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국제학석사학위논문

When Do Acquirer's Absorptive
Capacity Has Better Performance
Different Emphasis between Acquirer and Target

인수기업의 흡수 능력과 그에 따른
기업의 성과에 대한 연구
인수기업과 피인수 기업의 다른 강조점을 바탕으로

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Master's Thesis of YunJae Bae

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When Do Acquirer's Absorptive Capacity Has Better Performance

Different Emphasis between Acquirer and Target

Abstract

This study cumulates the importance of a firm's absorptive capability and the future performance after obtaining extrinsic resources through acquiring other firms. Using 141 international M&A transactions from firms in the United States toward foreign companies in developed countries during 2000-2014, we first propose that with a higher level of absorption capacity, firms are more likely to have better future performance.

In addition, acquiring firms have different experiences in managing the new external knowledge resources from the target firms. Therefore, this study further extends the view from two perspectives by using four different moderate variables that would further effect a firm's future performance. From the acquiring firm's perspective, the study finds how the acquirer could utilize the external assets : the firm's payment method of cash and past M&A experience positively creates higher firm performance. On the other side, from the target firm's perspective, this study finds the quantity and the type of the target firm's assets.

The final result shows that the target firm's amount of strategic assets show similar results as the target firm possess more assets, acquirer will have positive result. However, when the target firm is in the high-tech industry, firm's performance showed a negative impact as a moderator.

Key Words: Absorptive Capabilities, M&A, Firm Performance, Past M&A Experience, Cash Payment, Target Asset

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Chapter I. Introduction

1.1 General Background of the Study

International mergers and acquisitions (IMAs) have been one of the biggest business trends since the late 20th century. Events including the IT boom and China joining the WTO were two triggers to cross-border M&As (Zhu et al, 2015; Park & Roh, 2018). As of 2016, cross-border M&As took nearly 21% of total worldwide M&As (S&P Global, 2017), worth nearly \$4.8 trillion (Bureau Van Dijk).

Firms have a variety of investment motivations of buying out foreign firms. Dunning's OLI paradigm states that firms from developed countries may invest due to finding "new resources, new market, and seek for efficiency" (2001). Whereas new strategic assets such as unknown technology and knowledge can be a motivation for the firms from developing countries transitioning toward developed countries (Luo & Tung, 2007). However, Dunning still argues that firms from advanced nations also put effort investing on other developed countries for "strategic-asset" (Dunning, 1993). Some of the latest cases provide evidence that firms from developed countries also invest toward other developed countries for new knowledge. For instance, Samsung Electronics from South Korea recently acquired American audio company Harman for up-to-date audio technology; and Alphago from the United States took over British firm Deepmind Technology for a new artificial intelligence program. These cases show that not only companies from developing countries use M&As to extend their leverage to the global market, but also firms from developed countries

are using cross-border M&As to find out new knowledge in unknown areas (Park & Roh, 2018).

As the world is becoming more global with the increasingly fast delivery of new knowledge, competition between firms is getting fiercer and simply obtaining new external resources is not enough to maintain the firm's position in the recent business landscape. Therefore, the perspective steps further toward how firms could utilize new knowledge with existing internal resources and can better explain the firm's success. For instance, one of the mainstreams of business theory, resource-based view (RBV), explains the purpose of a firm's behavior regarding international M&As. As a tool of foreign direct investment, firms are eager to find new resources to win over other competitors by increasing their competitive advantage via new resources (Barney, 1991). Although RBV could describe the motivational reason for the firm's M&A toward an international market, this theory could not fully explain whether the firm's eagerness to merely add new know-how turned into successful firm performance. This is because RBV cannot clarify if a firm's overseas M&A directly affected the increase of the firm's future prosperity.

Therefore, Teece et al (1997) bring a new concept of dynamic capabilities view to supplement the weakness of RBV, by finding out the importance of a firm's ability to absorb and mix with internal resources to adapt into new business surroundings, which would give the firm a competitive advantage. Besides, based on the business learning mechanism, absorptive capacity can best be explained from the dynamic capabilities view. Cohen and Levinthal explain that when a firm wants to create

higher value, research and development (R&D) investment should be considered to increase their ability to combine new assets for financial prosperity (1990). This capability may have four different steps with “acquisition, assimilation, transformation and finally exploitation” for transferring new knowledge into profit-making action (Zahra and George, 2002). Therefore, this study will use the concept of absorptive capacity to find out the success of a firm’s future performance after attaining external knowledge.

1.2 Purpose and Structure of the Study

As there are past studies on success of different business strategies explained by absorptive capacity level (Mowery et al, 1996; Lane et al, 2001; George et al, 2001, Meyer and Sinani, 2009), this study will contribute toward the perspective which firms would be more successful in profit-making when using business tools of merging and acquiring foreign firms through an absorptive capability view. Not just simply descriptively explaining the success of IMAs related to absorptive capacity, this study will analyze with empirical evidence on hundreds of U.S. M&A transactions on firms overseas.

In addition, this study further develops based on a knowledge-based view, although firms may have a similar level of absorptive capability, each acquiring firms would have a distinct background and history of how to utilize the new knowledge (Eriksson & Chetty, 2003). Moreover, firms hold diverse knowledge resources that

are unique and unable to be copied by other firms and lead themselves to keep their business feasible (Wiklund and Shepherd, 2003). These knowledge resources can be moved or shared through diverse business strategies and later mixed with acquiring firm's internal assets (Lyles and Salk, 1996; Inkpen, 2002; Collins et al, 2009). Therefore, this study extends the view that both the acquiring and target firms have different characteristics. When absorbing external knowledge resources, acquiring firms would have different past experiences and confidence for the future M&A, while target firms would have various types and amounts of knowledge resources. Therefore, this study used four different moderate variables that could have a different effect on the firm's future performance with two different perspectives, we have looked from both the acquirer's side and the target firm's side.

This study will be illustrated as follows. First, it will explain why the study chooses international M&A as a reliable tool for firms to learn external knowledge, even though there are other useful business strategies in the international market. Next, this study will explain the importance of a firm's absorption capability when acquiring new external resources to increase a firm's performance. Also, not just explaining the need for high absorption capability in international M&A, but also this study will discuss four moderators that could either bring positive or negative effects toward a firm's performance. For this study, the samples have to meet two conditions. First, we found all the United States' M&A transactions toward other developed countries through SDC Platinum. Then, through the WRDS database, we inserted all the necessary financial data for the study. By sorting out all the

unfounded financial information provided by WRDS, the data we obtained has a total sample of 141 M&A cases which were used for empirical analysis. The statistical analysis result will be illustrated with descriptive correlation, an OLS regression. In the last section, the discussion and conclusion part will explain the overall summation of the study.

