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경영학 석사학위논문

# **Post-Acquisition Innovativeness in High-Tech Industries:**

The Attention-Based Perspective

첨단기술산업에서  
인수합병 후 혁신에 대한 연구:  
주의 기반 관점을 중심으로

2015 년 8 월

서울대학교 대학원

경영학과 경영학 전공

정 성 훈

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## ABSTRACT

# Post-Acquisition Innovativeness in High-Tech Industries: The Attention-Based Perspective

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Despite the growing recognition of managerial attention as one of critical factors that drive firm behavior, its influence on the post-acquisition innovativeness has been neglected. In this study, we examine the effects of entrepreneurial focus, future focus, and change focus on post-acquisition innovativeness. Also, we investigate the moderating role of firm size disparity and that of strategic complementarity in order to find the optimal organizational and environmental fit that influences post-acquisition innovativeness and to complete the explanations of attention-based view (ABV). Drawing from the sample of 177 M&A deals in high-tech industry, we have found out that most of our hypotheses were supported. In addition, theoretical and empirical contributions for attention-based view were provided.

**Keywords:** Entrepreneurial Focus, Future Focus, Change Focus, Firm Size Disparity, Strategic Complementarity, Post-Acquisition Innovativeness

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# I. INTRODUCTION

Research on successful M&A and its conditions have been extensively studied in strategic management field. Strategic management scholars have increasingly been interested in the determinants of successful M&As. Generally, the greater performance after the acquisition has been regarded as the indicator of successful M&A (King, Slotegraaf, & Kesner, 2008). Other than the firm performance, in particular, synergies generated by two merging firms have been deemed as M&A success (Chatterjee, 1986; Harrison, Hitt, Hoskisson, & Ireland, 1991; Larsson & Finkelstein, 1999; Li & Greenwood, 2004). Especially in high-tech industry, post-acquisition innovativeness has become an important element to predict the collaboration between two merging firms (Ahuja & Katila, 2001; Puranam, Singh, & Zollo, 2006). Thus, subsequently, researchers have identified several factors that influence post-acquisition innovativeness to show how those factors are contributed to two merging firms' synergies (Fowler & Schmidt, 1989; Kusewitt, 1985). Among several factors, acquiring firm's characteristics, such as the level of strategic and market complementarity (Kim & Finkelstein, 2009; Ramaswamy, 1997), technological capabilities (Sears & Hoetker, 2014), prior acquisition experience (Haleblian & Finkelstein, 1999; Haleblian, Kim, & Rajagopalan, 2006), cultural difference (Björkman, Stahl, & Vaara, 2007; Stahl & Voigt, 2008), TMT characteristics (Cannella & Hambrick, 1993;

Krishnan, Miller, & Judge, 1997), and organizational environment (Ellis, Reus, Lamont, & Ranft, 2011), were indicated as major issues. In addition, the interaction effects of those characteristics have been investigated (Bauer & Matzler, 2014; Kapoor & Lim, 2007).

However, previous research have not fully addressed the effects of managerial attention on post-acquisition innovativeness. A few exceptions have examined managerial characteristics as an antecedent, but they have only focused on managerial perceptions (Krug & Hegarty, 2001; Zollo, 2009). Although some research have studied the effects of managerial attention, they were limited to qualitative methodologies, survey data, and case studies (Yu, Engleman, & Van de Ven, 2005). Nor have prior research addressed the interaction effects between managerial attention and organizational characteristics, even if the combination of the two could actually produce a greater synergies than one factor alone.

In this sense, this lack of studies could not fully explain the acquisition cases that were implemented through the misfit between two merging firms, rendering a large gap in the literature. A typical example of this case is the acquisition failure between AT&T and NCR in 1991 which could not fully explain the cause of failure with the existing resources. When AT&T took over NCR to expand a larger market in computer industry in 1991, those two companies' technologies, customer data bases and several resources were expected to generate enormous synergy effects after the integration (Das & Teng, 1999). However, AT&T suffered severe loss, 10 times greater than its



pre-acquisition loss; and finally, 5 years later, AT&T gave up NCR and sold it away (Rothaermel, Hitt, & Jobe, 2006). Experts and scholars in M&A have commented that the AT&T case was a complete failure and this was because AT&T had neglected cultural clash, strategic misfit, and managerial conflict between two merging firms (Gutknecht & Keys, 1993). They also noted that those problems became worse since the managers in two merging firms disregarded the problems. In this respect, King, Dalton, Daily, and Covin (2004) noted in their research that some missing and unidentified moderators of post-acquisition performance had been detected.

Therefore, the main purpose of this paper is to show how managerial attention affects the post-acquisition innovativeness in high-tech industry. Also, the aim of the present paper is to investigate the interaction effects between managerial attention and organizational characteristics. Thus, in this study, we explore a number of theoretical questions that link managerial attention and post-acquisition innovativeness. Specifically, the research questions of this paper are three folds: (1) What types of attentional orientation do have an impact on post-acquisition innovativeness?; (2) How does organizational characteristic (e.g., firm size disparity) interact with managerial attention in post-acquisition innovativeness?; and (3) How does environmental characteristic (e.g., strategic complementarity) interact with managerial attention in post-acquisition innovativeness? To answer these questions, we adopted Miles, Snow, Meyer, and Coleman (1978)'s typology and Ocasio (1997)'s attention-based view (ABV). This study may lead to a

better understanding of the effects of managerial attention, and its interactions with organizational and environmental characteristics in the context of post-acquisition integration in high-tech industry.

In sum, our study intends to contribute to previous literature in four important aspects. First, we have investigated several types of managerial attention that properly influence post-acquisition innovativeness. According to managerial and organizational cognition scholars, organizations are open systems that cognitively scan, interpret and analyze the environments surrounding the organizations (Daft & Weick, 1984; Miles et al., 1978; Scott & Davis, 2007; Walsh, 1995). Miles et al. (1978) proposed that organizations can be classified in terms of whether their strategies emphasize attention based on the four types - Prospectors, Defenders, Analyzers and Reactors. In this process, strategic level managers, namely, top management team (TMT) plays a crucial role to determine organizational cognitions (Cho & Hambrick, 2006; Thomas, Clark, & Gioia, 1993). More on to this managerial cognition perspective, Ocasio (1997) defined managerial attention, suggesting that how top managers assume and pay attention to the environments facilitates strategic change, and this change will eventually determine organization's survival. In other words, TMT's cognitions regulate organizational cognition as an interpretive system that generates organizational behavior and how organizations interpret the environment will decide how organizations behave (Hambrick & Mason, 1984; Kaplan, 2008; Kiesler & Sproull, 1982). Therefore, the application of managerial attention into organizational-level

outcome, namely, post-acquisition innovativeness may provide support for the prior research that have emphasized managerial cognitions are initial steps to produce strategic change and organizational action.

Second, we have studied the moderating effects of firm size disparity and those of strategic complementarity in the relationship between managerial attention and post-acquisition innovativeness by setting organizational and environmental boundary conditions. By doing so, we have verified whether the effects of each managerial attention could be maximized or minimized depending upon those conditions. In this sense, we have endeavored to find out the ideal fits between managerial attention and organizational surroundings. This may lead to a better understanding of Ocasio (1997)'s attention-based view (ABV). Ocasio (1997) emphasized that decision maker's attention is affected by attention structures and environment of decision. Firm size disparity between two merging firms and strategic complementarity provide the best opportunities to demonstrate how managerial attention interacts with organization and environment in order to generate organizational move, that is, post-acquisition innovativeness. Especially, firm size disparity can represent attention structures, because it explains target firm's tacit knowledge that provides acquiring firm for a chance to generate innovative outcome (Cording, Christmann, & King, 2008; Ranft & Lord, 2002). On the other hand, strategic complementarity can represent environment of decision, because two merging firms' similar or complementary strategies provide managers for a chance to recombine the

resources or transfer the knowledge (Finkelstein & Halebian, 2002; Stieglitz & Heine, 2007).

Third, we have investigated several types of managerial attentions by setting dictionaries from annual reports, have solved measurement problem by content analysis in annual reports, and finally have looked into the relationship between attentional orientation and post-acquisition innovativeness. This methodological contribution could serve as the basis for a study of content analysis that measures manager's attentional orientation (Duriau, Reger, & Pfarrer, 2007; Pennebaker, Mehl, & Niederhoffer, 2003). It can also provide a novel approach to examine managerial attention and an opportunity to generalize the relationship between managerial attention and post-acquisition innovativeness (Fiol, 1989; Newman, Pennebaker, Berry, & Richards, 2003).

Last, the research setting of post-acquisition integration process in high-tech industry has provided the ideal context to search for managerial attention, its interaction effects with organizational and environmental and conditions. High-tech industry allows us to study the effects of managerial attention on post-acquisition innovativeness since it is a high managerial discretion industry and innovativeness could be produced by managerial decisions (Finkelstein & Hambrick, 1990; Makri, Hitt, & Lane, 2010). It also has various organizational and environmental characteristics to help conduct the moderating effects of firm size disparity and those of strategic complementarity (Bauer & Matzler, 2014; Ellis et al., 2011).

## II. LITERATURE REVIEW

In previous literature, there have been several investigations into the factors that foster collaboration and synergies in context of post-acquisition process. The factors of post-acquisition integration have been widely investigated in three main streams. The first stream has studied industry characteristics generally based on economic perspective. Market complementarity, technological capabilities, science capabilities, and industry difference appear to have a complex set of causes for synergies in M&A (Finkelstein & Haleblian, 2002; Kim & Finkelstein, 2009; Lien & Klein, 2008; Makri et al., 2010; Wang & Zajac, 2007). The second stream has focused on organizational characteristics mostly concentrating on resource-based perspective. Strategic complementarity, prior acquisition experience, R&D intensity, and cultural difference have become a major issue in this perspective (Baysinger & Hoskisson, 1989; Björkman et al., 2007; Haleblian et al., 2006; Ramaswamy, 1997; Stahl & Voigt, 2008). The third stream has highlighted the importance of managerial characteristics mainly focusing on behavioral perspective. Top management team (TMT)'s functional backgrounds, integration decision making, retention, and demographic variables have been discussed (Cannella & Hambrick, 1993; Haleblian & Finkelstein, 1999; Krishnan et al., 1997; Krug & Hegarty, 1997).

