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Asia Pacific Management Review

journal homepage: www.elsevier.com/locate/apmr

Organizational learning and acquirer performance: How do serial acquirers learn from acquisition experience?

Yu-Chieh Chao

Department of Business Administration, National Pingtung University of Science and Technology, Pingtung, Taiwan

ARTICLE INFO

Article history:

Received 20 April 2016

Received in revised form

13 May 2017

Accepted 5 July 2017

Available online xxx

Keywords:

Mergers and acquisitions

Organizational learning theory

Acquisition experience

Acquirer performance

ABSTRACT

How do serial acquirers learn from acquisition experience has been a prominent issue in the field of acquisition. However, the empirical findings about performance implications of acquisition experience have still been mixed. Drawing on the organizational learning theory, this study analyzes the influence of the quality, the pattern, and the context of acquisition experience on acquirer performance. Using a sample of 2223 firm-year observations gauged from 11,571 acquisitions conducted by 889 listed firms in the United States during the 2001–2014 period, this paper finds that (1) the portion of related acquisition experience has a non-significant effect on acquirer performance; (2) the relationship between the velocity of acquisition experience and acquirer performance is an inverted-U shape; (3) Target product-market scope positively moderates the relationship between the portion of related acquisition experience and acquirer performance; and (4) Target product-market scope positively moderates the relationship between the velocity of acquisition experience and acquirer performance. These findings echo an acquisition program view and suggest that a pro-active, plan-ahead acquisition trajectory benefits acquirer performance.

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1. Introduction

The topic of mergers and acquisitions (hereinafter, acquisitions) is one of the central themes of academic literature and of business practice. Over the past forty years, the market has witnessed a consistent stream of acquisitions, although the numbers and dollar values of such acquisitions fluctuate annually. The value of worldwide M&A approached 3.9 trillion US dollars during full year 2016, the third best record for worldwide deal making since 2007.¹

Acquisitions offer various advantages such as efficiency gains (Avkiran, 1999) and the immediate access to external resources (Heeley, King, & Covin, 2006; Al-Laham, Schweizer, Amburgey, 2010). More and more firms frequently engage in acquisitions to achieve their growth strategy, such as Cisco, General Electric, Google, and Facebook (Laamanen & Keil, 2008; Schipper & Thompson, 1983). Rather than making an acquisition occasionally, these serial acquirers actively conduct streams of mutual

interrelated acquisitions to fulfill their strategic goals (Hansell, Walker, & Kengelbach, 2014; Laamanen & Keil, 2008).

However, the performance implications of cumulative acquisition experience have remained elusive (Muehlfeld, Rao Sahib, & Van Witteloostuijn, 2012) as learning from acquisitions involves causal ambiguity (Castellaneta & Conti, 2017; Lippman & Rumelt, 1982). Some studies found a positive relationship between acquisition experience and performance (Bruton, Oviatt, & White, 1994; Barkema, Bell, & Pennings, 1996), others found a U-shaped effect (Haleblian & Finkelstein, 1999), and others found a non-significant effect (Hayward, 2002; Wright, Kroll, Lado, & Van Ness, 2002; Zollo & Singh, 2004). For example, research has shown that routines arising from acquisition experience increase the likelihood of subsequent acquisitions (Collins, Holcomb, Certo, Hitt, & Lester, 2009; Haleblian, Kim, & Rajagopalan, 2006). However, learning curve effects from acquisition experience are not bound to happen (Hayward, 2002). Specifically, understanding why some acquirers are better at learning than others is still an active research area (Basuil & Datta, 2015; Cuypers, Cuypers, & Martin, 2017; Haleblian & Finkelstein, 1999; Hayward, 2002; Muehlfeld et al., 2012).

Drawing on the organizational learning theory, scholars have reasoned whether and under what conditions, firms can learn from

¹ E-mail address: ycchao@mail.npust.edu.tw.

Peer review under responsibility of College of Management, National Cheng Kung University.

¹ Source: 2017 M&A outlook by J. P. Morgan.

acquisition experience. Literature has mainly advanced organizational learning theory in three directions. First, scholars have focused on the quality rather than the quantity of a firm's past acquisition experience (Collins et al., 2009; Haleblian et al., 2006; Hayward, 2002). Second, research has contributed to the temporal perspective of managing acquisitions. It shifted from the performance implication of isolated acquisitions into the influence of multiple acquisitions by investigating how the acquisition pattern can affect acquirer performance (Laamanen & Keil, 2008; Shi & Prescott, 2011). Third, studies have focused on the moderators which influence the relationship between acquisition experience and performance, such as target firm performance (Bruton et al., 1994), acquisition context (Muehlfeld et al., 2012), and regulatory change (Castellaneta & Conti, 2017).