Chapter 2. Literature Review and Theoretical Extension

2.1 International M&A

Business strategies such as M&A, joint venture, or strategic alliances with other firms are a useful tool for companies to learn external knowledge. The firm could create their intrinsic value through continuously repeating their process, but the process may have limitations in increasing a firm's competitiveness (Levitt and March, 1989). This is because firms are provided with selections only within their knowledge and have only a choice to select the better ones, which cannot always be the best as unknown external insights exist (Simon, 1982). Also, firms might lose their competence as staying in an outdated tradition while other firms are catching up with new knowledge and more advanced technology (Franko, 1989). Making efforts to stay in business, firms also invest outside through foreign direct investment. Firms in developed countries may invest in other developed countries such as the United States or Japan for new, valuable insights to learn and strengthen their own competencies (Dunning, 1998). On the contrary, firms in developing nations may also invest in developed countries because of a firm's "ownership disadvantage" compared to firms in developed countries (Moon and Roehl, 2001). These examples show that firms are eager to escape from conventional knowledge within internal creation, and firms select different ways to earn other firm's assets. This variety of strategic tools can be reliable when firms are creating information in a new field.

Investing activities can later create new prosperity to firms with higher profits (Hitt et al, 2000).

This study chooses the M&A strategy for the method of learning and absorbing external resources from other companies. M&A is one of the reliable ways to learn knowledge in both similar and different types of industry (Park and Roh, 2018), especially, to learn sophisticated and complex technology (Bresman et al, 2010) or in the fields of IT (Zhu et al, 2015). M&A is a much more decent approach compared to the company creating its own through R&D. This is because assets and information created autonomously by spending more on R&D would be inefficient and inaccurate, whereas acquisition may help eliminate this unnecessary process and bring demanding knowledge (Prabhu et al, 2005).

Although firms have the purpose of acquiring other firms to learn unknown knowledge, vulnerabilities exist and numerous numbers of M&As fail (Bower, 2001; Christensen et al, 2011). M&A success means that firms could create their values (Vermeulen & Barkema, 2001) or lead to better firm performances (Bauer & Matzer, 2014) from mixing internal and external resources. However, when firms cannot create their own values or increase their performances, the M&A experience becomes a failure. A firm's M&A failure comes from many reasons. Buying out firms by paying more than values of target firms could negatively influence due to the lack of cash, or the synergy creation is lower than expected (Hayward & Hambrick, 1997). Firms have their own distinctive values due to the different organizational culture, and without balancing it with target firms, it may lead to an M&A failure (Very et al,

1997). Finally, firms need to be familiar with the target firms to lower the risks of failure. Cloudt et al argued that M&A would more likely to be successful when the acquiring firm has a certain level of knowledge of where the target belongs (2006).

There are also some defects that occur from the international M&A. For instance, related to synergy creation, firms could suffer difficulty due to a different culture that comes from country value. From the study of Zhu et al (2015) showed with empirical evidence that when firms acquire firms from other countries with different languages, they may have a negative outcome in profit-making. It may be due to communication errors in the learning stage of acquired firms in the international market. Moreover, firms from different countries have a different culture to conflict (Jemison & Sitkin, 1986), which can be well explained through Hofstede's cultural score from his survey on IBM employees in many different countries (Hofstede, 1980). When the different cultures are mixed, it may create conflict and lower organization profit (Jemison & Sitkin, 1986; Stahl & Voigt, 2008).

Even though there are some conflicts in the processes of acquiring foreign firms, successful process to combine these conflicts and absorbing new knowledge or assets actually create greater firm values. Related to cultural conflict, firms would make an effort to solve the cultural clash and learn not only the new knowledge but also the new insight that different countries have (Morosini & Singh, 1994; Bauer & Matzer, 2014). A study from Van Wijk et al (2008), found a positive relationship of learning new knowledge with absorptive capability may bring a firm's profit gain. In the process of learning a variety from unknown areas, firms could be successful

from acquisition with high firm performance when properly combining and absorbing for the new competences. It implies that after acquiring targets, firms should not end with simply learning outside insight, but they need to mix and utilize it as commercial use with existing competitiveness to increase the firm's performance and stay in business. Therefore, acquiring other firms should have their own absorption capabilities for the firm's success through attaining new know-how and strengthening a firm's competitiveness via creating an innovative outcome.

Some of the studies argue the necessity of absorption capacity of a firm when taking foreign firms, especially for absorbing knowledge-asset purposes (Deng, 2010; Sarala & Vaara, 2010; Junni, 2011; Junni & Sarala, 2013; Liu & Woywood, 2013; Zhu et al, 2015; Reus et al, 2016). However, some of the studies focusing on international M&A and how it changed the firm's value during the late 1990s and early 2000s (Zhu et al, 2015; Reus et al, 2016), and seems to focus on the IT boom (Zhu et al, 2015). Related to international M&A with absorption capability, the study does not provide the results with the change of market value but the study proceeded with the survey (Junni, 2011; Junni & Sarala, 2013). Moreover, many of the recent studies related to international M&As and absorptive capacity have shifted toward developing countries such as China (Deng, 2010; Liu & Woywood, 2013). It is because the trend of foreign direct investment with the tool of international M&A for the new knowledge and technology is more focused on developing countries compared to developed countries. Still, we find that developed countries take the majority of global M&A and the United States is on the top, this study would update

the current cross-border M&A with the motivation of knowledge attaining the purpose. Therefore, this study would provide the latest cross-border M&A from firms in the United States toward other developed countries for the knowledge purpose and the succession after acquisition through empirical evidence.

2.2 Absorptive Capabilities

The concept of a firm's absorptive capability originated from the study of Cohen and Levinthal, suggesting that after learning extrinsic knowledge through acquiring target firms, the acquirer needs to apply new knowledge to create its own new assets for the firm's improved performance (1990). Therefore, the concept of absorptive capability includes transferring new knowledge and also applying complementary knowledge into a firm's profitability. Some studies show that firms need higher absorptive capacity for better success in different fields. Woiceshyn and Dallenbach's study on drilling companies shows a higher advantage was given to firms with higher absorbing companies (2005). Henderson and Cockburn discussed capability absorption of firms in the pharmaceutical industry, whether the size of the company would matter the effectiveness of absorbing levels leading to better performance (1996). Not only at the firm level, but also absorptive capabilities can be applied into individual levels. For the high-level managers, in the process of absorbing external resources, different types of leadership styles were needed for better firm performance (Sun & Anderson, 2011).

