

The Red Queen Effect and Maelstrom Effect: Principles and Implications for Survival Strategy

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要 旨

本研究は、何故新興企業がライバル企業より利益率を早くそして高くあげることができるのかについて実証するため仮説と検証方法を提案することを目的とする。二つの対立的な概念を用いる。一つ目はレッドクイーン効果（RQE-攻めの競争行動）、二つ目はメールストローム効果（MSE-守りの戦略）である。RQE 下での DC と、MSE 下での DC では、企業が得られる成果が全く異なることを論じる。DC は、急激な環境変化に対処するために内部と外部のコンピタンスを統合、構築、再構成することができる企業的能力（Teece, 2009）をいう¹。ハイパー・コンペティション下の市場では積極的に攻めることがますます重要になってきている。しかし RQE 下での行動は競争圧力を向上させ、競争者の数を増やし、行動のスピードも増すことになり、次第に企業業績に悪影響を及ぼす。利益率を上げるには攻めと守りの両立が解であることを分析し実証を次回の論文で明らかにする。

Keywords: Red Queen Effect, Maelstrom Effect, Survival Strategy, Dynamic Capability, Dynamic Instant Innovation

1 Introduction

In this paper I propose that success in a hypercompetitive world is where disruptive innovation reigns but exceptional speed rules. Although some would question the validity of this statement, studies that directly examine speed for determining successful outcomes of firms are rare. Baer² argues that the relationship between the *creativity* of ideas and their implementation can be less straightforward than the relationship between the *quantity* of ideas and their implementation. Creativity is likely to be lost unless actors are motivated to push for the realization of their ideas and skilled at developing strong buy-in relationships. Furthermore, the speedy realization of ideas into innovation is one of the central challenges that actors in competing firms face. The nature of people's ideas with respect to risk taking and achievement can be

reflected through the old fisherman's force of the Maelstrom effect (Howell and Higgins, 1990).³ The Maelstrom effect metaphor is introduced as "A Decent into the Maelstrom" drawing from Edgar Allan Poe's classic story.⁴

This paper integrates the concepts of Dynamic Capability (DC) and Dynamic Instant Innovation (DII) using the metaphor of the Red Queen effect (RQE). By RQE, I draw from Lewis Carroll's, *Through the Looking-Glass* (1871)⁵ to illustrate that an organization needs to move faster in order to be competitive. Furthermore, sensing, seizing and reconfiguring opportunities among the business enterprise's assets (especially the intangible assets of knowledge) are examined as illustrated by Teece (2009).⁶ The theoretical contribution of this study lies in identifying the most critical factors and then hypothesizing and testing how they jointly shape the rapid development and implementation of innovation.

This study will examine DII's most critical element, which I argue is *speed*. In this paper, the actions of the firm, rival firms, and the speed of all of these actions will be analyzed. Speed actions are defined as specific and observable innovation moves, such as new product introductions or new patent applications, initiated by a firm to defend or improve its relative competitive position. These actions are typically fast and tend to be observable to customers, competitors, and other industry watchers and are typically reported in the popular business press. These actions are therefore identifiable for data capture, collection, and analysis in newspaper and trade magazine articles via the Lexis-Nexis article index.

In this study, the Red Queen effect is investigated as a contest of competitive moves or actions against rival firms for strategic survival. The results from a multi-industry study and case studies (Barnett and Sorenson, 2002⁷; Barnett and McKendrick, 2004⁸; Derfus, Maggitti, Grimm, and Smith, 2008⁹) confirm the existence of the Red Queen effect, whereby a firm's actions increase survival rate, but also increase the number and speed of rival firms' actions, which, in turn, affect the firm's initial performance. Hence, the goal of this study is to extend this stream and explicate *why and how new firms can outperform their competition through speed*.

2 NEW THEORY DEVELOPMENT INTEGRATION OF DYNAMIC CAPABILITY (DC) WITH DYNAMIC INSTANT INNOVATION (DII)

Schoonhoven (2006) states that the firm's resources are an essential basis for innovation. These resources within the firm determine how competitive advantage is achieved and how that advantage might be

sustained over time. Within this perspective, firms are conceptualized as a bundle of resources, which are heterogeneously distributed across the organization and where resource differences persist over time.¹⁰ Teece et al. argue that well-known companies like IBM, Texas Instruments, Philips, and others appear to have followed an aggressive intellectual property stance. However, this strategy is often not enough to support a significant competitive advantage. They further propose that the winners in the global marketplace have been the firms that can demonstrate responsiveness and flexible product innovation, coupled with the management capacity to effectively coordinate and redeploy internal and external competences. This is referred to the Dynamic Capability of the firm's ability to integrate, build, and reconfigure internal and external competencies to address changing environments.¹¹