In sum, scholars have provided insightful explanations about how acquirers may learn from acquisition experience through three sets of factors: the quality of experience, the pattern of experience, and the context of experience. However, the three sets of factors were separately examined in most research. By simultaneously investigating how serial acquirers can learn from acquisition experience in term of experience quality, pattern, and context, this study contributes current literature in the following ways. First, this paper examines firms' learning from acquisition experience by integrating experience quality, pattern, and context on a longitudinal basis to fill in the research gap in the field of organizational learning and acquisition performance. According to prior literature, the quality of experience was measured by the portion of related acquisition experience (Hayward, 2002); the pattern of experience was calculated by the velocity of acquisition experience (Laamanen & Keil, 2008); the context of experience was gauged by the product-market scope of target firms (Cuypers et al., 2017). Second, despite serial acquirers become prevalent in the business world, few studies provide evidence on the performance of active acquisition behavior (Laamanen & Keil, 2008), this study addresses this important question to find out why some serial acquirer are better learner than others in making acquisitions. Third, this paper identifies a moderator in the acquisition context – the product-market scope of target firms and theorizes about how the knowledge embedded in target firms may influence acquirers' learning outcome (Ahuja & Katila, 2001; Ranft & Lord, 2002; Puranam, Singh, & Zollo, 2006).

2. Theory and hypotheses

2.1. Organizational learning and acquisition experience

Organizational learning is a process by which firms encode inferences from experience for the creation of knowledge and routines that guide future behavior (Argote, 1999; Huber, 1991). In the context of acquisitions, organizational learning is defined as the transfer of a firm's acquisition experience from one event to another one (Barkema & Schijven, 2008). Firms learn from cumulative acquisition experience and develop routines to manage subsequent acquisitions. Routines stemming from repetitive momentum can allow acquirers become familiar with the process of acquisitions such as the selection and evaluation of target, the dual diligence process, the negotiation of the deal, and the integration of two combined firms to achieve potential synergy (Haleblian & Finkelstein, 1999; Kim & Finkelstein, 2009).

Acquisition experience has been an important source of organizational learning that enables acquirers to draw inferences from prior experience to produce competitive advantage and enhance performance (Barkema & Schijven, 2008; Levitt & March 1988). Traditionally, learning curve effects in operating setting are documented to be the source of superior performance (Dutton &

Thomas, 1984). In strategic context such as acquisitions, however, activities are far more complex than those at the operating level. To untangle the casual ambiguity (Castellaneta & Conti, 2017; Lippman & Rumelt, 1982) about how firms can learn from acquisition experience, scholars have move beyond learning curve effects which were mainly measured by the quantity of prior experience (Barkema & Schijven, 2008) and reasoned the influence of the quality, the pattern, and the context of acquisition experience on acquirer performance respectively (Bruton et al., 1994; Hayward, 2002; Haleblian et al., 2006; Laamanen & Keil, 2008; Collins et al., 2009; Shi & Prescott, 2011; Muehlfeld et al., 2012; Castellaneta & Conti, 2017). Advancing the literature, this study postulates that acquirer performance is the function of (1) the portion of related acquisition experience; (2) the velocity of acquisition experience; and (3) the product-market scope of target firms.

2.2. The portion of related acquisition experience

Rather than treat acquisition experience as a homogeneous construct, a line of research has identified the quality of acquisition experience such as the similarity of experience by industry or country. Scholars emphasize the concept of 'near transfers' (Perkins & Salomon, 1992) and argue that inferences from similar experience enhance subsequent performance (Basuil & Datta, 2015). For example, Markides and Ittner (1994) and Lee and Caves (1998) point out that international acquisition experience, measured by a dummy variable, positively benefit subsequent international acquisition. Basuil and Datta (2015) find that industry-specific and region-specific cross-border acquisition experiences, measured by the total number of acquisitions in the same industry or in the same geographic region in the five years preceding the focal acquisition, are positively associated with shareholder value creation.

This line of reasoning implies that related acquisitions have positive effects on acquirer performance for the following reasons. First, related acquisitions increase the efficiency of resource employment. According to Penrose (1959), acquisitions are driven by the exploitation of firms' excess resources that result primarily from resource indivisibility, multiple usages of resources, and managerial learning effects. Acquisitions facilitate the application of acquirers' fungible resources to different organizational and market settings, which leads to value creation for the acquirer (Penrose, 1959; Wernerfelt, 1984). Second, related acquisitions help the transfer and integration of resources. The routines and practices established in prior acquisition experience can facilitate knowledge transfer when the acquirer and the target in the similar industry (Finkelstein & Haleblian, 2002). Furthermore, business and industry relatedness between the acquirer and the target may enable managers to evaluate and integrate the target more efficiently and effectively (Hitt, Harrison, & Ireland, 2001) as they can more easily employ their 'dominant logic' (Bettis & Prahalad, 1995; Prahalad & Bettis, 1986) to manage the combined entity. The similarity between multiple acquisitions can be viewed as a deployment of dominant logic in acquisitions through which acquirers can benefit from learning by doing. Moreover, acquisition experience in the related industry can enhance the acquirers' absorptive capacity (Cohen & Levinthal, 1990) to absorb the knowledge of the target. Therefore, we postulate that relatedness of acquisition experience will have a positive effect on acquirer performance.

