Target Selection Strategies in Mergers and Acquisitions in the Medical Technology Industry

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Abstract

This paper identifies attributes of target companies and proposes a theory to explain and support the decision making of acquiring companies in selecting target companies. It draws on three perspectives: resource-based view (RBV), market power and organizational theory. In order to fulfill this, four in-depth case studies were conducted across three primary sectors in the Medical Technology Industry. Data were collected by series of semi-structured interviews and were analyzed to explore the strategies of target selection in the Medical Technology Industry, typically from RBV, industry characteristics, and acquisition experiences. Findings include eight propositions to support and enrich the conceptual framework and result in a new target selection framework. These eight propositions considers the three major resources: R&D, manufacturing, and marketing in the RBV, important features of industry and acquisition experience by investigating their relationships with target selection, motives, and the stage of the targets. Finally, as a key concept in the propositions, mature business is interpreted in the circumstance of the Medical Technology Industry.

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However, the relatively small number of the cases means that this research is exploratory in nature. The eight propositions and the new framework can form the basis of future work. There may be applications beyond the Medical Technology Industry.

**Key words** target selection strategies, mergers and acquisitions, the Medical Technology Industry

1 Introduction

In the course of the last two decades, there has been a noteworthy surge in the growth, both in volume and value, of the medical technology industry. However, it has been appeared that acquiring companies failed to obtain positive benefits in most of the deals. Also, during the development of these twenty years, this industry has come to a phenomenon which makes it quite representative in mergers and acquisitions (M&As). This industry is dominated by only a few large companies. In total, small companies accounted for less than 20% of the value of the sector but more than 80% of the number of companies in this sector. Due to this particular situation, M&A deals are relatively more than other industries and there is a large candidate pool for large companies to choose from. As such, the Medical Technology Industry is regarded as a typical to study target selection strategies in M&As.

Target selection is the first step of acquisitions, it has been considered as the source of the success or failure of acquisitions. It appears at least as important as the integration in capturing synergies, especially that little effective findings come from tremendous studies on post-acquisitions. Scholars have made quite a few attempts to explore how to select target companies. Basically, the research is from three perspectives: resource-based view (RBV), industry characteristics, and organizational learning. First, the resource-based view of the firm (Wernerfelt, 1984) indicates that the primary objective of acquisitions is to add strategically valuable resources to acquiring firms for long-term competitive advantage and
superior performance (Graebner et al., 2010). Second, some research emphasizes the impact of market power on target selection. Market power theories view M&As as a means to reduce competition and increase market presence (Santos and Eisenhardt, 2009). Third, acquisition experiences provides opportunities for the acquiring companies to improve its skills in screening potential targets with refined criteria, and put on a more accurately price based on their prior experiences (Capron and Shen, 2007).

However, research on target selection strategies is quite limited for two reasons. First, the research on resource-based view only focuses on the resource relatedness without linking to the features of targets in terms of firm growth. As such, some important features of targets are not included, such as, target size and age, which are especially important for start-ups. Second, market power shows the role of competition in acquisitions. It missed the characteristics of industry which provide a platform for competitions and influence the degree and behavior of competition. Third, whether the acquisition experiences is useful or helpful is still controversial. There is a need to identify what kind of experiences is useful in which situation. Fourth, the more considerations in an issue are covered, the more robust and reliable the results will be. It is required to consider these three areas in one framework to identify and explore the triggers embedded in the strategic thinking of acquiring firms.

In recognizing the knowledge gap and business needs, we argue that target selection strategy has critical impact on the synergies captured in the integration. It is considered as the source of success or failure of an acquisition. However, previous research finds that it is difficult to do deep analysis and generalize the results to fit all types of mergers and acquisitions in all the industries (Schweizer, 2005). Besides, frequent use of M&As in the Medical Technology Industry mean that the industry is a rich source of case examples. Thus, research in this industry may provide a comprehensive understanding of target selection strategies in acquisitions. As such, our research question is “How do the acquiring firms select target
companies in the Medical Technology Industry”. The research methodology adopted for the research presented in this paper is essentially exploratory. In-depth case studies were undertaken in four medical device companies. Significant access to staff and records allowed the detailed capture and tracking of the business strategies in each case.

This paper is structured as follows. In Section 2, we explore the research background across the literature in a resource-based view, market power and acquisition experiences. It concludes with identified several research gaps for this study. In Section 3, we set out the methodology in this research and explain the research approach in terms of data collection, data analysis, and quality of research. In Section 4, we present the data collected and describe within-case analysis in this multiple case research. In Section 5, we discuss the findings of the study, which are organized under the preliminary framework proposed in Section 3. In Section 6, we summarize this study with highlights on the major findings, analyze the contributions to both academia and practice, and explore research limitations and future study directions.

The findings from this research include a list of target selection criteria and the crisis assessment theory underlying to choose appropriate target companies. It shows the nature and logic of decision making in target selection among numerous small and medium sized enterprises. The framework fills a theoretical gap between the strategic management and target selection in acquisitions in the medical technology industry. Finally, it offers details in the theory by addressing six constructs which are critical for decision making. Future research can focus on validating the theory by more cases to improve the usability of the theory in different contexts.