Fjeld and Burton (2014) illustrate Dynamic Capability as how something is done. The "how" is the mechanism or process at a deeper level than simply the statement of the input-output relations of resources to products as modeled in the neoclassical model of the firm. They further state that material and human resources are the inputs where capabilities are how these resources are used to realize a product or service.¹² Helfat et al. emphasized that competing in a changing environment through innovation and other mechanisms is a paramount importance for firms. Dynamic capabilities are "the capacity of an organization to purposefully create, extend or modify its resource base".¹³

Indeed, the concept of dynamic capabilities (Eisenhardt and Martin, 2000¹⁴; Teece et al., 1997¹⁵) has evolved from the resource-based view (RBV) of the firm (Barney, 1986¹⁶, 1991¹⁷; Wernerfelt, 1984¹⁸). RBV proponents argue that simultaneously valuable, rare, inimitable and non-substitutable resources can be a source of superior performance, and may enable the firm to achieve sustained competitive advantage (Barney, 1991).¹⁹ When firms have resources that are valuable, rare, difficult to imitate and non-substitutable, they can implement value- strategies that resist duplication by other firms and hence create a competitive advantage of product innovation or development. The theory of dynamic capabilities is based on antecedent organizational and strategic routines by which managers alter their resources base to generate new value-creating strategies.

2.1 SENSING (AND SHAPING) OPPORTUNITIES AND THREATS

Teece²⁰ surmised that opportunities get detected by the enterprise. This happens first, as stressed by Kirzner (1973)²¹ and, second, new information and new knowledge (exogenous or endogenous) can create opportunities, as emphasized by Schumpeter (1942).²²

2.2 RESEARCH MODEL (RED QUEEN COMPETITION: FOCAL FIRM ACTIONS, RIVAL ACTION SPEED AND FOCAL FIRM PERFORMANCE)

I next draw from literature for developing three hypotheses. I theoretically model Dynamic Instant Innovation (DII) for analyzing the Red Queen “running as fast as you can” process by examining the relationships among focal firm performance. Through this analysis, I will be able to empirically illustrate the relation between focal firm actions versus rival actions and speed of actions.

I propose that speed is a core element of DII. Drawing from literature, Ferrier, et al. (1999)²³ have empirically found that firms that are more active (i.e. are running faster) than their rivals improve their competitive positions. Miller and Chen (1994)²⁴ illustrated that more active firms achieve greater performance. Barnett and Hansen argue that a firm facing competition is likely to act, which allows firms to “learn by doing” (Argote, 1999²⁵; Eisenhardt and Tabrizi, 1995²⁶; Pisano, 1994²⁷).

Evolutionary theory outlines how performance differences among rival firms are determined by a competitive race to gain an ultimate competitive advantage. This theory draws on the advantages provided by superior speed and innovation by one firm to keep ahead of its rivals (Nelson & Winter, 1982).²⁸ Red Queen competition (Barnett 1997²⁹, 2004³⁰), is when one firm’s actions directly affect that firm’s viability and also the viability of rival firms. Barnett (1997)³¹ illustrated the components of this variance as the direct and indirect effects of competitive actions on the focal firms and rival firms. The actions of the focal firm affect the performance of the focal firm, and these actions also have an effect on the performance of rival firms. This leads me to hypothesize:

Hypothesis 1. The number of small business actions is likely to have a positive impact on small business performance.

Derfus, et al. (2008)³² argue that successful actions evoke reaction from rivals. Firms are spurred to engage in a cycle of action as they continually seek to learn more about action-performance relationships. These firms must act if they are to stay viable. Thus I hypothesize:

Hypothesis 2. New industry actions and speed of actions are likely to have a positive impact on small business performance.

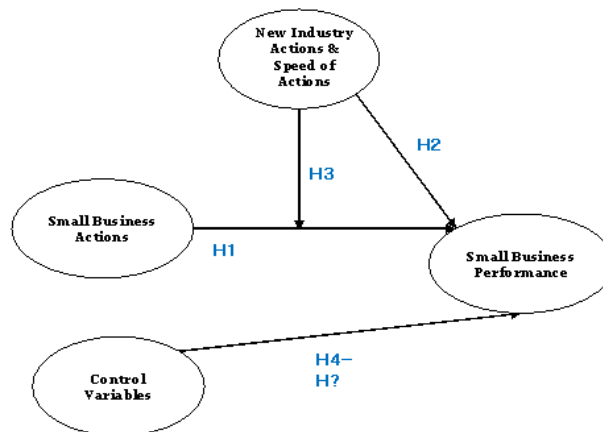
The focus of this paper is on new industry, and why some are more competitive than others through superior speed. Competitors can provide strategic benefits by helping to develop markets and increase industry demand, and may represent a “positive sum competition” (Porter 1985).³³ New product introductions such as Exubera did not affect the existing competition in the new market. Injex witnessed an

increase in their business. Therefore new product introductions increased the needle free market. Case study of this hypothesis will lead to ascertain this hypothesis. This brings me to my next hypothesis, which is to examine the actions of new industry one at a time in light of strategies used by new industry-speed. Ferrier, Smith, and Grimm (1999)³⁴ found that firms that are more active (i.e., are running faster) than their rivals improve their competitive positions and increase their performance. The more active firms achieve greater performance (Miller and Chen, 1994).³⁵ Thereby leading to the following:

