CREATING VALUE THROUGH FORESIGHT: FIRST MOVER ADVANTAGES AND STRATEGIC AGILITY

RUNNING TITLE: FORESIGHT AND VALUE CREATION

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Abstract

This paper explores the relationship between corporate foresight and the capability of the organization to respond successfully to external changes (i.e., strategic agility). More generally, we investigate the value that firms, facing growing uncertainty because of the fast pace of external changes, create through foresight. We base our analysis on three different research streams: the first one is literature on environmental uncertainty; the second one is literature on strategic planning and first mover (dis)advantages; the third one is literature on organizational learning and organizational memories. We thus focus on two fundamental questions which characterize the interaction between turbulent environments, foresight and long-term performances: what kind of knowledge should organizations achieve in order to sustain their competitive edge? Under what conditions can this knowledge enhance strategic agility?

Keywords: Environmental uncertainty; corporate foresight; adaptation; inertia; competitive advantage.

1. Introduction

Among the most critical challenges in business is creating strategy for the future – particularly in the case of an organization that is doing well. How do we know what we have to do next? In many cases this question is not asked or answered, being the course simply maintained until a threat or an opportunity crashes into the organization. However, in recent years the fast pace of new events and changes have considerably increased the volatility and complexity of the business environment [1]. In a chaotic world in which markets and entire industries continuously emerge, collide, split, evolve, and decline, one of the primary determinants of success is the ability of the firm to cope with uncertainty, by enhancing its resilience and adaptation to the changing environment [2,3,4].

The challenge of coping with growing environmental uncertainty encouraged reconsideration of both the processes and nature of strategic decision making, including various practices and techniques which today are commonly used in a wide set of industries. Scholars developed tools for managing uncertainty at the level of innovation projects [5,6], capital budgeting and capital structure policies [7,8,9]. More generally, scholars investigated the future-oriented techniques that might be used for enhancing decision-making at the level of business and corporate strategy [10]. Some of the most popular techniques are environmental scanning, product and technology roadmaps, scenarios and real options. Environmental scanning concerns the detection of new events and drivers of change [11,12]. Roadmaps consist of representations of interconnected nodes of major changes and events in selected fields, i.e. science, technologies, markets and products. The connecting links between nodes are the roadmaps themselves, illustrating their causal and temporal inter-relationships [13]. Scenarios are focused descriptions of fundamentally different paths, presented in a script-like or narrative fashion, which tell coherent and credible

stories leading to alternative futures [14,15,16]. Real options involve the application of financial options theory to investment decisions on real assets: the approach emphasizes that many initial investments (for example market tests, joint ventures, or operating licenses) create relevant opportunities that give the firm the chance (but not the obligation) to make subsequent follow-on investments [17,18,19].

A survey of the US companies revealed that by the ‘80s almost half of the US Fortune 1000 industrial companies were using future-oriented techniques for supporting their planning processes [20]; a similar pattern was followed by European firms [21]. More recently, scholars have documented that many large firms in such diverse sectors as energy, automotive, telecommunications, and information technology have been regularly applying future-oriented techniques [22,23,24,25]. This wide interest seems to be confirmed by the growing number of consulting companies and networks in the field: relevant examples are GBN (Global Business Network) in the United States and EIRMA (European Industrial Research Management Association) in the European Union.

In this context, the term ‘strategic foresight’ (or alternatively, ‘corporate foresight’) has now become widely used to encompass the activities that help decision makers in the task of sustaining the company’s future growth and success [26,27]. In particular, according to mainstream scholars in the field, we define strategic foresight as the set of techniques, practices and processes that organizations use for: detecting new events and changes in their external environment; exploring their likely evolution and effects; and defining response options [28,29,30]. A key feature of strategic foresight is the premise that the future is neither predictable nor predetermined, but it might be influenced by the present choices of the organization and other relevant players in its business [31]. Strategic foresight thus tries to envisage alternative futures,

by strongly differentiating from previous future-oriented approaches like forecasting – i.e. the process of making accurate statements about future events [32]. (The term 'prediction' is also used with a similar meaning. However, forecasts tend to be more accurate statements of future events – e.g.: "sales of smartphones will be 1,5 billion in 2015" -whereas predictions are more general – e.g.: "sales of smartphones will continue to grow in the next few years").

On the other hand, despite the widespread diffusion of strategic foresight in corporate organizations, some skepticism arose in the academic community about the effectiveness of its contribution to long term performances [26,1,33]. The major evidence of this skepticism may be the fact that today, apart from a few exceptions, there are a limited number of primary academic journals that regularly host papers addressing this research field. It is worth noting as well that foresight techniques are not specifically addressed by most MBA curricula: many managers in charge of strategic foresight activities in prominent companies pointed out to us that they had great difficulty in finding and recruiting the skills they required among MBA and Ph.D. graduates.

Increasing criticism about the effectiveness of corporate foresight has emphasized the impossibility of making reliable enough visions of the future: while relatively accurate in the short term, foresight accuracy diminishes in the medium and long term as political, economic, social and technological drivers of change interact in novel and unforeseeable ways [34]. Hamel [35] supported the idea that the best way to handle an uncertain future is simply to ignore it; Drucker [36: p. 98] claimed that *"prediction is not a worthwhile managerial activity"*.

