



# Exploration and exploitation in mergers and acquisitions

## An empirical study of the electronics industry in Taiwan

Liang-Hung Lin

*Department of International Business,  
National Kaohsiung University of Applied Sciences, Kaohsiung, Taiwan,  
Republic of China*

### Abstract

**Purpose** – The central concern of organizational learning and corporate strategy has, in recent decades, focused on the rational choice and appropriate balance between exploration and exploitation. Dividing mergers and acquisitions (M&As) into related and unrelated M&As, this study applies the exploration vs exploitation construct to examine how different M&A strategies affect exploration and exploitation of the combined firm, how post-acquisition integration affects exploration and exploitation of the combined firm, and how organizational ambidexterity affects post-acquisition performance. The paper aims to discuss these issues.

**Design/methodology/approach** – Organizational and industry level data were drawn from the top 1,000 Taiwanese electronic and computer firms reported by 2009 China Credit Information Service, an authorized credit-rating company in Taiwan. The companies are classified into four industries: computer and associated equipments manufacturing (SICs 271x, 274x, 276x); integrated circuits (SIC 261x), opto-electronics and telecommunication (SICs 264x, 272x, 277x) and electronic components (SICs 262x, 263x, 264x, 269x, 275x). Questionnaires were distributed to general managers of the top 1,000 electronics companies.

**Findings** – This investigation of Taiwanese electronic and computer firms revealed that related acquisitions with high degrees of acquisition integration positively affect the combined firm's exploitation; unrelated acquisitions with high degrees of R&D expenditure and acquisition experience positively affect the combined firm's exploration. The firm's ability of simultaneously pursuing exploitation and exploration positively affects its post-acquisition performance.

**Originality/value** – The contribution of this study is to understand how acquisitions influence exploitation and exploration. With regard to the relationship between acquisition and exploitation/exploration, this study finds that unrelated acquisitions enhance exploration, whereas related acquisitions enhance exploitation.

**Keywords** Organizational learning, Integration, Mergers and acquisitions

**Paper type** Research paper

The central concern of organizational learning and corporate strategy has, in recent decades, focused on the rational choice and appropriate balance between exploration and exploitation. Dividing mergers and acquisitions (M&As) into related and unrelated M&As, this study applies the exploration vs exploitation construct to examine:

- how different M&A strategies affect exploration and exploitation of the combined firm;



- how post-acquisition integration affect exploration and exploitation of the combined firm; and
- how organizational ambidexterity affect post-acquisition performance.

This investigation of Taiwanese electronic and computer firms revealed that related acquisitions with high degrees of acquisition integration positively affect the combined firm's exploitation; unrelated acquisitions with high degrees of R&D expenditure and acquisition experience positively affect the combined firm's exploration. The firm's ability of simultaneously pursuing exploitation and exploration positively affects its post-acquisition performance.

Strategic management theory suggests that corporate-level strategy involves the continuous pursuit of new domains, in which organizational ability is explored and exploited to create value from using its core competences. M&As, consisting of related and unrelated acquisitions, have been considered as an effective corporate-level strategy in recent decades (Barkema and Schijven, 2008; Shaver and Mezias, 2009). In industries such as automotive, pharmaceutical and computer industries, numerous acquisitions have increased the industrial consolidation. International firms usually implement acquisitions due to perceived benefits from reducing cost, adding product value, reducing price competition, increasing bargaining power and enhancing organizational innovativeness (Siegel and Simons, 2010). Firms may undertake acquisitions in order to access strategic assets of the acquired firm such as customer and supplier relationships, distribution systems and technological know-how. The acquiring firm may intend to increase efficiency and reduce production costs of the target firm by technology transfer and improved management as well as enhance innovation in a new market by investing heavily in R&D. Concurrent with increased acquisitions, technological development and organizational innovation has gained importance in recent decades. Global technological change and keen competition have increased the value of technological innovation because it can help firms gain and maintain competitive advantages.

Exploiting existing markets and exploring new markets are unquestionably the major reasons in acquisitions. Possible choices include concentrating on existing products in existing markets or diversifying into new products in emerging markets. In fact, different acquisition strategies may have different effects on exploration and exploitation. The benefits of related acquisitions can be achieved by minimizing R&D redundancy (i.e. closing acquired R&D departments and dismissing surplus R&D employees), so that R&D efficiency can be enhanced in the merged entity. Nevertheless, the repercussions might occur in the departments of the acquired firm and consequently reduce individuals' will to explore new or risky technologies. Although synergy can be available for some functions in unrelated merged firms, tightly integrating R&D is not required because technological capabilities of the acquiring and acquired firms are unrelated. Instead, a high degree of autonomy cannot only help the acquirer explore new products and technologies, and but also reduce the costs and difficulties associated with coordination. However, loosely coupled R&D departments may not reach the synergy required to exploit existing knowledge in the current domain for the acquiring firm. This study applies the exploration vs exploitation construct to examine the impact of acquisition strategy (related/unrelated) on exploration/exploitation.

While previous studies mainly concentrated on how to achieve the expected benefits of related/unrelated acquisitions, many scholars suggested that a cautious selection of target

firms (Haspeslagh and Jemison, 1991; Larsson and Finkelstein, 1999) and sufficient post-acquisition integration (Datta, 1991; Haspeslagh and Jemison, 1991; King *et al.*, 2004; Pablo, 1994; Phene *et al.*, 2012) are also crucial for a successful acquisition. However, combining two firms is a managerial challenge because different types of acquisitions require different integration strategies and mechanisms (Puranam and Srikanth, 2007; Stahl and Voigt, 2008). In general, scholars of organizational integration (Larsson and Finkelstein, 1999; Puranam *et al.*, 2009) proposed that related acquisitions demand high degrees of integration and tightly-controlled systems, whereas unrelated acquisitions demand low degrees of integration and loosely-controlled systems. Following integration literature (Puranam *et al.*, 2006), this study argues that different modes of organizational learning (exploitation/exploration) require different degrees of acquisition integration.