H1. The proportion of related acquisition experience is positively associated with acquirer performance.

2.3. The velocity of acquisition experience

Since learning from experience takes time, a routine-based

perspective, which mainly draws from behavioral learning theory (Cohen & Levinthal, 1990; Cyert & March 1963; Levitt & March 1988; Nelson & Winter 1982) was used to elaborate how the velocity of acquisition experience may influence acquirer performance. Routines are repetitive patterns of activity performed by organization members (Winter 1964); routines serve as organizational memory in which organizational resources and capabilities reside because organizations ‘remember by doing’ (Nelson & Winter 1982). Routines are also defined as recurrent patterns of interaction (Burns, 2000; Cohen & Bacdayan, 1994; Pentland & Rueter, 1994) and recurrent collective phenomena (Cohen & Bacdayan, 1994; Jones & Craven, 2001; Pentland & Rueter, 1994; Weick, 1993). Routines are building blocks of organizational capabilities (Dosi, Nelson, & Winter, 2000; Winter 2003) and dynamic capabilities (Eisenhardt & Martin, 2000) that lead to superior organizational performance. For example, Eisenhardt and Martin (2000) find that acquisition routines built by Cisco Systems facilitate managers to assemble an array of latest technologies that drive superior performance. Zollo and Singh (2004) argue that post-acquisition integration capability involves tacit routinization for repetitive tasks.

Routines take time to be developed and internalized as genes (Hodgson, 2008; Nelson & Winter 1982) of an organization. Either a too short or a too long time period between acquisitions hampers the development of acquisition routines as under such conditions inferences from the prior acquisition are unavailable (Hayward, 2002). A very short time period causes time compression diseconomies (Dierickx & Cool, 1989) which lead to insufficient learning and experience accumulation from prior acquisition. Evidence shows that managers are fail to evaluate acquisitions that happen in quick succession (Haunschild, Davis-Blake, & Fichman, 1994). A very long time period inhibits the replication of routines to refine routines to be more efficient and effective in the performative aspect (Feldman & Pentland, 2003).

Routines in acquisitions are analogous to dominant logic (Prahalad & Bettis, 1986) in acquisitions. A set of routines in acquisitions define task procedures and problem-solving principles about acquisitions that guide subsequent acquisitions. According to these routines, acquirers scan environmental opportunities, communicate and negotiate with possible candidates, evaluate targets, do due diligence, and conduct pre and post acquisition integration. The replication of routines in the acquisition process assists managers in employing dominant logic in managing acquisitions. Hayward (2002) confirmed that there is an inverted U-shaped relationship between the velocity of acquisition (the mean number of days between prior acquisitions) and subsequent focal acquisition performance (measured by announcement returns and analysts' rating). Hence, we posit an inverted U-shaped relationship between acquisition velocity and acquirer performance.

H2. The relationship between the velocity of acquisition experience and acquirer performance exhibits an inverted U-shaped curve.

2.4. The product-market scope of target firms

The value of experience for learning depends on the context in which the acquirer is embedded as learning is initiated when firms are exposed to various source of knowledge and interacted with their environments (Inkpen, 2000). Therefore, in addition to learn from prior acquisition experience *per se*, acquirers can learn from the knowledge embedded in target firms (Ahuja & Katila, 2001; Ranft & Lord, 2002; Puranam et al., 2006). The knowledge base of

target firms is one of factors which may impact acquirer performance. Research has documented that the targets' knowledge base positively impact acquirer performance. For example, Ahuja and Katila (2001) suggest that the absolute size of the target's knowledge base is positively associated with acquirer's innovation performance. Ranft and Lord (2002) conclude that the tacitness and social complexity of the acquired knowledge base impede the knowledge transfer during acquisition implementation. Discussing the knowledge transfer between alliance partners, Inkpen (2000) suggests that the accessibility of alliance partner's knowledge affects knowledge acquisition in strategic alliances.

The product-market scope of target firms which indicates the number of industries target firms operate in (Peng, Lee, & Wang, 2005) represents the proprietary know-how and related knowledge-intensive assets (Cuypers et al., 2017) an acquirer can access. A large product-market scope of prior targets provides an acquirer with broader learning opportunities for the utilization and creation of new knowledge to generate sustainable competitive advantage (Inkpen, 1998). By providing a larger base of knowledge repertoire in which an acquirer can access, product-market scope of target firms can moderate the relationship between the acquisition experience and acquirer performance. Therefore, *hypothesis 3* and *hypothesis 4* are presented.

