International Journal of Business and Management; Vol. 19, No. 3; 2024
ISSN 1833-3850 E-ISSN 1833-8119
Published by Canadian Center of Science and Education

# Asymmetric Learning in Successive Mergers and Acquisitions: Overconfidence and Loss Aversion

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Received: February 21, 2023 Accepted: March 29, 2024 Online Published: April 6, 2024

doi:10.5539/ijbm.v19n3p55 URL: https://doi.org/10.5539/ijbm.v19n3p55

**Abstract**

Using data from 865 acquisition events launched by Chinese A-share listed companies between 2013 and 2019, we divide the dataset into two subsamples: first-time merger successes and first-time merger failures. For firms that experienced initial merger success, we find the outcomes of their subsequent merger activities to be negative, as managerial overconfidence hindered the assimilation of valuable insights from the initial successful experience. Conversely, in the case of firms that encountered initial merger failure, managerial loss aversion stimulated a learning process that led to improved performance in subsequent merger endeavors. Asymmetric learning effects are observed to significantly impact the merger outcomes of serial acquirers. Further analysis reveals that managerial age plays a role in optimizing this asymmetric learning effect.

**Keywords:** successive acquisitions, overconfidence, loss aversion, asymmetric learning

## 1. Introduction

The operational performance of a firm significantly depends on managerial decision-making ability. For management teams, there are opportunities and challenges in conducting merger and acquisition (M&A) activities. In contrast to singular acquisitions, management manifests more discernibly pronounced learning effects within the realm of consecutive mergers and acquisitions. This particular learning dynamic exerts a direct influence on the overall M&A performance of the enterprise.

The existing literature on the impact of M&A on firm performance has yielded inconclusive findings over the past few decades, with divergent results showing positive, negative, inverted U-shaped, and U-shaped effects. Moreover, research concerning the driving forces behind these effects and the underlying mechanisms remains scarce. Hence, it is necessary to conduct in-depth investigations into the post-merger events occurring within companies to gain deeper insights into the outcomes of M&A activities. Scholars have advocated for a more comprehensive and rigorous analysis to shed light on the complex interplay among management decision-making, learning effects, and M&A performance in a continuous acquisition context (Graebner et al., 2017; Renneboog & Vansteenkiste, 2019; Devers et al., 2020).

In the past decade, a cohort of enterprises engaging in successive mergers and acquisitions has emerged in China. The focus of this study examines whether these enterprises can derive lessons from their experiences in consecutive M&A activities. For instance, Haier Group of China exemplifies successful learning from its sequential M&A activities, notably its acquisition of Hitachi's global home appliance business and the Italian brand Candy Group, which enabled the accomplishment of their objectives related to expanding domestic and international market shares and diversifying product lines. Conversely, Fosun Pharma, following its consecutive M&A activities involving Israeli company Alma, US-based Saladax Biomedical, and Silicon Valley's respiratory disease detection company Spirometrix, failed to effectively capitalize on these experiences, resulting in a persistent lack of core competitiveness. We posit that in order to attain enhanced performance, post-M&A entities must learn from their experiences. Solely embarking on industry entry through M&A does not assure the sustained prosperity of their financial performance and market valuation. Therefore, this paper endeavors to elucidate the factors contributing to divergent post-M&A performance outcomes by adopting a lens that focuses on the managerial learning effects derived from their M&A experiences.

Using a sample of mergers and acquisitions (M&A) involving Chinese A-share listed companies during the

period from 2013 to 2019, we find enterprises encountering initial M&A failure tend to intensify their focus on deriving lessons from their M&A experiences. This, in turn, leads to more pronounced learning effects, surpassing the learning effects observed in firms that achieve success in their inaugural merger and acquisition. This observed asymmetric learning effect is influenced by the psychological factors of managerial overconfidence and loss aversion. Importantly, these findings demonstrate robustness when employing different model specifications and event window periods. Further analysis reveals a positive association between managerial age characteristics and the inclination towards loss aversion, which contributes to optimizing the asymmetric learning effects in the context of continuous M&A activities.

This study contributes to the existing literature on continuous M&A activities in Chinese corporations. Based on psychology and behavioral economics, this study investigates the differences in managerial learning behaviors and effects after the success or failure of initial mergers and acquisitions. This study introduces an inaugural analysis framework for examining the asymmetric learning effects within consecutive M&A contexts. Furthermore, it pioneers an exploration from the perspective of psychological and cognitive biases to elucidate the asymmetric relationship between diverse acquisition experiences and performance outcomes. While previous research has examined the influence of managerial overconfidence on M&A behaviors, our study provides preliminary insights into the existence of asymmetric learning effects in continuous M&A endeavors, influenced by the effects of managerial overconfidence and loss aversion. Consequently, this research elucidates the mechanisms and principles underlying the impact of continuous M&A practices on a firm's future performance.