Although the exploration/exploitation selection or trade-off is necessary due to the competition for scarce resources within organizations, a complementary or balanced perspective is essential (March, 1991, 2006; Rothaermel and Deeds, 2004). As Levinthal and March (1993, p. 105) stated, “[t]he basic problem confronting an organization is to engage in sufficient exploitation to ensure its current viability and, at the same time, to devote enough energy to exploration to ensure its future viability”, survival and growth require a dynamic balance. In some cases, exploitation may involve exploring new business opportunities, and exploration may involve enhancing the knowledge base of the firm (Katila and Ahuja, 2002). Although near consonance exists on the need of balance, maintaining balance is difficult owing to not only the ambiguity of appropriate balance, but also the changing environment. In expanding the concept that “adaptation requires both exploitation and exploration to achieve persistent success” (March, 1991, p. 205), the concept of an ambidextrous organization was proposed (O’Reilly *et al.*, 2009; O’Reilly and Tushman, 2004; Tushman and O’Reilly, 1997). Ambidexterity refers to “the ability to simultaneously pursue both incremental and discontinuous innovation and change results from hosting multiple contradictory structures, processes, and cultures within the same firm” (Tushman and O’Reilly, 1996, p. 24). The concept of ambidexterity suggests that the harmonization of exploration and exploitation can enhance the dynamic capability of an organization (Eisenhardt and Martin, 2000; Lin *et al.*, 2007). Thus, this study applies the exploration vs exploitation construct to examine whether simultaneous pursuit of exploration and exploitation is possible in acquisitions, and how this ambidextrous capability affects post-acquisition performance of the combined organizations.

### Theory and hypotheses setting

#### *Acquisition strategies and organizational exploration/exploitation*

While exploration concerns the search for new technologies to develop new products/services in new markets, exploitation concerns the search for the improvement of existing technologies with the intention of enhancing product performance, quality and efficiency in the current market. Benner and Tushman (2002) proposed the typology of technological strategy, in which exploratory innovation involves altering the technological trajectory, whereas exploitative innovation involves improving the product and process on the current technological trajectory. In other words, “innovation is increasingly exploratory the more it departs from knowledge used in prior innovation efforts and, conversely, increasingly exploitative the more deeply anchored it is in existing firm knowledge” (Benner and Tushman, 2002, p. 679). Regarding acquisitions, corporate strategy involves identifying new domains in which

organizational advantages in costs or competence are explored or exploited (Porter, 1987). The two possible directions are exploiting existing products in the current industry or diversifying into new products in other industries.

In terms of strategic growth, corporate strategies concern identifying new domains to explore or exploiting to reduce costs or enhance competence (Porter, 1987). Possible choices consist of concentrating on existing products in existing markets or diversifying into new products in emerging markets. Related acquisitions are motivated to gain access to umbrella branding products, sharing knowledge, and production capacity. This strategy is appropriate when industry competitiveness is fierce and the industrial attractiveness is low (Porter, 1987). The distinctive competence of acquiring firms also gives them strength to diversify. Since the products and processes are related, this strategy aims to synergize the customer base, knowledge, skill and technology. However, related industries may operate in different trajectories. The core competence of firms adopting diversification and differentiation strategies is their ability to quickly develop new products. Senior managers must increase organizational exploratory and exploitative capabilities because close cooperation between functions is required to develop new products in new markets. Regarding functional departments after acquisitions, there are two major effects on the merged companies. First, minimizing R&D redundancy can be achieved by closing acquired R&D departments and dismissing surplus R&D employees. This action can increase R&D efficiency in the merged entity (Håkanson, 1995). Second, the repercussions in other departments in the acquired firm might reduce individuals' will to explore new or risky technologies. Even when the acquiring and acquired firms have overlapping technological capabilities, they might identify efficient method of extending existing R&D resources. This method is considered important when the labor market is tight and acquisitions can acquire engineers with first-hand knowledge. Based on the different learning process, a firm's exploitative learning is built upon the existing technologies, whereas exploratory learning demands new knowledge and departure from existing technologies (Benner and Tushman, 2003). Compared with unrelated integration, related M&A firms pay much attention on exploration as their existing market/product. Under the circumstances, firms tend to "engage in sufficient exploitation to ensure its current viability" (Levinthal and March, 1993, p. 105) to the exclusion of experimentation (Levitt and March, 1988). Since the objective of related acquisitions is to continuously exploiting opportunities in the existing domain, exploitative learning, built upon existing customers and knowledge, can be applied in related acquisitions (Benner and Tushman, 2003). Thus, this study proposes:

*H1A.* Exploitation of the combined firm is positively associated with related acquisitions.

Managers may adopt unrelated acquisitions when the current industry is unattractive and their firm lacks outstanding competence which can be easily transferred to related products or service (Delios and Beamish, 1999). Unrelated acquisition occurs when a firm merges with or acquires firms in new domains. The value from this strategy comes from one particular ability: improved performance of top management in developing unique skills, reducing bureaucratic costs and managing flexible structure. Firms acquiring inefficient companies in other industries may see opportunities to expand and explore new products in new markets. Unrelated acquisition has two main

effects on innovation. One of both is the addition of unrelated technologies and skills within the merged entity (Håkanson, 1995). Although synergy can be available for some functions, tightly integration of R&D is not necessary because the technological capabilities of the acquiring and acquired firms are unrelated. A high degree of autonomy in the acquired firm helps acquirer explore new products and technologies, and reduce the costs and difficulties associated with coordination. However, loosely coupled R&D departments may not achieve synergy required to exploit existing knowledge in the current domain for the acquiring firm. Moreover, potential benefits of unrelated acquisition derive from acquiring the target firm's complementary capabilities and resources (Haspeslagh and Jemison, 1991), which increase post-acquisition performance in the manufacturing and service industries (Harrison *et al.*, 2001; Hoskisson and Hitt, 1988) because the combined complementary capabilities (can be human capital as well) facilitates the merged entity to explore and take advantages of new opportunities.

Considering countervailing forces (Harrison *et al.*, 2000), takeover resistance frequently occurs, as the acquiring firm often replaces acquired managers in related acquisitions. However, these acquired managers often retain their jobs in unrelated acquisitions as they are needed to operate business until the acquiring firm's managers can handle new operations. From an organizational learning perspective, merging firms can learn from each other when they have different but complementary resources (Harrison *et al.*, 2001). Because knowledge is held by humans in a firm, unrelated acquisitions generally expand the knowledge base of the combined entity, and generate sustainable competitive advantages. According to the resource-based view, the acquiring firm can create private and unique synergy from the combination of complementary capabilities if no problems (e.g. top management team turnovers) are incurred by related acquisitions, in which similarity and relatedness are the major concerns (Barney, 2001; Harrison *et al.*, 2001). Nevertheless, a firm may acquire another firm having little similar resources, the purpose of which is to increase opportunities to expand and explore new products in new markets. Since exploration involves "a shift to different technological trajectories" (Benner and Tushman, 2002, p. 679) and requires new knowledge and departure from existing technologies (Benner and Tushman, 2003), it relates to unrelated acquisitions. Thus:

*H1B.* Exploration of the combined firm is positively associated with unrelated acquisitions.