Scholars and practitioners in the field of strategic foresight responded to such growing criticism by arguing that its role is not actually to anticipate the future as "it exactly will be", but to prepare the organization for future challenges. Corporate foresight would set the stage for a

learning process that fosters the flexibility and strategic agility of the organization, i.e. its capability to respond to changes in the external environment [1, 37]. In particular, as he studied several corporate organizations, Vecchiato [38] introduced the concept of 'planned learning' to outline the likely value of foresight activities and the kind of benefits organizations pursue through foresight efforts. However, he did not investigate under which conditions firms might concretely create this value, i.e. what are the essential mechanisms that enable this process of 'planned learning' to occur. Thus there is the need to fill a gap in literature on strategy and to develop a more complete and theoretically rich understanding of corporate foresight and the long-term value it might bring in dynamic environments. In this paper we focus exactly on this issue; we ask: *whether and under what circumstances does corporate foresight enhance the strategic agility of the organization?*

In order to investigate our research questions, we draw from three different research streams: the first one is literature on environmental uncertainty, a concept which we carefully re-examine in this paper; the second one is literature on strategic planning and first mover advantages; the third one is literature on organizational learning and organizational memories. Two fundamental issues characterize the interaction between environmental uncertainty, strategic foresight, and the long term performance of the firm: the first, regards what kind of knowledge (i.e., 'memory' of the future) organizations should build through foresight; the second, regards under what conditions this knowledge might bring to superior learning and adaptive skills.

Although this article is theoretical in nature, its insights are significantly based on empirical findings. We have been involved in the past ten years in the investigation of foresight practices in several leading firms of different industries (ICT, automotive, energy, home appliances).

The contribution of this paper is twofold. Building on previous work of scholars [38], first we emphasize that the value of strategic foresight lies not just in the alternative visions of the future it provides, but actually in how it fosters a process of 'planned learning' about external changes. This research thus adds to our knowledge in the field by exploring and shedding light on the key requisites for this 'planned learning' process. Second, this paper develops a research agenda that may lead to further theoretical and empirical work on the nature and effects of strategic foresight activities and their role in the future growth of the firm. It links the work on strategic foresight with other research streams (i.e., dynamic capabilities and strategic agility, organizational learning and organizational memory) which are enjoying growing popularity in literature on management, thus revealing new connections and issues to explore.

2. Environmental uncertainty, strategic planning and organizational learning

2.1 Environmental uncertainty: components, and features

There is no surprise that environmental uncertainty has established as a key issue in literature on strategic management: the competitive landscape has been changing in recent years more quickly than ever. Globalization, the rapid pace of technological development, codification of knowledge, the Internet, talent and employee mobility, increased rates of technology transfer, the continuous emergence of new customer needs and the quick innovation of products and business models: all these factors contributed to increase industry turbulence and thereby the overall level of uncertainty faced by decision makers [1].

Environmental uncertainty regards the difficulty of managers to understand what the major events or changes in their industry are and how they will affect their organization [39]. Early conceptualizations of uncertainty go back to pioneering management scholars such as Knight [40] March and Simon [41] and Cyert and March [42]. These scholars argued that managers are forced to make decisions under conditions of "bounded rationality." Bounded rationality involves the "choice of courses of action in an environment which does not fully disclose the alternatives available or the consequences of those alternatives" [43]. A logical result of bounded rationality is that managers and firms are not able to fully collect, process, and comprehend information about changes and new events. Environmental uncertainty arises exactly when managers lack accurate information about organizations, activities, and events in their external environment; namely, when they are not confident that they can anticipate what the major changes are or will be [39]. This lack of information poses relevant problems for managers as it creates ambiguity throughout decision making processes [44]. Together with the lack of information, Lawrence and Lorsch [45] identified two further determinants of environmental uncertainty. The first one is the long time span required for feedback after strategic actions: even after managers have formulated and implemented their strategic responses to external changes, they still cannot be sure if they have achieved a fit with these changes. The second determinant of uncertainty introduced by Lawrence and Lorsch regards the (mutual) causal relationships between the strategic actions implemented by an organization and their effects on the business environment: as strategic actions are implemented, they bring about reactions by other industry players which cannot be anticipated ex-ante.

As he explored and classified the external environment of an organization and the main sources of uncertainty , Dill [46] made the distinction between the 'general' and the 'task'

environment. The latter one is made up of elements and sectors with which the firm has direct contact and that affect directly business strategy, day-to-day operations, and goal attainment. According to the organization theory, the task environment was initially defined to include the sectors of competitors, suppliers, customers, and regulatory bodies [44]. Afterwards strategic management scholars expanded the concept of the task environment by defining the broader notion of business 'microenvironment', which identifies the key forces (sectors) that govern competition in an industry. These forces are competitors, customers, suppliers, potential incomers and substitute products [47], and providers of complementary products [48]. The microenvironment encompasses drivers of change that usually originate inside the industry and regard new technologies, customer needs and regulations. The general environment refers, instead, to the sectors that affect firms indirectly; these are the political, economic, ecological, societal, and technological landscapes that surround the business microenvironment and today are commonly referred to as the business 'macroenvironment' [14]. The greatest threats for incumbents are often due to technologies developed outside their industry - and thereby for serving other goals than the traditional needs of mainstream customers. At the time they are made available to mainstream customers, such technologies are still so unperfected that the established technology offers better performance or cost; but afterwards, if the new technology has real merit, it improves quickly its performance-price ratio, and ends up invading the industry by enabling products with superior or innovative features, at lower or comparable cost [49]. Similarly, macro changes in politics, economics, ecology and society can strongly affect the industry structure and its attractiveness in the long run, by opening the doors to new customers groups and/or by introducing new products features compared with the ones that mainstream customers were used to require.