Especially in the context of post-acquisition integration phase, top

management team plays a great role and it is essential to highlight the importance of managerial characteristics. In other words, the uncertainty in post-acquisition integration phase should be managed properly by top management team since post-acquisition innovativeness depends on whether the chaotic problems could be efficiently solved or not. Post-acquisition integration phase generates a great uncertainty, conflict and hostile atmosphere between two merging firms, and the direct outcome of resource combinations between two merging firms might be reduced due to those chaotic situations (Haspeslagh & Jemison, 1991). In this post-acquisition integration phase, two merging firms need structural and organizational integration process in order to generate a successful M&A outcome (Puranam et al., 2006). But post-acquisition success won't be guaranteed if strategic and cultural fits between two merging firms are not properly aligned by top managers (Bauer & Matzler, 2014).

Also, two merging firms should deal with human resources, such as the speed of integration, TMT retention, and employees' resistance (Larsson & Finkelstein, 1999) and this can also be properly managed when top managers in acquiring firm play a great role after the acquisition. Prior research have showed that post-acquisition integration process increases a possibility of dismissing TMT in target firm, which reduces the autonomy of target firm (Buchholtz, Ribbens, & Houle, 2003; Krug & Hegarty, 2001; Walsh, 1988, 1989; Walsh & Ellwood, 1991). And the negative effects of TMT turnover and those of employees' resistance on post-acquisition performance have been

already studied in previous research (Cannella & Hambrick, 1993; Krishnan et al., 1997). But again, post-acquisition success won't be guaranteed if the speed of integration, TMT retention, and employees' resistance are not properly managed by top managers (Bauer & Matzler, 2014).

More specifically, managerial cognition can play an important role during the integration process. There are several reasons and evidence that support this argument. First, managerial cognition which explains both strategic and cultural aspects of two merging firms can properly solve the coordination and autonomy dilemma, leading post-acquisition success (Ocasio, 1997, 2011; Puranam et al., 2006). Second, managerial cognition between two merging firms which is optimally aligned will improve the speed of integration by enhancing communication efficiency, strategic alignment, and ultimately post-acquisition success (Bauer & Matzler, 2014). Third, managerial cognition between two merging firm would increase TMT retention so that target firm will be able to maintain its morale and motivation (Hayes, 1979). In other words, if managerial cognition between two merging firms is properly aligned, it will decrease the rate of TMT turnover. In the end, TMT retention will provide the autonomy that protects a knowledge from target firm, thus, reduce inventors leaving their jobs and employees resisting to change (Ranft & Lord, 2002).

Therefore, in this uncertain situations, the role of top managers in acquiring firm is essential and it can generate a positive effect on post-acquisition integration phase. Then the integration process after merger

will ultimately lead the firm to post-acquisition innovativeness (Larsson & Finkelstein, 1999). In other words, the better the integration process, the better the post-acquisition innovativeness (Bauer & Matzler, 2014). In addition managerial cognition can directly affect and post-acquisition innovativeness as well. The direct outcome of resource combinations, namely, post-acquisition innovativeness can be achieved by a dynamic process of managing two different resources and top management team's directions (Grant, 1996; Teece, Pisano, & Shuen, 1997). As such, the role of top managers, specifically, the role of managerial cognition, is essential in managing this process of recombination and commercialization of the resources and capabilities (Clark, Smith, & Oliver, 2003; Li, Maggitti, Smith, Tesluk, & Katila, 2013), ultimately leading to post-acquisition innovativeness.



### **III. THEORY**

Previous literatures on managerial cognition and its effects on post-acquisition integration have been emphasized already. Mainly three streams of managerial cognition research regarding post-acquisition integration have been discussed. One is a social construction perspective. Managers use a socially constructed process (e.g. sensegiving and sensemaking) that reconciles social-political conflicts and creates synergies between two merging firms (Vaara, 2003). The more managers frame the integration issues with rhetoric communication and discourse, the better employees are able to identify the importance of integration (Vaara, 2002). And once the cultural difference between two merging firms are reconstructed with managers' enactment, the rebuilt culture can continuously generate its own identity as one integrated organization (Monin, Noorderhaven, Vaara, & Kroon, 2012; Risberg, 2001; Vaara, 2000). Generally, qualitative studies such as experiment and field study were conducted to examine this social construction perspective.

The second stream of the research concentrated on managerial perception perspective. This study has emphasized that manager's perception determines manager's decision making such as top management team's leaves, organizational learning, and ultimately success of integration (Krug & Hegarty, 2001; Zollo, 2009). The first two perspectives are based on

individual manager's cognition. In this perspective, managers are assumed to be "information workers". That is, "they spend their time absorbing, processing, and disseminating information about issues, opportunities, and problems" (Walsh, 1995). But the perspective that we will discuss in this paper is not a little bit different. It includes not just individual manager's cognition per se, but also social cognition of managers and organizational cognition that managers are affected, that is managerial attention. According to Ocasio (1997)'s attention-based view, attention is defined as follows:

*"Attention is to encompass the noticing, encoding, interpreting, and focusing of time and effort by organizational decision-makers on both (a) issues; the available repertoire of categories for making sense of the environment: problems, opportunities, and threats; and (b) answers: the available repertoire of action alternatives: proposals, routines, projects, programs, and procedures ..... The most critical players in attention regulation are typically the CEO and the top management group and that the attentional focus is shaped by the structured interests and identities of decision-makers."*

Thus, the third stream of the managerial cognition research and the fundamental theory that we will discuss in this paper consists of an attention-based perspective. This perspective emphasizes the structural view of managerial cognition and managerial perception, which considers attention

itself as a strategic and organizational actions. Attention-based view of the firm argues that decision maker's attention is reflected by their previous experience, political interaction of board members, and structural components from both internal and external environment sources (Ocasio, 1997). Yu et al. (2005) already provided the evidence of effects of managerial attention on post-acquisition integration with an eight-year real time study of the integration process.

Despite the importance of managerial attention and its effects on post-acquisition innovativeness, previous research has not addressed how the dynamics of managerial attention affect the integration process. As Ocasio (1997) proposed, “Organizational moves are the output of attentional processing and decision-making which is situated in procedural and communication channels.” Since post-acquisition innovativeness is also the output between two merging firms, we assume that the success of integration or post-acquisition innovativeness will be contingent upon managers’ attentional focus. Moreover, research has not fully considered the interactions between managerial attention and organizational characteristics. Although some research have studied the effects of managerial attention (Yu et al., 2005), they were limited to qualitative methodologies, survey data, or case studies. Due to those limitations in previous literatures, the generalization of relationship between managerial attention and its interactions with organizational and industry characteristics were always asked for.

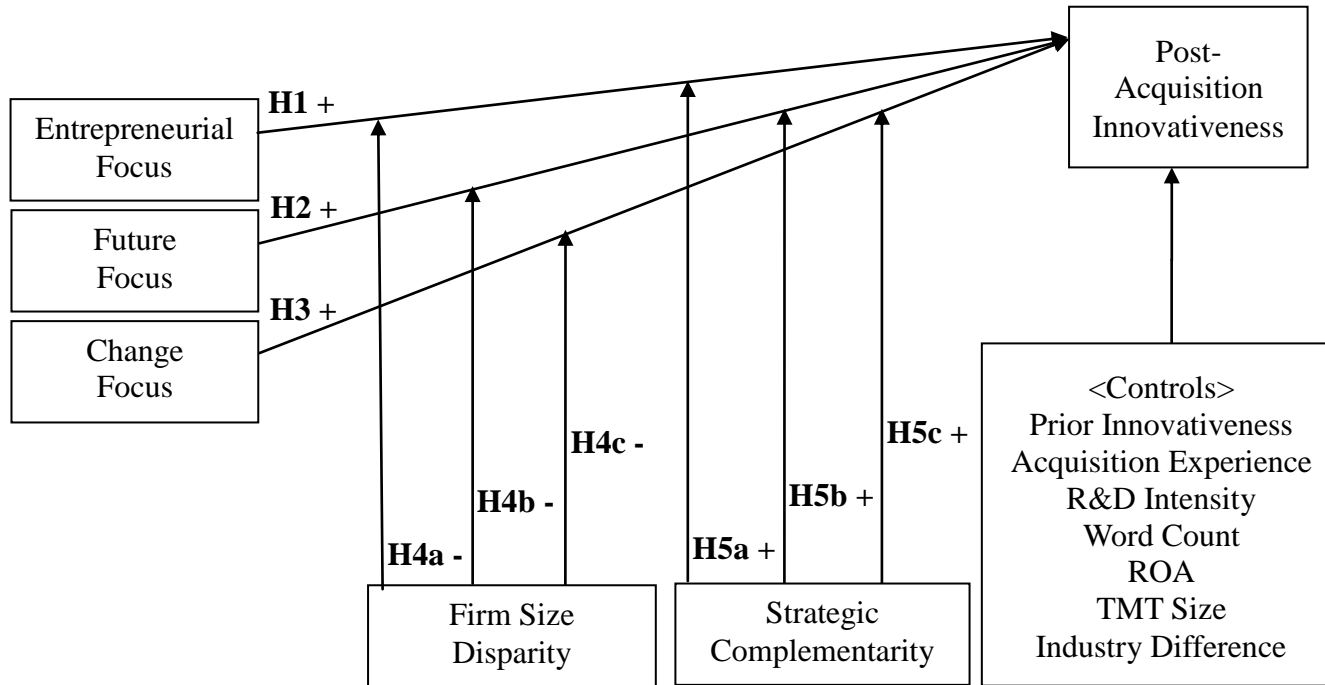
Therefore, the aim of this paper is to look into the effects of several

types of managerial attention and its interactions effects with firm size disparity and strategic complementarity. Our study is closely related with this attention-based view rather than social constructive perspective nor managerial perception per se. It provides a distinctive approach to examine managerial attention. Our approach focuses more on content analysis of annual report, thus, it will give us an opportunity to implement quantitative study and generalize the relationship between managerial cognition and post-acquisition innovativeness compared with qualitative study. Also, our study investigates post-acquisition innovativeness as dependent variable in the context of post-acquisition integration in order to find out several types of managerial attention that optimally influence the resource combinations between two merging firms. This is possible since we assume managerial attention is not only top manager's thinking but also structural level thinking that could generate organizational action. This also provides us with an opportunity to look into the interaction between managerial attention and other organizational level constructs (e.g. firm size disparity and strategic complementarity) which will be discussed in the following sections.