#### *Post-acquisition integration and organizational exploration/exploitation*

In related acquisitions, benefits of potential economics of scope and scale arise from jointly shared or utilized inputs in related activities (Jones and Hill, 1988). Moreover, tangible and intangible interrelationships of the acquirer and the acquired firm are exploited to achieve potential acquisition benefits. While tangible interrelationships consist of joint purchase of raw materials, joint development of shared production as well as joint sales and distribution systems, intangible interrelationships include the capability of transferred know-how and learning (Björkman *et al.*, 2007; Hill and Hoskisson, 1987; Sarala and Vaara, 2009). Therefore, gains of related acquisitions are realized through reciprocal and sequential interdependence (Thompson, 1967) between the acquired and pre-existing units. High levels of integration are consequently necessary to coordinate activities between both merged units (Hoskisson *et al.*, 1993).

Child (1984) also argued that centralization in the corporate office and interdependencies between divisions in related diversified firms encourage corporate managers to preserve control over the divisional operation and ensure sufficient coordination. Hoskisson *et al.* (1993) noted that interdivisional sharing of resources and technologies are achieved through centralization activities.

In addition to centralization, a high degree of post-acquisition integration and coordination is necessary to realize potential acquisition benefits. Linkages must be made between headquarters (the acquirer) and the merged divisions because key decisions are not made at the divisional level (Hill and Hoskisson, 1987) of related integrated firms. Firms having highly related divisions usually have a crucial problem that coordination may cause performance ambiguities (Hoskisson *et al.*, 1991). Poor divisional performance might be due to poor marketing decisions in corporate center or poor quality and productivity in individual division. Thus, headquarters should assess the integrated divisions as an entity in addition to individual operating performance. The organizational goals focus on the whole tasks, not on single divisional task only. Further, related acquisitions require sufficient integration mechanisms and functional experts to enhance both horizontal and vertical communication between divisions and headquarters because technological innovations in one division might affect operations of highly related divisions. The integration mechanisms may vary from simple liaison role to complex permanent team, depending on the extent of integration and interdivisional interdependence. In short, the synergy of related acquisitions is realized through the access to shared knowledge and production capacity of the target and through acquiring firms to facilitate organizational exploitation. With tight integration and coordination, the merged entity can minimize R&D redundancy by means of restructuring organizations (such as closing similar R&D departments and dismissing surplus R&D employees). Moreover, organizational efficiency can be enhanced through redesigning standard operational procedures of the related operating divisions. Since both redundancy reduction and efficiency improvement facilitates exploitation (Benner and Tushman, 2003), this study proposes that:

*H2A.* Post-acquisition integration positively affects exploitation of the combined firm.

Economies of internal capital markets arising from unrelated acquisitions is primarily understood as markets and hierarchies paradigm (Williamson, 1985), which indicates that unrelated acquisitions can overcome external capital market difficulties by using internal auditing and performance monitoring systems. Firms adopting unrelated acquisitions tend to expose the acquired firms to the discipline of an efficient internal capital market, so that the profitability of the acquired firms can be improved (Jones and Hill, 1988; Harrison *et al.*, 2001). Unrelated acquisition has the lowest need for coordination because each division functions as a self-contained unit under the relationship of pooled interdependence (Thompson, 1967). The internal capital market functions through a mechanistic audit and control system with assessment of divisional performance based on financial criteria. This also allows for considerable autonomy for the acquired divisions and frees top managers of the acquirer from involvement in the daily activities of the acquired firms.

In unrelated acquisitions, operating and business-level decisions are left to the divisional managers. And for the corporate center, decentralization allows for high

autonomy and accountability for divisions because divisional performance is evaluated by objective financial criteria. After restructuring, corporate managers monitor the performance of each acquired firm and intervene when necessary for these unrelated divisions demand the least coordination. In addition to decentralization, a low degree of inter-divisional integration and coordination are necessary to realize governance economics because the adoption of least cost behavior and the capital flow to high yield uses are encouraged. Excessive linkage is unnecessary because functional autonomy of divisions is the major concern. Concerning organizational exploration, Holmqvist (2004) proposed that exploratory and exploitative learning require different strategies, structures, and controls in different subunits. Exploratory learning, in pursuit of new knowledge external to an organization, involves loosely-coupled and flexible systems, typically in the context of emerging technologies and markets. As a result, scholars of organizational integration (Larsson and Finkelstein, 1999; Puranam *et al.*, 2009; Schweizer, 2006) proposed that unrelated acquisition demands low degree of integration and loosely-controlled systems. This study highlights the importance of autonomy in unrelated acquisitions, and proposed that:

*H2B.* Post-acquisition integration negatively affects exploration of the combined firm.

#### *Organizational ambidexterity and post-acquisition performance*

Different acquisitions demand different degrees of acquisition integration (Puranam *et al.*, 2009) and consequently have different effects on exploitation and exploration. In expanding the concept “adaptation requires both exploitation and exploration to achieve persistent success” (March, 2006, p. 205), an ambidextrous or dual organizational form is generated in both tight and loose coupling simultaneously (Benner and Tushman, 2002; Gupta *et al.*, 2006), and consists of highly differentiated and loosely integrated subunits. In the ambidextrous organizational form, exploratory efforts may be configured as “structurally independent units, each having its own processes, structure, and cultures but integrated into the existing senior management hierarchy” (O’Reilly and Tushman, 2004, p. 76). Conversely, exploitative efforts that focus on decreasing variance and increasing efficiency and control may require enhanced coordination and integration. However, is an ambidextrous organization that simultaneously pursues exploitation and exploration linked to superior post-acquisition performance?