Numerous characteristics of a firm's absorptive capacity exist. First, in the

learning process, firms would have the benefit of increasing a firm's performance when acquiring targets have knowledge moderately known compare to targets that belong to new knowledge (Lane et al, 2001). Second, firms which absorbed new assets from the outside in the past may have a higher absorptive capability compared to firms with no experience (Zahra & George, 2002), and in the future, firms may increase their ability to create value in the high-tech industry (Kim, 1998). Moreover, for the newly founded firms, the absorptive level may impact on efficient choices in producing goods (Fernhaber & Patel, 2012). Tsai's study mentioned that the firm's absorptiveness could directly have a positive impact on creating new competencies by utilizing the resources through a firm's network systems (2001). In addition, Cohen and Levinthal suggested that R&D activity is vital for a firm's absorption capacity (1990). They said that investment toward R&D could increase innovativeness on unifying internal and external knowledge together to create new assets.

In the process of cooperation with others, the firm needs to have high absorptive capabilities for higher prosperity. When doing a joint venture with firms in foreign countries, the absorptive capability should exist in some degree to increase the firm performance (Lane et al, 2001). Relationships between the strategic alliance and the firm's absorptive capacity were also discussed in some of the studies (Mowery et al, 1996; George et al, 2001). Adding toward foreign direct investment, Meyer and Sinani found out that developed countries have a greater advantage of a foreign firm's investment in their country compared to developing countries due to

the higher absorption level (2009). These examples show that the higher the absorption level is, the higher the profit that firms could earn is, in different fields of business strategy.

Similar to different types of business tactics, which were mentioned earlier, the acquirer also needs the learning process when absorbing external knowledge for the higher firm performance through cross-border M&A. Deng's case study shows the importance of high absorptive capability with two different cases and implies that Chinese acquirers, Lenovo and TCL improved after buying out IBM and Thomson each (2010). Cheng and Yang studied with an empirical test using a Chinese firm's international M&A toward developed countries (2017). This study found out that Chinese companies had a higher firm profit when a firm's 'technological innovation capabilities' were also at a high level (Cheng and Yang, 2017). In addition, not only from developing countries, but firms in developed countries should have high absorptive capabilities. Throughout Junni and Sarala's study, which was conducted by survey, they found out that this capability would have a positive relationship with attaining external knowledge and creating synergetic value (2013). The empirical study conducted by Hussinger supported the fact that when an acquiring firm has a high level of management skills to absorb foreign innovators, these new members are more likely to elicit effective outcomes in productive innovation (Hussinger, 2012). Therefore, this study also suggests that when the firms from the United States have high absorptive capability, these firms would have higher firm performance after acquiring other firms from other

developed nations.

Hypothesis 1: When acquiring other firms, the higher the absorption capability of acquiring firm, the greater the possibility of a successful M&A coming to fruition.

2.3 Four Moderators

After examining how absorptive capability would have an effect on the acquiring firm's future performance, this study then explores through knowledge-based views since we have focused on the international M&A of firms from only developed countries toward other developed nations due to knowledge resources. The knowledge-based view means that each firm may hold their own creation of knowledge that is specifically valuable for their firm (Wiklund and Shepherd, 2003) and these external assets would be transferred through acquisition. Moreover, when the new knowledge is shifted from one firm to another, firms have different environment which might bring different outcomes with creating new internal values (Vaara et al, 2012).

Therefore, this study has been designed with two different aspects that the acquiring firm and target firm may have distinct attributes toward knowledge resources. Even though acquiring firms have same level of investment on R&D, each firm has a different environment and history of how to utilize unknown assets, whereas target firms may lean toward different types of knowledge assets from target firms. This study brings four moderate variables with two different perspectives.

From the acquiring firm's perspective, the firm's capability of how to utilize external sources through past experience and confidence will be considered. On the other hand, this study will approach the target firm with quantity and the different types of assets they carry.

2.3.1 Acquirer's Payment Method

Payment method in M&A is a crucial component, especially in the field of finance. Payment method in M&A transactions is classified with payment with cash, stock, mixed with cash and stock, and some other payments (Martin, 1996; Chang, 1998; Faccio & Masulis, 2005) and studies divided the payment method with 'cash or stock' (Martin, 1996; Faccio & Masulis, 2005). These different kinds of payment methods show that stock values have either depreciated or not. When the stock value is higher than the expected price, acquiring firms are more likely to pay with stock (Travolos, 1987), whereas when the stock is undervalued, cash would be more likely to be the payment method since the stock price would more likely to be increased after acquisition (King et al, 2004).

There are some preferences and reasons for each payment method. For example, a stock payment would be the better option for acquiring firms due to lowering the tax payment in the transaction deals (Wansley, Lane, & Yang, 1983), since cash payments would incur a hefty tax. Besides, the stock payment could decrease the risks from the process and after the acquisition by sharing the stocks with target firms and lack of cash (Faccio & Masulis, 2005). In the international M&A context, Dutta et al (2013) found out that in the overseas M&A, firms are more

likely to pay with stock and this may be due to monitoring purposes. These reasons may lead firms to pay with stocks rather than cash. On the other hand, the target firm would more prefer to be paid with cash rather than the stock option. Therefore, paying with cash may bring an advantage of taking the better spot in competition with other firms that they would like to acquire (Fishman, 1989). Moreover, paying with cash could imply that acquiring firms are predicting more likely to be successful after the acquisition (Martin, 1996). Related to payment methods in an absorptive capacity, acquiring firms would prefer to use cash payments since they assure that the target firm's own knowledge that the acquirer is in need for the fuse of knowledge. Therefore, the acquirer would prefer to use cash to win over the competitors in the acquisition. With this reason, firms which use cash payment would have higher firm performance compared to other payments due to better usage of the target firm's assets.

Hypothesis 2: Positive relationship with acquirer's absorptive capacity and its performance becomes stronger as the acquirer pays the contracted deal with cash.

2.3.2 Acquirer's M&A Experience

As this study mentioned earlier, M&A is one of the most reliable strategic tools to obtain exceptional knowledge for the company's further growth. Many firms have undergone the experience of M&A in the past and have had various outcomes. Therefore, firms have different reactions toward new M&As in the future. When the past acquisition experiences were successful, firms were more courageous to select

a M&A strategy to learn from other firms, whereas firms with failed experiences would be hesitant to choose a M&A in the future (Haleblian et al, 2006). We could say that firms go through the experience of success and failure from the previous M&As and they would learn the best way to absorb the knowledge and find better methods in future M&As. Some of the studies found that experiences of M&As have positively influenced forthcoming M&A's in a firm's performance (Bruton et al, 1994; Fowler & Schmidt, 1989). Through feedback and repeating the results of M&A (Nelson & Winter, 1982; Greve, 2003), the firm would learn how to utilize and choose the essential external assets to combine. Study on M&A in the biotechnology industry found out that firms avoided obtaining external resources all at once but tried to acquire continuously with a couple of steps (Jo et al, 2016). It is because through the past M&A experience, acquirers are more reliable to reduce the conflicts since they learn acquisition specific capabilities (Prahalad & Bettis, 1986). Moreover, the study of Collins et al (2009) argues that previous M&A experience on both domestic and foreign firms may lead to more on cross-border M&A, especially earlier overseas experiences which may have more impact toward following international M&A. Therefore, this study proposes that the past international M&A experience would give an ability to choose the right knowledge to absorb and increase more on the firm's profit.