2 Literature Review

2.1 A resource-based view
Among all the classic theories, a resource-based view (RBV) is one of the most mature and most commonly used theory in mergers and acquisitions. RBV is based on the theory of firm growth (Penrose, 1959). Wernerfelt (1984) suggested that evaluating firms by their resources can lead to new insights which are different from the traditional perspectives. In the resource-based view, the competitiveness of a firm stem from its access to resources that are valuable, rare, and difficult to replicate and its capabilities to extract the potential value of these resources (Barney, 1991). Consistent with this view, acquisitions has been regarded as a means for rapidly filling in resource gap and obtaining desirable resources to benefit from corporate diversification (Finkelstein, 1997). The research on RBV in M&As are in three levels: (1) classification resources and identify its relationships with potential synergies; (2) Compare the resources of two firms and investigate on the relatedness of resources; (3) Methods and means to integrate the resources to capture synergies.

There are several classifications of resources. For example, tangible assets (such as plants, equipment) and intangible assets (such as brands, know-how, and technical knowledge) (Grant, 1991). Internal and external resources (Hooley et al., 1999). Internal resources refer to the resources which are inside and under the full control of the company. External resources usually consist of relations with parties that are outside the company. In order to identify the resources and its relationships between acquisition performance, five main categories of business resources stand out as: (1) R&D, (2) Manufacturing, (3) Marketing, (4) Managerial, (5) Financial resources (Capron et al., 1998). Further, a group of researchers emphasized on examining specific resources which were related to sustainable competitive advantage (Barney, 1986; Teece, Pisano and Shuen, 1997; Nelson, 1991).

More research studied the impact of relatedness of resources in two firms on acquisition performance. Salter and Weinhold’s (1981) work on the strategic relationship between acquiring firms and target firms indicates that the targets can be categorized as related and
unrelated firms. To this extent, target selection strategies are highly influenced by corporate strategy of acquiring firms on identifying what are their competitive advantages. The concept of relatedness of resources can be extended to resource similarity (Rumelt, 1984) and complementarity (Barney, 1986). Both the similarity and complementarity can bring the economic benefits of resource combination (Tanriverdi and Venkatraman, 2005). However, it has been commonly accepted that a high level of business relatedness creates value to firms in acquisitions (Seth, 1990; Dyer and Singh, 1998). One of the possible reasons is that similarity is always related to synergies from economies of scale and scope (Harrison et al., 1991). Complementarity is often involved with filling resource gap. However, Eschen and Bresser (2005) assert that “mergers and acquisitions are an appropriate means for closing resource gaps if the required resources are of high strategic value, possess a high distance to the existing resource base, and if market and technological uncertainties are moderate or low.” It means that complementarity can create strategic value for acquiring companies even though they are not that easy to obtain.

Resources possessed by two firms can indicate the integration and the value of these resources after acquisition. However, the combination of resources into bundles involves uncertainty and the real value of the resources appears only when they are combined (Denrell et al., 2003). Information asymmetric heavily influenced the judgment of acquiring firms on the real value of resources. The difficulty of acquiring companies to estimate the value of the target increases because of the information asymmetric. Therefore, several other features of targets are often considered by acquiring firms, such as target geographic scope, target age, and public or private. First, valuation difficulties tend to increase if targets are widely geographically dispersed (Carpron and Shen, 2007). Firms face lots of challenges in evaluating distant assets, especially for those spanned in multiple nations (Rosenkopf and Almeida, 2003). Second, the target age also has an influence on the uncertainty of
acquisitions. Generally, the longer firms stand, the more information available and more objective data about their operations (Henderson, 1999). Third, many scholars look at whether the acquiring companies tend to acquire public or private. The shareholders gain when buying a private firm but lose when purchasing a public firm (Fuller et. Al., 2002). Faccio, McConnell and Stolin (2006) confirmed this conclusion and attempted to investigate on the reasons underlying. However, Carpron and Shen (2007) reexamined this issue and proposed the conditions for selection of each type of firms.

Generally, from a resource-based view, the decision of target selection is based on the resources possessed and the future value of the bundles of resources. However, what resources and their attributes are relatively more important in M&As is still unknown. This is one of the research objectives in this research.

2.2 Market power

Market power as one of the motives of acquisitions has been less explored yet is also important (Santos and Eisenhardt, 2009). The concept of market power has overlap with resources. For example, acquisitions can increase the acquiring firm’s power by providing customer relationships (Birkinshaw et al., 2000; Graebner, 2004) to make it more difficult for rivals to emerge. This view is confirmed by Ranft and Lord (2000) by asserting that acquiring companies consider market or customer knowledge and sales relationships as a primary motivation. Besides the market presence, acquisitions can completely eliminating the potential or current rivals to enhance the acquirers’ market power (Graebner et al., 2010). Acquiring companies tend to acquire targets that have technologies which posed competitive threats to the acquirers’ market control (Santos and Eisenhardt, 2009).