In this sense, the hypotheses that we are going to prove in this paper are presented in Figure 1. Firstly, we will study the effects of several types of managerial attention including entrepreneurial focus, future focus, and change focus. Next, we will investigate the interaction effects of firm size disparity and those of strategic complementarity in order to look into which types of managerial attention properly fit organizational and environmental conditions

in terms of generating post-acquisition innovativeness. Our research setting is based on a high-tech industry where M&As require a knowledge recombination between two merging firms. In addition, high-tech industry provides managers with a high managerial discretion which clearly explains the effects of managerial attention and directly determines the knowledge recombination, post-acquisition innovativeness.

**FIGURE 1. THEORETICAL FRAMEWORK**



## IV. HYPOTHESES

In the following sections, we develop hypotheses on three types of managerial attention that may affect post-acquisition innovativeness: entrepreneurial focus, future focus, and change focus. By doing so, we gain a better understanding of Miles et al. (1978)'s typology as well as Ocasio (1997)'s attention-based view. Miles et al. (1978) denoted that "firms develop their strategy based on their attention of the environment" and named four types of organizational types - Prospector, Defender, Analyzer, and Reactor - which could be represented by top manager's attention here in this article. Among those four types of organizational types, generally scholars argue that firms differ in their strategic orientation in terms of two types, Prospectors and Defenders to show whether organizations have proactive behavior or not (Cho & Hambrick, 2006). We also assume that these two types can be good indicator whether two merging firms can seek innovative outcome after the integration.

Thus, in our paper, entrepreneurial focus, future focus, and change focus can be categorized into Prospector type whereas engineering focus, past focus, and commitment to the status quo can be categorized into Defender type. This is because Prospector can be described as "frequently the creators of change in their respective industries by finding and exploiting new products and market opportunities" while Defender can be illustrated as

"frequently the creator of a narrow, stable domain through a limited mix of products and customers, and aggressive efforts to 'protect' the domain from competitors" (Lumpkin & Dess, 1996; Miles et al., 1978; Thomas, Litschert, & Ramaswamy, 1991). Furthermore, how top manager's attention represents organizational perception goes back to Ocasio (1997)'s attention-based view again. Each characteristic of focus and whether it matches with either Prospector or Defender will be discussed in the following section.

#### **4.1. Entrepreneurial Focus of the Acquiring Firm**

We believe that entrepreneurial orientation at the top executive team-level in acquiring firm is more likely to generate innovative outcomes after the acquisition. Lumpkin and Dess (1996) defined entrepreneurial focus as "the processes, practices, and decision-making activities that lead to new entry", indicating that entrepreneurial focus include five factors - autonomy, innovativeness, risk taking, proactiveness, and competitive aggressiveness - that may facilitate organization to engage in a new entry. Those five dimensions of entrepreneurial focus would lead acquiring firm to actively utilize a new knowledge from target by giving the target its discretion to generate innovative outcome (Barreto, 2012; Dess, Pinkham, & Yang, 2011). Moreover, even though the target is not likely to foster its energy to generate innovativeness, the acquirer itself would proactively take a risk to grasp the fruit of innovativeness with competitive aggressiveness (Navis & Glynn, 2011;



Slevin & Terjesen, 2011). Thus, entrepreneurial orientation in managers' attention would foster a more proactive pursuit of entrepreneurial activities, with bold and significant combination of resources and capabilities in the integration process.

In contrast, engineering-orientation in managerial attention would lead to the prioritization of efficiency-related issues over entrepreneurial ones. Engineering focus can be defined as managerial attention that focuses on the engineering problem which is "the challenge of efficiently and effectively generating the product and getting it to the customer" (Cho & Hambrick, 2006; Miles et al., 1978). This engineering focus compared to entrepreneurial focus would not sense the diverse knowledge nor notice various information after the integration (Boling, 2012), eventually leading top manager's in the acquiring firm not to grasp the fruit of innovativeness from the target (Cao, Simsek, & Jansen, 2012). Thus, a high engineering focus of managers, in other words, a low level of entrepreneurial focus, will reduce the motivation to search for a new market by merely concentrating on the existing market. Drawing from this literature, we predict that managers' entrepreneurial focus is positively related to the post-acquisition innovation and offer the following hypothesis. Therefore, we propose the following theoretical expectation:

*Hypothesis 1: The level of entrepreneurial focus in the acquiring firm is positively related to the post-acquisition innovativeness.*

## **4.2. Future Focus of the Acquiring Firm**

We argue that an acquiring firm whose top managers have a higher future focus is more likely to generate post-acquisition innovativeness. Future focus is defined as "the amount of attention devoted to events that are yet to occur" and manager's future focus directs strategic change and action (Chandy, Prabhu, & Antia, 2003). Managers with future focus have greater ability to anticipate environmental changes and to prepare for them (Yadav, Prabhu, & Chandy, 2007). They concentrate on the deployment of new technology and on the development of new product instead of being overly concerned with the past or present focus (Brown & Eisenhardt, 1997; Chandy & Tellis, 1998; Nadkarni & Chen, 2014). Their ability to perceive a new product will ultimately determine organization's success to launch innovation after the integration (Krug & Hegarty, 2001; Yu et al., 2005; Zollo, 2009).

On the other hand, if acquiring firms do not have future focus, instead they have past focus, past focus will be detrimental for managers in acquiring firm to perceive the product that leads to organization's innovativeness after the integration. Past focus is defined as "the reflection on the past and repeated use of past memories in decision making" (Clark & Collins, 1993; Strack, Schwarz, & Gschneidinger, 1985). This may increase the organizational ability to facilitate its past learning and experience to innovative outcome by retrieving the past memory (Shipp, Edwards, &

Lambert, 2009). However, this will also cause the firm to concentrate only on redundant strategy without thinking out of the box (Bluedorn, 2002). Thus, Nadkarni and Chen (2014) suggested that the effects of past focus on new product initiate are positive only in stable environments but not in turbulent environment, denoting that the effects of past focus on new product initiate are dependent upon environmental dynamics. Drawing from this literature, we surmise that managers who focus on the future are more likely to recognize and value the potential synergy created by the complementary assets. Therefore, we propose the following theoretical expectation:

*Hypothesis 2: The level of future focus in the acquiring firm is positively related to the post-acquisition innovativeness.*

### **4.3. Change Focus of the Acquiring Firm**

We believe that managers' change focus in acquiring firm has a positive impact on post-acquisition innovativeness. Managers with change focus are more open to a new information outside the organization (Gioia & Chittipeddi, 1991; Reger, Gustafson, Demarie, & Mullane, 1994), and this will lead acquiring firm to detect and grasp a new knowledge in the target firm to produce innovative outcome (DiGeorgio, 2002; Dutton & Duncan, 1987; Dutton & Jackson, 1987). It is important for top managers to create

atmosphere that emphasizes openness within organization in order to generate innovative outcomes, and to formulate organizational culture that concentrates on receiving a new information from outside the organization (Livengood & Reger, 2010). In this logic, change focus would facilitate the acquiring firm to possess that atmosphere to grasp the new knowledge from the target (Thomson & McNamara, 2001).

On the other hand, if acquiring firms do not have change focus, instead they have commitment to the status quo (CSQ), CSQ will hinder managers in acquiring firm from adopting a new strategy or a creative idea so that it will eventually lead firm to the poor subsequent performance, especially in high-discretion industries (McClelland, Liang, & Barker, 2010). Hambrick, Geletkanycz, and Fredrickson (1993) defined CSQ as "the strength of an executive's belief in the enduring correctness of current organizational strategies and profiles," indicating that CSQ is based not on any change of the existing routines, but on the persistence of the previous system. Therefore, a high CSQ of managers, in other words, a low level of change focus, reflects their adherence to the prior strategic process without receiving any knowledge from target firm during the post-acquisition integration phase (Livengood & Reger, 2010; Nag, Corley, & Gioia, 2007). Drawing from this literature, we surmise that managers' change propensity is positively related to post-acquisition innovativeness. Therefore, we propose the following theoretical expectation:

*Hypothesis 3: The level of change focus in the acquiring firm is positively related to the post-acquisition innovativeness.*

In the following sections, we develop hypotheses on two organizational level attributes that may moderate the linkage between attentional orientation and post-acquisition innovativeness: *disparity in firm size* and *strategic complementarity*. By doing so, we gain a better understanding of Ocasio (1997)'s attention-based view as well. Ocasio (1997) posited that decision maker's attention is affected by attention structures and environment of decision. Relative firm size between two merging firms and strategic complementarity provide an ideal platform to test the notion of structured interest and its dynamic interplay with post-acquisition innovativeness.

Firm size disparity between an acquirer and its target embodies attention structure as it has implications for the feasibility and process of the knowledge transfer between the two (Fowler & Schmidt, 1989; Kusewitt, 1985; Ranft & Lord, 2002). Specifically, a large firm size disparity provides the acquirer with a great opportunity to exploit the target but at the same time it will lead target firm to lose the tacit knowledge (Puranam et al., 2006). On the other hand, a small firm size disparity can help target firm to maintain tacit knowledge that gives acquirer a chance to generate innovative outcome

strategically, but at the same time it will also hinder the acquirer exploiting the knowledge (Ranft & Lord, 2002). In this sense, studying the interaction effects of firm size disparity is essential.

Similarly, strategic complementarity influences the degree to which the resources of two merging firms can be utilized and recombined in synergistic ways (Finkelstein & Halebian, 2002; Stieglitz & Heine, 2007; Wang & Zajac, 2007). More specifically, strategic complementarity between two merging firms determines whether managerial attention can maximize two firms' strategic and cultural compatibility. For example, a high strategic complementarity can provide two merging firms with resource complementarity that generates synergies and finally produces a high post-acquisition performance (Stieglitz & Heine, 2007). On the other hand, a low strategic complementarity can provide two merging firms with cultural similarity that increases the speed of integration (Bauer & Matzler, 2014). Since managerial attention has both strategic and cultural aspects, investigating its interaction effects with strategic complementarity is critical.

