

The Composition Nature of Competitive Advantage: Investigations on Firms' Contemporaneous Innovation and Market Engagement

Tung-Shan Liao¹⁺ and Hsiao-Wen Li¹

¹ College of Management, Yuan Ze University, Taiwan

Abstract. The central tenet of this study is to illustrate the variance patterns of competitive advantage. The research is developed on the basis of the a priori model drawing on the factors of market engagement mediating the effects of innovation investment on firm performance. It conducts MIMIC analysis for the illustration and assessment of variance patterns of the inter-temporal competitive advantage of firms. The results suggest that the composition nature of sustainable competitive advantage (SCA) of the firm is perceived as a series of short-term advantages. The research highlights the innovation efficiency within such the interaction is of an influence to a firm's evolution of market fitness in the marketplace.

Keywords: Competitive Advantage, Innovation, Market Fitness, Evolutionary Fitness, the MIMIC Model.

1. Introduction

Recent research into the issue of competitive advantage of the firm generally focuses on some short-term views (D'Aveni, 1994; Eisenhardt and Santos, 2002; Lehrer, 2001; Porter, 1981; 2008), and is often based upon cross-sectional analysis (Eisenhardt and Santos, 2002). Common measures include growth in sales and firm productivity, which have the benefit of both firm growth and market relative strength at least in part incorporated in the measurement of firm performance (Steers, 1975; Venkatraman and Ramanujam, 1986; Demirag, 1987; Bird and Beechler, 1995; Madu et al., 1996; Helfat, et al., 2007).

This study aims to investigate the nature of how organizations build competitive advantage with foci on innovation-related antecedents and consequences in strategy literature. It is noted that innovative activities within firms have traditionally been viewed as a natural driver of firm performance improvement and industry perturbation (Helfat, et al., 2007). The research also notes that those activities transform the market presence of the firm, effectively disseminating these innovations to existing and potential customers; and that influence the firm's competitive position vis-a-vis its customers, accentuating the benefits available for those innovation-related investments.

Such the inference highlights a firm's innovative activities that are viewed as necessary but not sufficient predeterminants of its economic performance. If looking into innovation that, as such, is suggested as a core element of dynamic capabilities (Eisenhardt and Santos, 2002; Teece, et al., 1997; Liao and Rice, 2010), this presupposition resonates with the insights of Eisenhardt and Martin (2000) and Zott (2003) relating to the manner of how dynamic capabilities contribute to firm performance. In other words, the presence of dynamic capabilities may only be a necessary, but are not necessarily a sufficient, element for developing competitive advantage (Helfat, et al., 2007). Recent discussion has also been suggested, specifically, to assess the proposition that innovative activities contribute to resource reconfiguration and transformation, and hence tangible presence of market position (Liao and Rice, 2010).

¹ + Corresponding author. tel.: +886-3-4638800; fax: +886-3-4633824.
E-mail address: valenliao@saturn.yzu.edu.tw.

By extending Liao's and Rice's (2010) investigation on market fit and its role in firm evolution, the intention of the paper is to discover, empirically, that sustainable competitive advantage (SCA) of the firm comprises of a series of short-term competitive advantages. This will be done by looking at how a firm secures economic performance by enhancing and shifting its market position in the marketplace through innovative activities on an ongoing basis. In doing this, the significant empirical evidence of the paper addresses a gap in the literature for understanding the vicissitudes of competitive advantage of the firm (Eisenhardt and Martin, 2000; Eisenhardt and Santos, 2002; Pablo, et al., 2007).

2. The Paradigm: Market Fit as a Key to Firm Evolution

Applying the concept of evolutionary fit into firms implies that firm development is context dependent. A firm's evolutionary fit is a reflection of the degree to which the firm's dynamic capabilities empower it to adapt to the changing environment "by creating, extending, or modifying its resource base" (Helfat, et al., 2007:7). This is, in the sense, reflected in references to the process of reconfiguration and transformation of resources and competences, in which a firm's resources are redeveloped and redeployed, and its resource position is able to be re-positioned into a new state (Teece, 2007).

