey, 1997, 1999; Lewin and Volberda, 1999).

Additionally, top management’s appreciation of the environment will be subjective, based in perceptions determined by decision makers’ mental models, which result from their education and previous experience (Weick, 1979). Consequently, different actors will see different things in the same situation.

Subjectivity in the interpretation of the key characteristics of the environment in a context of bounded rationality, interdependence and uncertainty, makes impossible, except in situations of extreme stability, the construction of a system able to formalize and objectivize the rationality of the different actors. The most relevant attempt to strive with this enormous task is owed to the field of Game Theory (Von Neumann and Morgenstern, 1980). Game Theory built very valuable knowledge at the time of, describing and understanding certain competitive interactions. However, Game Theory cannot help us to interpret situations of interaction beyond certain simple formulations, as it ignores aspects whose consideration is crucial at the time of understanding most of the real interaction situations. First, it assumes the capacity of the players to reduce the payouts of the strategic game to a single scale, and that all the actors have a exactly the same appreciations of the game. Both conditions are impossible in a context of multiple interaction, bounded rationality and multidimensional values as the one in which the company operates. Second, it ignores central aspects of real interdependence situations as the capacity of actors to form coalitions that alter the original setup of the game, and their trend to modify their structure of objectives, or rationality through time. Both factors alter the payouts the actor attributes to the game. Consequently, the lack of comparability and uncertainty that characterizes strategic decisions originate the conflict and the operation on it as a mechanism to solve disagreements.

2.2) Conflict.
In the absence of an objective rationality, strategic interactions between actors will be necessarily subjective and discrentional, according to a structure of objectives or rationality previously defined by the governance structure of the organization also in a subjective way.

For this reason, in order to understand the task of strategic management, we must develop a dynamic model of the structure and process of the strategic problem of the company, assuming:

- strategic decisions have multidimensional impact.
- actors have bounded rationality and act according to mental models.
- there is a non-structurable situation of interdependent rationality between actors that generates uncertainty.

Following March and Simon (1958), Schelling (1960) and Eisenhardt, Kahwajy and Bourgeois (1998), I will discuss the problem of managing the interaction with external actors under the notion of conflict. We describe the conflict as a situation represented by the existence of a set of actors who act following certain rules of the game in an interaction landscape.

March and Simon (1958) state that conflict arises when 1) different actors have different preferences and 2) different actors prefer incompatible, non-comparable actions of uncertain results. Conflict appears when an actor cannot reach his objectives through the simple formulation of a plan, i.e., ignoring the interests of other actors. If other actors’ interests were independent we would not need strategy, but only planning and operations, to achieve our objectives. However, most of the companies cannot escape from this situation of interdependence with respect to other actors, therefore, rationality of allies and opponents must be taken into account. Companies must practice “competitor role playing” (Eisenhardt, Kahwajy and Bourgeois, 1998) as they are affected by the moves of other firms and react to them (Porter, 1980).

2.3) Structure of conflict.

Real life conflicts resemble non-zero sum games of Game Theory in the fact that between actors there exists mutual dependence as well as opposition. Success in a conflict is not a notion relative to opponents but related to the capacity to impose our will (Schelling, 1960), expressed in the structure of objectives or rationality of the actor. For that reason we propose that the end of strategy is to increase the freedom of action of the actor. We will define freedom of action as the ability of the
actor to achieve his strategic objectives without facing the resistance of opposite external wills, i.e., the ability to impose his will. In short, it is the ability to turn the nature of his adaptation problem from a dialectic one to a merely administrative and operational one. Regardless of the structure of objectives agreed in the internal conflict, it will be always preferable not to face opposed wills from other actors in the external conflict (or at least to reduce their weight in our decisions) than to face their resistance.

In this sense, the “non plus ultra” of strategic management should be the achievement of a total freedom of action, situation in which the company would be completely immunized from the effects of opposed wills, because of their inexistence or irrelevance, being able then to concentrate exclusively in planning and operations. However, total freedom of action is impossible to achieve. Then, we must focus in improving our relative degree of freedom of action, reducing our excluding interdependencies with other actors. For instance, a competitor who is clearly unable to equal my value proposal, despite having an interest in the same market, that is excluding with mine, cannot affect significantly with his actions the achievement of my targets of, for instance, margins or volumes. Then, I can plan without caring too much in his possible reactions.