#### **4.4. Moderating Role of Firm Size Disparity**

We believe that the main relationship between attentional orientation (entrepreneurial, future, and change focus) and post-acquisition innovativeness would be weakened by firm size disparity. First of all, if the acquirer is much larger than the target, managers with attentional orientation

(entrepreneurial, future, and change focus) will not be able to take a proactive stance to recombine the knowledge from the target since there are myriads of internal issues that managers have to deal with (Sciascia, Mazzola, & Chirico, 2013; Wales, Patel, & Lumpkin, 2013; Zollo & Singh, 2004). Also, they will not be able to explore target's knowledge more sufficiently by changing the systems or structures within target firm (Kapoor & Lim, 2007; Puranam et al., 2006). This is due to a heavy routine within the internal organization that requires managers to spend more time and efforts (Hannan & Freeman, 1984; Miller & Chen, 1994). Especially, a large acquiring firm will have a routinized structure, organizational experience, and organizational memory (Haleblian & Finkelstein, 1999; Walsh & Ungson, 1991). These formalized systems may be beneficial for acquirer to retrieve the memory to make their present decision making and to enhance acquirer's capability (Cyert & March, 1992; Huber, 1991); however, since strategic decision making is on the acquirer's hand with attentional orientation (entrepreneurial, future, and change focus) after M&A, these system will become an inertia that hinders acquirer's decision making and that resists to the change of acquirer. In other words, a large acquirer with complex routines is characterized with organizational inertia (Hannan & Freeman, 1984), and it will be detrimental for acquiring firm with attentional orientation (entrepreneurial, future, and change focus) to engage in activities that utilize newly formed synergy. In this situation, not the attentional orientation (entrepreneurial, future, and change focus) that seeks external issue but the attentional orientation that deals with internal issue (e.g.

engineering orientation that pay attention to efficiency-enhancing practices) is much more essential to exploit internal resources and capabilities in the acquiring firm (Cho & Hambrick, 2006).

On the other hand, if the acquiring firm is smaller than the target firm, that is, if the target is larger than the acquirer, the acquiring firm can be provided with more sources of knowledge from the target firm and there is a high chance for the acquirer to explore a new knowledge from the target (Cording et al., 2008; Zollo & Singh, 2004). Also, target firms maintain tacit knowledge and social complex information (Asquith, Bruner, & Mullins Jr, 1983; Ranft & Lord, 2002), thus, in acquiring firm's perspective, it would be easier for acquirer to explore all the knowledge from the target and there is a high chance to receive socially complex and tacit information from the target (DiGeorgio, 2002). In other words, the target will maintain organizational knowledge that facilitates managers in acquiring firm to change and make use of the target's knowledge (Haveman, 1993). In this situation, it is beneficial for the acquiring firms to have entrepreneurial orientations that emphasize a new market and search for a novel product in order to generate innovative outcome (Cao et al., 2012). Moreover, since managers in acquiring firm have future focus that focuses on the deployment of new technology and the development of new product in advance, future focus will interact with larger target firm to generate innovative outcome (Yadav et al., 2007). Lastly, managers in acquiring firm that have a change focus to transform the target's routine into the acquirer's routine would take a more proactive stance in such



leveraging of target's knowledge (Baker & Cullen, 1993). Therefore, we argue that firms size disparity would moderate the relationship between attentional orientation (entrepreneurial, future, and change focus) and post-acquisition innovativeness. In other words, the larger the acquirer, the less impact its attentional orientation (entrepreneurial, future, and change focus) would have on post-acquisition innovativeness. Therefore, we propose the following theoretical expectation regarding firm size disparity between an acquirer and target as a moderator:

*Hypothesis 4a: Firm size disparity between an acquirer and target will weaken the relationship between the acquirer's entrepreneurial focus and post-acquisition innovativeness.*

*Hypothesis 4b: Firm size disparity between an acquirer and target will weaken the relationship between the acquirer's future focus and post-acquisition innovativeness.*

*Hypothesis 4c: Firm size disparity between an acquirer and target will weaken the relationship between the acquirer's change focus in acquiring firm and post-acquisition innovativeness.*

## **4.5. Moderating Role of Strategic Complementarity**

We believe that the main relationship between attentional orientation (entrepreneurial, future, and change focus) and post-acquisition innovativeness would be strengthened by strategic complementarity. If strategic complementarity is high, it would enhance the relationship between attentional orientation (entrepreneurial, future, and change focus) and post-acquisition innovativeness. Strategic complementarity will provide firms with complementarity resources in post-acquisition integration phase (Bauer & Matzler, 2014). Given the strategic complementarity is generated by several factors, such as resources like science and technology; market and industry; and top management team's background and composition, strategic complementarity would provide two merging firms with diverse opportunities to generate synergies in multi-dimensions (Krishnan et al., 1997). This is due to a new strategic direction and internal motivation as well as incentive to generate innovative outcome after the acquisition (Stieglitz & Heine, 2007). Especially, complementary and inter-dependent resources facilitate two merging firms to inter-connected together strongly so that the acquiring firms can minimize the conflict and costs after the integration (Baumol & Braunstein, 1977). In this light, managers with attentional orientation (entrepreneurial, future, and change focus) would be more likely to take a proactive stance in such leveraging of complementary assets (Cao et al., 2012).

Namely, these managers with attentional orientation (entrepreneurial, future, and change focus) would tend to engage in active utilization of complementary assets in order to create novel use of existing core assets (Barreto, 2012). More specifically, managers with entrepreneurial focus would proactively search for strategic complementarity with target in order to generate innovative outcome. Also, managers with future focus will be more likely to concentrate on the deployment of new complementary resources than those with past focus since they are ready to anticipate a new market in advance in the uncertain integration process. Lastly, managers with change focus would be more likely to detect and grasp a new knowledge in the target firm's complementary assets to produce innovative outcome than those with commitment to the status quo since they pay attention to the openness to change (Lee, Venkatraman, Tanriverdi, & Iyer, 2010; Stieglitz & Heine, 2007; Thomson & McNamara, 2001).

On the other hand, if strategic complementarity between two merging firms is low, it would weaken the relationship between attentional orientation (entrepreneurial, future, and change focus) and post-acquisition innovativeness, because strategic similarity compared to strategic complementarity gives less opportunity for firms to be exposed to novel resources and few chance for managers to maximize their attentional orientation (entrepreneurial, future, and change focus) to leverage the assets (Grimpe & Hussinger, 2013; Harrison, Hitt, Hoskisson, & Ireland, 2001; Wu, Wan, & Levinthal, 2013). Strategic similarity will provide the acquirer with

two aspects of environment. One is cultural compatibility and the other is resource similarity (Bauer & Matzler, 2014). First of all, when it comes to cultural compatibility, it may smoothen the efficiency and communication between acquiring firm and target firm so that acquiring firm can easily take over the target firm (Stahl & Voigt, 2008). Then managers with attentional orientation (entrepreneurial, future, and change focus) will not be hindered by obstacles and change organizational routine in fast manner compared to managers who don't have the attentional orientation (entrepreneurial, future, and change focus) (Wu et al., 2013). In other words, the acquiring firm will have more chance to adapt to itself in fast changing environment after M&A by producing innovative outcome. Thus, it would be still true that the acquiring firm will produce innovative outcome during post-acquisition integration even in case of a low strategic complementarity (Thomson & McNamara, 2001). However, this won't guarantee the acquiring firm to maximize the innovative outcome since there is few complementary resource to leverage and this can be explained by second aspect of strategic similarity, which is resource similarity. When it comes to resource similarity in same business environments, managers with attentional orientation (entrepreneurial, future, and change focus) will not be able to take a proactive stance to adjust their organizations by changing firm's strategy or structure (Lee et al., 2010). In this respect, in case of post-acquisition integration phase where there are redundant resources, managers will not able to promote active experiment in new asset combinations, and utilize complementary assets in order to generate

innovative outcomes (Thomson & McNamara, 2001). Therefore, we propose the following theoretical expectation regarding strategic complementarity between an acquirer and target as a moderator:

*Hypothesis 5a: Strategic complementarity between an acquirer and target will strengthen the relationship between the acquirer's entrepreneurial focus and post-acquisition innovativeness.*

*Hypothesis 5b: Strategic complementarity between an acquirer and target will strengthen the relationship between the acquirer's future focus and post-acquisition innovativeness.*

*Hypothesis 5c: Strategic complementarity between an acquirer and target will strengthen the relationship between the acquirer's change focus in acquiring firm and post-acquisition innovativeness.*

## V. METHODS

### 5.1. Sample

We took a number of steps to construct our sample. First, we chose six high-tech industries with high level of managerial discretion (Finkelstein & Hambrick, 1990): pharmaceutical preparations, biological products, computer, semiconductor, telecommunication, and prepackaged software. Second, we collected data on all M&A transactions that occurred between 2001 and 2002 using SDC Platinum, a database from Thompson Financial. We selected a completed deals by including not only merger cases but also acquisition cases. Third, we collected annual reports (10-k filings) from the SEC (Securities and Exchange Commission) EDGAR website and measured several managerial attentional variables through a content analysis called QDA Miner. Based on Sapir-Whorf hypothesis, we assume the language that managers speak affects the way they think and this thinking would ultimately lead to strategic actions (Sapir, 1944; Whorf, 1940). Financial information for both acquirers and targets was drawn from Standard & Poor's COMPUSTAT, and patent data was drawn from United States Patent and Trademark Office (USPTO). Due to data availability, our final sample consisted of 177 M&A transactions.

## **5.2. Measurements**

### **5.2.1. Dependent Variable**

Our dependent variable, *post-acquisition innovativeness*, was operationalized by the number of patents that an acquirer files from the first to the fourth year after the acquisition, in view of prior literature (Ahuja & Katila, 2001). Post-acquisition innovativeness can be divided into two stages. One is an immediate innovation right after M&A occurred and the other is a subsequent innovation after an integration process was proceeded (Hargadon & Sutton, 1997; Puranam et al., 2006). The former is closely related to the inventions from resource recombination in two merging firms and the latter is closely related to the commercialization of those inventions (Makri et al., 2010; Paruchuri, Nerkar, & Hambrick, 2006). Thus, Makri et al. (2010) denoted that post-acquisition innovativeness is defined as either an invention or a commercialization in two merging firms and emphasized that the former functions as an input of innovation whereas the latter works as the final outcome of innovation. Especially the first stage is critical since they are the direct outcome of knowledge recombination between two merging firms in post-acquisition integration phase.