Actually, the market power is closely related to industry characteristics as it involves other actors in the industry. Conversely, the industry structure and features might impact the
market power of acquiring companies. As such, it needs to be considered as a factor of the
decisions on target selection. This research explores the relationships between industry
features and the characteristics of targets.

2.3 Acquisition experiences

The study of acquisition experiences is based on the theory of organizational learning. As the
uncertainty related to the value of the target’s resources, the experiences of acquiring
companies on acquisitions might help to make the selection decision. Therefore, researchers
actively relate acquisition experiences to acquisition performance (Haleblian and Finkelstein,
1999; Zollo and Singh, 2004). Hayward (2002) identified the broad conditions in which firms
generated adoptive and timely inferences from acquisition experiences. Zollo and Singh
(2004) pointed out that acquiring firms need to not only select the appropriate mix of
decisions but also have to simultaneously develop the organizational capability to implement
it in order to enhance acquisition performance. The organizational capability can be
cultivated from acquisition experiences. However, research has not identified the impact of
acquisition experiences on target selection strategies, which is also an aspect of this research.

2.4 Medical Technology Industry

The medical technology industry provides tools to healthcare practitioners. The term
“medical technology” was introduced to encompass a wide range of instruments and
equipment which are used by healthcare practitioners and diagnosis, treatment and the
continuing provision of care. In the medical technology industry, there are several different
sectors. Different sectors have different behaviors and regulations in doing business. Major
sectors include orthopedic devices and equipment, medical equipment, and device delivery
system.
The medical technology industry is a representative industry to study mergers and acquisitions. First, rapid technology innovation, high market barriers, and regulatory and reimbursement systems, make it very difficult for small firms to compete directly with larger firms on broad based platforms. As a result, small firms often seek to be acquired after a certain stage, which makes M&As are quite common in this industry. Second, M&As are risky in the medical technology industry. Acquiring companies are quite often to pay high premium to the target, which makes the research in this industry on M&As is worth. Third, shareholders of the target are impossible to lose the game as they have lots of financial rewards in the acquisition. The synergies capture then naturally comes to how to achieve synergies for shareholders of acquiring companies, which is the objective of this research. Fourth, it can be easily identified that deals were led by several seniors of acquiring companies. Therefore, strategies and strategic management are critical to the success of an acquisition. Finally, although different deals have different circumstances and factors, they have more similarities if they are in the same industry. Thus, it is possible to find some patterns and rules in doing a successful acquisition in this industry, which makes this research meaningful.

In sum, considering both the effectiveness and feasibility of the research, the Medical Technology Industry is chosen as a pool of samples in this study.

2.5 Research gap and conceptual framework

It appears from the previous studies that research in target selection strategies are still far less to explain the phenomenon, identify the rationale of decision making and develop a theory in strategic management. Further, previous studies tend to explore or test target selection strategies from only one aspect, such as RBV, market power or organizational theory. The fewer the considerations, the weaker the phenomenon can be explained. Therefore, the
The purpose of this study is to explore the target selection strategies from three perspectives/schools/theories: resource-based view theory, market power/industry characteristics, and acquisition experiences/organizational theory (Fig. 1).

![Fig. 1 Conceptual framework](image)

### 3 Methodology and Research Approach

#### 3.1 The case study approach

This study chooses multiple case study approach by holding social constructionism view. It has been chosen for three reasons. First, the method is appropriate for answering “how” and “why” questions (Yin, 2009). Second, it offers an opportunity to test and explore the preliminary framework with first-hand data. Third, it facilitates the collection of rich data through multiple case studies to provide a comprehensive understanding of each block in the preliminary framework.

The sampling of case studies is essential, as the choice of sample influences the results of a study (Miles & Huberman, 1994). In this study, the case study firms were selected on the basis of criterion sampling (Patton, 2002). The selection of cases should meet a set of priori criteria which are important to the research. Specifically, the firms should be: (1) the two companies should not have equity based relationship before the deal. (2) the deal achieved at least some synergies to shareholder of acquiring firms at a period after the deal from the
Interviewees’ perspective. (3) All the business areas of acquiring firms involved in acquisitions are from developed countries to reduce the regional impact. (4) All the cases should be in major sectors in the medical technology industry. (5) The integration should not be interrupted by external factors.

Generally, research maturity refers to a situation that data collection becomes exhaustive and emergence of key concepts become repetitive. Normally, 4 to 10 cases in case study methodology are understood to be typical (Eisenhardt, 1989). With the criterion sampling strategy, 4 cases were selected across three major sectors: radiation therapy, orthopedics and delivery systems and all the people involved in acquisitions are based in the UK (Table 1).