Hypothesis 3: Positive relationship with the acquirer's absorptive capacity and its performance becomes stronger as the acquirer has more M&A experiences in the past.

2.3.3 Target's Strategic Assets

According to RBV, strategic assets can be exemplified as an enterprise's 'know-how, knowledge and advanced technologies' (Teece et al, 1997). However, this information should include some of the aspects such as 'valuable, rare, inimitable, and nonsubstitutable as other firms can not copy the inherent assets (Bollinger and Smith, 2001). Amit and Schoemaker defined strategic assets as "the set of difficult to trade and imitate, scarce, appropriable, and specialized resources that bestow the firm's competitive advantage" (1993). These types of assets are the ones that could increase the company's performance by creating their competence (Barney, 1991). Therefore, not just basically know-how or knowledge, but organizational culture, brand, R&D capabilities, reputation, and relationships with other firms can be considered as strategic assets (Michalisin et al, 1997; Teece et al, 1997). The strategic asset also is considered to be one of the motivations of foreign direct investment to enlarge their assets and increase a firm's performance through becoming competitive in the global market (Dunning, 1998; Moon & Roehl, 1993). A study of a Chinese M&A found that target companies should possess a certain level of strategic knowledge so that Chinese acquirers could absorb and utilize for further future performance (Ai and Tan, 2017). Moreover, a study on a U.S. international M&A also implies that useful intangible assets can create a synergetically positive outcome (Seth et al, 2002). Therefore, the conclusion for the third moderator is that with more strategic assets that target firms hold, the more the acquirer can utilize and combine numerous mixtures, which leads to better success

of the firm.

Hypothesis 4: Positive relationship with acquirer's absorptive capacity and its performance becomes stronger as the target has more strategic assets.

2.3.4 Target's High-Technology Industry

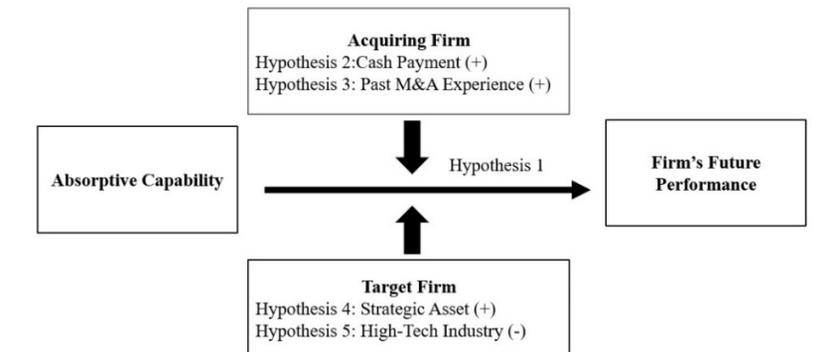
Companies that are dependent on technology should create profound knowledge continuously, and firms which are operating through high-technologies needs to discover new assets (Lane and Lubatkin, 1998). This phenomenon is due to higher R&D expenses spent in high-tech firms compared to other types of industries such as low-tech and medium-tech. Besides, when firms struggle to expand their leverage in the field of inter-industry, firms need to invest R&D expenses more on high-tech industry rather than low or medium-tech industry. Therefore, acquiring other companies can diminish the avoidable R&D expenditures when broadening to an unfamiliar industry (Bertrand and Zuniga, 2006). Moreover, the product life cycle has been shortened in the field of high-tech industry, newcomers or some of the lagging companies might be hard to catch-up with the up-to-date technology, whether an M&A might be the best way to progress their knowledge to fit (Yli-Renko et al, 2001).

However, acquiring high-tech companies cannot always be favorable to acquirers. Cloudt et al suggested that when acquiring firms with advanced technology, firm performance is not that much positively effective due to great distance (2006). Hayward also suggested that target firms should be relatively known

industry to have more significant potential for growth (2002). However, if the acquiring firm does not have much knowledge on target firm, especially in high-tech industry, the firm is more likely to buyout without noticing how much it should afford to pay (Reuer et al, 2004). Compare to other types of industry, it would be relatively needing more time and effort to absorb that knowledge when firms are to learn high-tech knowledge. It is because knowledge of high-tech industries is much more complicated to learn from the beginning than low-tech and medium-tech industry. Therefore, this study also proposes that acquiring high-tech firms would be challenging to absorb and would hardly influence positive synergy toward a firm's performance.

Hypothesis 5: Positive relationships with the acquirer's absorptive capacity and its performance become weaker when the target belongs to a high-tech industry.

Figure 1. Full Model of the Study



Chapter 3. Data and Methodology

3.1 Database

To propose the study on the firm's combining external knowledge resources from foreign countries, M&As from the United States with firms in other developed countries has been selected. Dunning stated that firms investing for knowledge resources are more toward developed countries compared to developing countries (1998). Therefore, following the study of Bertrand and Zuniga (2006) and Park and Roh (2018), this study also selected firms in OECD countries as a target firm in the acquisition.

The information on acquisition transactions of firms from the United States with firms in OECD countries was collected from the SDC Platinum database. This study collected 39,734 transaction cases from 2000 to 2014. Moreover, lacking information on financial data on each company more data was gathered from WRDS Compustat. As a conclusion, 141 pieces of data were used for the study.

3.2 Dependent Variable

Tobin's Q, which is the firm's total market value of a firm divided by the total asset value of the firm, is one of the most frequently used measurements for the M&A performance. Studies from Sirmon & Hitt (2009) and Zhu et al (2015) show the usefulness of Tobin's Q for arguing the succession of M&A. Also, this measurement

explains the long-term effects of the acquisition in the future (Das & Kapil, 2012) within a certain period. Therefore, to watch future performance after M&A, this study uses Tobin's Q for three years after as a dependent variable.

3.3 Independent Variable

This study suggests that the higher the absorption capacity, the M&A would be more successful in the future; therefore, a firm's absorptive capability is the explanatory variable. R&D intensity, which is R&D expenditure divided by total sales, can best explain the absorptive ability of the firm (Cohen & Levinthal, 1990). Following the work of Cohen and Levinthal's work, other studies related to the firm's absorption level also used R&D intensity for the firm's learning and creating level (Tsai, 2001; Schildt et al, 2012; Bertrand & Mol, 2013). Therefore, this study also uses R&D intensity to measure a firm's absorption capability.