Building on these contributions, Duncan [39] explored two specific environmental features which combine to increase the general level of uncertainty: complexity and pace of external changes. Complexity results from: i) heterogeneity of drivers of change and new events in the business environment; ii) the relationships and mutual influences among drivers of change, and the relationships of each driver with a large number of components of the micro and macro environments; iii) the low rate of evolution of drivers of change. The more heterogeneous the drivers of change are, the longer their development time and the more tightly they are linked (that is, the more they influence each other), the higher the complexity of the business environment will be. Complexity is typical of mature and global industries where trajectories of technologies and customer needs are well-established and companies compete for market share at the international level. The boundaries between the micro and macro environments are blurred in these industries; the huge number of drivers of change in the macroenvironment, their strong mutual influences and the slow overall pace of evolution contribute to increase complexity markedly. In contrast, dynamism is the result of: i) the frequency of the rise of new and disruptive drivers of change; ii) the speed of the evolution of these drivers. The more frequently disruptive drivers of change emerge, and the faster their development is, the higher the dynamism of the business environment will be. Dynamism is typical of emerging industries and more generally of industries where technology is the main leading force and new customer needs continuously come to the fore.

More recently, Milliken [50] explored the different types of uncertainty that strategic decision makers might face. He thus distinguished between three specific types: the first one is uncertainty about the state of the environment (‘state’ uncertainty): managers experience such kind of uncertainty when they perceive a particular component of their external environment to

be unpredictable, i.e. when they do not feel able to understand how this component might evolve over time. Recently such notion has been expanded by Courtney [51]. A second and quite different kind of uncertainty about the environment relates to managers' inability to predict the impact of external changes on the organization: this is exactly what Milliken [50] defines 'effect' uncertainty. Finally, a third type of uncertainty is associated with attempts to understand what response options are available to the organization and what the value or utility of each option might be. Milliken [50] defines 'response' uncertainty as the lack of knowledge of response options and/or the inability to predict their consequences.

2.2 Strategic planning and first mover (late mover) advantages

Studies in mainstream strategic management have developed around two fundamental prescriptions for how firms can cope with environmental uncertainty: they should either try harder to make more accurate predictions (rational strategies advocated by the "planning school") or be more flexible in order to adapt fast (adaptive strategies espoused by the "learning school"). This section and the next one focus on these research strands.

The '*planning school'* argues that, as uncertainty increases, organizations that work more diligently to predict changes in their environment will outperform those that do not. This approach therefore emphasizes the importance of systematic analysis and integrative planning, and discipline in the scanning of trends, the generation of alternatives and forecasts, the rational evaluation of these forecasts and their integration into the firm's existing operations: these are the hallmarks of the planning school [52,47]. Scholars recognize that predictions might not be perfect because they are obviously difficult; however, predictions still represent the best way for

remaining aligned with the changing environment, by allowing decision makers to identify emerging opportunities and threats.

In this vein, mainstream scholars define "first mover advantages" the main benefits that a firm might gain by anticipating – and thus by pioneering – market changes and, conversely, the disadvantages encountered by late mover firms that fail to anticipate such changes [53]. First mover advantages tend to be observed mainly in the form of higher profits and market share: the longer the lead time of competitive entry – and thereby the longer the time a firm anticipate external changes before its rivals – the higher the likelihood of achieving such benefits [54].

According to mainstream scholars, the main sources of first mover advantages lie in three basic categories: technological capabilities, customers' switching costs, and scarce inputs or assets [55]. The first source typically relates to technological changes which might stem from both the core industry (microenvironment) of the firm or from its macro-environment. Two basic mechanisms here are considered in literature on management: the first relates to advantages derived from the 'learning' curve, where costs fall with cumulative output; the second relates to success in patent or R&D races, or more simply to superior technological skills, where competitive edges in product or process features are a function of R&D expenditures [56]. Equally important, first mover advantages might also be achieved through the timely development of a set of organizational capabilities in marketing or manufacturing that are key to the establishment of new products and services; such marketing and manufacturing capabilities are likely to be affected as well by the learning curve.

The second source of first mover advantages, i.e. customers' switching costs, relates to the extra resources which late movers must invest in order to attract customers away from the first mover firms [53]. This source is typically due to technological and market changes in the micro

environment of the firm which lead to the rise of new customer needs. First, switching costs can stem from initial transaction costs or investments that the buyer makes in adapting to the seller's product. These include the time and resources spent in qualifying a new supplier, the cost of ancillary products such as software applications for a new operating system in the computer industry, and the time and financial burdens of training employees. A second category of switching costs is due to supplier-specific learning by the buyer. As the buyer adapts over time to the characteristics of the product and its supplier, he eventually finds it costly to switch to another brand. A third type of switching cost is contractual switching cost that may be intentionally created by the seller: airline frequent-flyer programs are compelling examples of this category [55].