We call actor to a subject having a structure of interests and objectives and influence in a conflict (Frischknecht, 1995). This definition implicitly carries a widened vision of interaction, similar to those of Porter (1980) and Brandeburger and Nalebuff (1995) that includes not only competitors, but also suppliers, customers, State, minor organizations, producers of substitute or complementary goods and every other actor with influence in the conflict. We understand influence as the ability to affect the rationality of the other actors.

The interests of the actor are the objects valued by it in the interaction landscape. Examples of strategic interests are: markets of products and services, raw materials, distribution channels, regulatory frameworks, access to the Government, capital, profits, managerial and technical talent, technology, capacity of expansion. The effects the actor tries to achieve on these interests are his objectives. Interests are valued per se, if they are related with the ends of the company, or as means or resources that can produce effects on other interests related with those ends (Frischknecht, 1995). Following Daft, we define resources as “all assets, capabilities, organizational processes, firm attributes, information, knowledge, etc. controlled by a firm that enable the firm to conceive and implement strategies that improve its efficiency and effectiveness.” (Daft, 1983, cited in Barney, 1991).
Every actor tends to identify who are the actors with whom it possesses interdependent interests in the conflict and to categorize them in allies and opponents, according to the relative weight of the reasons they have to collaborate or compete. This reasons will depend on the interdependencies between the interests they share. If these are excluding, as in the case of two competitors in the same market segment, the shared interest produces competence. Instead, if the common interest is not excluding, as the search of an entire industry of a more favourable regulatory framework, the interdependence will generate cooperation. The subjective (and always dynamic) balance of the weight of both kind of interests will determine the kind of interaction to follow with every actor and will raise coalitions.

The interaction landscape is the space that corresponds to the interests at stake in the conflict. The norms affecting the interests, the relationships between them an the actors and the relationships between the actors in the interaction landscape are labeled in our framework as the rules of the game.

Insert Figure 1.

2.4) Building a congruent vision.

Being impossible to objectivize the interdependent strategic reasoning of the different actors, strategic decision making is necessarily dialectic (Pascale, 1990, Stacey, 1993, Frischknecht, 1995). It is a result of the dialogue between the actors, who exchange messages trying reciprocally to modify their visions of the conflict leading them to a direction that enables them to increase their freedom of action, preventing at the same time to lead the conflict to an intolerable escalation. This process cannot be a deductive one, because its outcome depends on the decisions adopted by the different actors which are an unknown for all the others. Consequently, strategic management develops through experiments, following a trial and error method. In this sense, we can say that actors create their own environment (Weick, 1979, Stacey, 1993). Our appreciation of the conflict doesn’t have any guarantee of truth, but, as cartographers know, every map begins with another map which is gradually corrected (Weick, 1979).

Such dialogue or communication takes place in different ways, from a statement of intentions to invest published in the business press, through a lawsuit, or a price war, according to the intensity of conflict of the relationship between the actors that are communicating. Strategic management literature inspired in Game Theory labeled these messages “strategic moves” (Dixit and Nalebuff,

\[1\] Defined on page 8.
A strategic move is a message designed by an actor with the purpose of altering beliefs and actions of the other actors towards a direction favourable to the actor performing it, that we will call the focal actor. These moves can be unconditional, through a specific initiative or commitment of resources (Ghemawhat, 1991), or conditional, consistent in communicating which should be our response rule under different circumstances. Conditional moves can be divided in threats, a response rule that punishes actors that don’t collaborate with the focal actor and promises, an announcement of cooperation with those who cooperate with the focal actor (Schelling, 1960; Dixit and Nalebuff, 1991). Actors must be able to recognize and read with precision market signals to prevent developing wrong assumptions about its functioning (Porter, 1980).