3.4 Moderate Variable

As this study observed, four moderators would affect the firm's absorptive capability. The four moderators are the acquirer's payment method, acquirer's past M&A experience, target's strategic assets, and whether or not the target is in the field of high-technology. For the payment method, this study used a dummy variable; if the process is made with cash, it would be marked as 1, if not 0. Past M&A experiences would show whether the acquirer had experience within three years,

which were used in different studies (Haleblian & Finkelstein, 1999; Zhu et al, 2015). For the target's strategic assets, this study used the amount of intangible assets as an indicator of a firm's strategic assets. Studies on R&D as an indicator of strategic asset found that there are two vulnerabilities to use. It is because R&D expenses can make failing outcomes in the end (Rouse & Dallenbach, 1999), and other firms could catch-up-to the new technology (Crook et al, 2008). However, intangible assets include a firm's patent, trademarks, network, and corporate culture (Hall, 1992). These assets are difficult for other firms to copy, which also leads to the firm's core competencies (Michalisin et al, 1997). Finally, for high-tech target firms, this study followed the Kile and Phillips study (2009) by using a dummy variable to indicate whether it is high-tech or not. If the first three digits of SIC codes include 283, 357, 366, 367, 382, 384, 481, 489, 737, 873, it will be marked as 1, excluding those ten SIC codes, it will be marked as 0.

3.5 Control Variable

This study included some of the control variables that might influence the future M&A performance results. Language is a crucial issue and sharing a similar language would allow easier access when combining external knowledge. This study follows the work of Dow and Karunaratna (2006), a standard for different language using branches and family. Industry-relatedness is also essential since it is much easier to learn and mix the knowledge that is already known. Delgado et al. used the NAICS code to explain the industry-relatedness (2016), if the first three digits are

the same, then the target and acquirer are in the similar industry (coded as 0), whereas if the first three digits are not the same, it is not the similar industry (coded as 1).

Moreover, based on information on the acquirer side, this study used firm size, which is measured with the total asset, for control variable. The firm's return on the asset was measured by net income divided by total asset, to show how profitable it was with the firm using their assets. In addition, this study included whether the acquirer is in the high-tech industry or not. It follows the same method of the moderators of the target's high tech.

Chapter 4. Results

Table 1 shows the results of descriptive statistics and the correlation matrix between each variable from 141 international M&A deals of U.S. firms with foreign companies. First, the correlation between the dependent variable of this study, Tobin's Q of three years after the M&A transaction, and other variables show mostly positive results and all the correlation coefficients were below 0.5. In addition, from the correlation result, the coefficient between the deal value and the size of the firm shows a high correlation of 0.62. However, after the variation inflation factor test, the study found that the minimum was 1.12 and the maximum outcome was 2.42. This result shows that there is no multicollinearity since the result is below 10. Therefore, the results show the confidence that this study has no concern between variables for the hypotheses.

Table 2 presents the results of OLS regression of this study, showing the correlation between acquiring firm's absorptive capacity through R&D intensity and the firm's future performance by using Tobin's Q after three years of M&A transaction with four different moderate variables. In this study, the first hypothesis was discussed to show the direct relationship between the acquirer's absorption capability and after the acquisition firm's performance. Hypothesis 1 predicted that the higher firm's absorption level is what the higher firm's performance would be. Model 1 of Table 2 provides the direct correlation between the dependent and independent variable, and the result demonstrates that the first hypothesis is

supported ($\beta = 0.351, P < 0.001$).

1. Descriptive Statistics

Table 1. Correlations

c	1	2	3	4	5	6	7	8	9	10	11	12	13
1 A_Tobin'sQ_3YR	1.00												
2 ln_size	0.14	1.00											
3 A_ROA	0.05	0.27**	1.00										
4 A_Age	0.28*	0.48*	0.15	1.00									
5 ln_dealvalue	0.08	0.62*	0.29*	0.28*	1.00								
6 A_M&Aexp_3YR	0.07	0.29*	0.14	0.04	0.19*	1.00							
7 A_HighTech	0.32*	0.25*	0.12	0.39*	0.01	0.09	1.00						
8 T_HighTech	0.07	0.12	0.06	0.30*	0.13	0.05	0.53*	1.00					
9 Cash payment	0.12	0.09	0.16	0.05	0.04	0.00	0.08	0.05	1.00				
10 Language	0.16	0.09	0.06	0.06	0.04	0.15	0.09	0.15	0.13	1.00			
11 Relatedness	0.10	0.13	0.21*	0.07	0.02	0.08	0.01	0.05	0.13	0.11	1.00		
12 ln_intangible	0.09	0.33*	0.08	0.18*	0.35*	0.03	0.01	0.03	0.04	0.06	0.06	1.00	
13 A_R&Dintensity	0.15	0.24*	0.53*	0.24*	0.14	0.07	0.25*	0.21*	0.10	0.06	0.00	0.18*	1.00

Note: * $p < 0.05$

[ln_dealvalue 1.12 < VIF < ln_size 2.42] < 10 = no multicollinearity

As the first hypothesis is supported, this study considered four different moderate variables that would affect the acquiring firm's absorption capacity for further study. The four moderators were seen from two different perspectives, from acquiring firms and target firms. Two variables such as payment method and past M&A experience can be searched from information provided from acquiring firms, and the other two variables, the amount of strategic assets and high-tech, are provided based on the target firms' data. Model 2 through 5 show the results of using

a single moderate variable and Model 6 provides the full model with the outcome of using all different moderate variables. Hypothesis 2 through 5 would be proved by showing both single and multiple moderate variables from the result of OLS regression.

For the study, hypothesis 2 assumed that the acquiring firm's past three-year M&A experience would influence positive correlation on the acquirer's absorptive capability and the future firm's performance. In Model 2 of Table 2, the moderation effect of acquirer's past three-year M&A experience with absorptive capacity on firm's future performance is verified at the level of 0.308 and is found to be significant ($P < 0.001$). In the full model, illustrated in Model 6 of Table 2, also shows similar moderation effect ($\beta = 0.211$, $P < 0.1$). Figure 2 depicts the positive moderating effect of the past three-year M&A experience. Therefore, Hypothesis 2 is supported.

Hypothesis 3 assumed that acquiring firm's payment method of cash in the international M&A transaction would create stronger synergy between the acquiring firm's absorptive capacity and the firm's performance. In Model 3 of Table 2, the moderation effect of the acquirer's cash payment with absorptive capacity on the firm's future performance is verified at the level of 1.129 and is found to be significant ($P < 0.001$). However, from Model 6 of Table 2, the full model shows no significance. Figure 3 depicts the positive moderating effect of cash payment. Therefore, Hypothesis 3 is partially supported.

Hypothesis 4 assumed that the more target firm possesses in strategic assets, the stronger the effect on the acquiring firm's absorption capability and its performance would be. In Model 4 of Table 2, the moderation effect of the target firm's strategic assets with absorptive capability on the firm's future performance is verified at the level of 0.415 and is found to be significant ($P < 0.001$). In addition, in the full model, illustrated in Model 6 of Table 2, also shows a similar moderation effect ($\beta = 0.311, P < 0.001$). Figure 4 depicts the positive moderating effect of the target firm's amount of strategic assets. Therefore, Hypothesis 4 is supported.