Table 1 Descriptions of M&A cases as samples

<table>
<thead>
<tr>
<th>Case</th>
<th>Acquiring firm</th>
<th>Year of foundation</th>
<th>No. of employees</th>
<th>Target firm</th>
<th>Year of foundation</th>
<th>No. of employees</th>
<th>Firm Type</th>
<th>Region</th>
<th>Time of the deal</th>
<th>Deal value</th>
</tr>
</thead>
<tbody>
<tr>
<td>B</td>
<td>Firm B</td>
<td>1886</td>
<td>114,000²</td>
<td>Target B1</td>
<td>1895</td>
<td>5,300</td>
<td>Public</td>
<td>UK, US</td>
<td>July, 1998</td>
<td>$35.00 per share and $3.5 in total</td>
</tr>
<tr>
<td>C</td>
<td>Firm C</td>
<td>1856</td>
<td>10,000</td>
<td>Target C</td>
<td>2001</td>
<td>830</td>
<td>Private</td>
<td>Switzerland, UK</td>
<td>Mar., 2007</td>
<td>$889M in cash</td>
</tr>
</tbody>
</table>

² Number of employees in total but not in the medical field
3.2 Data collection

Data were collected from a variety of sources, including 20 in-depth personal semi-structured interviews, archival data in acquisitions, and field visits. About 5 interviews in each case were conducted, amounting to a total of 20 in-depth personal interviews with director of Business Development, Integration leader (Director of Product Managers in most cases) or CFO in the acquiring firms. All these executives were chosen due to their direct experiences of the acquisitions.

In order to fully answer the research question and identify the relationships of each block in the conceptual framework, data were collected based on sectors overview, attributes of acquiring firms, the corporate strategies of acquiring companies in target selection, attributes of target companies, and the motivation, which is used as a test to validate the strategic fit of two companies. Data of resources attributes, industry characteristics, and acquisition experiences can be analyzed from these data.

3.3 Data analysis

The data analysis was in six steps. First, fully transcribed the taped interviews as sources of case analysis. Second, conducting within case analysis by summarizing and comparing interviews within one case (Miles and Huberman, 1994). Third, analyzing interviewee’s feedback on within case analysis to check the validity of the description. Fourth, comparing the interview findings with the preliminary framework to identify potential modifications and fulfillment to the framework. Fifth, cross-case analysis among all the case to identify similarity and differences to generalize the findings. Sixth, refining the preliminary framework according to both within case analysis and cross case analysis.
Typically, resource possession of two companies is analyzed from the motives; industry characteristics can be analyzed from sector overview, attributes of acquiring firms, and attributes of targets; and acquisition experiences can be extracted from corporate strategies of acquiring firms in target selection and attributes of acquiring firms.

### 3.4 Quality of findings

In order to ensure the quality of the case study findings, the following practices were used to increase the validity and reliability of the evidence.

- The preliminary framework which is derived from literature was used to structure the list of questions in semi-structured interviews.
- The evidence was acquired from three sources of evidence (interviews, archives and field visits) and from different key people in acquisitions (Director of Business Development, Director of Product Development and CFO) to present a thorough view of each case.
- The data collected were compared across cross-case studies and against to the preliminary framework.
- The quality of findings was also safeguarded by organizing the procedures of data collection, the use of a case study protocol throughout the data collection process, and the circulation of case study reports to respondents (Yin, 2009).
- The findings were sent back and double-checked by interviewees during case studies to make sure they are correct and have practical meanings.

However, this study is still exploratory to build theories. More work is needed to be done to test and robust the theories.

### 4 Main case studies

#### 4.1 Case A
**Sector Overview**

Radiotherapy sector is quite mature and oligopolistic. There are three main global players having over 50% of the global market share. However, the field is technology led. There are lots of start-ups, which are usually single technology solutions. The vast majority of start-ups fail after a few years, usually because the costs of entering the market are so high (e.g. in meeting medical regulatory standards for design and manufacture) and the adoption of new technology is slow, especially if they haven’t established sales channels. Most of these start-ups are acquired by one of the big players in certain stages.

**Company A**

Company A is an international medical-technology group, which provides clinical solutions, information systems and services for cancer care and management of brain disorders. Its solutions in oncology and neurosurgery are used in over 5,000 hospitals globally. It employs around 2,500 employees globally.

Company A has an active acquisition strategy, and chooses acquisition targets for different reasons.

Tab. 3 Reasons for acquisitions of Company A

<table>
<thead>
<tr>
<th>Reasons</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>To expand product and service range</td>
<td>Acquisition in 1997 to enter the RT business as a linac manufacturer</td>
</tr>
<tr>
<td></td>
<td>Acquisition in 2005 to offer more complete RT solution for customers and increase profitability (high margin products)</td>
</tr>
<tr>
<td>To fill gaps in</td>
<td>Acquisition in 2005 and 2007</td>
</tr>
</tbody>
</table>
product line  Acquisition in 2008 to fill major gap in treatment planning and provide a complete software solution offering

To enter emerging Acquisition in 2006 in China to provide factory, R&D skills, markets with low and low-cost products suited to emerging market.

price products

With these acquisition strategies, Company A has shown a very conservative policy on acquisitions. They have not acquired any speculative start-ups. Even for those targets which were not profitable at the time of acquisition, Company A can see that they would become profitable in a very short-time route. Thus, Company A would like to acquire a company with established products and revenues.

**Target A**

Target Company A1 was co-founded by two scientists in 1995 in Germany. It provides innovative products that improve patient handling and positioning. Before acquired by Company A, it was a leading worldwide supplier of innovative and advanced radiation oncology and interventional guidance products.