In such processes, technical fit in reflecting to a firm's resource position measured by quality and cost is suggested (Helfat, et al., 2007). Yet, technical concerns may not be always or best suited for an understanding for how a firm's market engagement and operations affect its actual market position in response to the market needs (Agarwal and Bayus, 2002). For example, substantive and tangible changes in offerings by a combination of new product and service release; and changes in distribution and market locations are served to much more reach customer needs in perceptual and positional markets. These market operations require a firm's commitment of continuous innovation in fitting in and pursuing their best suited environmental fitness (Srivastava and Christensen, 2001) – be it, the market fit this study tends to define.

Continuous innovation can be understood as a series of reconfiguration and transformation processes on the existing resource bases over time (Teece, et al, 1997), such as research and development (R&D) activities, changes in operations management, recruitment to reinforce the human resources, and even restructuring the organizational structure. A firm's market fitness would thus be perceived as the tactical outcomes of those transformation and reconfiguration activities. The variation of market fitness, further, can and should depend on the firm's innovative activities. If any increase of market fitness takes place in the context, the expectation of the odds of sensing and/or seizing innovation opportunities will be met (Teece, 2007). In thinking this, market fitness should be perceived as a part of evolutionary fitness of the firm.

For identifying the above notion empirically, a recent empirical model, proposed by Liao and Rice (2010), has been suggested. This model reveals a potential nexus between innovative activities and firm performance, where market fitness, based on market operations and engagement, is measured and tested as a mediating factor. This was done by tracing innovation and its intrinsic contributions to a firm's dynamics as the Schumpeterian rent creation approach has been widely recognized in dynamic capabilities and innovation related literatures (Liao and Rice, 2010). The logic implicitly contributes to an understanding of how a firm successfully commercializes its innovation, and simultaneously how its innovation secures and supports its market operations. That is, a firm's market engagement is able to be perceived as a set of strategic actions derived from the resource and capability renewals in order for the reposition of market fitness into a better landscape in the marketplace (Slate and Mohr, 2006).

3. Methods

The research was conducted on a method as a type of post-hoc analysis based on the previous investigation of Liao and Rice – the 'market transformation' model – on Australian manufacturing sectors (Liao and Rice, 2010). The data adopted in the research are drawn from the Business Longitudinal Survey (BLS) available from Australian Bureau of Statistics (ABS). The exploration focus of this study is set to be on the variation patterns, instead of the causal explanations, within the nexus among the innovation, market transformation and firm performance that might not be particularity specified a priori.

To investigate the persistence of competitive advantage according to a firm's market engagement and incorporating innovative activities, the selected sample (being screened from the BLS according to the criteria defined by Liao and Rice (2010)) was classified into four groups on the basis of changes in sales growth during the third and fourth years of the BLS. These four groups were defined as: (i) advantage sustainers that reported positive sales growth in both the third and fourth survey years; (ii) advantage creators that reported sales growth improving from negative to positive; (iii) advantage losers that had sales growth descending from positive to negative; and (iv) disadvantage sustainers that showed persistence of negative sales growth during the assessed years.

According to the "market transformation" model (Liao and Rice, 2010), this study developed a Multiple Indicator Multiple Cause (MIMIC) model undertaken with AMOS 7.0 (Jöreskog, and Goldberger, 1975). The test results relating to the differences of the latent means of innovation, market transformation and firm performance among the sample groups were presented in a form of the t test in linear regression. If there are any significant differences among the latent variables across the sample groups, some distinct behaviors or potential differences in relation to market transformational activities (and innovative activities) between these predetermined firm groups are therefore detected. It may be surmised that endogenous antecedent characteristics exist that will sustain or improve (or in absence deplete) a firm's competitive advantage (measured by the factor of firm performance), at least in a short term form within the survey years. In thinking so, this will be a seminal explanation for the natural composition of SCA of the firm – a given firm's SCA would thus be able to be thought as a series of short-term competitive advantages that, ideally, are continuously renovated by the presence of desirable processual capabilities related to innovation and market transformation.