Hypothesis 5 assumed that if the target firm is in the high-tech industry, it would have a negative effect on the acquiring firm's absorption capability and the firm's performance. In Model 5 of Table 2, the moderation effect of the target firm's high-tech industry with absorptive capacity on the firm's future performance is verified at the level of -2.787 and is found to be significant ($P < 0.001$). Moreover, in the full model, illustrated in Model 6 of Table 2, also shows similar effect ($\beta = -1.456, P < 0.05$). Figure 5 depicts the negative moderating effect of the high-tech industry. Therefore, Hypothesis 5 is supported.

2. OLS regression

Table 2. The Results of OLS regression

Variables	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Acquisition_Year=2001	0.540* (2.33)	0.504* (2.18)	0.549* (2.39)	0.635** (2.85)	0.503* (2.24)	0.565* (2.53)
Acquisition_Year=2002	0.452+ (1.92)	0.413+ (1.76)	0.438+ (1.89)	0.512* (2.27)	0.429+ (1.88)	0.462* (2.05)
Acquisition_Year=2003	0.158 (0.63)	0.134 (0.54)	0.100 (0.40)	0.272 (1.12)	0.190 (0.78)	0.260 (1.07)
Acquisition_Year=2004	0.103 (0.41)	0.086 (0.34)	0.101 (0.41)	0.107 (0.44)	0.066 (0.27)	0.075 (0.31)

Acquisition_Year=2005	-0.266 (-1.05)	-0.280 (-1.11)	-0.276 (-1.10)	-0.250 (-1.03)	-0.302 (-1.23)	-0.279 (-1.15)
Acquisition_Year=2006	0.199 (0.81)	0.162 (0.66)	0.184 (0.76)	0.268 (1.13)	0.143 (0.60)	0.200 (0.85)
Acquisition_Year=2007	-0.123 (-0.48)	-0.150 (-0.59)	-0.107 (-0.42)	-0.050 (-0.21)	-0.103 (-0.42)	-0.081 (-0.33)
Acquisition_Year=2008	0.390 (1.43)	0.364 (1.35)	0.370 (1.37)	0.411 (1.57)	0.357 (1.35)	0.376 (1.45)
Acquisition_Year=2009	0.050 (0.17)	0.024 (0.08)	0.030 (0.10)	0.108 (0.38)	0.012 (0.04)	0.062 (0.22)
Acquisition_Year=2010	0.420 ⁺ (1.79)	0.380 (1.63)	0.393 ⁺ (1.69)	0.437 ⁺ (1.95)	0.411 ⁺ (1.81)	0.409 ⁺ (1.83)
Acquisition_Year=2011	0.168 (0.62)	0.118 (0.44)	0.100 (0.37)	0.109 (0.42)	-0.054 (-0.20)	-0.008 (-0.03)
Acquisition_Year=2012	0.243 (0.96)	0.205 (0.81)	0.227 (0.90)	0.272 (1.12)	0.241 (0.98)	0.242 (1.00)
Acquisition_Year=2013	-0.035 (-0.11)	-0.051 (-0.17)	-0.015 (-0.05)	0.045 (0.16)	-0.022 (-0.08)	0.015 (0.05)
Acquisition_Year=2014	0.479 ⁺ (1.74)	0.452 ⁺ (1.65)	0.470 ⁺ (1.72)	0.562* (2.13)	0.486 ⁺ (1.82)	0.529* (2.01)
ln_size	-0.021 (-0.67)	-0.022 (-0.71)	-0.017 (-0.55)	-0.003 (-0.10)	-0.001 (-0.02)	0.001 (0.04)
A_ROA	0.351 ⁺ (1.77)	0.395* (1.99)	0.414* (2.10)	0.480* (2.50)	0.439* (2.27)	0.506** (2.65)
A_Age	-0.002 (-1.49)	-0.002 (-1.45)	-0.001 (-1.15)	-0.001 (-1.21)	-0.001 (-1.08)	-0.001 (-1.12)
Deal_Duration	-0.001* (-2.04)	-0.001* (-2.13)	-0.001 ⁺ (-1.84)	-0.001 (-1.62)	-0.001 ⁺ (-1.73)	-0.001 ⁺ (-1.68)
ln_dealvalue	0.076* (2.12)	0.077* (2.17)	0.069 ⁺ (1.94)	0.062 ⁺ (1.81)	0.061 ⁺ (1.76)	0.061 ⁺ (1.78)
A_M&Aexp_3YR	0.018 (1.29)	-0.028 (-1.32)	0.018 (1.35)	0.020 (1.48)	0.015 (1.14)	-0.014 (-0.64)
A_HighTech	0.477*** (3.78)	0.462*** (3.68)	0.410** (3.24)	0.326** (2.65)	0.396** (3.21)	0.330** (2.68)
T_HighTech	-0.248* (-1.97)	-0.240 ⁺ (-1.92)	-0.223 ⁺ (-1.79)	-0.221 ⁺ (-1.83)	0.017 (0.13)	-0.091 (-0.68)
cash	0.222* (2.10)	0.213* (2.03)	0.081 (0.72)	0.203* (2.01)	0.172 ⁺ (1.68)	0.215 ⁺ (1.94)
Language	0.100 ⁺ (1.83)	0.089 (1.64)	0.101 ⁺ (1.87)	0.085 (1.62)	0.086 (1.63)	0.074 (1.41)
Relatedness	0.027 (0.27)	0.005 (0.05)	0.029 (0.29)	0.063 (0.65)	0.093 (0.95)	0.073 (0.75)
ln_intangible	-0.019 (-0.89)	-0.016 (-0.77)	-0.016 (-0.79)	-0.067** (-3.09)	-0.023 (-1.11)	-0.056* (-2.52)
A_R&Dintensity	0.351*** (4.30)	0.077 (0.60)	0.308*** (3.78)	0.339*** (4.34)	3.080*** (6.09)	1.592* (2.29)
A_R&Dintensity × A_M&Aexp_3YR		0.308** (2.79)				0.211 ⁺ (1.84)
A_R&Dintensity × cash			1.129*** (3.31)			-0.319 (-0.75)
A_R&Dintensity × ln_intangible				0.415***		0.311***

A_R&Dintensity × T_HighTech				(6.32)	-2.787***	(3.82)
Constant	0.716*	0.846**	0.733*	0.649*	(-5.46)	(-2.11)
	(2.44)	(2.87)	(2.53)	(2.31)	(1.58)	(2.12)
Observations	141	141	141	141	141	141
R^2	0.186	0.200	0.206	0.254	0.238	0.268
Adjusted R^2	0.133	0.147	0.153	0.204	0.187	0.214
Log-likelihood	-622.535	-618.421	-616.740	-602.133	-607.115	-597.627
F	3.551***	3.749***	3.885***	5.110***	4.684***	4.953***
Df(m)	28	29	29	29	29	32

Notes: (1) t statistics in parentheses, (2) ⁺ $p < 0.1$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Chapter 5. Discussion

5.1. Theoretical implications

Throughout the study, we found some of the past literature that featured the importance of absorptive capacity in many different business fields, including international M&As, joint ventures, and strategic alliances. Theoretically, this study highlights the importance of a firm's absorptive capability with international M&A toward the future firm's performance. From the study of Junni and Sarala, their consequence of past literature review argues the deficient of empirical test of relationship between this capability and M&A context (2013). Above all, through proving the first hypothesis with empirical evidence, the study first highlights that if the acquiring firm have higher absorptive capacity, it will bring more prosperity after obtaining the foreign firm.