**Motivation**

The primary motive of this acquisition was to fill gaps in product line of Company A. The products of Target A could be integrated to the products of Company A very well. The market for these products was expected to grow rapidly in the next a few years. Development capability, which is highly related to the products, was also complementary and one of the motives of the acquisition. Also, the manufacturing site of Target A was in Germany, while the site of Company A was in the UK. The sales of Target A relied on third parties but not direct sales, which was quite different from Company A. Finally, Target A was in a healthy financial status and became profitable before the acquisition.
4.3 Case B

**Sector Overview**

The orthopedics sector does not have rapidly changing technology, compared with technology in other sectors, such as cardiology. It is dominated by three top players. Each has 20% market share. There are two other players which have 14% or 15% market share. And there are lots of players less than 2%. It is quite a stable market on competition. Therefore, it is hard for a company to change its position. Surgeons in orthopedics usually take a number of efforts and trials to get comfortable to use the new product. Once a surgeon gets comfortable to a particular design, shape and other attributes of the product, he doesn’t want to change. In order to switch, the surgeon runs the risk of making mistakes. In this circumstance, the only way for companies with small market share to get market in orthopedics sector is through acquisition. However, in orthopedics, apart from spine, most of the companies cannot compete with market leader in terms of products. Therefore, a majority of acquisitions in this sector are for the market channels but not the products.

**Company B**

Company B is a global American pharmaceutical, medical devices and consumer packaged goods manufacturer. The corporation includes some 250 subsidiary companies with operations in over 57 countries. Its products are sold in over 175 countries and its brands include numerous household names of medications and first aid supplies.

In target selection, from Company B’s view, which stage of the target company is more appropriate to acquire depends on the individual technology and how much risk there is in each of these stage. First, if Company is acquiring a well-paid protected technology that was very similar to some they have already had, they would be happy to acquire the business
early as they understand this business extremely well and can assess what risks are associated with regulatory approval, clinical outcome and etc.. But if there is a huge risk in regulatory approval, unless if they missed this opportunity it would be dangerous to them in case of their competitor acquiring, they generally tend to wait. Second, the stage of start-ups depends heavily on how the technology changing the way of the products and services offered in a particular healthcare. Generally, if it is a rapidly changing technology, it is changing the way that the disease is treated or the cost or the availability of how healthcare delivered: receiving treatment at home or in hospital. Then it is wise to do an early acquisition. On the other hand, if it is more steady mature technology, it is more likely to buy a stable stage company, after the company has already proved their products work. Although more money is expected to pay, it would be safe.

**Target B**

Target B was a very first commercial orthopedic manufacturing company in the United States. Before the acquisition, its portfolio includes more than 200 products and headquartered in Warsaw, Indiana, USA and Leeds, U.K.

**Motivation**

At the time of the acquisition, the business of Target B was more mature than the orthopedics business of Company B. The orthopedics business was part of the whole business of Company B. The primary initiative of this acquisition is from the corporate strategy of Company B. Company B has a clear view to be No.1 or No.2 in the key markets they play in. They took a broad picture of where the growth opportunities in healthcare might be and orthopedics is one of these segments identified. After reviewing the available companies in the market, they found that Target B could be a strong candidate as it had a relative complete product portfolio in orthopedics (knees, hips, spine, trauma and sports medicine), strong
development capabilities, global footprint and better financial performance. However, Company B only had some products of hips and knees and American market. As a result, Company B benefited a lot from this acquisition, mostly from revenue synergies (market growth, full range of products and sales channels in Europe and other countries), but not so much from cost synergies, which are only from economies of scale on the overlapped products.

4.4 Case C

Company C

Company C is an industry leader in each of three main global business units: orthopedic reconstruction and trauma, endoscopy and advanced wound management. It currently operates in 32 countries and is top listed in Arthroscopy, Advanced Wound Management, Trauma and Clinical Therapies and reconstruction. It is one of the top companies in its field in the world.

There are not so many companies which are available to be acquired. Company C has experts in business development to keep an eye on the companies which can be available for acquisitions. In the orthopedics industry, DePuy, Stryker and Zimmer are the market leaders with more than 20% of the market each. Company C is at the fourth place and wants to improve its market position. Therefore, in seeking the target, Company C chooses companies which can improve its market position through consolidation.

Target C

Target C was founded in Switzerland in 2001. At the time of the acquisition, it had sales about 300 million dollars and the trading profit was 36 million dollars.

Motivation
The strategic rationale of this deal is to increase the market coverage and position of Company C in the market. Target C had a good geographical coverage in Europe, which was complementary to Company C. The two companies had similar products and similar ongoing research projects. The sales channels were overlapped in most of the regions. Target C had two manufacturing facilities: Switzerland and China, which were complementary to Company C. The two companies do not have similarities in suppliers. Therefore, synergies of Company C are potentially from revenue and cost. Revenue synergies were primarily from the cross-selling. Opportunities for cost synergies were from rationalization of sales force, head office, administrative and back office functions across Europe.