For firms pursuing only exploitation, they are proficient at making incremental improvement of their existing technological trajectories and products. They attempt at better adapting to current conditions and enhance needs of the existing customers (Benner and Tushman, 2003). This kind of short term profits, however, is predictable but not necessary sustainable (Lubatkin *et al.*, 2006). As Levinthal and March (1993) pointed out, firms that engage exclusively in exploitation will suffer from obsolescence. For firms that only pursue exploration, they may gain first mover’s advantages especially if they explore new competencies that shape technological dominant standards which are difficult for competitors to imitate, or if they expand their consumer base into new market domains (Lubatkin *et al.*, 2006). Nevertheless, such exploratory firms also entail some inherent risks because these firms allocate all resources to exploration without attaining benefits from exploitation. As Levinthal and March (1993) have pointed out, firms engaging exclusively in exploration will suffer from the problem that they never gain the returns of their existing knowledge. Exploratory firms may even be trapped in “an endless downward cycle of

search, failure, and unrewarding change” (Raisch and Birkinshaw, 2008, p. 392). Recognizing the adaptive limitations of exploitation and exploration, risk and tensions will be inevitable arise if the firm only focuses on one of these activities at the expense of the other (Gibson and Birkinshaw, 2004; Lin *et al.*, 2007). As conceptualized in the way described above, ambidexterity is conducive to sustainable performance. Exploitation is geared toward improving performance in the short term; exploration is geared toward improving performance in the long term. Based on this logic, firms’ ability to compete successful may be rooted in the ability of simultaneously pursuing exploitation and exploration (Nemanich and Vera, 2009; Raisch and Birkinshaw, 2008; Raisch *et al.*, 2009). Thus:

*H3.* Organizational ambidexterity positively affects post-acquisition performance of the combined firm.

## Methods

### *Organizational data collection*

Organizational and industry level data were drawn from the top 1,000 Taiwanese electronic and computer firms reported by 2009 China Credit Information Service (CCIS), an authorized credit-rating company in Taiwan. The companies are classified into four industries: computer and associated equipments manufacturing (SICs 271x, 274x, 276x); integrated circuits (SIC 261x), opto-electronics and telecommunication (SICs 264x, 272x, 277x) and electronic components (SICs 262x, 263x, 264x, 269x, 275x). Questionnaires were distributed to general managers of the top 1,000 electronics companies, and 150 were returned. The 850 unresponsive firms were contacted by telephone and sent a second series of questionnaires, of which 131 were returned. After eliminating invalid responses, this study yielded a sample of 281 questionnaires, in which 105 firms had undertaken M&As within the past three years. Thirty-two firms of the sample came from the computer manufacturing industry; 34 firms came from the integrated circuits industry; 21 firms came from the opto-electronics industry; and 21 firms came from the telecommunication industry. Fifty-eight firms came from top 500 Taiwanese electronic and computer firms; other 50 firms ranked from 501 to 1,000. Data of firms’ exploration, exploitation, organizational integration and ambidexterity came from questionnaires; data of firms’ ROA were obtained from the Director General of Budget, Accounting and Statistics (DGBAS) and the Securities and Futures Commission databases, Ministry of Finance, Republic of China, Taiwan.

### *Measures*

*Related and unrelated acquisition strategies.* This study adopted entropy measure of diversification developed by Jacquemin and Berry (1979) to rate related and unrelated M&As. The general form to measure industrial concentration and corporate diversification is:

$$I = \sum_{i=1}^n P_i * w_i$$

where  $P_i$  is the share of segment  $i$ ,  $w_i$  is an assigned weight, and  $n$  the number of firm’s product. The entropy measure of firm’s total diversification ( $DT$ , Palepu, 1985) is thus:



$$DT = \sum_{i=1}^n P_i * \ln(1/P_i)$$

where  $\ln(1/P_i)$  is the weight for each segment. The entropy measure can be divided into related and unrelated diversification, that is:

$$DT = DR + DU$$

where  $DR$  is related diversification arising out of operating segments within an industrial group;  $DU$  is unrelated diversification between industrial groups. In M&As, the acquired firms  $DR$  and  $DU$  are measured on the base of the acquirer's operating industry groups. The greater  $DR$ , the greater the extent of related M&A. The greater  $DU$ , the greater the extent of unrelated M&A. Standard Industrial Classification codes in Taiwan (Taiwanese SIC, rev. 8, 2006, that was encoded on the base of International Standard Industrial Classification codes, ISIC 4.0, 2006) were used to define segment and industrial groups. Two-digit SIC industries were treated as industrial groups, and four-digit SIC were treated as segments. Data to calculate  $DR$  and  $DU$  were taken from National Statistics, Taiwan, Republic of China ([www.stat.gov.tw](http://www.stat.gov.tw)). These indices and the use of SIC codes are increasingly adopted in the strategy literature.

*Exploration and exploitation.* Previous studies on exploration vs exploitation suggested different definitions of operationalization, e.g. patent study (Benner and Tushman, 2002) and radical vs incremental innovation (Bierly and Chakrabarti, 1996). Regarding studies of Katila and Ahuja (2002) and He and Wong (2004), this study regarded exploration and exploitation as two different dimensions behavior in ambidextrous organizations. Many organizations (e.g. high-tech firms) operate in multiple domains and simultaneously pursue high exploration in product R&D and high exploitation in process implementation. This study thus adopted the measure developed by He and Wong (2004, pp. 485-486) because of the industrial characteristics of high tech firms. This measure was designed to quantify activities in new product-market domains (exploration, including introduction of new generations of products, extension of product range, opening new markets and entering new technological fields, Cronbach's  $\alpha = 0.80$ ) or increase current product-market efficiency (exploitation, including improving current product quality and production flexibility, reducing production cost, improving yield or reducing material consumption, Cronbach's  $\alpha = 0.81$ ).

*Ambidexterity.* Ambidexterity is measured in two different views: balanced and combined views (Cao *et al.*, 2009). According to the balanced view, ambidexterity is measured as the absolute difference of exploitation and exploration (He and Wong, 2004). Conversely, ambidexterity can be measured as the product (Gibson and Birkinshaw, 2004) or sum (Lubatkin *et al.*, 2006) of exploitation and exploration. This study views organizational ambidexterity as a multidimensional construct comprising the non-substitutable combination of exploitation and exploration, each of which can complement the performance-enhancing effect of the other. Hence, this study uses multiplicative interaction of exploitation and exploration to measure ambidexterity. That is, ambidexterity = exploitation\*exploration.