Not just simply the effect of acquiring a firm's absorptive capacity on the future outcome of the international M&A, but also this study widens the perspective using a knowledge-based view that different characteristics of both acquiring firms and target firms may create a difference in the result. These aspects were seen in two perspectives with four moderate variables. First, this study chooses some of the capability that acquiring firms possess. Past M&A experience implies the possible outcome of utilizing knowledge better to compare to less experienced, and cash payment suggests the courageous action that the acquirer would become successful. Second, this study also implies the importance of the target firm's possessing assets

that influence as moderators toward a firm's performance. The study is differentiated with two moderate variables by providing the amount of the target firm's strategic asset with intangible assets and the type of the asset by differentiating whether the target firm is in the high-tech industry or not.

In addition, as this study used four moderate variables that might influence different future outcomes, we considered not only positive but also negative outcome with moderators. This study presented three different moderate variables; cash-payments, past M&A experiences, and the amount of strategic assets that cause a positive impact on international M&A. On the other hand, when acquiring target firms which are in the high-tech industry, it showed a negative influence while absorbing their knowledge.

5.2. Managerial implications

This study also brings insights for the managerial implications into two points. First, a firm should consider increasing its absorptive capability by increasing their R&D investment for the firm's future success so that they can manage the new knowledge whenever the external insights come in. Not only with R&D investments, their experience of the learning process and confidence to absorb new knowledge might have a more considerable influence on the firm's performance. However, a firm should consider acquiring other high-tech firms more carefully since absorbing the new high-tech knowledge might take more time and effort to digest all the details,

which might negatively influence as expected.

5.3. Limitations & Further Studies

After studying international M&A and absorption capability with four different moderate variables, we find several limitations and insights for further study. First, for the dependent variable, this study used Tobin's Q – three-years after the M&A transaction. Regarding acquiring target companies within the high-tech industry, we considered the negative outcomes since it might take time and effort to compare with non-high-tech companies. However, as considering the different timeline, firms might be able to absorb a much higher level of high-technology, which might have different outcomes. In addition, for further study, we could use different dependent variables, such as patent data, to find out how absorptive capability could influence a firm's increased innovativeness.

Second, this study used four different moderate variables, two variables are from acquiring firms through M&A information and the other two variables are from financial data of the target company. After this study, we could consider some of the other possible moderators from either M&A and financial data. For example, related to industry-type knowledge fusion, this study addressed the target firm's in high-technology. Exploring further, we could consider other industry-types such as inter or intra-industry knowledge. Similar to the high-tech industry, inter-industry might be negatively affected by absorption capability and the firm's performance since it

is a totally unknown area and M&A teams would have to learn from the beginning.

Third, this study only focused on international M&A as a business tool. For future study, we could consider using absorption capability into different business strategies rather than M&A. Earlier, this study mentioned past literature that firms used different tactics such as joint venture or strategic alliance related to the firm's absorption capacity. Therefore, we could extend this study further by using the four moderators into the study of absorption capacity with a joint venture or strategic alliance, whether the moderators would have a similar effect with this study or not.

Fourth, this study only used the United States acquisition of international firms, namely in developed countries. By only limiting acquiring firms only from the United States, this brought only over 140 cases of acquisition. Although samples of over 100 acquisitions may be accepted for the empirical test, this might bring different results when changing some of the circumstance, for instance, eliminating some control variables. Therefore, the study can further extend to acquiring firms from other developed countries for the statistical adjustment.

Chapter 6. Conclusion

The success of M&A cannot be straightly explained, but absorption capability of acquiring firms can partially clarify the possibility of achievement. Therefore, this study cumulates the importance of absorption capability in the field of international M&A. Although there were many studies related to M&A and the absorption capacity, this study found the importance of the acquirer's behavior and action that may influence the higher absorption capability and better future succession. First, the acquiring firm's payment method would have a different effect on future performance. This study found out that cash payments in an acquisition may have a more positive impact on the future firm's performance. It is because acquiring firms are having confidence in profit-making through exchanging knowledge, and cash payment would be a more reliable way to take over target firms among the competition from other firms. Second, the acquiring firm's experience on acquisition brings higher succession effect on the new acquisition. It is because the previous acquisition may bring wisdom on how to absorb necessary extrinsic knowledge and combine it with internal assets. On the other hand, having no experience would take more effort on how to absorb the new assets. Therefore, having an acquisition experience would be beneficial for firms to fuse external know-how faster and easier.

This study also implies the importance of a target firm's possessing assets that influence as moderators toward a firm's performance. First, the amount of the target firm's strategic assets is found to give a positive impact on the final firm's

performance. This is due to the more the target carries their know-how, the possibility would be higher than the acquiring firm would mix different knowledge with their possession, creating new value for better firm performance. On the contrary to the positive effect from the target firm's asset amount, a particular asset type of target firms is causing a negative influence on the acquirer. In this study, the target firm's that are in the field of high-tech industry show the negative impact on acquiring firms. This may be because learning external knowledge and adapting to create internal assets may take more time and effort with high-technology compared to low-tech or medium-tech. Therefore, we could find some opposing effect on the amount and types of the target's own assets.