4.5 Case D

**Sector Overview**

In medicine, infusion therapy deals with all aspects of fluid and medication infusion, usually via the intravenous route. A special infusion pump can be used for this purpose. Infusion therapy sector doesn’t have high or rapidly changing technology. Its customers are more widely spread across hospitals and home. It has been recognized as consumer-based products. The manufacturing sites of this business sector are now moving to developing countries to benefit from the low labor costs. The profits of this sector are primarily from reducing the costs by economies of scale.

**Company D**

Company D is a leading global provider of medical devices for the hospital, emergency, home and specialist environments. Their products are used during critical and intensive care, surgery, post-operative care during recovery, and in a series of high-end home infusion

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therapies. They employ around 7,500 people, with manufacturing concentrated in the U.S.,
the U.K., Mexico and Italy.

Company D prefers to buying companies which is relatively in small size. They call it “bolt
on” acquisitions. From their perspective, big acquisitions are not value creative. There are
three reasons to buy small companies.

1 Non-core business

Because the target company is small, it doesn’t have so many businesses that the
acquiring company doesn’t want. It reduces the possibility of disposal in the future.

1 Culture

For “bolt on” acquisitions, the company doesn’t tend to worry so much about the
culture. But for bigger acquisitions, there is a culture problem. One of the major
culture problems is power struggle. Usually, senior managers have their team around.
If they are fired, their team would go with them. The power struggle after the
acquisition can be very disruptive.

1 Restructure

For small company, the acquiring can take off some costs and nurture it by
developing the technology from that company and cross-selling. In theory, it makes
more value than acquiring a big company. For the big company, the acquiring
company need huge amount of energy to restructure the mesh the two companies,
which makes creating value difficult.
In terms of risk of acquisitions, Company D always buys mature businesses. They tend to buy companies which already have products on the market because of low risk. Normally, they choose targets in mature business because they plan to be profitable in three years.

**Target D**

Target D is a global manufacturer and marketer of critical care and alternate care medical products. It markets and sells critical systems and products to over 5,500 hospitals in more than 75 countries through a global sales force and distribution network. Target D is headquartered in California, the U.S.

**Motivation**

The primary motive of Company D was to complete its product portfolio to develop a small but fast growing safety business. Target D had safety catheters which filled the gap. It also had strong R&D capabilities in safety business. The two companies were complementary in manufacturing and supply chain. However, they covered the same market, both in the U.S. Synergies are expected from both product portfolio complement and savings from economies of scale.

**5 Cross-case Analysis and Discussion**

This section primarily deals with conclusions from the cross-case analysis. The focus is on how the acquiring companies select targets from the considerations of RBV, Industry characteristics and Acquisition experiences.

**5.1 Resource-based view**

As discussed in the literature review, the resource-based view which is related to target selection is consisted of two parts: classification of resources and resource relatedness.
Resources which contribute to synergies were categorized as R&D, manufacturing, marketing, managerial and finance (Capron et al., 1998). Relatively, R&D, manufacturing, and marketing are more important to future performance. However, this categorization seems too general to explore the target selection strategies from RBV. The typology of resources draws from the classification of Amit and Schoemaker (1993). R&D resources encompass technological capability, R&D capability, and product development speed. Manufacturing resources include production cost structure and facilities. Marketing resources are consisted of brand management, distribution channels, buyer-seller relationships, user base, customer service, and business reputation. Reviewing the case data, some attributes of elements of each category can be identified.

R&D: Two elements in R&D resources are highlighted in sampled cases: Technology and Product.

Mostly, targets’ technology typically involves complex, socially embedded knowledge that is difficult to measure (Coff, 1999). Complexity and social embeddedness can improve the possibility that the acquired technologies are inimitable and will bring competitive advantages to acquiring companies, yet these technologies also bring uncertainty and increase the likelihood that the targets’ resources will be under-valued (Coff, 1999). In order to reduce the uncertainty and risk, different companies have different strategies. In Case A, Company A prefers to acquire the targets which have mature technologies. The targets are normally with established products and revenues. The technologies in Target A are complementary to Company A. In Case B, Company B is possible to acquire technologies at an early stage they are familiar with to have a better estimate on the value of technologies. Also, the strategy is heavily on how the technology changes the way of products and services in a particular healthcare. Target B has technologies which are highly complementary to those Company B have. If the targets possess a rapidly changing technology, it will change the way that the
disease is treated or dramatically reduce the cost or improve the availability of how healthcare delivered. Company B prefers to acquire early. In Case C, Company C tends to acquire mature technology to reduce risk and business of big companies in order to improve its market position through acquisitions. The technologies of Target C are similar to Company C. In Company D, Company D prefers to buy companies which are relatively in small size but the technology is mature. The technologies of Target D are similar to Company D but the R&D capabilities are stronger. The acquisition enhances the market of Company D in the American market.

In sum, the overall rationale behind these acquisitions is related to two attributes of technologies: the maturity of the technology and the relatedness of the technology.