The remainder of this article is structured as follows. Section 2 reviews the related literature and establishes the hypotheses, while Section 3 describes the data and research design. Section 4 presents and discusses the results obtained, and Section 5 concludes.

## 2. Related Literature and Hypotheses Development

### *2.1 Asymmetric Learning Effects in Successive Acquisitions: An Exploratory Analytical Framework Based on Psychology and Behavioral Economics*

The literature on how acquirers learn from the post-merger integration (PMI) process in dynamic M&A and the subsequent impact on performance after multiple acquisitions remains inconclusive. Specifically, there is a lack of consensus on whether management can effectively learn from consecutive M&A events. Trichterborn et al. (2016) conducted a study focusing on the acquisition behavior of German companies and found evidence suggesting that the M&A learning process plays a pivotal role in the establishment of M&A capabilities and contributes to improved performance. Similarly, Renneboog and Vansteenkiste (2019) argued that the experiential learning gained from M&A activities can be leveraged in subsequent acquisitions targeting similar firms, leading to positive average M&A returns.

In contrast, Hayward (2002) conducted an investigation on consecutive M&A transactions spanning the period from 1990 to 1995, and the findings did not provide support for performance enhancement through experiential learning. Zollo and Singh (2002) also failed to establish a positive correlation between M&A experience and performance outcomes. Similarly, Conn (2004) reported a gradual decline in acquisition performance with an increase in the sequence of M&A deals, indicative of a limited learning effect. Additionally, Ahmad and Abed (2013) conducted a multiple regression analysis on 6,503 M&A events in the UK from 1985 to 2004, revealing no evidence substantiating the organizational learning theory, meaning M&A performance remains largely unaffected by previous experiences. Drawing on the threat rigidity theory, Meschi et al. (2015) proposed that organizational leaders are unable to learn from prior failures, resulting in adverse effects on their future performance.

We believe that a significant reason for this lack of consensus may be the absence of differentiation between successful and unsuccessful experiences. There exists a strong correlation between managerial experiential learning and outcomes of the initial M&A activity. This paper delves into the mechanisms underpinning asymmetric learning effects in successive acquisitions, drawing insights from the fields of psychology and neuroscience. Figure 1 delineates an exploratory analytical framework for investigating the asymmetric learning effects observed in management practices during successive mergers. Sections 2.2 and 2.3 are devoted to the formulation of research hypotheses pertaining to the phenomenon of asymmetric learning effects.

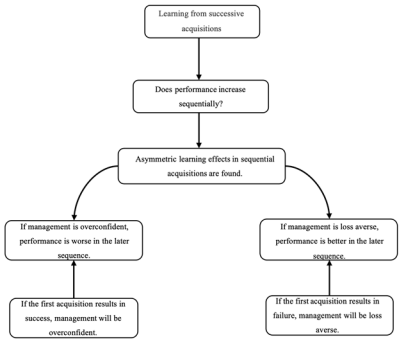


Figure 1. Analytical framework for asymmetrical learning effects in Successive Acquisitions

### *2.2 Overconfidence, M&A Experience, and Performance*

#### 2.2.1 Theory of Overconfidence

Overconfidence manifests itself through three primary reactions: overestimation, overprecision, and overplacement. Overestimation involves the tendency to portray a given situation or object in a more favorable or ideal light than warranted by reality. For instance, individuals may demonstrate an inflated belief in their own abilities and engage in embellishing their professional skills during employment interviews. Overprecision pertains to an unwarranted level of confidence in specific outcomes. Notably, when executives are solicited to prognosticate the future prospects of a company, they may espouse an aura of certitude, ostensibly claiming precise foresight regarding upcoming events (Moore & Schatz, 2017). Overplacement refers to an individual's inclination to perceive themselves as stronger or superior to others. Such individuals tend to attribute their successes to internal factors while attributing failures to external factors, thereby, overestimating their decision-making abilities (Palmer et al., 2019). In the context of overconfidence, managerial personnel are prone to overestimate the likelihood of success while underestimating the probability of failure. This manifests as overconfident decision-making (Kunz et al., 2022) and an excessively optimistic outlook on the financial standing of their companies (Schumacher et al., 2020). As behavioral economist Daniel Kahneman stated in *Thinking, Fast and Slow*, "We tend to overestimate our understanding of the world and underestimate the randomness of events. When we look back at the past, with the benefit of hindsight, we have an erroneous sense of certainty about events, which leads to overconfidence." Does this "overconfidence" lead managers to make erroneous merger and acquisition decisions, resulting in adverse M&A performance?