*Organizational integration following the acquisition.* Based on the single scale by Zollo and Singh (2004), organizational integration is measured by the extent of coordination of systems, procedures and products between joint firms.

Organizational integration is measured by the acquired managers estimating the degree of coordinative activities between the acquirer and target firms in:

- joint procurement;
- sharing a sales force;
- sharing production information;
- sharing best practices in various administrative processes; and
- involving the combination of resources from different divisions to create new business (five-point scale, Cronbach's  $\alpha = 0.87$ ).

*Post-acquisition performance.* The measure for post-acquisition performance is the economic benefit by the efficiency use of resources within the merged entity. Three possible candidates are return on assets (ROA), return on investment (ROI) and return on equity (ROE). This study adopted ROA because it demonstrates greater year on year stability (Hill *et al.*, 1992), which is also less sensitive to biases from changes of leverage or bargaining power in acquisitions (Barkema and Schijven, 2008). Thus, this study used the change in ROA ( $\Delta$ ROA) as a dependent variable. Change in ROA was measured as the merged entity's ROA at the end of the acquisition year (actual ROA) minus the weighted average ROA of the two firms prior to the acquisition (expected ROA). For example, a firm with a 20 percent ROA (asset of \$100) acquires a firm with a 10 percent ROA (assets of \$200) has an expected ROA of 13.3 percent. After acquisition, if the acquired firm actually earns 15 percent and the acquirer still earns 20 percent, the actual ROA became 16.7 percent. Change in ROA is +3.4 percent that exhibits a performance improvement.

*Control variables.* The acquirer's size, age, R&D expenditure and acquisition experience are considered important in determining financial and technological performances in acquisitions (Datta, 1991; Hill *et al.*, 1992). Firm size and age are measured separately by a firm's annual sale (million dollars) and the number of years for which this firm has existed. Owing to the expectation that R&D expenditure have significantly positive effects on profitability (Hill *et al.*, 1992), it is also controlled and measured by the ratio of R&D expenditure to sale. Acquisition experience, measured as the number of acquisitions completed by the acquirer in the ten years preceding the observed acquisition (Zaheer *et al.*, 2010).

### Analysis and results

This study uses regression analyses to examine the research hypotheses. Before analyzing, all variables are standardized to provide comparisons among coefficients which are estimated in different units. Normal probability check is applied to confirm the normality of the error terms and residual check is applied to confirm the constancy and independence of the error terms. The result of average variance inflation factor (VIF) is associated with each coefficient of regression models 1-3 ranges from 1.22 to 1.38. All of the VIFs of control and independent variables range from 1.05 to 1.49, suggesting the unimportance of multicollinearity. Moreover, the Durbin-Watson test statistics in each regression model are less than 2.42, supporting the assumption of random error terms. The descriptive statistics are shown in Table I. The correlation matrix in Table II indicates that exploration strongly relates to unrelated acquisition ( $r = 0.29, p < 0.01$ ), acquisition experience ( $r = 0.25, p < 0.01$ ), and R&D expenditure ( $r = 0.36, p < 0.01$ ).

Variable	Mean	SD	Min.	Max.
Organizational size	7.98	3.89	1.32	49.20
Organizational age	6.98	3.05	1.00	37.00
R&D expenditure	0.07	0.08	0.01	0.23
Acquisition experience	2.88	4.11	0.00	8.00
Unrelated acquisition	0.75	0.40	0.00	2.00
Related acquisition	0.70	0.42	0.00	1.65
Exploration	3.10	1.45	1.00	5.00
Exploitation	3.29	1.49	1.00	5.00
Ambidexterity	9.98	3.98	1.00	25.00
Organizational integration	3.25	1.65	1.00	5.00
Acquisition performance	0.96	4.29	-7.72	7.28

**Table I.**  
Descriptive statistics

**Note:**  $n = 105$  for all variables

As for exploitation, it is associated with unrelated acquisition ( $r = 0.28, p < 0.01$ ) and acquisition integration ( $r = 0.22, p < 0.01$ ).

Concerning *H1A* and *H1B* that exploitation is associated with related acquisitions and exploration with unrelated acquisitions, all sample firms are included in regression analyses. Table III presents a series of regression models associated with a firm's exploitation and exploration. In model 1, related acquisition positively relates to exploitation ( $\beta = 0.28, p < 0.01$ ). In model 2, unrelated acquisition positively relates to exploration ( $\beta = 0.30, p < 0.01$ ). *H1A* and *H1B* are thus supported. As for *H2A* and *H2B*, this study predicts that post-acquisition integration positively affects exploitation. As well as negatively affects exploration. In model 1, organizational integration does not relate to exploration ( $\beta = 0.08, n.s.$ ). In model 2, organizational integration positively relates to exploitation ( $\beta = 0.25, p < 0.01$ ). Therefore, only *H2A* is supported. *H3* further predicts that organizational ambidexterity positively affects post-acquisition performance of the combined firms. In model 3, ambidexterity positively affects acquisition performance ( $\Delta ROA$ ), so *H3* is also supported.

### Discussions

Acquisition strategy involves deciding directions for search for new domains, in which differential advantages in costs or competence are explored and exploited. The five major objectives of M&As are overcapacity reduction, geographic extension, industrial convergence, product or market extension and technology acquisition (Dorf and Byers, 2005). The former three are related to exploitation, and the last two are related to exploration. Therefore, acquisition strategies search for opportunities to exploit current organizational abilities or explore in different domains. The contribution of this study is to understand how acquisitions influence exploitation and exploration. With regard to the relationship between acquisition and exploitation/exploration, this study finds that unrelated acquisitions enhance exploration, whereas related acquisitions enhance exploitation. Exploitation involves continuous improvement of existing products and low cost. Concerning that most Taiwan firms are assembling and OEM, the maintenance of high quality and low cost is their requirement, which is associated with exploitation (Rothaermel and Alexandre, 2009). In relation to effects of control variables on