To see the conflict as a process of negotiation with allies and opponents, as proposed by Schelling (1960) is useful to emphasize that, regardless that the interests in dispute could be mutually exclusive, there is a powerful common interest in reaching a result not enormously destructive for the objectives of the different actors. Porter (1980) states that success is possible only if competitors choose or are forced to respond in a non-destructive way, preventing, for example, price wars that frequently leave market shares unaltered, and ruin profits for a long time because they take consumers’ price expectations to unrealistically low levels (Day, 1997). The value, risk and effectiveness of every move must be seen en relation to competitors’ actions (D’Aveni, 1994). Consequently, we must introduce in the model the notion of intensity of the conflict, understood as the variable that represents the option of interaction chosen by the actor in his bilateral relationships with each actor. The values of this variable vary across a continuum in which one extreme represents total collaborations among actors and the other total rivalry.

As different levels of intensity of the conflict demand a different degree of resource application or effort, in the strategic moves, not all the companies will be equally well positioned to deal with different levels of conflict. For companies less rich in resources, the higher options could even put at risk their survival. Therefore, the search for freedom of action must be done within the restriction imposed by the risk that our strategic moves might provoke an elevation of the level of conflict above the possibilities of action that our resources permit us. We will call the increase of the intensity of the conflict beyond the focal actor’s possibilities to respond an intolerable escalation. The actor that, because of its strenght can deal with every intensity of conflict has the advantage of dominating the escalation. This should persuade the other actors to escalate the conflict or motivate to build coalitions in order to balance forces.
The dialectic process is an essential characteristic of strategic management. Actors formulate hypotheses about the conflict, they act consequently and they modify these hypotheses for “better maps” as short as they are contradicted by facts. The history of continuous interaction between the parties, leads them to get more acquainted with each other and to act in a more predictable way, promoting stability and, consequently, a higher ability to create more correct plans (Porter, 1980).

3.- Strategy in Turbulent Environments.

At the beginning of this work we mentioned the importance that the notion of “turbulent environments” has acquired in the field of strategic management. Turbulent environments are characterized by their high level of dynamism (showing nonlinear positive feedback), complexity and uncertainty (Crossan, Nanjad and Vera, 2001). Reasons behind this increasing turbulence are associated to many factors. First, technological convergence and the consequent fall in the barriers to entry of industries related with communications and information (Chackravarthy, 1997). Second, the increasing access and availability of information and the need to manage that information in a more effective way (D’Aveni, 1994). Third, the increasingly global profile of competitors (D’Aveni, 1994) and finally the existence of new global public sector trends, characterized by the downsizing of government in many countries, after its massive retreat in its roles of shareholder in different sectors of the economy and by the significant increase in social and environmental activism, resulting in major new legislation aimed at improving life quality of citizens, but often at a significant cost to industry (Bailey, 1997).

We propose that turbulence is a consequence of the difficulty many industries are facing to achieve a congruent vision of the external conflict they are dealing with as its building blocks, actors, landscapes and rules of behavior are suffering strong transformations. This situation makes very hard for actors to build stable expectations about each other’s behavior or, in Porter’s (1980) words, to identify their “response profiles”.

For analytical purposes, I will discuss changes in the three building blocks of conflict individually, but as it can be easily observed, changes in the three dimensions tend to be interrelated and have mutual causality as shown in Figure 1.

3.1) Changes in actors.
Technology and deregulation make market boundaries of many industries become more blurred, allow new business models to appear, and new competitors to bump, breaking the “dominant logic” (Prahalad and Bettis, 1986) of many industries and challenging the standard practices. Players coming from diverse backgrounds, with different business logics, and with no history of competitive interaction, are more likely to clash, leading to an increase in rivalry (Porter, 1980; Day, 1997) or, in our words, in the intensity of the conflict. Many knowledge based industries show increasing returns to scale, a pattern that increases unstability (Arthur, 1999), as competitors engage in “winner takes it all” type battles of extreme hostility, trying to develop “network externalities” (Shapiro, Varian, 1999) that bend the battle definitely in their favor.

Additionally, M&As and alliances multiply, as actors give up their independence in exchange for the prospect of being a part of a more powerful coalition in a (usually) wider sphere. This situation changes the interdependencies between the interests, creating new coalitions and widen the interaction sphere. Similarly, Pfeffer and Salancik (1978) highlighted that mergers take place with the purpose of reducing the dependence from outside, making their environments more stable.

In short, higher complexity in the interdependence between the actors and the lower familiarity among each other, make more difficult the possibility of coordinating action around congruent visions or focal points (Schelling, 1960) around which the conflict could converge in a mutually acceptable way. Our idea of congruent vision corresponds to Game Theory’s concept of Nash equilibrium.