#### 2.2.2 Overconfidence and Successive M&A

Existing research indicates that CEO narcissism, overconfidence, extroverted personality traits, and focus on promotion increase the frequency and boldness of mergers and acquisitions (Chatterjee & Hambrick, 2007; Gamache & Johnson, 2014; Malhotra, Reus, Zhu, & Roelofsen, 2018). When a company's management faces decisions regarding successive acquisitions, they often rely on experiences from recent mergers and acquisitions. Influenced by overplacement, managers often attribute past successes to their own abilities and personal qualities, leading to overconfidence, judgment errors, overestimation of benefits, and underestimation of risks (Qiao et al., 2022). Malmendier & Tate (2005b) found that overconfident CEOs tend to overestimate their investment decision-making abilities. Similarly, optimistic managers tend to increase their risk exposure and initiate more investment activities (Glaser et al., 2008). Hwang et al. (2020), through annual observational data on 13,754 U.S. companies from 1996 to 2014, discovered that overconfident CEOs are more inclined towards diversifying acquisitions compared to non-overconfident CEOs. Zhang et al. (2021) found that overconfident CEOs tend to implement multiple acquisitions within a short time frame. These findings indicate that a higher degree of managerial overconfidence corresponds to an increased propensity for pursuing mergers and acquisitions.

The aforementioned literature indicates that overconfident managers tend to engage in successive acquisitions. However, this study is particularly interested in examining the post-merger performance of companies after engaging in such continuous acquisition activities. Research has shown that managerial overconfidence can lead to a decline in subsequent merger performance (Malmendier & Tate, 2005b). When overconfident managers make acquisition decisions, they not only overestimate the synergistic effects of mergers but also believe they have the ability to identify undervalued assets (Renneboog & Vansteenkiste, 2019), ultimately resulting in higher acquisition premiums (Ismail and Mavis, 2022). As the number of acquisitions increases, even though the

company accumulates more merger experience, the subsequent merger performance deteriorates. This is attributed to the detrimental influence of overconfident psychology, whereby as acquisition experience increases, the quality of managerial decision-making diminishes.

China is a typical collectivistic culture that emphasizes the primacy of collective interests over individual interests. Prior research predominantly accentuate that individuals within a collectivist cultural milieu often exhibit heightened levels of overconfidence (Moore et al., 2018). Additionally, influenced by traditional Confucian and Legalist ideologies, hierarchical systems are prominent features of Chinese culture. Consequently, Chinese managers often wield more authority in comparison with to other counterparts. Under the influence of collectivism, individuals may be hesitant to express their own opinions, leading them to defer to managerial decisions in the decision-making process. This dynamic creates favorable conditions for the manifestation of overconfidence.

Overconfidence has become a significant characteristic among top executives in Chinese enterprises. Following the success of their initial mergers and acquisitions, overconfident managers, influenced by their own self-assuredness, tend to overlook valuable lessons from their experiences. Instead, they attribute their success solely to their exceptional abilities and outstanding decision-making skills. This overestimation of potential benefits and underestimation of potential losses before the acquisition stage result in excessive investments and overvaluation of target companies. Subsequently, after the mergers, management remains excessively confident, overestimating their capabilities to coordinate and integrate resources, leading to a failure to take timely and effective measures to realize synergistic effects. As a result, this study proposes the following hypothesis:

H1: Due to managerial overconfidence, for companies that have achieved success in their initial mergers and acquisitions, the performance of their subsequent acquisitions exhibits a negative correlation with their acquisition experience.

### *2.3 Loss Aversion, M&A Experience, and Performance*

#### 2.3.1 The Basic Theory of Loss Aversion

When evaluating decisions concerning gains and losses, decision-makers generally pay more attention to losses. In other words, the negative utility caused by a loss is larger than the positive utility caused by an equivalent gain. This phenomenon is known as "loss aversion." Kahneman and Tversky (1979) observed that the value function for loss is steeper than the value function for gain (as shown in Figure 2), indicating that people are more sensitive to loss. For instance, the negative utility from losing $100 is greater than the positive utility from gaining $100. The subjective impact of a loss is approximately twice as powerful as a gain (Ucbasaran, 2013), implying that individuals typically require $100 in potential income to compensate for a $50 potential loss. Loss aversion is a prevalent phenomenon in behavioral decision-making, and it can significantly influence people's investment decisions (Sheng et al., 2021).