### **5.2.2. Explanatory Variables**

For independent variables, we conducted a content analysis as a way to capture managerial attention. *Entrepreneurial focus*, *future focus*, and

*change focus* were calculated using QDA miner. Dictionaries for *entrepreneurial focus* and *future focus* were drawn from Cho and Hambrick (2006) and Yadav et al. (2007), respectively. *Change focus* was measured by the inverse function of measurement in commitment to the status quo (CSQ) (McClelland et al., 2010). *Firm size disparity* between an acquirer and a target, a moderating variable, was operationalized as a ratio, dividing the employees of an acquiring firm by those of a target (Kapoor & Lim, 2007). Following Wang and Zajac (2007), *strategic complementarity* was operationalized by calculating the difference between two firms in terms of primary North American Industry Classification System (NAICS).

### **5.2.3. Control Variables**

Lastly, we included a number of control variables in order to rule out alternative explanations: *prior innovativeness*, *acquisition experience*, *R&D intensity*, *word count of annual reports*, *return on assets (ROA)*, *TMT size*, and *industry difference*. *Prior innovativeness* from each acquirer and target was operationalized by the number of patent that the firm filed in three years prior to the acquisition and we collected the data from USPTO website (Ahuja & Katila, 2001). *Acquisition experience* from two merging firms was measured by the number of acquisition experience for the last 10 years and it was collected from SDC Platinum (Haleblian & Finkelstein, 1999). We also calculated *R&D intensity* of each acquirer and target by R&D expenditure divided by revenue using COMPUSTAT (Baysinger & Hoskisson, 1989), and



controlled *word count of annual reports* from each acquirer and target using SEC DEF-14A proxy statement since it could rule out other types of attentions from two merging firms (Short & Palmer, 2008). Furthermore, *return on assets (ROA)* was calculated by net income divided by total assets from COMPUSTAT (Ramaswamy, 1997), *TMT size* was counted by the number of members in target's top management team from SEC DEF-14A proxy statement (Krishnan et al., 1997), and *industry difference* was measured by the differences in primary Standard Industrial Classification (SIC) codes from COMPUSTAT (Lien & Klein, 2008). We included those variables as controls based on the previous literatures because we assumed that those variables could greatly affect post-acquisition innovativeness and we wanted to rule out those effects in order to clearly verify the effects of explanatory variables (Haleblian & Finkelstein, 1999). Specific explanations regarding the measurements were shown in Table 1.

### **5.3. Analysis**

We conducted a negative binomial regression analysis using STATA 12.0. Dependent variable of our study was the number of patent which are not a minus quantity but a discrete variable with a lot of zeros. In this situation, we can choose either poisson regression analysis or negative binomial regression analysis. In general, we assume that the number of events which are generated in continuous time and space are following poisson distribution

and that vector  $X$  in explanatory variables affects the generation of the events. However, our dependent variable, post-acquisition innovation are discrete variable and the limited condition that mean is equal to variance is seldom satisfied, frequently leading to over-dispersion problem in actual empirical analysis. Since this problem occurs, we chose negative binomial regression over poisson regression analysis.

**TABLE 1. EXPLANATORY NOTE FOR MEASUREMENTS**

<b>Variables</b>	<b>Descriptions</b>	<b>References</b>
<b><i>Dependent Variable</i></b>		
Post-Acquisition Innovativeness	number of patents that an acquirer filed from the first year to the fourth year after the acquisition	Makri et al. (2010) Ahuja and Katila (2001)
<b><i>Control Variables</i></b>		
Prior Innovativeness	number of patents that acquirer and target filed in three years prior to the acquisition	Ahuja and Katila (2001)
Acquisition Experience	number of acquisition experience for last 10 years	Haleblian and Finkelstein (1999)
R&D Intensity	(R&D expenses / revenue) x 100	Baysinger and Hoskisson (1989)
Word Count	ln (number of words in annual reports)	Short and Palmer (2008)
ROA	(net income/total assets) x 100	Ramaswamy (1997)
TMT Size	number of members in target's top management team	Krishnan et al. (1997)
Industry Difference	differences in primary SIC codes	Lien and Klein (2008)
<b><i>Moderating Variables</i></b>		
Firm Size Disparity	standardization of relative firm size in acquirer and target $\ln(\text{acquirer's number of employees}) / \ln(\text{target's number of employees})$	Kusewitt (1985) Fowler and Schmidt (1989)
Strategic Complementarity	standardization of differences in primary NAICS codes six-digit difference=6/6, five-digit difference=5/6, four-digit difference=4/6, three digit difference=3/6, two digit difference=2/6, one-digit difference=1/6, no difference=0/6	Wang and Zajac (2007) Finkelstein and Haleblian (2002)
<b><i>Independent Variables</i></b>		
Entrepreneurial Focus	ln (number of words related to "entrepreneurial focus" in annual reports + 2), (e.g. advertise, consumer, opportunity, service)	Using QDA Miner (Cho & Hambrick, 2006)
Future Focus	ln (number of words related to "future focus" in annual reports + 2), (e.g. frequency of the word "will")	Using QDA Miner (Yadav et al., 2007)
Change Focus	ln (number of words related to "change focus" in annual reports + 2), (e.g. change, create, initiate, innovative, introduce, launch, reposition, transform)	Using QDA Miner (McClelland et al., 2010)

## VI. RESULTS

Table 2 shows descriptive statistics (mean and standard deviation) and correlations between variables. As seen in correlations, explanatory variables have relatively low correlations, indicating a low likelihood of a potential multicollinearity problem. In order to confirm this, we conducted VIF (variance inflation factor) and found out that every variable amounts to less than 3. Since there was no apparent multicollinearity issue, we included every variable in the models.

Table 3 shows the results of negative binominal analysis on post-acquisition innovativeness as a dependent variable; our hypotheses were generally supported. We analyzed the effects of several attentional orientations, and the interaction effects of firm size disparity and those of strategic complementarity. While Model 1 includes just the control variables without moderators and Model 1 includes the control variables with moderators, the subsequent models have each type of attentional orientations: Model 3 (entrepreneurial focus), Model 4 (future focus), Model 5 (change focus), Model 6 (entrepreneurial focus with interaction effects), Model 7 (future focus with interaction effects), and Model 8 (change focus with interaction effects). For control variables, prior innovativeness of both the acquirer and target was positively significant on post-acquisition innovativeness. In addition, the acquirer's prior acquisition experience was

positively significant while the word counts of the annual reports were negatively significant on post-acquisition innovativeness (Model 1 and 2).

In Hypothesis 1, 2, and 3, we had predicted that entrepreneurial focus, future focus, and change focus in acquiring firm would be positively related with post-acquisition innovativeness. As we expected, the result on Model 3 and 5 shows that two hypotheses regarding entrepreneurial focus and change focus were supported ( $\hat{\beta}= 0.4484$ ,  $p<0.05$  /  $\hat{\beta}= 0.6938$ ,  $p<0.001$ ). These effects became even more stronger when the interaction effects were included as we can see in Model 6 and 8 ( $\hat{\beta}= 0.6001$ ,  $p<0.01$  /  $\hat{\beta}= 0.7661$ ,  $p<0.001$ ). However, contrary to our expectation, Hypothesis 2 was not significant in Model 4; future focus is not positively related with post-acquisition innovativeness significantly. Instead, Hypothesis 2 was supported in Model 7 when the interaction effects of both firm size disparity and strategic complementarity were included ( $\hat{\beta}= 0.3996$ ,  $p<0.05$ ). Therefore, Hypothesis 1, 2, and 3 were all supported.

For Hypotheses 4a, 4b, and 4c, we had predicted that firm size disparity would weaken the relationship between three types of managerial attention and post-acquisition innovativeness. Hypothesis 4a was significantly supported in Model 6, suggesting that firm size disparity weakens the relationship between entrepreneurial focus and post-acquisition innovativeness ( $\hat{\beta}= -0.2341$ ,  $p<0.01$ ). In addition, Hypothesis 4b was also supported in Model 7; future focus becomes weaker as firm size disparity

increases compared to the target ( $\hat{\beta} = -0.1875$ ,  $p < 0.01$ ). Finally, Hypothesis 4c received supported as well in Model 8, indicating that firm size disparity does weaken the relationship between change focus and innovativeness ( $\hat{\beta} = -0.2741$ ,  $p < 0.01$ ). Figure 2-(1), (2), and (3) illustrate these three predicted relationships regarding firm size disparity as moderator. Therefore, Hypotheses 4a, 4b, and 4c on firm size disparity were supported.

For Hypotheses 5a, 5b, and 5c, we had predicted that strategic complementarity would strengthen the relationship between three types of managerial attention and post-acquisition innovativeness. First, Hypothesis 5a was significantly supported in Model 6, suggesting that strategic complementarity strengthens the relationship between entrepreneurial focus and post-acquisition innovativeness ( $\hat{\beta} = 0.2284$ ,  $p < 0.05$ ). In addition, Hypothesis 5c was also supported in Model 8, demonstrating that change focus becomes stronger as strategic complementarity increases ( $\hat{\beta} = 0.2503$ ,  $p < 0.05$ ). However, contrary to our expectation, Hypothesis 5b was not supported; strategic complementary does not strengthen the relationship between future focus and innovativeness. Figure 2-(4) and (5) illustrates the significant interaction effects of two managerial attention (entrepreneurial focus and change focus) and strategic complementarity. Therefore, in terms of strategic complementarity as moderator only Hypothesis 5a and 5c were supported.