H3. Product-market scope of target firms positively moderates the relationship between the portion of related acquisition experience and acquirer performance.

H4. Product-market scope of target firms positively moderates the relationship between the velocity of acquisition experience and acquirer performance.

3. Methodology

3.1. Sample

We tested the hypotheses on a large sample of acquisitions in the United States from 2001 to 2014. To explore the quality, the pattern, and the context of past acquisition experience from a temporal perspective, this paper followed Cuypers et al. (2017) and used a 10-year window to calculate the independent variables with the dependent variable lagged by one year. For example, acquisitions during the 2005–2014 period were used to gauge acquisition experience and predicted acquirer performance in 2015. However, this led to a low variance of independent variables for two consecutive years. To solve the issue of insufficient variance for independent variables, every two years data (year of 2011, 2013, and 2015) were used to verify the hypotheses. Furthermore, the results for every three years data (year of 2012, 2015) and every four years data (year of 2011, 2015) were consistent, suggesting the robustness for the model.

We collected acquisition data from the Securities Data Corporation (SDC) database, which is commonly used by studies on acquisitions (Ahuja & Katila, 2001; Cuypers et al., 2017; Hayward, 2002; Laamanen & Keil, 2008; Makri, Hitt, & Lane, 2010; Reuer, Tong, & Wu, 2012). Financial data for acquirers were gathered from the Wharton Research Data Services (WRDS) Compustat North American database. The final sample was selected following the criteria below.

1. Following Laamanen and Keil (2008), serial acquirers are defined as acquirers that conduct at least 4 acquisitions during the 10-year observation period. Therefore, public acquirers in

the United States that engaged at least 4 acquisitions during the 10-year observation period were selected.

2. The acquisition status was completed.
3. The “deal type” of acquisitions categorizing in the SDC database as recapitalizations, self-tenders, repurchases, and acquisitions of remaining interest were excluded.

The final sample was 2223 observations (791 in year of 2015, 751 in year of 2013, and 681 in year of 2011)² calculated from 11,571 acquisitions made by 889 serial acquirers listed in the United States.

3.2. Dependent variable

3.2.1. Acquirer performance

The dependent variable is acquirer performance. Since the purpose of this study is to explore the influence of acquisition experience on acquirer performance on a longitudinal basis, we adopted an accounting-based measure – return on assets (ROA) – to measure acquirer performance. ROA was measured by net income divided by total assets. Accounting-based measures has been reported to represent the long-run impact of firm behavior on operating performance (Park, 2002; Zollo & Singh, 2004; Tuch & O’Sullivan, 2007). While other performance measures such as returns on equity (ROE) or returns on sales (ROS) are often used to measure firm performance, ROA controls for the effects of differing financial structure (Bettis & Hall, 1982; Michel & Hambrick, 1992; Park, 2002) and is more suitable for our research setting.

3.3. Independent variable

3.3.1. The portion of relatedness of acquisition experience

The portion of relatedness of acquisition experience was gauged as the number of related acquisitions divided by the total number of acquisitions during the 10 years preceding the focal year. In this measurement, related acquisition was followed prior literature and defined by the 2-digit SIC code between the acquirer and the target. If the acquirer and the target shared the same 2-digit SIC code before the acquisition, this acquisition was categorized as related (Harrison, Hitt, Hoskisson, & Ireland, 1991). The value of the measurement was between 0 and 1.

3.3.2. The velocity of acquisition experience

The velocity of acquisition experience was measured by the mean number of days between acquisitions during the 10 years preceding the focal year (Hayward, 2002; Cuypers et al., 2017). The square term of this variable was included to model the curvilinear relationship.

3.3.3. The product-market scope of target firms

The product-market scope of target firms is measured by the diversification of four-digit SIC codes in which target firms operated during 10 years preceding the focal year. That is,

The product – market scope of target firms

$$= 1 - \sum_{j=1}^n \left(\frac{\text{num}_j}{\text{total}_{\text{num}_i}} \right)^2$$

where,

² Acquisition data during the 2001–2010 period are used to predict acquirer performance in 2011; acquisition data during the 2003–2012 period are used to predict acquirer performance in 2013; acquisition data during the 2005–2014 period are used to predict acquirer performance in 2015.

num_j = number of SIC code in the j category of 4 digit SIC code.

$\text{total}_{\text{num}_i}$ = total number of acquirer i ’s targets.