Finally, first mover firms may be able to gain advantages by pre-empting rivals in the acquisition of scarce assets. Such assets may be physical resources or other process inputs: that's typically the case of changes in regulation or in the political landscape which enable the access to new markets or geographic areas. In the early 1990s, the fall of the Soviet Union allowed energy majors to expand their exploration activities in the country with the largest reserves of oil and gas in the world. Alternatively, scarce assets may relate to positioning in 'space', including geographic space, product space, shelf space, or even customers perceptual space. On this regard, it is worth stressing that early entrants might be able to shape the cost and preference structure of customers: that's the case for instance of network externalities which tend to establish the pioneer's product as the industry standard. As they accumulate experience with the pioneer's products and enjoy lower cost or greater benefits when using them – thanks to the compatibility with the largest base of external users -, customers increasingly become reluctant to switch to the

offer of late mover firms [48]. In this case, the pre-emption of scarce resources by early movers regards the size of its customer base.

On the other hand, first mover advantages may be counterbalanced by various disadvantages which can reduce, or even completely negate, the benefits which pioneer firms derive from the sources described previously. The full understanding of the opportunities inherent in the sources of first mover advantages thus requires to analyse systematically and contextually these first mover disadvantages which are, in effect, advantages enjoyed by late mover firms. First, late movers may benefit from the ability to "free-ride" on first mover investments in a number of areas including R&D, buyer education, and infrastructure development: imitation costs are often lower than innovation costs. Second, late movers might benefit from the resolution of technological and market uncertainty. Firms' size is a key issue on this regard: large firms usually control complementary resources in marketing (e.g. brands, distribution channels) and production (e.g., facilities) which allow them to easily bridge the time gap with small-sized innovators. Third, the vulnerability of first movers might stem from incumbents' inertia. Such inertia can have several root causes: a) incumbent firms may be locked-in to a specific set of fixed assets; b) they may be reluctant to cannibalize existing product lines; c) they may become organizationally inflexible. These factors inhibit the ability of first mover firms to respond to new environmental changes or competitive threats.

2.3 Organizational leaning and adaptation

Contrary to the planning school, the 'learning school' prescribes avoiding prediction as much as possible, but focussing rather on responding to change events as they emerge. This strand emphasizes quick adaptation: it suggests firms maximize their profits by minimizing the use of

predictive rationality, and by experimenting instead so as to be able to move quickly to capture emerging opportunities [57,58]. The 'learning school' advocates using purely reactive approaches which avoid trying to define future changes and seek instead to position the firm to make timely responses to *actual* events and changes. This approach ultimately argues that the impossibility to make reliable enough predictions represents an insurmountable barrier to strategic planning, by compromising its real effectiveness.

Organizational learning builds on two classical observations drawn from behavioral studies of organizations. The first is that behavior in organizations is based on routines [42,59]. Actions stem from a logic of appropriateness or legitimacy more than from a logic of consequentiality or analysis: they involve matching procedures to situations rather than planning alternatives. The second observation is that organizational actions are history-dependent [60]. According to Levitt and March [61: p. 320] organizations are seen:

> "*as learning by encoding inferences from history into routines that guide behavior. The generic term 'routines' includes the forms, rules, procedures, conventions, strategies, and technologies around which organizations are constructed and through which they operate. It also includes the structure of beliefs, frameworks, paradigms, codes, cultures, and knowledge that buttress, elaborate, and contradict the formal routines. Routines are independent of the individual actors who execute them and are capable of surviving considerable turnover in individual actors."*

Organizational routines continuously change as a result of experience and interpretation of history, i.e. evaluation of outcomes in terms of targets. The likelihood that a routine will be used increases when it is associated with success in meeting a target, decreases when it is associated with failure [42]. To describe the underlying processes through which routines develop and change, and thereby organizations learn from their actions and the feedback they receive from their environment, Nonaka and Takeuchi [62] introduced a four-stage spiral model based on the distinction between "tacit" and "explicit" knowledge. Tacit knowledge is hard to be formalized

and therefore to be communicated; it consists basically of personal know-how, mental models and individual beliefs, deeply rooted in a specific context. It's the case, for example, of the craftsmanship of silk printing, that is the ability of reproducing on a piece of silk exactly the shape or the combination of colours of a given sketch: such a craftsmanship is the result of several years of experience that cannot be simply articulated in terms of scientific or technical principles and operational routines. Ultimately tacit knowledge consists of what we know and what can do, even if we cannot explain it. Explicit knowledge, on the other hand, is formal and systematic and, as such, it can be easily communicated through archives and records. The distinction between tacit and explicit knowledge leads to four stages of the process of knowledge creation and organizational learning: a) socialization, that is the sharing of tacit knowledge between different individuals (from tacit to tacit); b) articulation, that is the conversion of tacit knowledge into explicit knowledge (from tacit to explicit); c) combination, that is the collection and assembly of discrete pieces of explicit knowledge (from explicit to explicit); d) internalization, that is the use and further elaboration of explicit knowledge to widen one's own stock of tacit knowledge (from explicit to tacit).