Proposition 1a: When acquiring firms in the Medical Technology Industry, acquiring companies tend to acquire technologies at their early stage in a familiar area in order to reduce risk and uncertainty.

Proposition 1b: When acquiring firms in the Medical Technology Industry, acquiring companies tend to acquire disruptive technologies at their early stage in order to maintain their competitive advantage.

Proposition 1c: When acquiring firms in the Medical Technology Industry, acquiring companies tend to acquire technologies which are complementary to their technologies in order to fill in the resource gap but similar to their technologies in order to enhance the market position.

In the Medical Technology Industry, it has been widely accepted that it becomes more safety to acquire a target which has its products as the target has already passed the regulatory approval and got reimbursement before product launch. In all the cases, acquiring companies
tend to acquire targets which have their products on the market. However, the motives of product acquisition vary in cases. In Case A, Company A acquires Target A as its products can fill in the product portfolio gap. Target A is a SME but not a large company. In Case B, Company B chooses Target B to start business in a new segment – Orthopaedics. At that time, Target B was already a large public company and top 3 in the orthopaedics sector. In Case C, the products of Target C are similar to Company C and their market size is about 12% in the orthopaedics sector. It is a large private company. In Case D, the products of Target D are highly similar to Company D. It is a large private company. It appears the rationale is different for the size of the targets.

**Proposition 1d:** When acquiring firms in the Medical Technology Industry, acquiring firms tend to acquire SMEs to complete their product portfolio but large targets to step into a new market segment or enhance their market position.

**Manufacturing:** Although an important asset, manufacturing has not attracted as much attention as technology and market. In the Medical Technology Industry, manufacturing is a big investment for SMEs. Also, as obtaining regulatory approval and reimbursement needs a large amount of expenditure, for most of the start-ups, they need a second-round ventral capital to establish manufacturing sites. If failing doing this, they outsourced their manufacturing. As such, manufacturing is a sign for a company stepping into a medium-size in the Medical Technology Industry. In Case A, the manufacturing sites of the two companies are complementary. Target A provides the manufacturing site in the Europe for Company A. In Case B, as Target B is a large well-established corporation, it gives Company B the manufacturing capabilities both in terms of the geographical coverage and new products. In Case C, similar to Case A, Target C complementary to the manufacturing of Company C in geographical expansion. In Case D, the situation is similar to Case A and C to provide manufacturing sites in the America.
Proposition 2: When acquiring firms in the Medical Technology Industry, the larger the targets, the more likelihood that the manufacturing becomes one of the primary motives of the acquisitions, especially for those have complementary geographical coverage.

**Marketing.** Marketing is crucial for companies as it closely related to sales and profits. Marketing resources such as sales networks often embody socially complex incentive mechanisms and tacit knowledge about the competitive environment (Hennart and Park, 1993). As the difficulty of establishment, companies tend to acquire to save time and costs. In Case A, Company A aims to obtain the market associated with complementary products of Target A. In Case B, Company B is motived by the large market share of Target B both in terms of geographical range and products. In Case C, Company C would like to increase its market position by acquiring the Target C’s market in Europe. In Case D, Company D easily gets the market coverage in America through the acquisition. It can be identified that the motives of acquiring marketing resources varies on the size of the company.

Proposition 3: When acquiring firms in the Medical Technology Industry, the larger the targets, the more likelihood that the motives of acquiring the marketing resources are enhance the market position by obtaining the geographical coverage. On the contrast, SMEs only provide marketing resources with product-related market.

5.2 Industry characteristics

The industry provides the acquisitions a competitive environment and the acquisitions restructure the industry as a feedback. Because of this interaction, industry characteristics are highly related to the preference in targets selection. The four cases cover the three major segments in the Medical Technology Industry: radiationtherapy, orthopaedics and delivery systems. Generally, all of these three segments are well-developed and quite stable, which means that they are dominated by several large companies and there is less possible for start-
ups to have disruptive technology to ruin the market of dominators. Therefore, the market leaders have less concern on start-ups but tend to acquire mature business to reduce risk. In the view of Company B, if the targets possess a rapidly changing technology, it will change the way that the disease is treated or dramatically reduce the cost or improve the availability of how healthcare delivered. Company B prefers to acquire early. It also indicates that to acquire targets at its early stage happens frequently in sectors which has rapid-changing technology, such as cardiology.

**Proposition 4:** When acquiring firms in the Medical Technology Industry, acquiring companies prefers to acquire targets at their early stage when the sector has rapid-changing technology and is not stable.

5.3 Acquisition experiences

Acquisition experiences can definitely help the acquiring companies to reduce uncertainty and risk when acquiring targets, especially when information asymmetry exists. However, whether the acquisition experience can guide the acquiring companies to choose a right target is still controversial. This research explores the phenomenon of the impact of acquisition experiences on target selection, and aims to identify several patterns.