4. Analysis and Results

Table 1. The results of comparative analysis through the MIMIC model

Group pairs		Mean difference (x – y)		
(x)	(y)	Innovation	Market transformation	Firm performance
G1	G2	-.124 ^{ns}	-.057 ^{ns}	-.006 ^{ns}
	G3	-.179 ⁺	-.189 ⁺	-1.407 ^{***}
	G4	-.005 ^{ns}	-.349 ^{**}	-1.139 ^{***}
G2	G1	.124 ^{ns}	.057 ^{ns}	.006 ^{ns}
	G3	-.055 ^{ns}	-.132 ⁺	-1.402 ^{***}
	G4	.120 ^{ns}	-.292 ^{**}	-1.133 ^{***}
G3	G1	.179 ⁺	.189 ⁺	1.407 ^{***}
	G2	.055 ^{ns}	.132 ⁺	1.402 ^{***}
	G4	.174 [*]	.160 ⁺	.268 ^{**}
G4	G1	.005 ^{ns}	.349 ^{**}	1.139 ^{***}
	G2	-.120 ^{ns}	.292 ^{**}	1.133 ^{***}
	G3	-.174 [*]	-.160 ⁺	-.268 ^{**}

Model diagnoses
 $\chi^2 = 91.97$, $df = 65$, $p = .02$, $GFI = .973$, $AGFI = .956$, $IFI = 0.976$, $CFI = 0.976$, $RMSEA = .030$

+ $p < 0.1$; * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$; (ns) $p > 0.1$

G1: disadvantage sustainers; G2: advantage losers; G3: advantage creators; G4: advantage sustainers.

Test results are summarized in Table 1. Model diagnoses show that the MIMIC model arranged for the comparison of latent means across the sample groups presents competent model fit ($\chi^2 = 91.97$, $df = 65$, $\chi^2/df = 1.41 < 2$, $GFI = 0.973 > 0.90$, $AGFI = 0.956 > 0.90$ and $RMSEA = 0.030 < 0.05$).

The results of the latent mean differences tests according to the sample groups across disadvantage sustainers (G1), advantage losers (G2), advantage creators (G3) and advantage sustainers (G4) show that most of the mean differences on the factors of firm performance and market transformation are significant, while the mean differences between G1 and G2 on these two factors appear to be equivalent. The test results

on the factor of innovation, on the contrary, show that only the mean differences between G1 and G3 (0.179, $p < 0.1$) and between G3 and G4 (0.174, $p < 0.05$) are significant.

It is unsurprising that G3 and G4 (the advantage groups) encompass superior performance than the firms that are allocated into G1 and G2 (the disadvantage groups) ($G3-G1=1.407$, $G3-G2=1.402$, $G4-G1=1.139$ and $G4-G2=1.133$). These results are presented to demonstrate the variation patterns of firm performance that follow the same trend with market transformation. However, it is worth to note that the variation patterns of firm performance are in effect reflective of the significant differences in market transformation across the sample groups ($G3-G1=0.189$, $G3-G2=0.132$, $G4-G1=0.349$ and $G4-G2=0.292$). In addition, in considering the market transformation plays a role in mediating the effects of innovation on firm performance, it would also be able to be partially proven by the significant differences between G3 and G1 (the mean differences on innovation = 0.179, market transformation = 0.189, performance = 1.407) and between G3 and G4 (the mean differences on innovation = 0.174, market transformation = 0.160, performance = 0.268).

From the results listed in Table 1, the research also notes some interesting and implied relationships between innovation and market transformation, as most of the mean differences of innovation across the sample groups appear to be insignificant (in addition to the sample group pairs of G1-G3 and G3-G4). This in fact identifies that the variation patterns of innovation investments between each of the group pairs may not present in a homologous pattern as they are observed in the factor of market transformation. Thus, this requires us to raise an analysis by contrasting the firm's innovation efficiency. In other words, we compare the efficiency of firms in transforming innovation investments into successful diffusion of innovations in the market. Likewise, various aspects, including in-house R&D for products (and services), production enhancement, training and market investigation, play an important part in assisting firms to transform resources and new technologies into commercial products (and services).