According to mainstream scholars, learning is a key condition for adaptation, i.e. the organizational capability to sense changes in its external environment and respond accordingly. Milliken [50] characterized the process of adaptation in terms of three main tasks. First, managers must scan their environment in order to identify the key trends, events and changes that might affect the performance of the organization. Second, they must identify the key threats and opportunities inherent in these changes. Such task requires that managers assess the meaning and significance of each change they noticed during the scanning phase. Third, they must take actions in response to environmental changes.

More recently, Teece et al. [60] introduced the term ‘dynamic capabilities’ to encompass the adaptive skills of organizations: dynamic capabilities are “the firm’s processes that use resources – specifically the processes to integrate, reconfigure, gain and release resources - to match and even create market change. Dynamic capabilities thus are the organizational and strategic routines by which firms achieve new resource configurations as markets emerge, collide, split, evolve, and die.” More specifically, dynamic capabilities consist in the three capacities: (a) to sense and shape opportunities and threats; (b) to seize opportunities; and (c) to maintain competitiveness through enhancing, combining, protecting, and, when necessary, reconfiguring the enterprise’s intangible and tangible assets [2].

Following the work of Teece and colleagues, Doz and Kosonen [63] introduced the concept of ‘strategic agility’ for explaining how adaptive skills are activated in organizations. Strategic agility is” the ability to continuously adjust and adapt strategic direction in core business, as a function of strategic ambitions and changing circumstances, and create not just new product and services, but also new business models and innovative ways to create value for a company.” They described strategic agility as the ‘thoughtful and purposive interplay’ on the part of top management between three ‘meta-capabilities’: a) strategic sensitivity: the sharpness of perception of, and the intensity of awareness and attention to, strategic developments; b) resource fluidity: the internal capability to reconfigure capabilities and redeploy resources rapidly; c) leadership unity: the ability of the top team to make bold, fast decisions, without being bogged down in top-level ‘win-lose’ politics.

3. First mover advantages, organizational memories and the value of strategic foresight

In the previous section, first we analysed the concept of environmental uncertainty and then we drew from mainstream literature on strategic planning and organizational learning to explore different approaches for coping with environmental uncertainty. In this section of the paper we focus on strategic foresight and we try to shed light on its role and contribution to the long-term performance of the organization. In particular, we draw from the basic principles of both the planning school and the learning school and we thus explore the potential benefits and limits inherent in the use of foresight for sustaining strategic decision making.

3.1 Organizational memory and "memory of the future"

Practitioners and scholars in the field of strategic foresight generally agree that its role in handling uncertainty is not to predict the future but to prepare the organization for dealing with it [64,65,66].

The most relevant description of the learning process that strategic foresight would induce is based on the concept of 'memory of the future', through which professor David Ingvar explores how the human brain deals with the future. According to Ingvar [62, p.128], human brains constantly probe the conditions of the outside world and then immediately look at the actions they can take, in a constant sequence, on alternative paths that run into different futures. He thus observed that "concepts about the future, like memories of past events, can be remembered, often in great details": human brains not only construct but also store these alternative time paths, which become "memories of the future". 'Memories of the future' offer important insights into the ability of human beings to learn and adapt: the more time paths are stored, i.e. the more memories of the future are built, the more individuals are able to recognize and make sense of changes in their external environment. 'Memories of the future' form the basis for anticipation

and expectation as well as for the short and long-term planning of goal-oriented behaviours: human beings use these memories for extracting meaningful information from the enormous and random sensory noise to which the brain is continuously exposes. Without a 'memory of the future', such extraction would not be possible.

Despite its original root in human neurobiology, the topic of "memory of the future" closely resembles the mainstream research field in literature on organizational learning and, more specifically, 'organizational memory'. This term is used to refer to the experiential knowledge of the organization, that is the accumulated body of data, information, beliefs and routines that the organization creates throughout its whole history and past experience [68,69,61]. It thus encompasses the collection of knowledge-based resources, both explicit (i.e., organizational archives like data bases) and tacit (i.e., individual memories) that organizations have at their disposal for facing external changes.

Organizational memory is considered to influence the strategic response of firms and thereby their performances in dynamic environments by reflecting the knowledge developed from their *past* experience into their *present* and *future* actions. Specifically, according to Walsh and Ungson [68: p. 73] it plays three relevant roles: first, it plays an informational role which helps decision makers select and make sense of signals from their external environment; second, it fulfils a coordination function that reduces the transaction costs that are often associated with the implementation of new decisions; third, it plays a political role which allows individuals (or groups of individuals) in power to influence the actions of others.

Together, the literature on organizational memory and the work from Ingvar suggest that the main role of strategic foresight is to allow the organization to build its own collective "memories of futures" – exactly as experiential knowledge enables it to develop its "memories of the past".