3.2) Changes in the interaction landscape.

During the last two decades, many industrial sectors increased their degree of internationalization or, directly became global sectors (Porter, 1980, Bartlett and Ghoshal, 1987, Yip, 1989) significantly affecting the scope of markets included in the interaction landscape. Moreover, this situation leads to an increase in the number and different profiles of actors and to a big shift in the network of interests at stake, creating new interactions that alter the coalitions. Additionally, traditional industry barriers simply dissappeared in industries related to information and communication (Chakravarthy, 1997). Many of these knowledge-based industries show increasing returns to scale, a pattern that increases instability (Arthur, 1999). In an environment in which business definitions are often in flux, determining the arena of competition becomes a key and non-trivial challenge (Day, 1997).
In this situation, differences in perceptions of the different actors increase, leading to strategic moves subjectively rational, as they respond to each actor’s structure of objectives, but collectively irrational, because they increase the intensity of conflict making many actors assume serious risks of facing an unacceptable scalation.

3.3) Changes in rules of the game.

Formal rules (laws, specific regulatory frameworks, etc.) have suffered strong modifications thanks to the changing role of the State in many countries, characterized by a massive retreat in its role as shareholder in industries as utilities, banking, telecommunications and airlines in many European, Latin American and Asian countries (Bailey, 1997). This trend has been reinforced by an increasing deregulation of the private economic activity.

The second trend, somewhat contrary to the first, has been the significant increase in social and environmental activism, resulting in major new legislation aimed at improving life quality of citizens, but often at a significant cost to industry (Bailey, 1997). Informal rules, resulting from interaction between the actors, have also been modified as a consequence of the abovementioned changes at the level of actors and interaction spheres. Companies try to influence public policy in order to control interdependence (Pfeffer and Salancik, 1978).

Besides, changes in rules generate changes in the interaction spheres and actors, due to the impact of deregulation and privatization on the frontiers of the industrial sectors and on the set of interdependent interests.

4.- Environmental turbulence is contingent.

Is this Tower of Babel of strategic interactions a new natural state of the business environments or it is simply a temporary outcome resulting from the emergence of the society of information? D’Aveni (1994), for instance, states that “hypercompetition” is here to stay as a desirable scale in the inevitable descent towards perfect competence. Chackravarthy (1997), instead, affirms that turbulence and hypercompetition are not the same and that in industries operating in turbulent environments there exist multiple and unpredictable equilibrium points.
Our model conceives turbulence as a phenomena derived from the impossibility of actors to make their moves converge towards sensible focal points, as a result of the sharp changes affecting the three building blocks of conflict. For that reason, we say that there is no reason to believe that turbulence is a new state of nature, as it should mean to believe that actors will never be able to reach sensible focal points through communication. This should only happen if the speed of change were permanently higher to the speed of actors to agree congruent visions. A history of continuous interaction between actors may promote stability, easing to build expectations about competitor’s potential reactions (Porter, 1980) and, therefore, ease the road towards sensible focal points.

5.- Conclusion.

Our approach for a discussion on turbulence puts the stress on behavioral issues, as it focuses on the characteristics of interactions among a set of particular coevolving actors, more than in identifying general events happening “out there” as most descriptions of environmental turbulence do. The model introduced here helps to analyze interorganizational interactions in detail, therefore, facilitating the prediction of the probable evolution of a particular conflict’s level of turbulence by “mapping” it using the model’s concepts and variables.

The entrance in the information age immersed many industrial sectors in changes in the identity and profiles of actors, in the scope of the interaction landscapes, and in the rules of the game that link actors and interests, framing the set of feasible strategic moves. Then, interactions are characterized by a lack of mutual familiarity, with the resultant lack of tacit agreements or coordination that enable actors to reach sensible focal points. Actors try to enact a new congruent vision of conflict through dialectics, as they lost their common language based in known focal points. Meanwhile, competitive turbulence reigns and competitive dynamics are characterized by non-linear positive feedback and, getting unpredictable. But as long as actors become familiarized with the new realities it can be expected that new congruent visions may emerge, making turbulence fade as long as the new focal points are sustained.
References.

Figure 1. Structure of conflict.