**TABLE 2. DESCRIPTIVE STATISTICS AND CORRELATIONS**

Variable	Mean	S.D.	1	2	3	4	5	6	7
1. Post-Acquisition Innovativeness	232.11	702.44	1.00						
2. Target Prior Innovation	49.19	279.89	0.42	1.00					
3. Acquirer Prior Innovation	60.46	289.72	0.79	0.13	1.00				
4. Target Acq. Experience	1.03	2.50	0.13	0.00	0.14	1.00			
5. Acquirer Acq. Experience	5.74	7.05	0.37	-0.02	0.28	0.14	1.00		
6. Target R&D Intensity	333.53	691.18	-0.07	-0.05	-0.05	-0.04	-0.10	1.00	
7. Acquirer R&D Intensity	-10943	149790	0.02	0.01	0.01	0.03	0.06	-0.64	1.00
8. Target Word Count	8.31	1.36	-0.01	-0.01	0.02	0.08	0.08	-0.02	0.08
9. Acquirer Word Count	7.99	1.81	-0.11	-0.18	-0.06	0.13	-0.09	0.07	0.05
10. Target ROA	-200.03	1830.11	-0.02	0.02	0.02	0.03	-0.11	-0.08	0.03
11. Target TMT Size	5.62	1.66	0.04	0.09	0.00	-0.13	0.07	0.03	0.07
12. Industry Difference	0.28	0.34	-0.01	0.11	0.00	-0.09	-0.03	0.03	-0.10
13. Strategic Complementarity	0.00	1.00	0.04	-0.19	0.09	0.14	0.43	0.24	-0.08
14. Firm Size Disparity	0.00	1.00	-0.03	-0.03	-0.05	0.03	0.11	0.02	-0.12
15. Entrepreneurial Orientation	4.32	1.32	-0.03	-0.23	0.06	0.12	-0.10	0.06	0.09
16. Future Orientation	3.97	1.35	-0.11	-0.21	-0.03	0.08	-0.12	0.09	0.10
17. Change Propensity	3.15	1.17	0.01	-0.16	0.07	0.14	-0.08	0.01	0.16

Variable	8	9	10	11	12	13	14	15	16	17
8. Target Word Count	1.00									
9. Acquirer Word Count	0.33	1.00								
10. Target ROA	-0.02	-0.09	1.00							
11. Target TMT Size	-0.04	-0.10	-0.03	1.00						
12. Industry Difference	-0.05	-0.07	-0.15	0.08	1.00					
13. Strategic Complementarity	0.02	-0.02	0.03	-0.22	-0.07	1.00				
14. Firm Size Disparity	-0.01	0.01	-0.11	0.03	0.73	0.06	1.00			
15. Entrepreneurial Orientation	0.45	0.73	-0.10	-0.08	-0.13	-0.05	-0.06	1.00		
16. Future Orientation	0.44	0.62	-0.13	-0.05	-0.08	-0.03	-0.02	0.83	1.00	
17. Change Propensity	0.42	0.64	-0.13	-0.06	-0.13	-0.04	-0.06	0.90	0.79	1.00

**Number of Observations = 177**

**TABLE 3-1. RESULTS OF NEGATIVE BINOMIAL ANALYSIS**

Variable	Model 1	Model 2	Model 3	Model 4
Target	0.0043***	0.0045***	0.0055***	0.0049***
Prior Innovativeness	(0.00)	(0.00)	(0.00)	(0.00)
Acquirer	0.0017**	0.0019**	0.0017**	0.0019**
Prior Innovativeness	(0.00)	(0.00)	(0.00)	(0.00)
Target	-0.0108	-0.0354	-0.0620	-0.0548
Acquisition Experience	(0.04)	(0.05)	(0.05)	(0.05)
Acquirer	0.0654***	0.0490*	0.0427+	0.0474*
Acquisition Experience	(0.02)	(0.02)	(0.02)	(0.02)
Target	-0.0004	-0.0004	-0.0005	-0.0005
R&D Intensity	(0.00)	(0.00)	(0.00)	(0.00)
Acquirer	0.0000	0.0000	0.0000	0.0000
R&D Intensity	(0.00)	(0.00)	(0.00)	(0.00)
Target	-0.1775+	-0.1731+	-0.2243*	-0.2309*
Word Count	(0.10)	(0.10)	(0.10)	(0.11)
Acquirer	-0.2025*	-0.2030*	-0.4424**	-0.2887**
Word Count	(0.08)	(0.08)	(0.15)	(0.11)
Target	-0.0001	-0.0001	-0.0001	-0.0001
ROA	(0.00)	(0.00)	(0.00)	(0.00)
Target	0.1207	0.1231	0.1276	0.1492
TMT Size	(0.11)	(0.11)	(0.11)	(0.11)
Industry	-0.3996	-0.8923	-0.8090	-0.8856
Difference	(0.45)	(0.74)	(0.70)	(0.72)
Firm Size		0.0928	0.2911	0.2140
Disparity		(0.17)	(0.19)	(0.19)
Strategic		0.2370	0.2512	0.2406
Complementarity		(0.28)	(0.26)	(0.27)
Entrepreneurial			0.4484*	
Focus			(0.21)	
Future				0.2441
Focus				(0.17)
Change				
Focus				
Entrepreneurial Focus x				
Firm Size Disparity				
Entrepreneurial Focus x				
Strategic Complementarity				
Future Focus x				
Firm Size Disparity				
Future Focus x				
Strategic Complementarity				
Change Focus x				
Firm Size Disparity				
Change Focus x				
Strategic Complementarity				
Constant	6.5285***	6.7236***	7.0660***	6.7843***
	(1.33)	(1.34)	(1.29)	(1.33)
Inalpha	1.1180***	1.1130***	1.0902***	1.1038***
Constant	(0.10)	(0.10)	(0.10)	(0.10)
Observations	177	177	177	177
Chi-squared	86.5430	87.6219	92.6124	89.6588
Prob>Chi <sup>2</sup>	0.0000	0.0000	0.0000	0.0000
Pseudo R <sup>2</sup>	0.0462	0.0468	0.0494	0.0478

**Standard Errors in Parentheses**

**+  $p < 0.1$ , \*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$**



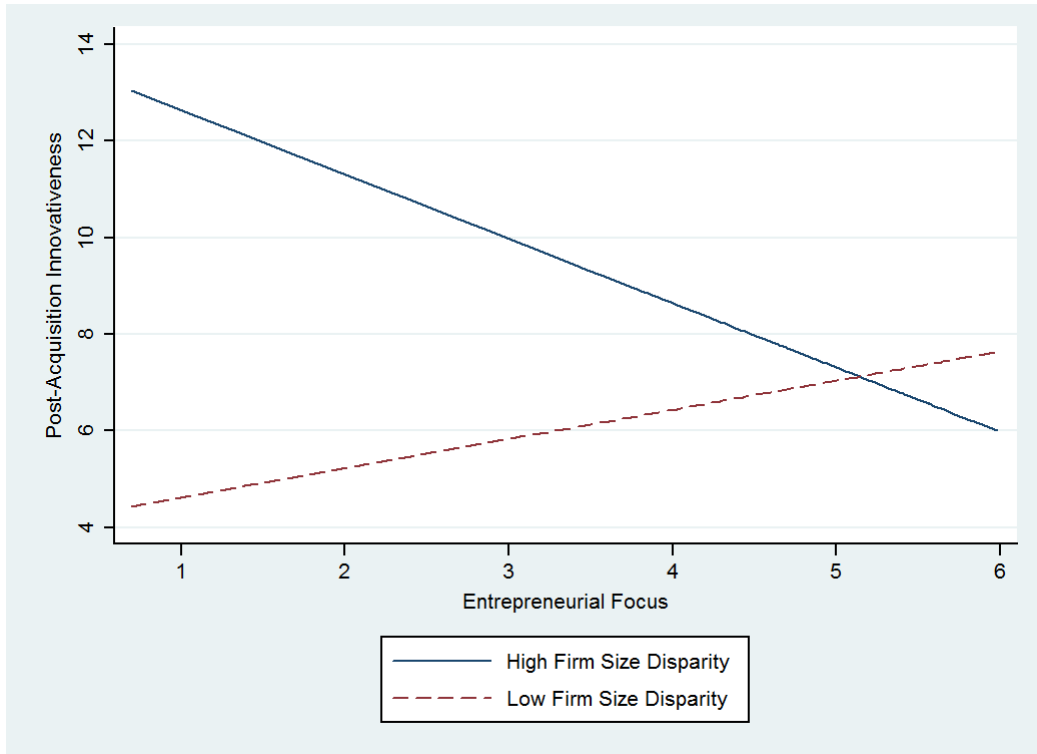
**TABLE 3-2. RESULTS OF NEGATIVE BINOMIAL ANALYSIS**

Variable	Model 5	Model 6	Model 7	Model 8
Target	0.0056***	0.0055***	0.0047***	0.0057***
Prior Innovativeness	(0.00)	(0.00)	(0.00)	(0.00)
Acquirer	0.0017**	0.0021**	0.0019**	0.0020**
Prior Innovativeness	(0.00)	(0.00)	(0.00)	(0.00)
Target	-0.0771	-0.0421	-0.0323	-0.0508
Acquisition Experience	(0.05)	(0.05)	(0.05)	(0.05)
Acquirer	0.0426+	0.0420+	0.0524*	0.0386+
Acquisition Experience	(0.02)	(0.02)	(0.02)	(0.02)
Target	-0.0005	-0.0004	-0.0005	-0.0004
R&D Intensity	(0.00)	(0.00)	(0.00)	(0.00)
Acquirer	0.0000	0.0000	0.0000	0.0000
R&D Intensity	(0.00)	(0.00)	(0.00)	(0.00)
Target	-0.2297*	-0.2406*	-0.3183**	-0.2036*
Word Count	(0.10)	(0.10)	(0.12)	(0.10)
Acquirer	-0.4846***	-0.4132**	-0.2402*	-0.4082***
Word Count	(0.13)	(0.14)	(0.10)	(0.12)
Target	-0.0001	-0.0000	-0.0000	-0.0000
ROA	(0.00)	(0.00)	(0.00)	(0.00)
Target	0.1591	0.1614+	0.1606	0.1878*
TMT Size	(0.10)	(0.09)	(0.10)	(0.09)
Industry	-0.6877	-1.2175+	-1.1502+	-1.0892
Difference	(0.69)	(0.67)	(0.69)	(0.67)
Firm Size	0.3753*	1.2030**	0.8808**	1.1286***
Disparity	(0.19)	(0.41)	(0.33)	(0.34)
Strategic	0.1963	-0.6411	-0.0849	-0.4642
Complementarity	(0.25)	(0.49)	(0.60)	(0.41)
Entrepreneurial		0.6001**		
Focus		(0.20)		
Future			0.3996*	
Focus			(0.17)	
Change	0.6938***			0.7661***
Focus	(0.20)			(0.19)
Entrepreneurial Focus x		-0.2341**		
Firm Size Disparity		(0.09)		
Entrepreneurial Focus x		0.2284*		
Strategic Complementarity		(0.11)		
Future Focus x			-0.1875**	
Firm Size Disparity			(0.07)	
Future Focus x			0.0854	
Strategic Complementarity			(0.14)	
Change Focus x				-0.2741**
Firm Size Disparity				(0.09)
Change Focus x				0.2503*
Strategic Complementarity				(0.12)
Constant	6.9553***	6.0956***	6.4155***	5.7180***
	(1.25)	(1.24)	(1.30)	(1.21)
Inalpha	1.0589***	1.0467***	1.0760***	1.0096***
Constant	(0.10)	(0.10)	(0.10)	(0.10)
Observations	177	177	177	177
Chi-squared	99.4256	101.9833	95.6580	109.8954
Prob>Chi <sup>2</sup>	0.0000	0.0000	0.0000	0.0000
Pseudo R <sup>2</sup>	0.0531	0.0544	0.0511	0.0586