The “memories of the future” that organizations build through strategic foresight complement their “memories of the past”, as decision makers are faced with new and different kinds of changes from the ones they had previously experienced. Strategic foresight and organizational ‘memories of the future’ involve exactly the four stages of the learning and knowledge creation process described by Nonaka and Takeuchi. As human have many organs of perceptions - i.e. ears, eyes, touch, sense and smell – that allow them to depict signals from the outside world, organizations have many channels, sources, and media through which they learn about new events, trends and changes in their external environment [70,71,72,73,74]. These channels and sources might be both internal (e.g., employees, middle and senior managers) and external (rivals, suppliers, consultants, academics), formal (press media, web sources, conferences) or informal (meetings, social events). This basic knowledge about trends and changes in the external environment is then elaborated collectively by the members if the organizations through such techniques as scenarios and roadmapping, which foster the:

a) Socialization of tacit knowledge about changes in the external environment: strategic foresight involves a series of workshops and meetings through which middle and senior managers from different divisions and functions share their insights and perceptions about changes and new events in their external environments. Such workshops, which usually involve also external experts (e.g., academics, consultants), allow executives to share information (e.g., quantitative data and personal opinions and evaluations) about the likely evolution of external changes, their likely impact on the organization, and the likely response options. The direct interaction between people with different backgrounds (e.g., R&D, marketing, operations) tends to foster provocative thinking: the use of metaphors turns out to be quite effective for conveying intimate ideas and beliefs [75]. A metaphor is a way not only of communicating, but also of

perceiving; it's a way of sharing experiences by means of images, symbols, behaviours, rather than formal rules or routines;

b) articulation of tacit knowledge about changes in the external environment into explicit knowledge: middle and senior managers translate their visions about the likely evolution of external changes, their impact on the organization and the suitable response options into a set of coherent pictures, like scenarios and roadmaps. Scenario building and roadmapping require the managers of the organizations to elaborate some formal models and conceptual frameworks, which define the most relevant changes and explore their mutual linkages and interactions over time: these formal models, i.e. alternative scenarios or roadmaps, become the explicit "memories of the future" of the organization;

c) combination of explicit knowledge about changes in the external environment: the outcomes of strategic foresight, i.e. scenarios or roadmaps, are shared throughout the organization and made available also to those members who were not directly involved in the foresight process;

d) internalization of explicit knowledge about changes in the external environment into tacit knowledge: through their 'memories of the future', senior and middle managers sharpen their ability to detect new events and changes in their external environment and seize the opportunities and threats these changes bring to the long-term competitiveness of the organization [76].

In this way, strategic foresight lays the foundations for an ongoing process through which new knowledge (tacit and explicit) about changes in the external environment is continuously gained and the 'memories of the future' of the organization are continuously updated and revised by its members through the collective processes of socialization, articulation, combination and internalization.

Table 1 compares the development of "memory of the future" by individuals with the development of organizational "memories of the future", by summing up the main similarities and differences.

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3.2 Memory of the future, first mover (late mover) advantages, and long-term value

In the previous section, we draw from literature on organizational learning and organizational memory to argue that strategic foresight is a continuous process which allows the firm to build and renew over time its collective 'memories of the future'. We now go deeply into this concept, by exploring whether and how such collective memories enhance long-term performances.

Mainstream scholars in literature on strategic planning devoted a lot of efforts into identifying the first mover advantages that a firm might achieve by anticipating changes in its external environments. According these scholars, we argue that the core role of strategic foresight is exactly to allow organizations to build 'memories of emerging (i.e., future) sources of first mover advantages'. Of course, no technique and process might be designed to predict the future "as it exactly will be", by fully anticipating the impact and response to external changes: scholars in the learning schools of strategic management and even in the field of corporate foresight largely agree on this conclusion [57,26,37]. But what strategic foresight efforts should still be able to envisage are the likely sources of first mover advantages, so as to give decision makers the opportunity to address these sources in a timely and profitable way. Once first mover advantages have been depicted, a firm might get a head start in the development or acquisition of the key

resources – i.e. assets and capabilities – which underlie the concrete achievement of these advantages.

As they use strategic foresight to depict promptly drivers of change in their external environment and to reflect upon the first mover advantages these changes might bring about, decision makers build their "memories" of the future opportunities and threats they will have to deal with. In this way, they increase exactly their "power of perception": they "hear" and make sense of the relevant signals that anticipate the rise of first mover advantages, like technological capabilities, scarce assets, customers' switching costs. They thus gain a head start in the development or pre-emption of these advantages, by adapting to their changing environment more quickly and more effectively than their rivals.

Literature on organizational memory shows that the ability of the organization to cope with external changes depends on the knowledge it had previously acquired through its own past experience: as this experience has a degree of similarity with external changes, it provides a helpful basis on which the organization can rely for crafting its strategic response [68,69,76]. The value of strategic foresight lies exactly in enabling decision-makers to experience the future sources of first mover advantages before they actually take place, i.e. to build their 'memories' of future sources of first mover advantages: as these memories embrace the rising sources of first mover advantages, strategic foresight will provide the organization a helpful basis for crafting its response to its changing environment.

Strategic foresight and first mover advantages thereby are strictly intertwined. On the one hand we emphasize the role that the anticipation of sources of first mover advantages has in order to strategic foresight be valuable. On the other hand, first mover advantages stem from changes in the external environment: only the firms that recognize these changes promptly, will be

eventually able to benefit from them [53]. Strategic foresight involves precisely the capabilities of organizations to identify the first mover opportunities stemming from market and technological changes: firms need strategic foresight in order to enhance these capabilities [78].