	1	2	3	4	5	6	7	8	9	10
1. Organizational size	0.24**									
2. Organizational age	0.10	0.04								
3. R&D expenditure	0.02	0.15*								
4. Acquisition experience	0.10	-0.07	0.01							
5. Unrelated acquisition	0.14*	0.08	-0.01	0.01						
6. Related acquisition	0.18*	-0.02	0.36**	0.25**	-0.49**					
7. Exploration	0.08	0.19**	0.14*	0.14*	0.14*	-0.02				
8. Exploitation	-0.01	-0.01	0.17*	0.26*	0.15*	0.28**	0.13			
9. Ambidexterity	-0.02	-0.01	-0.07	0.12	0.07	0.12*	0.48**	0.49**		
10. Organizational integration	0.10	0.04	0.30**	0.05	-0.08	0.26**	0.08	0.22**	0.13*	
11. Acquisition performance						-0.06	0.27**	0.24**	0.30**	0.16*

Notes: Significant at: \*  $p < 0.05$  and \*\*  $p < 0.01$ ; two-tailed tested;  $n = 105$

Table II.  
Correlation matrix

Variables Independent	Model 1		Model 2 Dependent		Model 3 Acquisition performance	
	$\beta$	<i>t</i>	$\beta$	<i>t</i>	$\beta$	<i>t</i>
<i>Controls</i>						
Organizational size	0.07	0.36	0.18	1.99*	0.08	0.56
Organizational age	0.15	1.74	0.02	0.25	-0.02	-0.09
R&D expenditure	0.20	2.01**	0.26	2.90***	0.23	2.82***
Acquisition experience	0.12	1.52	0.19	2.14**	0.09	1.02
<i>Direct effects</i>						
Unrelated acquisition	0.11	1.35	0.30	3.05***	-0.01	0.36
Related acquisition	0.28	2.70***	-0.07	-0.60	0.06	0.72
Organizational integration	0.25	2.82***	0.08	1.35	0.18	2.08**
Ambidexterity	-	-	-	-	0.24	2.95***
$R^2$	0.38		0.36		0.32	
$F$	8.10***		7.02***		6.14***	

**Table III.**  
Results of regression  
analyses for exploitation  
and exploration

**Notes:** Significant at: \* $p < 0.1$ , \*\* $p < 0.05$  and \*\*\* $p < 0.01$ ;  $n = 105$ ; standardized coefficients used

exploration and exploitation, this study finds that organizational size relates to exploration. Since exploration requires large investment, only larger firms are willing to and capable of investing in exploration. As for acquisition experience, it has a significant influence on exploration because exploring new markets needs time and experience. Finally, R&D expenditure affects both exploration and exploitation because R&D expenditure is the foundation for enhancing both innovativeness (exploration) and effectiveness (exploitation).

Ambidextrous organizations are comprised of two distinctly different businesses, one of which focuses on exploring new opportunities and the other of which focuses on exploiting existing capabilities (O'Reilly and Tushman, 2004). As Levinthal and March (1993, p. 105) stated, "[t]he basic problem confronting an organization is to engage in sufficient exploitation to ensure its current viability and, at the same time, to devote enough energy to exploration to ensure its future viability", survival and growth require a dynamic balance. In some cases, exploitation may demand exploring new business opportunities, and exploration may demand enhancing the knowledge base of the firm (Katila and Ahuja, 2002). In fact, firms in high-tech industries must simultaneously improve their effectiveness and innovativeness because these firms usually face keen competition (e.g. low cost, high product quality) and fast technological change (e.g. fast new product introduction, breakthrough innovations) at the same time. This study further shows that organizational ambidexterity for the combined firms can significantly enhance post-acquisition performance.

Furthermore, this study shows that degrees of organizational integration between target and the acquirer positively impact post-acquisition performance of the combined firms. In addition to the concern of ambidexterity, the ease, with which the acquiring and acquired firms can be integrated after acquisition, has received considerable attention in the studies of acquisition performance (Datta, 1991; Haspeslagh and Jemison, 1991; Pablo, 1994). After selection and acquisition of target firms with synergistic potential, it is crucial to realize such combining synergy by developing sufficient organizational integration.

Thus, the realization of synergistic benefits still depends on effective integration of both associated organizations (Barkema and Schijven, 2008; Jemison and Sitkin, 1986; Larsson and Finkelstein, 1999). However, it is difficult for two organizations to combine their different processes, coordinate existing business units, and resolve conflicts between dissimilar cultures. In a successful acquisition integration, it requires attention on building appropriate management practice (Shimizu *et al.*, 2004), structural integration (Puranam *et al.*, 2006) and cultural integration (Chatterjee *et al.*, 1992).

#### *Limitation and future directions*

This study is an exploratory study with some limitations. Factors such as cultural or cross-industrial effects were not examined. Extending the study period of time is also important in acquisition studies because managers need to understand acquisition's long-term effects for competitive advantages and performance. From these views, longitudinal cross-industrial studies are important because any single acquisition by a large firm is merely a small part of a longitudinal sequence of acquisitions. The final limitation of this study concerns related/unrelated acquisition classification. Although related/unrelated typology is popular in organizational and strategic studies, analyzing vertical acquisitions is still needed (Afuah, 2001). Perhaps a vertical/related/unrelated acquisition classification may provide better understandings for relationships among acquisition, exploration/exploitation, and performance.

#### **References**

- Afuah, A. (2001), "Dynamic boundaries of the firm: are firms better off being vertically integrated in the face of a technological change?", *Academy of Management Journal*, Vol. 44, pp. 1211-1228.
- Barkema, H.G. and Schijven, M. (2008), "How do firms learn to make acquisitions? A review of past research and an agenda for the future", *Journal of Management*, Vol. 34, pp. 594-634.
- Barney, J.B. (2001), "Is the resource-based view a useful perspective for strategic management research? Yes", *Academy of Management Journal*, Vol. 26, pp. 41-56.
- Benner, M.J. and Tushman, M.L. (2002), "Process management and technological innovation: a longitudinal study of the photography and paint industries", *Administrative Science Quarterly*, Vol. 47, pp. 676-706.
- Benner, M.J. and Tushman, M.L. (2003), "Exploitation, exploration, and process management: the productivity dilemma revisited", *Academy of Management Review*, Vol. 2, pp. 238-256.
- Bierly, P. and Chakrabarti, A. (1996), "Generic knowledge strategies in the US pharmaceutical industry", *Strategic Management Journal*, Vol. 17, pp. 127-135.
- Björkman, I., Stahl, G.K. and Vaara, E. (2007), "Cultural differences and capability transfer in cross-border acquisitions: the mediating roles of capability", *International Business Studies*, Vol. 38, pp. 658-672.
- Cao, Q., Gedajlovic, E. and Zhang, H. (2009), "Unpacking organizational ambidexterity: dimensions, contingencies and synergistic effects", *Organization Science*, Vol. 20, pp. 781-796.
- Chatterjee, S., Lubatkin, M.H., Schweiger, D.M. and Weber, Y. (1992), "Cultural differences and shareholder value in related mergers: linking equity and human capital", *Strategic Management Journal*, Vol. 13, pp. 319-334.
- Child, J. (1984), *Organization: A Guide to Problems and Practice*, Harper & Row, London.