Hypothesis 3. New industry actions and speed of actions are likely to positively moderate the impact between the number of small business actions and small business performance.

Additional hypotheses will be developed drawing from the following literature for the control variables. Figure 1 is an illustration of the hypothesized relationships of the research model.

Figure 1: Research Model



3. VARIABLES AND MEASURES

Small Business Action is the independent variable. This variable measures the number of new product introductions and patent applications in a given year. The moderating variable of the research model is New Industry Actions & Speed of Actions. New Industry Actions is measured as the total number of actions by the competition minus small business actions of the focal firm. New Industry Speed is defined as the number of

days for the first rival to respond to another rival's action. The dependent variable is Small Business Performance. I use the following measures for this: Return on Sales (ROS) and Return on Assets (ROA). I also include several key control variables in this study. These variables are as follows: Small Business Size, New Industry Size, Previous Year (Lagged) ROS, and Previous Year (Lagged) ROA. Relations for these control variables will be developed and tested starting with Hypothesis 4.

4. METHODOLOGY

This study focuses on the concept of the Maelstrom effect to determine, *what exactly is this phenomenon? Why and how regularly does it occur, in what settings, and in conjunction with what other phenomenon?* This paper delves into research directed toward uncovering empirical patterns revealing the Maelstrom effect. In order to accomplish this, a qualitative analysis is conducted using a “grounded theory” approach derived from detailed case observation of people's behavior in the “real” world (Helfat et al. 2007).³⁶ As per Helfat et al. (2007),³⁷ an accumulation of evidence that points to empirical regularities provides us with a much broader and more generalized understanding of the world. Such empirical regularities are known as “styled facts”. We must first understand at least the broad outlines of “what” a phenomenon consists of before it can be explained “why” it occurs.

For the Red Queen effect, data will be collected from Lexis-Nexis documents and codified for capturing evidence of the Red Queen effect. I will then test this model with the data using the logistics regression statistical analysis technique.

5. ANTICIPATED RESULTS

In line with the red queen theory, the relationships in this model should be supported. The number of small business actions and the speed of those actions are likely to have a positive impact on small business performance. Specifically, I anticipate that Small Business Actions will have a positive impact on Small Business Performance as per Hypothesis 1. Similarly, New Industry Actions and Speed should have a positive impact on performance as predicted by Hypothesis 2. Finally, as per Hypothesis 3, I anticipate that New Industry Actions and Speed of Actions will positively moderate the impact between the number of small business actions and small business performance.

6. IMPLICATIONS AND FUTURE RESEARCH

This study will contribute both theoretical and managerial implications for successful strategic innovation. Winning or losing among competing firms is a fundamental contrast in strategic management. This is a particularly critical issue for new, startup firms. This paper will contribute to theory by being the first study to show how speed and competition impacts performance at the small startup level. This study will also benefit managers by showing how small business actions, and the speed of actions of the competition impact the overall competitive advantage of their organization. However, the Maelstrom effect is a new concept introduced in this paper as a survival strategy and needs further empirical study. Further research will be to focus on varying action types to demonstrate how future geographic expansion, new marketing campaigns and new product introductions by new industries may represent a positive sum competition. An illustration of this “win-win” dynamic can be seen when Pfizer entered the needle-free market with Exubera and spent 1 billion dollars in R&D. Finally, I agree with Ambrosini and Bowman’s statement that the dynamic capability perspective extends the resource-based view argument by addressing how valuable, rare, difficult to imitate, and imperfectly substitutable resources can be created and how the current stock of valuable resources can be refreshed in a changing environment.³⁸ Dynamic capabilities might not automatically lead to performance improvements without Dynamic Instant Innovation (DII) perspective. My next paper will implement quantitative analysis on RQE as well as qualitative analysis on the Maelstrom effect. This paper encourages scholars to look to integrate DC *into* DII. This can be through the complementary field of inquiry, e.g. innovation creation, knowledge management, and organizational learning. Through this new theory of DC, DII can be useful for strategic management for both researchers and practitioners. In order to accomplish this, the Maelstrom effect needs to be more fully researched.

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