The case of Nokia, which in the early 2000s successfully adapted to deep changes in its industry, provides a compelling example. To prepare itself for 3G and the convergences of digital technologies into mobile communication, Nokia established in the 2001 a formal and systematic process for carrying out strategic foresight [79]. 3G (and allied advances in microelectronics and software) promoted the convergence of a wide range of digital sectors - mobile voice communications, software, e-mail and web-surfing, information, multimedia, imaging, music, games, entertainment and consumer electronics - into one broader industry area, with the promise of new market segments being established. Nokia's foresight efforts led the company to build a set of product and technology roadmaps through which it envisaged, in the mid 2000s, the desire of mobile phone customers for digital imaging, game and music and the rise of completely new product categories (e.g., camera phones) setting apart from traditional cell phones. Nokia's roadmaps clearly anticipated the opportunity for early movers into the converging digital markets to disrupt traditional phones and to gain a competitive edge over rivals by means of leading technological skills in imaging, games and music and by means of new product models which could allow to pre-empt customers' perceptual space. Nokia's roadmaps thus spurred the company to develop such technological skills (both hardware and software, through experience curve and patents) and allied capabilities in manufacturing (production capacity) and marketing (brand), through which it launched new product models (e.g., the Nseries) and increased its market leadership in the second half of the 2000s.

On the other hand, if strategic foresight is not able to anticipate the emerging sources of first mover advantages or even *mistake first mover advantages for late mover advantages*, it will actually increase the *inertia* of the organization rather than its *adaptive skills*. Literature on organizational memory and, more generally, managerial cognition strongly emphasized that the strategic beliefs that the organization has developed through its past experience are likely to doom its faith when they are not aligned with the shifting environment, i.e. when they lack proximity with the new knowledge required to address external changes [80,81,82]. In the same way, firms that fail to anticipate first mover advantages are going to develop strategic beliefs about first mover opportunities (and threats) that actually will not establish, thus moving away their strategic focus from the real actions they require to adapt to their shifting business.

The case of Nokia, with its recent struggles, provides again a compelling example with regard to this issue. Such struggles were due to major mistakes in anticipating the challenges that mobile Internet brought about. Nokia predicted that being the first mobile phone manufacturer to move into the nascent market of mobile Internet would give it a sound advantage: network externalities would establish its Symbian operating system as the industry standard. Indeed, in the mid 2000s Symbian was the ruling platform in the industry. But this edge did not last for a long time: as they entered the mobile Internet market in 2007 and 2008 respectively, both Apple and Google – that could exploit the software skills they had originally developed in the PC industry - quickly established their iOS and Android operating systems over Symbian.

In the face of Apple and Google, the only choice available for established mobile phone manufacturers was to pursue late mover advantages, by waiting for the resolution of market uncertainty and the rise of the winning operating system: that was exactly what Samsung did, when it embraced Android in 2009.

The chances of organizations to survive in dynamic environments depend exactly on the ability to understand when their "memories" of the future are not aligned with real future, i.e. when the sources of first mover advantages they have predicted are not going to rise. Firms thereby should carefully use strategic foresight, by fully recognizing that predictions (even in the form of alternative visions) are *not* the real future but a way of preparing for the future and thus by emphasizing the process of foresight instead of the output of foresight (e.g., scenarios or roadmaps) . On this regard, Ahlqvist et al. [83: p.824] introduce the concept of anticipatory capacity to emphasize the relevance of the organizational capability to "continuously reflect on one's own actions against systematically formed strategic views of the future, and to change one's own behaviour and/or strategic view of the future when necessary". Strategic foresight should be framed as an ongoing activity, through which firms relentlessly looks for new events that allow them to inform new strategic views about first mover advantages and revise in case their initial views. Contextually, it is worth noting that first mover advantages require a high propensity for risk-taking. Tools like strategic options might be very helpful to gain a head start but, at the same, not the obligation to further develop and/or acquire the sources of first mover advantages - i.e. scarce assets, technological and marketing capabilities, customer switching costs - which the firm has initially envisaged. Strategic options might thus contribute to enable organizations to escape the trap of being 'locked into' the future which they have foreseen and in the mistakes which might be inherent in this future.

4. Discussion

We add to the study of decision making in uncertain environments, our core contribution being a conceptual framework of the value that strategic foresight might create in relation to fast

adaptation and long-term performances [84]. We focus on the role of corporate foresight in building "memories" of future sources of first mover advantages which allow organizations to recognize (i.e., coping with effect uncertainty) and address (i.e., coping with response uncertainty) these sources more promptly and more profitably than rivals that do not use foresight. Figure 1 summarizes our conceptual framework.

Figure 1 about here

We started by noting that the work on strategic foresight has garnered much attention by scholars and practitioners. However, with its success and wide diffusion also have come some pitfalls. One can easily see from a search for 'strategic foresight' and "corporate foresight" on the web how loosely the terms have become to be used and how they have become separated from their theoretical basis. Therefore, a reconsideration of the nature of corporate foresight efforts and their role in strategic decision making – in terms of either enhanced learning and adaptive skills or, conversely, inertia – is required. We propose this work on corporate foresight as a springboard which might serve to formulate several important issues that have remained unresolved from both an academic and managerial perspective.

Our main contribution concerns the long running debate between the planning and the learning schools of strategic management on the role of prediction in strategy formulation. On the one hand, our model is consistent with the core tenet of the planning school - that an organization should try hard to predict changes and new events. We argue that, in turbulent environments, more foresightful firms, that plan their strategic moves in advance, can pre-empt emerging market opportunities and prevent the entry of competitors who rely simply on adaptation. On the

other hand, our model emphasizes that the value of strategic foresight lies not just in the alternative visions of the future it provides, but more in how it fosters a process of 'planned learning' about the future, by allowing the organization to be ready to adapt to changing situations as they develop.