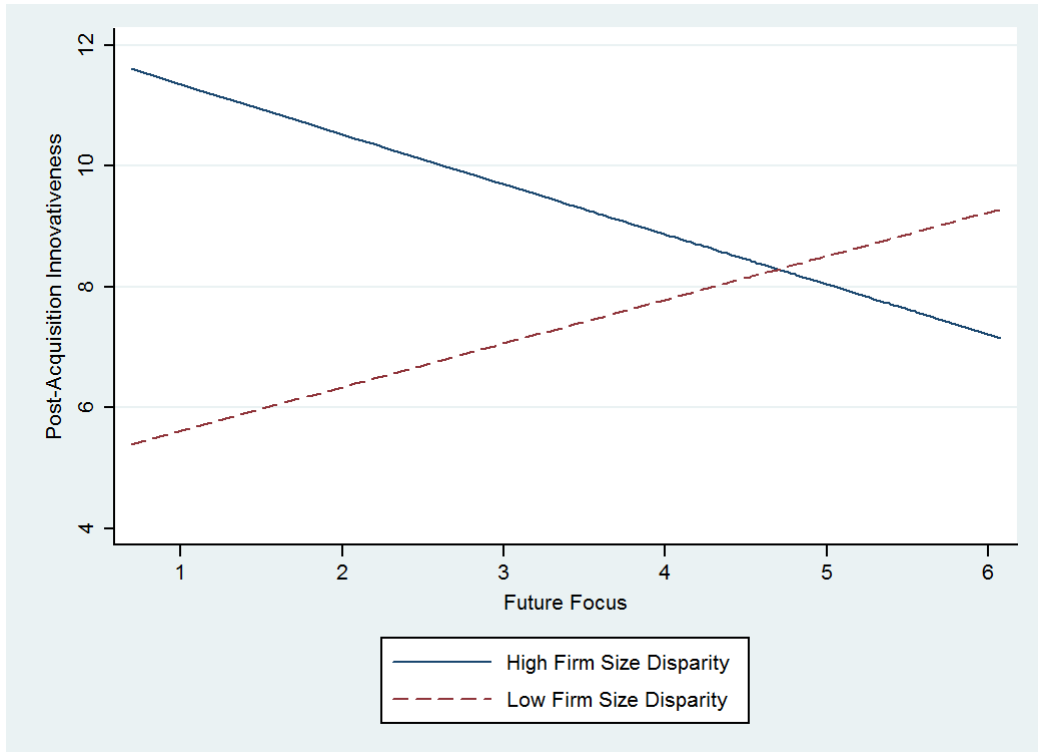
**Standard Errors in Parentheses**

**+  $p < 0.1$ , \*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$**

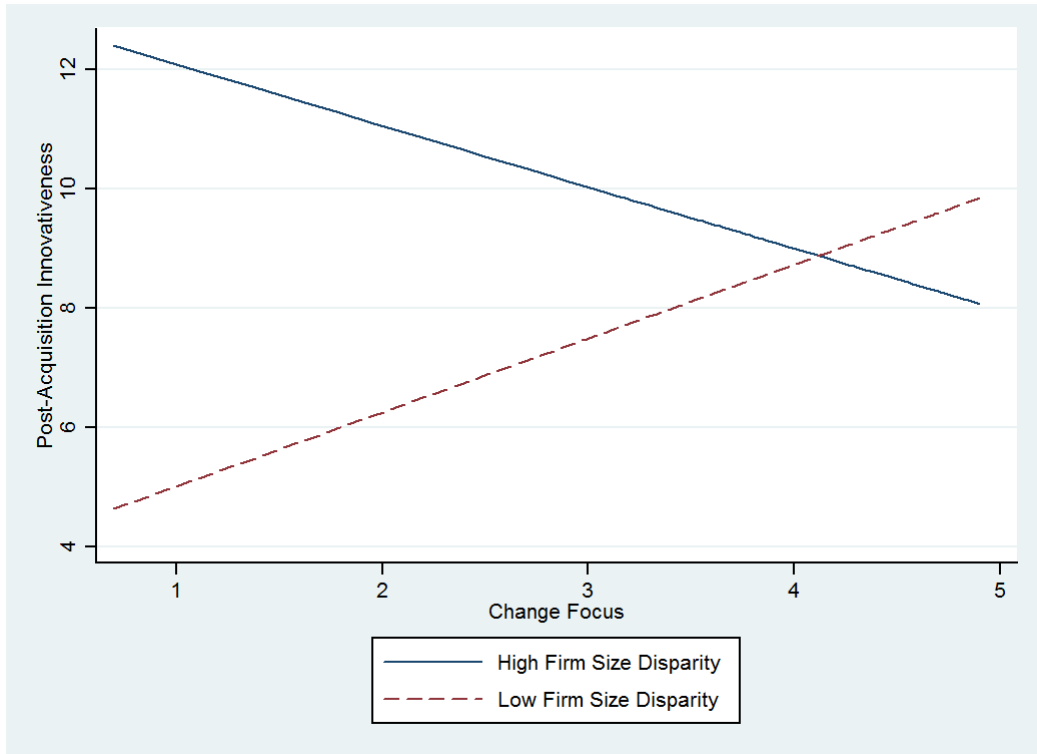
**FIGURE 2-1. INTERACTION EFFECTS:  
Entrepreneurial Focus and Firm Size Disparity  
(Hypothesis 4a)**



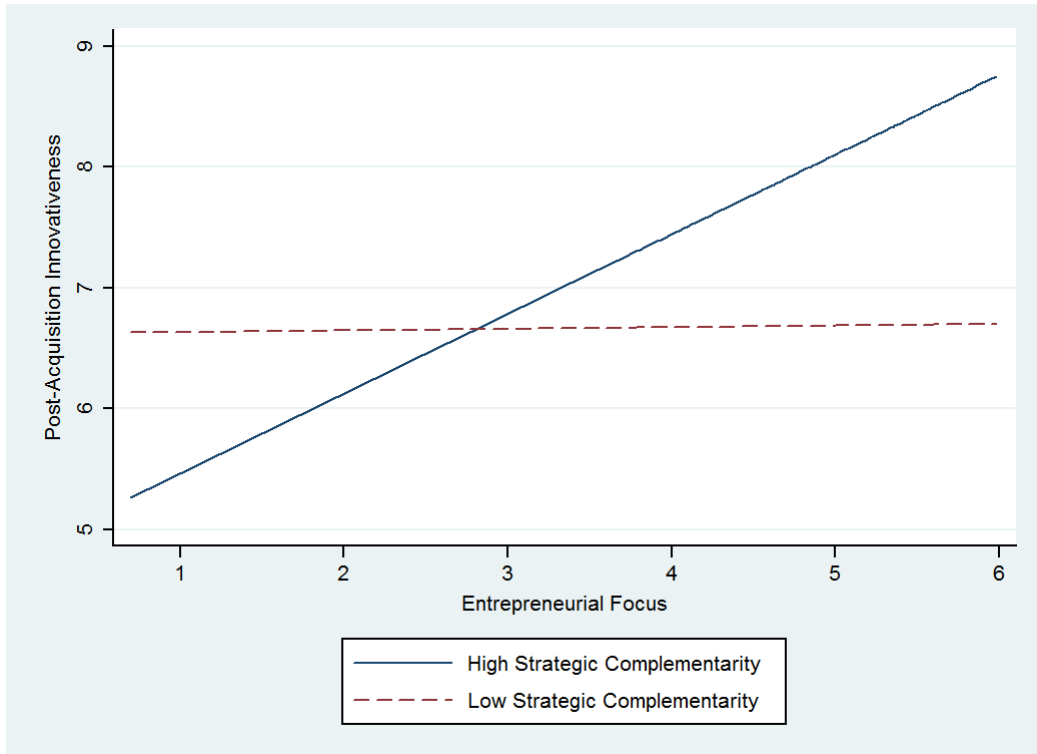
**FIGURE 2-2. INTERACTION EFFECTS:  
Future Focus and Firm Size Disparity  
(Hypothesis 4b)**