- Datta, D.K. (1991), "Organizational fit and acquisition performance: effects of post-acquisition integration", *Strategic Management Journal*, Vol. 12, pp. 281-297.
- Delios, A. and Beamish, P.W. (1999), "Geographic scope, product diversification, and the corporate performance of Japanese firms", *Strategic Management Journal*, Vol. 20, pp. 711-727.
- Dorf, R.C. and Byers, T.H. (2005), *Technology Ventures: From Idea to Enterprise*, McGraw-Hill, Singapore.
- Eisenhardt, K.M. and Martin, J. (2000), "Dynamic capabilities: what are they?", *Strategic Management Journal*, Vol. 21, pp. 1105-1121.
- Gibson, C.B. and Birkinshaw, J. (2004), "The antecedents, consequences, and mediating role of organizational ambidexterity", *Academy of Management Journal*, Vol. 47 No. 2, pp. 209-226.
- Gupta, A.K., Smith, K.G. and Shalley, C.E. (2006), "The interplay between exploration and exploitation", *Academy of Management Journal*, Vol. 49, pp. 693-706.
- Håkanson, L. (1995), "Learning through acquisitions: management and integration of foreign R&D laboratories", *International Study of Management & Organization*, Vol. 25 Nos 1/2, pp. 121-157.
- Harrison, J.S., O'Neill, H.M. and Hoskisson, R.E. (2000), "Acquisition strategy and target resistance: a theory of countervailing effects of pre-merger bidding and post-merger integration", in Cooper, C. and Gregory, A. (Eds), *Advances in Mergers and Acquisitions*, JAI Press, New York, NY, pp. 157-182.
- Harrison, J.S., Hitt, M.A., Hoskisson, R.E. and Ireland, R.D. (2001), "Resource complementarity in business combination: extending the logic to organizational alliance", *Journal of Management*, Vol. 27, pp. 679-690.
- Haspeslagh, P.C. and Jemison, D.B. (1991), *Managing Acquisitions: Creating Value Through Corporate Renewal*, The Free Press, New York, NY.
- He, Z.L. and Wong, P.K. (2004), "Exploration vs exploitation: an empirical test of the ambidexterity hypothesis", *Organization Science*, Vol. 15, pp. 481-494.
- Hill, C.W.L. and Hoskisson, R.E. (1987), "Strategy and structure in the multiproduct firm", *Academy of Management Review*, Vol. 12, pp. 331-341.
- Hill, C.W.L., Hitt, M.A. and Hoskisson, R.E. (1992), "Cooperative versus competitive structures in related and unrelated diversified firms", *Organization Science*, Vol. 3, pp. 501-521.
- Holmqvist, M. (2004), "Experiential learning processes exploitation and exploration within and between organizations: an empirical study of product development", *Organization Science*, Vol. 15, pp. 70-81.
- Hoskisson, R.E. and Hitt, M.A. (1988), "Strategic control and relative R&D investment in large multiproduct firms", *Strategic Management Journal*, Vol. 9, pp. 605-621.
- Hoskisson, R.E., Hill, C.W.L. and Kim, H. (1993), "The multidivisional structure: organizational fossil or source of value?", *Journal of Management*, Vol. 19, pp. 269-298.
- Hoskisson, R.E., Hitt, M.A. and Hill, C.W.L. (1991), "Managerial risk taking in diversified firms: an evolutionary perspective", *Organization Science*, Vol. 3, pp. 296-314.
- Jacquemin, A.P. and Berry, H.H. (1979), "Entropy measure of diversification and corporate growth", *Journal of Industrial Economics*, Vol. 4, pp. 359-369.
- Jemison, D.B. and Sitkin, S.B. (1986), "Corporate acquisitions: a process perspective", *Academy of Management Review*, Vol. 11 No. 1, pp. 145-163.