3.4. Control variables

We controlled for the following variables that might affect acquirer performance: (1) acquirer characteristics, such as acquirer size, acquirer prior experience, and acquirer slack; and (2) acquisition variables, such as the proportion of public targets and the proportion of high-technology targets. We also used year dummy variables to control for economic fluctuation during our study period.

3.4.1. Acquirer size

We included acquirer size, which was measured by the log of the total assets one year before the focal year, to control for size effects because larger firms tend to have better performance.

3.4.2. Acquirer prior experience

We followed previous acquisitions literature (Haleblian & Finkelstein, 1999; Hayward, 2002; Laamanen & Keil, 2008) and measured acquisitions experience by the number of acquisitions undertaken by the firm during each 10-year study period.

3.4.3. Acquirer slack

Two components of slack that are absorbed slack and unabsorbed slack were measured (Smith, Grimm, Gannon, & Chen, 1991). Absorbed slack was calculated by the amount of selling, general, and administrative expenses divided by total revenue, suggesting slack that is absorbed by cost but could be recovered when firms encounter financial difficulty (Geiger & Makri, 2006). Unabsorbed slack was measured by the extent to which the sum of cash and marketable securities for the year covered current liability, capturing the extent to which firms have resources that are readily available.

3.4.4. Proportion of public targets

The proportion of public targets was measured by the number of public targets divided by the total number of acquisitions during the 10 years study period.

3.4.5. Proportion of high-technology targets

The proportion of high-technology targets was measured by the number of high-technology targets divided by the total number of acquisitions during the 10 years study period.

3.4.6. Year dummy

We included year dummy variables for the years of 2013 and 2015, where 2011 serves as the residual category, to control for year effects.

Table 1 describes the operationalization of all variables in the study.

4. Results

Table 2 reports descriptive statistics and correlations for the variables used in this study. Data presented in Table 2 show that the portion of related acquisition experience is 35 per cent, indicating that an acquirer owns 35 per cent of related targets that were in the same 2-digit SIC code industry in the 10 years preceding the focal

year. The velocity of acquisition experience is 356.79 – that is, an acquirer undertakes acquisition almost once a year. The product-market scope of target firms is 0.64, suggesting that most acquirers enter new product-market fields through acquisitions. The correlations between the variables are low to modest, indicating little multicollinearity problems.

Table 3 shows the results of multiple regressions that predict acquirer performance measured by acquirer ROA. Model 1 included only control variables and served as the base model. We found significant size and year effects. The portion of public targets negatively impact acquirer performance, which is consistent with prior literature on the private company discount (Fuller, Netter, & Stegemoller, 2002). The portion of high-technology targets positively impact acquirer performance. The product-market scope of target firms is positive and significant. This results echo prior literature about the influence of target firms on acquirers' learning outcome (Ahuja & Katila, 2001; Ranft & Lord, 2002; Puranam et al., 2006).

Hypothesis 1 predicts a positive relationship between the portion of related acquisition experience and acquirer performance. The coefficient for the variable in Model 2 is positive but non-significant. Hypothesis 1 is thus not supported. Hypothesis 2 presents an inverted U-shaped relationship between the velocity of acquisition experience and acquirer performance. To test the hypothesis, the velocity of acquisition experience and the square term of velocity of acquisitions were added to Model 3. The velocity of acquisition experience and its square term were mean-centered to avoid multicollinearity. As Hypothesis 2 predicts, acquirer performance is positively correlated ($p < 0.01$) with the velocity of acquisition experience and negatively correlated ($p < 0.01$) with the squared term of the velocity of acquisition experience in Models 2 and 3. Taken together, the results confirm an inverted U-shaped curvilinear relationship, providing support for Hypothesis 2.

Hypothesis 3 and 4 state the moderation effect of the product-market scope of target firms on the acquisition experience and acquirer performance. This study mean-centered the variables used to compute the interaction items (Aiken & West, 1991; Basuil & Datta, 2015). The result shows that the interaction term comprising the portion of related acquisition experience and the product-market scope of target firms in Model 4 is positive and significant ($p < 0.05$). Hypothesis 3 is supported by the findings that indicate that acquirer performance is enhanced by the interaction of the related acquisition experience and the product-market scope of target firms. Fig. 1 graphically indicates the effects of the portion of related acquisition experience on acquirer performance for high

and low levels of the product-market scope of target firms. The slope of the line presenting the relationship in the context of acquisitions associated with high level of product-market scope of targets is steeper than that of the line associated with low level of the product-market scope of target firms, suggesting that the product-market scope of target firms positively moderates the relationship between the portion of related acquisition experience and acquirer performance.

