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Option chain and change management: A structural equation application

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Summary Building on concepts from a resource-based view of a firm and real option theory we propose a model that describes the links between a firm options development and the expected profitability. Empirical results of structural equation models on the video-game industry indicate that (i) the balance between industry innovativeness and firm innovativeness affects the perception of potential option, (ii) the industry threats and firm competences mediate the transformation of real option into profitable product, (iii) the strategic choice of project to be developed in a creative industry can be satisfactorily modelled by the option chain model.

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Introduction

The success of a firm depends on its ability to earn increasing returns or obtain performance by creating and exploiting new projects, routines and technologies in a more efficient way than the other firms in the industry (Teece et al., 1997). Those projects are competitive opportunities that the firms have to recognize, evaluate, and for which they have to build operating capabilities to take advantage of them. The general management responsible for the firm's strategic direction frequently fails to manage the organization's technological innovation and change processes that create these opportunities (Adner and Levinthal, 2004a).

To help managers in their decision making process in uncertain environments, new techniques and theories are developed, one of them is the real option theory. This conceptual decision making framework is about to become a standard (McGrath et al., 2004). The formal approach, originating from financial models, dealing with future uncertainties and the opportunities a firm can seize, is appealing for managers.

Bowman and Hurry (1993) present a conceptual model, called option chain (the successive steps of creation, development and use of a real option) aimed at bringing the real option logic from the financial field to the strategic management field. Their work was based on the intuition that people try to keep options open. The authors showed that the option chain could be seen as an analysis framework integrating many aspects of innovation management (resource allocation, sense making, organizational learning and

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strategic positioning) and that their model could be useful to explain many aspects of the development of a firm, from both a theoretical and an empirical point of view.

The real option logic gains a broad success in financial and managerial literature but comparatively the concept of option chain is barely used in theoretical work and to our knowledge, no empirical work tries to represent it explicitly. This is regretful because the elimination of the causal logic behind the option chain pushes the managerial approach of real option into some wrong tracks, considering situations as options when there are not (Garud et al., 1998; Adner and Levinthal, 2004a,b; Kogut and Kulatilaka, 2004). Also, the partial consideration of the option chain, focusing only on the real option element, makes the financial approach still predominant and avoids many non-financial topics of innovation management that are important from a strategic point of view such as organizational learning or firm strategy–structure relations.

In this work we use the option chain to answer a major issue, almost ignored in this literature, the question of the origin of the real options a firm possesses from a theoretical point of view and we propose a possible empirical approach.

We suggest the use of the entrepreneur/manager duality to explain the creation of new options. This duality, often described by opposing two actors with different mind sets, responsibilities and abilities, can be found in many firms active in industry where constant innovation is a necessity.

The insights gained from considering real option and the entrepreneur/manager duality are bi-directional. On the one hand entrepreneurship, in a resource-based framework, can explain the origin of real option and contribute to a better evaluation of its value. On the other hand real option can explain the direction a decision maker gives to the development of the new capabilities and resources, as an entrepreneurial activity, by suggesting another use of the resources. Combining entrepreneurship and real option explains the heterogeneity of the firm and its resources collection and capabilities building.

The empirical approach we propose is based on a structural equation model allowing us to create latent variables close to the notions used in the option chain and to test

the relationships (the paths) existing between those variables along the chain. Our endeavour is to make a structure apparent between the different kinds of options. To that end, structural equation modelling (SEM) is an appropriate tool (Tabachnick and Fidell, 2007: p. 30). The use of this tool in strategic management has strongly increased in recent years and, following Shook et al. (2004) and Henley et al. (2006), is able to generate insights in the strategic management where the constructs are complex and multidimensional. This exploratory study is carried out on innovative firms from the video-game industry.

In the next section we present the theoretical background: the option chain. This is done by introducing the original model by Bowman and Hurry (1993) and the incremental developments and improvements that have been made since, including the addition of our entrepreneur/manager duality. The section ends with the proposal of a conceptual model of the genesis of option and new product development. Subsequent sections transform this conceptual model into a structural equation model, present the data, the empirical analysis and the results. The paper concludes with the discussion on the findings and their implications in future research.

Theoretical background

An option gives the right but not the obligation to take a specific decision (invest, defer, alter) on an underlying asset, for a predetermined price at, or before, a certain time. For example, a firm can possess a production plant, and choose, depending on customer demand or competition, to construct a bigger capacity plant to obtain economies of scale (a growth option) or, on the contrary, to shut down momentarily the plant (option to defer production). The firm has the right, but not the obligation, to change its production capacity. This option, depending on the information at hand at the moment of exercise, allows the firm to seize new revenues flows or to reduce costs.

Figure 1 represents the successive developments of the real option chain in the strategic management literature. The following discussion and presentation of the option

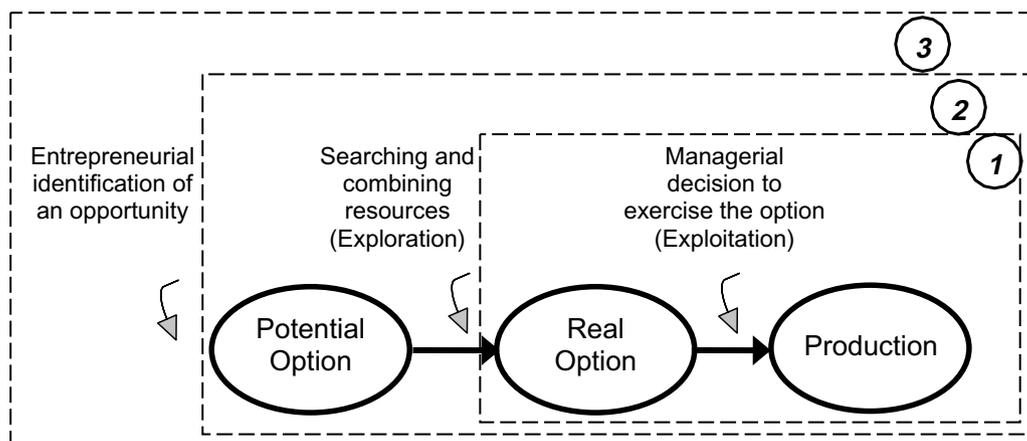


Figure 1 The option chain in the strategic literature.

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