In Case A, Company A has a conservative strategy in firm growth. It is a company which is grown up by organic growth. Therefore, it does not have much acquisition experiences. In order to be safe, it requires the targets is or can be proved to be profitable after the acquisition. In Case B, Company B is grown up by acquisitions. It usually chooses acquisitions as a means to go into a new market segment. It can acquire targets in their early stage as Company B is confident in their experiences to reduce risk and uncertainty. In Case C, the acquisition experiences are not as much as Company B has. But it did several acquisitions before. Acquisitions and organic growth is a corporate strategy in firm growth in different periods,
which appears alternatively. Company C prefers to buy big companies to enhance its market positions. In Case D, Company D has quite a lot of experiences in acquisitions. It prefers to buy companies which are relatively in small size but should have mature business. Acquiring large companies is not value creative in their view as it brings too many conflicts in integration.

In sum, the relationship of acquisition experience with the target selection strategies are mainly around the size and stage of the targets.

Proposition 5a: When acquiring firms in the Medical Technology Industry, the more acquisition experiences of acquiring firms have, the more possibility to afford risk and uncertainty to acquire targets at their early stage with relatively lower price.

Proposition 5b: When acquiring firms in the Medical Technology Industry, the more acquisition experiences of acquiring firms have, the more possibility to acquire a large company to enhance market position and step into a new market and more capabilities to deal with conflicts arose in integration.

6 Toward a new target selection framework

This study investigated how acquiring firms in the Medical Technology Industry select targets to obtain strategic fit and resulted in the development of a targets selection framework (Fig. 2).
This new target selection framework encompasses three research perspectives (RBV, Market power, and organizational theory). The purpose is to identify and explore the underlying rationale for target selection in acquisitions from the standpoint of acquiring companies. The framework is consisted of eight propositions to show the preference of target selection. Generally, if reviewing all the propositions, more than half are related to the stage of firm growth of the targets. It might due to the target age is an important feature of a company, especially for companies in a high-tech industry, such as the Medical Technology Industry. The growth path of SMEs in the Medical Technology Industry can be divided into six stages: Intellectual Property Filling & Issuance, Proof of concept, POC clinical trial, Reimbursement, CE Approval/ FDA Approval and CE 1st revenue/ FDA 1st revenue. However, not all of
these stages have impacts on strategies of target selection and some critical stage needs to be inserted to the growth path. From main case studies in Section 4, the growth path which needs to be concern in target selection in acquisitions is categorized as clinical trial, 1st revenue, and manufacturing ability for SMEs.

Companies expand their critical resources when they grow their business. Typically, in the Medical Technology Industry, when the company has just finished clinical trial, they only have the technology. After the company has the 1st revenue in the market, they have possessed the resources of technology, reimbursement, regulatory and products. When the company starts to build up their manufacturing ability, they have stable sales channels and mature business of after-sales service. In the few years after the company obtain the manufacturing ability, the company steps into the period of big companies and they have their own market which have significant influences on the industry.

Fig.3 Path of firm growth in the Medical Technology Industry
Fig. 3 shows the stages of firm growth and the key resources they have in each stage in the Medical Technology Industry. The vertical axis means the resources which become considerations of acquiring companies in acquisitions. If relating the path of firm growth in the Medical Technology Industry to the maturity of targets in propositions, it is easy to identify that the firms become mature after they have manufacturing ability. In other industries, there may be different interpretation on the maturity of business.

7 Conclusion

This paper explores the strategies in target selection in acquisitions in the medical technology industry from the view of acquiring firms. In order to provide a generic view, it considers the research schools ranging from RBV, Market power, to Organizational theory. First, it starts with the review of the literature in the three research schools and clarifies the research gaps by developing a conceptual framework. Second, it chooses case study approach to develop the framework from four in-depth cases. It collects data from four parts: sectors overview, attributes of acquiring firms, the corporate strategies of acquiring companies in target selection, attributes of target companies, and the motivation. Third, cross-case analysis and discussion are around the three blocks in the conceptual framework and develop eight propositions to support and enrich the framework. Fourth, further discussions are the new target selection framework with a deeper analysis on the firm growth in the Medical Technology Industry.

The research set out in this paper suggests the following:

1. R&D, manufacturing, and marketing are three major resources which influence the target selection strategies. In selecting targets, the R&D needs to be considered from two elements: technology and products. The familiarity of the technology (P1a), its attributes (P1b) and the relatedness of technology (P1c) are the factors to decide whether to buy. And the stage of the targets impacts the motives which related to
products (P1d). Besides, the primary motives associated with manufacturing (P2) and marketing (P3) are explored separately.

Industry characteristics interact actively with the target selection. The industry structure and its features are explored relating to the stage of the targets (P4).

The impact of acquisition experiences is a popular issue in organizational theory on M&As. Its relatedness with the stage of the target (P5a) and the motives associated (P5b) are proposed.

Mature business, as a key concept in propositions, is interpreted in the circumstance of the Medical Technology Industry and can vary in other industries.

It is important to recognize that findings based on only four cases cannot provide robust validation of the framework and further work is undoubtedly needed to test issues in discussion to develop a more validated framework. Also, the work of this study needs to be test in other industries in order to generalize the findings. Finally, the theory also offers the opportunity to develop tools to support more systematic and comprehensive selection of target companies in mergers and acquisitions. This can also be considered as part of future work.

References