Focusing on the group pair of 'G3 vs. G2', their innovation investments are found to be statistically equivalent ($G3-G2=0.055^{ns}$), while G3 presents that its ability of market transformation is significantly better than G2 ($G3-G2=0.132$ with $p < 0.1$). It can thus be noted that G3's innovation efficiency is significantly superior than G2's in respect of their innovation investments in transforming their concrete market presence. Since the market transformation was proven to be a key driver of firm performance (according to the investigation of Liao and Rice [14]), the role of G3's ascendant innovation efficiency on market transformation allows it to be better than G2 in conducting innovation diffusion hence economic performance. Similar analyses can also be applied to the cases of 'G4 vs. G1' and 'G4 vs. G2' and reveal that G4 encompass far extraordinary innovation efficiency if comparing with G1 and G2.

5. Concluding the Remarks

This paper has assessed the variation patterns of competitive advantage by illustrating the sample behaviours in sustaining advantage, creating advantage, losing advantage and remaining disadvantage. The assessing focus has been built based on two central tenets. First, by investigating the persistence of competitive advantage over a short-to-medium term horizon, it would be noted that short-term persistence is a necessary precursor to SCA of the firm. Second, a firm must innovate and must effectively disseminate its innovations in order to achieve competitive advantage.

Applying the paradigm of market fitness into the research emphasizes that market transformation is potentially an immediate influential factor to firm competitive performance (Liao and Rice, 2010). Nevertheless, the fundamental role of innovation has not been discounted. Rather, the present analysis has revealed that innovation forms a necessary prerequisite for the improvement of competitive performance. This seems intuitively sensible, as this study has observed by measuring various resource commitments and capability systems in the context, that commitment to innovation is an antecedent to competitive advantage. In the view of advantage persistence, Firms creating physical products must continuously renovate both the products themselves and also their systems that develop these products to stay up with the leading group of competitive firms within their industrial milieu.

In addition, the present findings have also revealed that innovation efficiency – an outcome in relation to the manner in which a firm's innovations are disseminated within its product market – is a necessary

antecedent to (at least medium term as we have investigated) persistence of competitive advantage. The research notes that, in and of themselves, the commitment to innovation cannot be a driver of either short or medium term competitive advantage in the absence of those efforts that transform the market presence of the firm through the eyes of its customers. These findings are in fact supported by the recent work of the RBV theorists, and most notably those proponents of dynamic capabilities within this school of thought by Teece et al (1997), Eisenhardt and Martin (2000), Zott (2003) and Helfat et al (2007). Specially, in this study, the researcher has identified the proactive nature of firms engaging in dynamic capabilities intuitively appealing in the context.

As observing in line with the significant part of the statistics in the research, the presence or absence of these 'renovating capabilities', such as R&D, training, marketing and production system improvement, are of essential importance in explaining how certain firms emerged from the pack in terms of market transformation. This outcome is reflective of effective synergies achieved through the co-occurrence of effective product and process innovation and effective market transformation, and on the other hand, the absence of the latter processes (related to the decrease of market fitness) precludes the appropriation of benefits from the former process.

Blending the insights from market fitness with innovation, it can and should be perceived that the present findings are supportive of Schumpeterian views of disruptive innovation and industry emergence. Schumpeter's *unternehmergeist*, or entrepreneur-spirit, engaged in both technological innovation and also market engagement. It was the combination of resources in novel ways in order to meet market perceived and/or unmet needs that moved an economy forward (Schumpeter, 1974; 1982; Brouwer, 1991). In addition, this paper, by using empirical evidence, underlies emerging consensus efforts in organizational ambidexterity with contribution to the understanding for the interplay of exploratory activities (e.g. innovation activities with the firm and searching for innovation opportunities outside the firm) and exploitative activities (e.g. effective commercialization of innovations) by firms that is noted as a vital pre-determinant of economic performance (Tushman and O'Reilly, 1996; He and Wong, 2004; Sidhu, et al., 2007).

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