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Appendix

Figure 2. Moderation effect of IMA experience

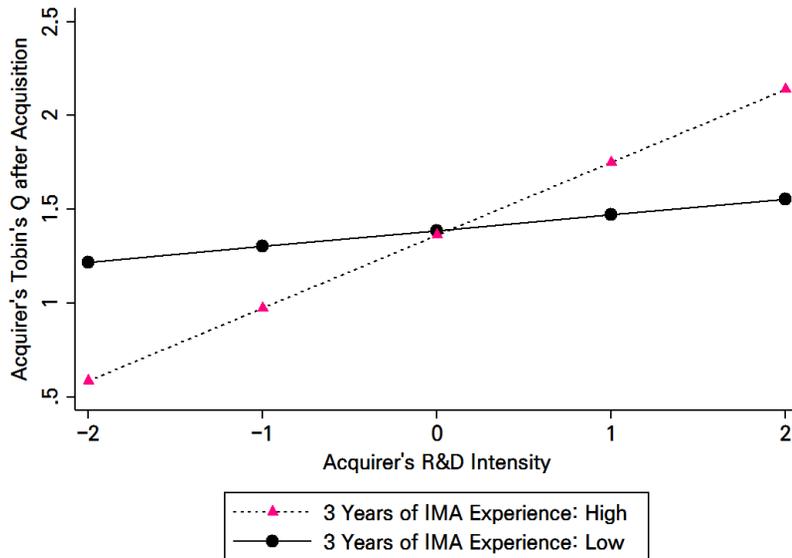


Figure 3. Moderation effect of cash payment

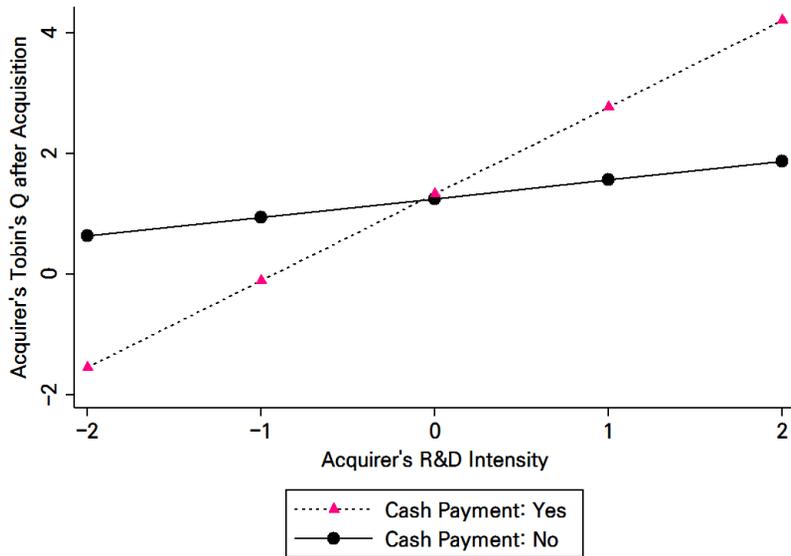


Figure 4. Moderation effect of target firm's Strategic Assets

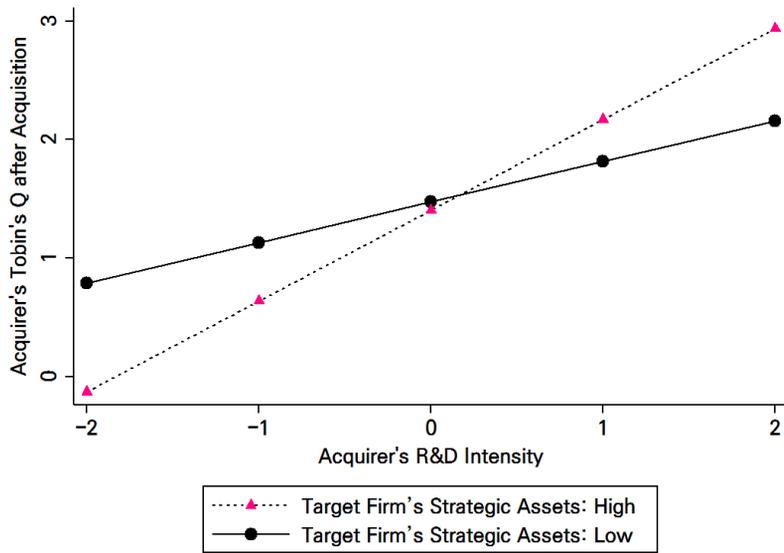
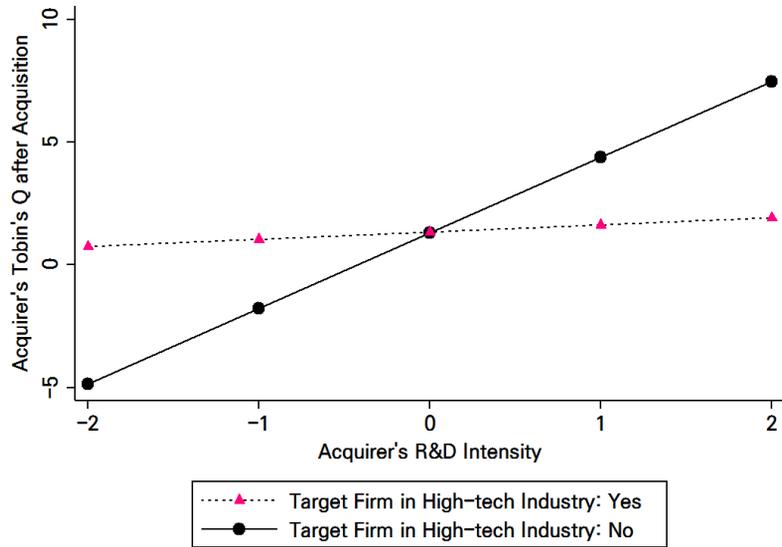


Figure5. Moderation effect of target firm's high-tech industry



국문 초록

본 연구는 기업이 M&A를 통하여 타 기업이 지니고 있는 외부의 자원을 흡수할 때, 인수 기업이 지닌 흡수 능력과 그에 따른 기업의 성과를 알아보려고 한다. 2000년에서 2014년 사이 발생한 미국 기업에서 다른 선진국으로의 141개의 해외 M&A를 통해, 우선 인수 기업의 흡수역량이 높을수록 미래의 기업 성과가 높아질 것이라 주장한다. 더 나아가 본 연구는 인수 기업의 경우 외부의 자산을 다루는 방법이 서로 다를 것으로 추정하는 것과 동시에 피인수 기업 또한 고유의 지식을 가지고 있을 것으로 예상한다. 그러므로 본 연구는 인수기업과 피인수 기업의 특성을 고려하여 두 가지의 시선으로 서로 다른 4개의 조절 변수를 활용하여 기업의 미래 성과에 어떠한 영향을 끼치는가에 대해 연구하고자 한다. 인수 기업의 경우, 외부의 자산을 활용할 능력과 자신감을 알아보려고 하며 이는 기업의 과거 3년 이내의 M&A 경험과 인수하는 과정에서 지불한 방식이 현금일 경우 긍정적인 효과가 나타난 것으로 보여진다. 피인수 기업의 경우, 보유한 자산의 특성을 고려하였는데, 피인수 기업이 보유한 자산의 양과 자산의 종류를 알아보려고 하였으며, 기업의 자산의 양이 많을수록 긍정적인 효과가 나타난 반면 자산의 종류가 첨단 산업의 속한 경우 부정적인 효과를 보였다.