- Jones, G.R. and Hill, C.W.L. (1988), "Transaction cost analysis of strategy-structure choice", *Strategic Management Journal*, Vol. 9, pp. 159-172.
- Katila, R.G. and Ahuja, G. (2002), "Something old, something new: a longitudinal study of search behavior and new product introduction", *Academy of Management Review*, Vol. 45, pp. 1183-1194.
- King, D.R., Dalton, D.R., Daily, C.M. and Covin, J.G. (2004), "Meta-analyses of post-acquisition performance: indications of unidentified moderators", *Strategic Management Journal*, Vol. 25, pp. 187-200.
- Larsson, R. and Finkelstein, S. (1999), "Integrating strategic, organizational, and human resource perspectives on mergers and acquisitions: a case survey of synergy realization", *Organization Science*, Vol. 10 No. 1, pp. 1-26.
- Levinthal, D.A. and March, J.G. (1993), "The myopia of learning", *Strategic Management Journal*, Vol. 14, pp. 95-112.
- Levitt, B. and March, J.G. (1988), "Organizational learning", *Annual Review of Sociology*, Vol. 14, pp. 319-340.
- Lin, Z., Yang, H. and Demirkan, I. (2007), "The performance consequences of ambidexterity in strategic alliance formations: empirical investigation and computational theorizing", *Management Science*, Vol. 53, pp. 1645-1658.
- Lubatkin, M.H., Simesek, Z., Ling, Y. and Veiga, J.F. (2006), "Ambidexterity and performance in small- to medium-sized firms: the pivotal role of top management team behavioral integration", *Journal of Management*, Vol. 32, pp. 646-672.
- March, J.G. (1991), "Exploration and exploitation in organizational learning", *Organization Science*, Vol. 2, pp. 71-87.
- March, J.G. (2006), "Rationality, foolishness, and adaptive intelligence", *Strategic Management Journal*, Vol. 27, pp. 201-214.
- Nemanich, L.A. and Vera, D. (2009), "Transformational leadership and ambidexterity in the context of an acquisition", *The Leadership Quarterly*, Vol. 20 No. 1, pp. 19-33.
- O'Reilly, C.A. and Tushman, M.L. (2004), "The ambidextrous organization", *Harvard Business Review*, April, pp. 74-81.
- O'Reilly, C.A., Harreld, J.B. and Tushman, M.L. (2009), "Organizational ambidexterity: IBM and emerging business opportunities", *California Management Review*, Vol. 51 No. 4, pp. 75-99.
- Pablo, A.L. (1994), "Determinants of acquisition integration level: a decision-making perspective", *Academy of Management Journal*, Vol. 37, pp. 803-836.
- Palepu, K. (1985), "Diversification strategy, profit performance, and the entropy measure of diversification", *Strategic Management Journal*, Vol. 6, pp. 239-255.
- Phene, A., Tallman, S. and Almeida, P. (2012), "When do acquisitions facilitate technological exploration and exploitation?", *Journal of Management*, Vol. 38 No. 3, pp. 753-783.
- Porter, M.E. (1987), "From competitive advantage to competitive strategy", *Harvard Business Review*, May/June, pp. 43-59.
- Puranam, P. and Srikanth, K. (2007), "What they know vs what they do: how acquirers leverage technology acquisitions", *Strategic Management Journal*, Vol. 28, pp. 805-825.
- Puranam, P., Singh, H. and Chaudhuri, S. (2009), "Integrating acquired capabilities: when structural integration is (un)necessary", *Organization Science*, Vol. 20 No. 2, pp. 313-328.



- Puranam, P., Singh, H. and Zollo, M. (2006), "Organizing for innovation: managing the coordination-autonomy dilemma in technology acquisitions", *Academy of Management Journal*, Vol. 49 No. 2, pp. 263-280.
- Raisch, S. and Birkinshaw, J. (2008), "Organizational ambidexterity: antecedents, outcomes, and moderators", *Journal of Management*, Vol. 34, pp. 375-409.
- Raisch, S., Birkinshaw, J., Probst, G. and Tushman, M.L. (2009), "Organizational ambidexterity: balancing exploitation and exploration for sustained performance", *Organization Science*, Vol. 20 No. 4, pp. 685-695.
- Rothaermel, F.T. and Alexandre, M.T. (2009), "Ambidexterity in technology sourcing: the moderating role of absorptive capacity", *Organization Science*, Vol. 20 No. 4, pp. 759-780.
- Rothaermel, F.T. and Deeds, D.L. (2004), "Exploration and exploitation alliances in biotechnology: a system of new product development", *Strategic Management Journal*, Vol. 25 No. 3, pp. 201-221.
- Sarala, R.M. and Vaara, E. (2009), "Cultural differences, convergence, and crossvergence as explanations of knowledge transfer in international acquisitions", *Journal of International Business Studies*, Vol. 41 No. 8, pp. 1365-1390.
- Schweizer, L. (2006), "Organizational integration of acquired biotech companies into pharmaceutical companies: the need for a hybrid approach", *Academy of Management Journal*, Vol. 48 No. 6, pp. 1365-1390.
- Shaver, J.M. and Mezas, J.M. (2009), "Diseconomies of managing in acquisitions: evidence from civil lawsuits", *Organization Science*, Vol. 20, pp. 206-222.
- Shimizu, K., Hitt, M.A., Vaidyanath, D. and Pisano, V. (2004), "Theoretical foundations of cross-border mergers and acquisitions: a review of current research and recommendations for the future", *Journal of International Management*, Vol. 10, pp. 307-353.
- Siegel, D.S. and Simons, K.L. (2010), "Assessing the effects of mergers and acquisitions on firm performance, plan productivity, and workers: new evidence from matched employer-employee data", *Strategic Management Journal*, Vol. 31, pp. 903-923.
- Stahl, G.K. and Voigt, A. (2008), "Do cultural differences matter in mergers and acquisitions? A tentative model and examination", *Organization Science*, Vol. 19, pp. 160-176.
- Thompson, J. (1967), *Organizations in Action*, McGraw-Hill, New York, NY.
- Tushman, M.L. and O'Reilly, C.A. (1996), "Ambidextrous organizations: managing evolutionary and revolutionary change", *California Management Review*, Vol. 38, pp. 8-30.
- Tushman, M.L. and O'Reilly, C.A. (1997), *Winning Through Innovation: A Practical Guide to Leading Organizational Change and Renewal*, Harvard Business School Press, Boston, MA.
- Williamson, O.E. (1985), *The Economic Institutions of Capitalism*, The Free Press, New York, NY.
- Zaheer, A., Hernandez, E. and Banerjee, S. (2010), "Prior alliances with targets and acquisition performance in knowledge-intensive industries", *Organization Science*, Vol. 21 No. 5, pp. 1072-1091.
- Zollo, M. and Singh, H. (2004), "Deliberate learning in corporate acquisitions: post-acquisition strategies and integration capabilities in US bank mergers", *Strategic Management Journal*, Vol. 25, pp. 1233-1256.

**Further reading**

Weber, Y., Tarba, S.Y. and Reichel, A. (2011), "A model of the influence of culture on integration approaches and international mergers and acquisitions performance", *International Studies of Management & Organization*, Vol. 41 No. 3, pp. 9-24.

**About the author**

Liang-Hung Lin is currently an Associate Professor in the Department of International Business, National Kaohsiung University of Applied Sciences (Taiwan). Dr Lin is interested in the fields of technology management and organizational innovation. He ever published academic papers in the *Journal of Business Ethics*, *Journal of Organizational Change Management*, *International Journal of Human Resource Management*, *International Journal of Technology Management* and *Total Quality Management and Business Excellence*. Liang-Hung Lin can be contacted at: lhlin@cc.kuas.edu.tw

---

To purchase reprints of this article please e-mail: [reprints@emeraldinsight.com](mailto:reprints@emeraldinsight.com)  
Or visit our web site for further details: [www.emeraldinsight.com/reprints](http://www.emeraldinsight.com/reprints)

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.