Furthermore, the interaction term comprising the velocity of acquisition experience and product-market scope of target firms in Model 4 is positive and significant ($p < 0.01$), suggesting the support for hypothesis 4. The interaction graph was shown as Fig. 2. The graph represents that with high level of the product-market scope of target firms, the positive relationship between the velocity of acquisition experience and acquirer performance is more. The positive moderating effect of the product-market scope of target firms on the relationship between the velocity of acquisition experience and acquirer performance has been confirmed.

We performed a variance inflation factor (VIF) in all models to detect multicollinearity. The largest VIF value of our predictors is 2.63, which is far below 10, the threshold value, suggesting little concern for multicollinearity (Wooldridge, 2009).

5. Discussion

Drawing on an organizational learning perspective, this study develops a framework that predicts relationships between acquisition experience and acquirer performance. The study is based on a sample of acquisitions in the United States over 14 years and finds that (1) the quality of acquisition experience (measured by the portion of related acquisition experience during the 10 years preceding the focal year) has a non-significant effect on acquirer performance; (2) the pattern of acquisition experience (measured by the velocity of acquisition experience during the 10 years preceding the focal year) significantly impact acquirer performance; (3) the context of acquisition experience (measured by the product-market scope of target firms) positively moderates the relationship between the portion of related acquisition experience and acquirer performance; and (4) the context of acquisition experience (measured by the product-market scope of target firms) positively moderates the relationship between the velocity of acquisition experience and acquirer performance. We explain this influence by arguing that the quality, the pattern, and the context of acquisition experience intertwine to shape acquisition routines and affect acquirer performance. Acquisition routines developed from

Table 1
Operation of variables.

Variables	Exp. signs	Operationalization
Dependent variables		
Acquirer performance (ROA) _t		ROA was measured by net income divided by total assets of the focal year
Independent variables		
The portion of related acquisitions $t_{-10-t-1}$	+	the number of related acquisitions (measured by 2-digit SIC codes) divided by the total number of acquisitions during the 10 years preceding the focal year
The velocity of acquisitions $t_{-10-t-1}$	inverted-U	the mean number of days between acquisitions during the 10 years preceding the focal year
The product-market scope of target firms $t_{-10-t-1}$	+	the diversification of four-digit SIC codes in which target firms operated during 10 years preceding the focal year
Control variables		
Acquirer size t_{-1}	+	the log of the total asset
Acquirer prior experience $t_{-10-t-1}$	+	the number of acquisitions undertaken by the firm during each 10-year study period
Acquirer absorbed slack t_{-1}	+	the amount of selling, general, and administrative expenses divided by total revenue
Acquirer unabsorbed slack t_{-1}	+	the sum of cash and marketable securities for the year covered current liability
The portion of public targets $t_{-10-t-1}$	–	the number of public targets divided by the total number of acquisitions during the 10 years study period
The portion of high-technology targets $t_{-10-t-1}$	+	the number of high-technology targets divided by the total number of acquisitions during the 10 years study period

Table 2
Means, standard deviations, and correlations.

Variables	Mean	SD	1	2	3	4	5	6	7	8	9
1 Acquirer performance t	0.03	0.18	1.00								
2 The portion of related acquisition experience $t_{-10-t-1}$	0.35	0.25	-0.08 *	1.00							
3 The velocity of acquisition experience $t_{-10-t-1}$	356.79	215.77	0.01	-0.03	1.00						
4 The product-market scope of target firms $t_{-10-t-1}$	0.64	0.23	0.12 *	-0.44 *	-0.13 *	1.00					
5 Acquirer size t_{-1}	7.58	1.85	0.20 *	-0.19 *	-0.21 *	0.09 *	1.00				
6 Acquirer prior experience $t_{-10-t-1}$	10.91	9.95	0.06 *	-0.03	-0.52 *	0.16 *	0.35 *	1.00			
7 Acquirer absorbed slack t_{-1}	0.34	4.03	-0.03	-0.02	-0.01	0.01	-0.08 *	-0.01	1.00		
8 Acquirer unabsorbed slack t_{-1}	0.85	1.62	0.00	0.04	0.06 *	-0.05 *	-0.09 *	-0.04 *	0.01	1.00	
9 The portion of public targets $t_{-10-t-1}$	0.07	0.11	0.02	-0.05 *	0.12 *	-0.05 *	0.31 *	-0.03	-0.01	0.10 *	1.00
10 The portion of high-technology targets $t_{-10-t-1}$	0.41	0.39	0.05 *	0.10 *	0.00	0.03	-0.03	0.12 *	0.02	0.29 *	0.16 *

*p < 0.05, n = 2223.

Table 3
Multiple regression of acquirer performance (ROA).