The concept of 'planned learning' was originally introduced by Vecchiato [38] as he described foresight activities in corporate organizations. This paper further explores this concept and strongly advance our understanding of it. We draw from the research streams of first mover (dis) advantages, organizational memories and strategic agility in order to provide a fully original theoretical framework, which sheds light on the circumstances under which strategic foresight might really enable 'panned learning' processes (and thus value creation) in fast-paced environments. Contextually, we shed light on the circumstances under which foresight efforts might increase the inertia of the organization instead.

The concept of "planned learning" we develop in this paper, echoes the theme advanced recently by several prominent scholars that connects rational planning with effective adaptation [1,85]. First of all, our study of strategic foresight is rooted in the dynamic capabilities view of the organization [60,86]. Teece [2] identifies dynamic capabilities as the capacities to sense, seize and reconfigure, and explores the firm's skills, procedures and processes – to which he refers as microfoundations - that underpin dynamic capabilities. Strategic foresight, through its input into the firm's capacities to learn about its shifting environment, involve precisely the microfoundations of dynamic capabilities. By addressing the future state of external changes ('state uncertainty'), strategic foresight serves the organization as microfoundation of the capacity to sense emerging opportunities and threats; by addressing the future effects of external changes ('effect' uncertainty), it serves as microfoundation of the capacity to seize the rising

sources of first mover advantages; and by addressing response options to external changes ('response' uncertainty), it serves as microfoundation of the capacity to concretely gain first mover advantages, by expanding its technological and marketing capabilities, creating customer's switching costs, and pre-empting scarce assets.

In particular, our conceptual framework builds on the work of Doz and Kosonen [63] on "strategic agility". By exploring the linkages between strategic foresight, organizational learning and first mover advantages, we deepen our understanding of the relationships between strategic foresight and strategic agility and the three microfoundations of strategic agility, i.e. strategic sensitivity, resource fluidity and leadership unity. Through the building of organizational 'memories of the futures', strategic foresight enhances the 'strategic sensitivity' of managers, i.e. their ability to recognize and interpret changes in the external environment. By exploring the rising sources of first mover advantages, strategic foresight fosters the capability of the organization to redeploy its resources rapidly so as to achieve and benefit from such advantages; finally, collective "memories of the futures" sustain cohesion and sharing of long-term aims throughout the organization. We thus respond to the calls for deeper investigation of the links between organizational processes, strategic agility and performance in fast-paced environments [85].

5. Conclusions

Our work focuses on strategic foresight and its role in enhancing the long-term performances of the organization. We draw from three different research streams: the first one is literature on environmental uncertainty, a concept which we carefully re-examine in this paper; the second one is literature on strategic planning and first mover advantages; the third one is literature on

organizational learning and organizational memories. Our work thus offers interesting opportunities for scholars who aim at deepening our understanding of the linkages between these research streams and their role in shaping the responses of organizations to environmental changes [38]. Scholars should develop a framework for becoming increasingly aware of the real value-added of strategic foresight – i.e., potential benefits and limits - and thus for profitably embedding it within the mainstream routines and processes of the organization [87]. A relevant field of research regards in particular how strategic beliefs about sources of first mover advantages take root among decision makers and whether and under what circumstances such beliefs might be exploited – or changed - successfully [80,81]. Finally, one of the most critical issues in foresight is wild card analysis: a wild card is a description of an event that is assumed to be improbable, but which would have large and serious consequences for the organization [88]. A relevant avenue for future research efforts regards the exploration of the relationships between wild card analysis and organizational 'memories of the future', and the ways these relationships contribute to enhance the resilience of the firm [89].

By conceptualizing strategic foresight as a "planned learning" process about the future which enhances the adaptive skills of the organization, we hope to respond to criticism regarding its usefulness and value in strategic management, so as to increase discussion among scholars [57,90]. As they further explore the linkages between the research streams on strategic foresight, organizational memories and first mover advantages we outlined in this paper, joint efforts of scholars and practitioners can improve our knowledge and use of strategic foresight in ways that are consistent with the principles of the dynamic capabilities and strategic agility views – and that seamlessly embed foresight in these research frameworks.

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Table 1: Comparing the "memory of the future" of individuals with the "memory of the future" of organizations: similarities and differences.

Memory of the future	Individuals	Organizations
Sources of information	Organs of perceptions - i.e. ears, eyes, touch, sense and smell.	Internal sources (e.g., employees, middle and senior managers). External sources (rivals, suppliers, consultants, academics). Formal sources (press media, web sources, conferences). Informal sources (meetings, social events).
Building process	a) Probing the conditions of the outside world. b) Looking at the actions that might be taken on alternative paths that run into different futures. c) Storing alternative actions and futures.	a) Socialization of tacit knowledge about changes in the external environment. b) Articulation of tacit knowledge about changes in the external environment into explicit knowledge. c) Combination of explicit knowledge about changes in the external environment. d) Internalization of explicit knowledge about changes in the external environment into tacit knowledge.