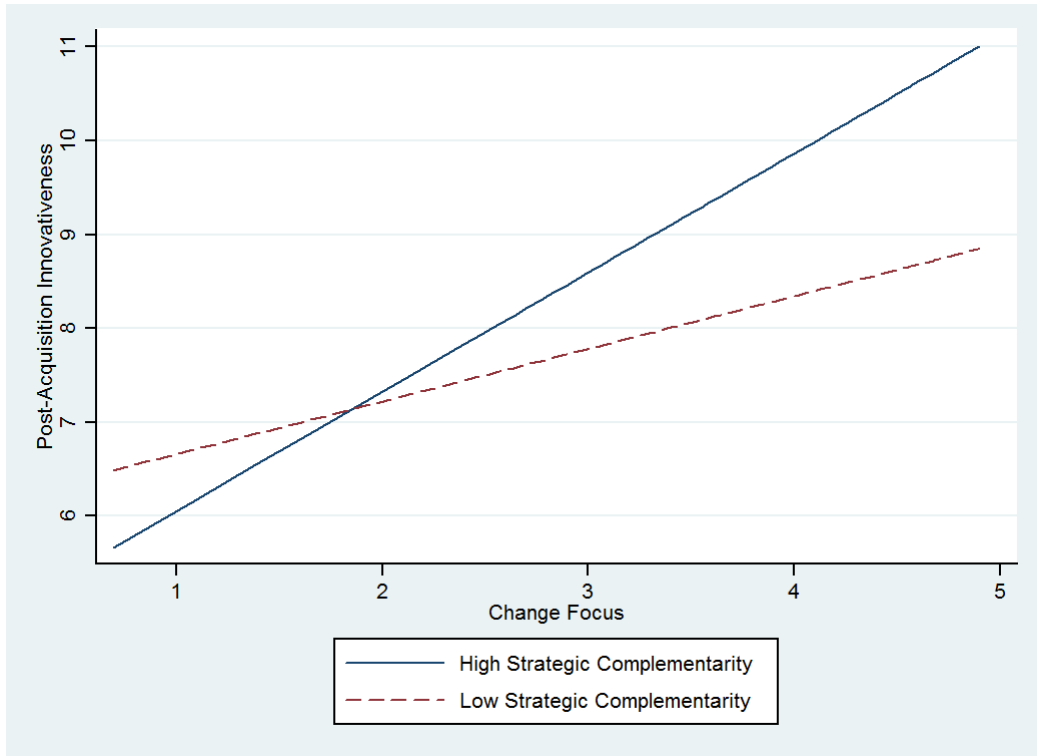
**FIGURE 2-3. INTERACTION EFFECTS:  
Change Focus and Firm Size Disparity  
(Hypothesis 4c)**



**FIGURE 2-4. INTERACTION EFFECTS:  
Entrepreneurial Focus and Strategic Complementarity  
(Hypothesis 5a)**



**FIGURE 2-5. INTERACTION EFFECTS:  
Change Focus and Strategic Complementarity  
(Hypothesis 5c)**



## VII. DISCUSSION

The main finding of this research suggests the effects of entrepreneurial orientation and other inter-temporal orientations on post-acquisition innovativeness. The results showed that entrepreneurial orientation, future focus, change propensity had significant positive impacts on post-acquisition innovativeness respectively as we have expected. These results indicate that managerial attention plays an important role to produce firm level post-acquisition innovativeness. And these results are in substantial agreement with Attention-Based View (ABV). In other words, managerial attention is a critical factor that can determine strategic choice and implementation. In addition, future focus was not significant at first, yet it was positively related with post-acquisition innovativeness along with the interaction effects. We can have two interpretation for this: (1) Future focus is significant only when there is a boundary condition such as firm size disparity between two merging firms; and (2) We need to find out other ways to capture future focus in order to verify whether our results are consistent.

The second finding of this research indicates the interaction effects between managerial attentions and relative firm size of acquirer to target. The results showed that the interaction effects were all significantly negative. These results accurately support our expectations, since we had predicted that relative size of acquirer to target would weaken the relationship between

managerial attentions (entrepreneurial orientation, future focus, and change propensity) and post-acquisition innovativeness. These results suggest that the relative firm size of acquiring firm itself has a positive impact on innovativeness, yet its interaction effects with managerial attention are negative. The positive influence of acquirer's relative firm size is substantial agreement with previous M&A literature that suggests acquiring firm should be relatively large enough and target firm should be relatively small compared to acquirer in order to produce innovativeness. However, when it comes to the interaction effects with managerial attention, the regression coefficients become significantly negative. Therefore, we can assume that managerial attention plays a critical role to explore the target firm to breed the innovativeness.

The last finding of this research includes the interaction effects between managerial attention and strategic complementarity of two merging firms. The results showed that entrepreneurial orientation and change propensity had a positive interaction with strategic complementarity. This results suggest that the fit of strategic complementarity is applicable to entrepreneurial orientation and change propensity. And we could find that strategic complementarity actually strengthens the main relationship of entrepreneurial orientation and that of change propensity. This indicates that strategic complementarity between two merging firms will be beneficial to entrepreneurial orientation and change propensity, since the acquisition made complementary assets an entrepreneurial problem that seeks new opportunity



by focusing on external issues but not engineering problem. However, contrary to our expectation, the interaction effects of future focus and strategic complementarity were not significant. And we could find that strategic complementarity actually have no impact on the relationship between future focus and post-acquisition innovativeness. Considering the future focus has two different results on post-acquisition innovativeness, the effects of strategic complementarity as a moderator could be verified again after the problem of measurement of future focus is solved.

## **7.1. Theoretical and Managerial Implications**

The contributions of this paper are three folds. First, we searched for several types of managerial attention in acquiring firm that best influence post-acquisition innovativeness. The results showed that all types of managerial attention including entrepreneurial orientation, future focus, change propensity were positively related with innovativeness, proving that how managers scan and interpret organizational issues actually generate organizational actions. This also proves that managerial cognition reflects organizational cognition that produce strategic change and organizational survival. In other words, we support the existing managerial cognition literatures that emphasize the important role of managerial cognition as an organization's interpretation system.

Second, we also found the ideal fits between managerial attention and

organizational characteristics. We realized that there are typical organizational characteristics that best interact with managerial attention, that is, relative firm size and strategic complementarity. These two constructs have a theoretical contribution by completing Ocasio (1997)'s attention-based view (ABV), because managerial attention can be explained not only by individual manager's perspective and social cognition but also by other organizational surroundings, namely, environment of decision and attention structure. These constructs also contribute to diversification literatures by supporting strategic complementarity and cultural similarity. Furthermore, these constructs support the idea of knowledge-based view by illustrating knowledge transfer and knowledge recombination.

Lastly, content analysis of annual report provides a distinctive approach to examine managerial attention and an opportunity to generalize the relationship between managerial attention and post-acquisition innovativeness. By doing so, we have found out the cognitive process in high-tech industry. High-tech industry itself provided us an ideal context to search for managerial attention and its interaction effects with organizational conditions. It gave us to test the relationship between multiple types of managerial attention and firm-level outcome by setting the boundary conditions of attention-based view of the firm.

Thus, there are several implications for managers. First, from the compelling examples, we can conclude that managers should possess attentions that search for new markets and new products in order to produce

post-acquisition innovativeness, such as entrepreneurial orientation, future focus, and change propensity. Acquisition engenders turbulent environment in both two merging firms. In this circumstances, post-acquisition performance or innovativeness depends on how managers scan and interpret the environment accurately and properly. If managers do not focus on external and future issue with only commitment to the status quo, organization will be mired in the poor performance. Moreover, managers should consider whether relative firm size or strategic complementarity is suitable for their attention in order to generate innovativeness in more efficient and effective way. They should realize that a greater acquirer will reduce the chance to make an innovative outcome when it meets managerial attention. In addition, they should know strategic complementary also works differently depending upon managerial attentions.

## **7.2. Limitations and Future Research**

Despite several contributions and implications, this paper also has some limitations and future studies that are required to improve the research. First, we have to find other ways to capture managerial attention to prove the relationship between managerial attention and post-acquisition innovativeness. There will be other ways for measuring managerial attention even among the content analysis. Thus, future studies should identify other ways of capturing managerial attention. Second, there must be other types of managerial

attentions that have great impacts on post-acquisition innovativeness. TMT's external/internal focus, certainty, optimism or commitment to status quo could be examples. Therefore, future studies should look into other kinds of managerial attentions that are best suitable for post-acquisition innovativeness. Third, post-acquisition innovativeness can be measured not only with the number of patent (quantity) but also with the number of patent citations (quality). By doing so, we can have a robustness check on our previous results with a consistent result. Lastly, with the several types of managerial attentions, searching for other possible organizational characteristics such as a prior performance, an absorptive capacity, and an organizational slack that best fit the typical attention is necessary.

## VIII. CONCLUSION

In conclusion, this study has looked into the effects of attentional orientation on post-acquisition innovativeness along with the interaction effects of firm size disparity and those of strategic complementarity. By assuming managerial attention is not only managerial thinking but also structural level thinking that generates organizational action, we could find out that attentional orientation that emphasizes entrepreneurial issues, future expectations, and changing environment has a significant positive impact on firm-level innovativeness. We also conducted the content analysis and empirical investigation to test the hypotheses in high-tech industry settings and found out that most of our hypotheses were supported. Moreover, we can also suggest managers several implications in that how they make sense of the organizational issues and how they convey cognitive capability will actually lead the firm to select the adaptive strategy in the uncertain environment of post-acquisition integration. We hope that our study provides both theoretical and empirical contributions for attention-based view and M&A literatures.

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# 첨단기술산업에서 인수합병 후 혁신에 대한 연구:

주의 기반 관점을 중심으로

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경영진의 주의가 기업의 행동에 미치는 중요한 요인이라고 인식되었음에도 불구하고, 경영진의 주의가 인수합병 후 혁신에 끼치는 영향에 대한 연구는 부족하였다. 본 논문은 경영진의 기업가적 지향성, 미래 지향성, 변화 지향성이 인수합병 후 혁신에 미치는 효과에 대해 연구한다. 또한 본 연구는 기업 크기 차이의 조절효과와 전략적 보완성의 조절효과를 연구함으로써, 인수합병 후 혁신에 영향을 끼칠 수 있는 적합한 조직적·환경적 조건을 찾아보고, 주의 기반 관점의 설명을 보완하고자 한다. 첨단기술산업에서 177개의 인수합병의 표본을 추출하여 분석한 결과, 대부분의 가설이 지지됨을 확인하였다. 나아가 주의 기반 관점에 근거하여 이론적, 실증적인 기여를 제공할 수 있었다.

**주요어:** 기업가적 지향성, 미래 지향성, 변화 지향성, 기업 크기 차이, 전략적 보완성, 인수합병 후 혁신

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