Dependent variable: Acquirer ROA t	Model 1	Model 2	Model 3	Model 4
Constant	-0.1249 (0.0178)	*** -0.1390 (0.0182)	*** -0.1318 (0.0183)	*** -0.1348 (0.0183)
Acquirer size (log) t_{-1}	0.0230 (0.0023)	*** 0.0241 (0.0024)	*** 0.0235 (0.0024)	*** 0.0243 (0.0024)
Acquirer prior experience $t_{-10-t-1}$	-0.0008 (0.0004)	0.0000 (0.0005)	0.0008 (0.0005)	0.0010 (0.0005)
Acquirer absorbed slack t_{-1}	-0.0006 (0.0009)	-0.0004 (0.0009)	-0.0004 (0.0009)	-0.0003 (0.0009)
Acquirer unabsorbed slack t_{-1}	0.0016 (0.0024)	0.0016 (0.0024)	0.0015 (0.0024)	0.0010 (0.0024)
The portion of public targets $t_{-10-t-1}$	-0.1024 (0.0357)	*** -0.1178 (0.0359)	*** -0.1079 (0.0359)	*** -0.1053 (0.0359)
The portion of high-technology targets $t_{-10-t-1}$	0.0315 (0.0102)	*** 0.0287 (0.0103)	*** 0.0262 (0.0103)	*** 0.0249 (0.0102)
The product-market scope of target firms $t_{-10-t-1}$	0.0831 (0.0163)	*** 0.0963 (0.0183)	*** 0.0905 (0.0183)	*** 0.0849 (0.0189)
year dummy: 2013	-0.0094 (0.0093)	-0.0097 (0.0092)	-0.0083 (0.0092)	-0.0075 (0.0092)
year dummy: 2015	-0.0536 (0.0092)	*** -0.0542 (0.0091)	*** -0.0533 (0.0091)	*** -0.0533 (0.0091)
The portion of related acquisition experience $t_{-10-t-1}$		0.0209 (0.0171)	0.0202 (0.0171)	0.0303 (0.0176)
The velocity of acquisition experience $t_{-10-t-1}$		0.0001 (0.00002)	*** 0.0001 (0.00003)	*** 0.0002 (0.00003)
The square term of the velocity of acquisition experience $t_{-10-t-1}$			-0.000002 (0.000001)	*** -0.000002 (0.000001)
The product-market scope of target firms $t_{-10-t-1}$ x The portion of related acquisition experience $t_{-10-t-1}$				0.1290 (0.0572)
The product-market scope of target firms $t_{-10-t-1}$ x The velocity of acquisition experience $t_{-10-t-1}$				0.0002 (0.0001)
n	2223	2223	2223	2223
adjusted R-square	0.0723	**** 0.0773	**** 0.0825	**** 0.0875

Coefficient with standard errors under coefficients in parentheses.

* p < 0.1; ** p < 0.05; *** p < 0.01; **** F < 0.01.

experience have been refined by subsequent acquisitions and lead to a superior performance.

These findings contribute to the current stream of research on organizational learning and acquisition experience (Hayward, 2002; Laamanen & Keil, 2008; Muehlfeld et al., 2012; Basuil & Datta, 2015; Cuypers et al., 2017). Although our research did not find the main effect of the related acquisition experience on acquirer performance, the interaction effect of the related acquisition experience and the product-market scope of target firms is positive associated with acquirer performance. This implies that the benefits of ‘near transfers’ (Perkins & Salomon, 1992) occur only when the knowledge repertoire an acquirer can access has a border scope. The similarities between the acquirer and its targets bring advantages such as the ease of knowledge transfer. However, high level of similarity may lead to disadvantages such as local search and rigidity.

The results also contribute to the stream of literature about understanding how context variables interact with acquisition experience to affect acquisition performance (Barkema & Schijven, 2008; Castellana & Conti, 2017). The product-market scope of target firms for an acquirer is verified to positively moderate the relationship between acquisition experience and acquirer performance. The evidence shows that acquisitions are mechanisms by which firms enter new product-market field to gain sustainable competitive advantages.

Moreover, this study demonstrates that the velocity of acquisition experience matter for learning from experience. Consistent with Hayward’s (2002) work, we confirm the time compression diseconomies in experiential learning by presenting the inverted U-shaped effect of the velocity of acquisition experience on acquirer performance. It takes time to routinize prior acquisition experiences to guide subsequent acquisitions. Acquirers made

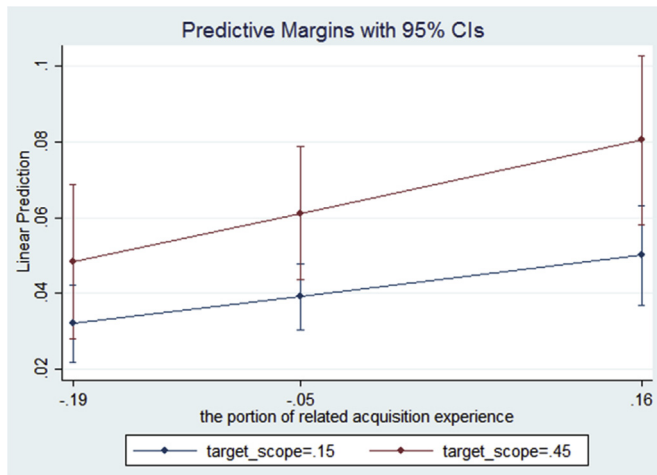


Fig. 1. Two-way interaction graph between the portion of related acquisition experience and the product-market scope of target firms. *The value of the variables to compute the interaction item was mean-centered.

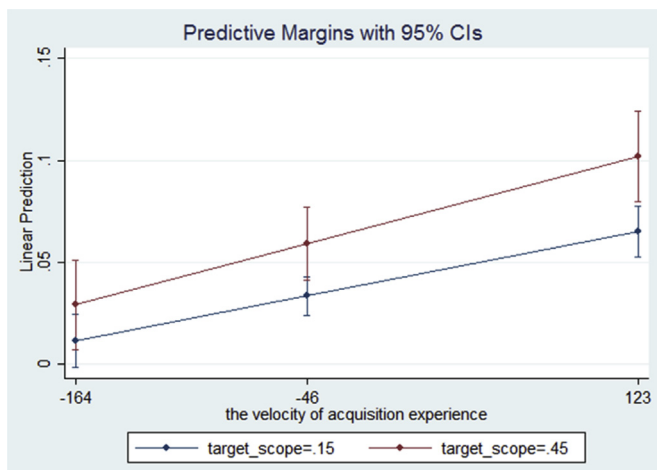


Fig. 2. Two-way interaction graph between the velocity of acquisition experience and the product-market scope of target firms. *The value of the variables to compute the interaction item was mean-centered.

acquisitions at a moderate velocity allow learning becomes effective to have better performance.

Furthermore, our study contributes to an emerging stream of acquisition program perspective (Laamanen & Keil, 2008). Prior studies on acquisitions, with few exceptions (Basuil & Datta, 2015; Côté, Langley, & Pasquero, 1999; Fuller et al., 2002; Hayward, 2002), adopt cross-sectional, large-sample methodologies to examine related issues of acquisitions. These studies implicitly assume that each acquisition conducted by a single acquirer is an isolated event and overlook their possible interdependencies, especially where several transactions involve the same acquirer (Côté et al., 1999). However, because acquisitions have become a mechanism by which firms can access external resources timely, more and more firms are engaging in acquisitions to achieve their strategic goals (Laamanen & Keil, 2008; Schipper & Thompson, 1983). When firms undertake multiple acquisitions over time, the overall performance may be influenced by more than the features of particular acquisition. Instead, the effects of acquisitions on acquirer performance require investigating multiple prior acquisitions on a longitudinal basis (Laamanen & Keil, 2008).

Our findings suggest an important implication for managers – in addition to considering firm and deal characteristics for individual acquisitions, managers must shift to a more plan-ahead, proactive acquisition strategy to manage a series of acquisitions from an acquisition program view (Laamanen & Keil, 2008); acquirer performance will depend on how the firm has operated in the past. Specifically, the velocity between acquisitions and the product-market scope of targets are factors which affect acquirers' learning from prior experience. Managers need to pay attention to arranging acquisitions from a temporal perspective rather than evaluate acquisitions case by case.

Some limitations of the study are explicated. The focus of the study is on serial acquirers that view acquisitions as key drivers of firm growth. However, strategic alliances also become one of mechanisms by which firms pursue their strategic goals. Prior alliance experience has documented to have a positive effect on acquisition performance (Chang & Tsai, 2013). Future research could build on our study by investigating the effects of prior alliance experience and how the variable interact with prior acquisition experience to impact acquirer performance. In addition, other context variables can be identified to examine how these variables may influence firms' learning from experience. Finally, this study adopts an accounting-based performance measure—ROA to measure acquirer performance. Other performance measures such as marketing-based performance measure or innovation outcome can be deployed to understand the influence of acquisition experience on acquisition performance.

6. Conclusion

In conclusion, this study offers valuable insights into the effects of acquisition experience on acquirer performance. Our findings provide a new research agenda for reexamining the causes and consequences of acquisitions from the perspective of organizational learning. Future research may focus on investigating how other experience variables and how these variables interact with other context variables to influence acquirer performance. Furthermore, given that cross-border acquisitions involve higher level of complexity, how firms can learn from cross-border acquisition experience also a prominent field deserved further research efforts.

Acknowledgements

The author would like to thank the anonymous reviewers for their valuable comments and suggestions to improve the quality of the paper and thank the Ministry of Science and Technology of the Republic of China (MOST 101-2410-H-020-001-) for the financial support.

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