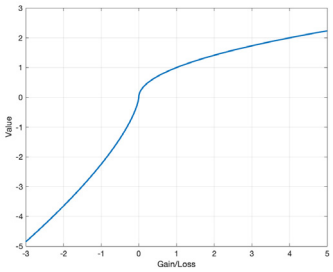


Figure 2. The value function curve of expectation theory

*Source:* Kahneman and Tversky, 1979, p. 279.

From a neurological perspective, loss aversion is significantly correlated with brain regions such as the striatum, amygdala, and prefrontal cortex (Chib et al., 2012; Bartra et al., 2013; Feng et al., 2013; Fukunaga et al., 2012; Byrne et al., 2022). For instance, a reduction in income can lead to activation of the autonomic nervous system (ANS), pupil dilation, and increased heart rate (Lejarraga et al., 2019). The insular cortex may also be involved in loss aversion, making individuals particularly sensitive to negative information such as punishment and loss (Huo et al., 2022). In addition to the stress responses in the human neural system related to loss aversion,

evidence of loss aversion has been found in retrospective studies on decision-making behavior in animals (Apicella et al., 2014; Li et al., 2012; Byrne et al., 2022). Loss aversion could be a response to fear shared by humans and animals, suggesting that humans might have inherited loss aversion from animals (Brosnan et al., 2023).

Overall, loss aversion represents a prominent aspect of decision-making behavior and highlights the significance of understanding both the psychological and biological factors that influence human and animal responses to gain and loss in various contexts.

2.3.2 Loss Aversion and Successive M&A

Some scholars have applied the psychological concept of loss aversion to analyze business decision-making. Christoph Merkle (2020) found that loss aversion significantly influences expected outcomes, with investors being twice as sensitive to negative expected returns compared to positive ones. From both psychological and neuroscience perspectives, loss aversion can explain why managers and companies exhibit different learning outcomes in the context of successive M&A. Zhang et al. (2013) proposed that, based on prospect theory and loss aversion theory, major shareholders tend to continue investing and strive to improve management when faced with severe external shocks or "losses." This behavior is part of a learning process: Loss aversion reinforces the awareness of financial loss among management and shareholders, emphasizing their concern for preserving reputation. It leads to their active engagement in problem-solving, enhances a sense of continuous learning, and encourages ongoing reflection, thereby improving performance.

(1) Loss aversion and endowment effect

The "endowment effect" refers to the psychological phenomenon wherein people tend to value items they already possess more highly than their actual market value. This effect is driven by the psychological characteristics of loss aversion. According to this theory, once a person owns a particular item, regardless of its actual value, they tend to overestimate its worth. In other words, the utility of reducing loss is greater than that of equivalent gain. Therefore, in the decision-making process, even when potential gains far outweigh losses, people often overvalue items they are selling due to their fear of losses.

The endowment effect is also observable in political activities. Elections of leaders (Alesina and Passarelli, 2019) and reforms undertaken by ruling parties (Schumacher et al., 2015) both reflect the psychological characteristics of loss aversion. For example, when a political party with low expectations of holding office senses potential failure in the next election, they tend to take risks and engage in radical reforms to pursue better governance outcomes. This behavior is driven by loss aversion. Similarly, in the economic context, enterprises, like countries on the political level, are influenced by their leaders. After a merger and acquisition, major shareholders and management, motivated by their fear of early investment loss, utilize their resources to help the company survive. As failures accumulate, they have a stronger incentive to avoid loss.

(2) Loss aversion and learning from failure

Experiencing loss is an essential component of the "learning journey" as it contains valuable information that goes beyond what success can offer. In comparison to success, loss can more effectively encourage organizations to seek new problem-solving approaches and encourage members to actively engage in the decision-making process (Selart et al., 2020). Research on learning from failure suggests that factors such as attribution (Yamakawa et al., 2015), intrinsic motivation (Yamakawa et al., 2010), prior experience (Ucbasaran et al., 2013), and knowledge exchange (Gressgård & Hansen, 2015) can all influence the learning process. These factors play significant roles in how organizations and individuals derive valuable insights from their setbacks and turn them into opportunities for improvement. After experiencing a failure, management often first identifies the failure and tolerates failure, which may lead to repeated failures and develop smaller failures and mistakes into larger failures. Secondly, management will attribute the failure and Instead of attributing major failures to uncontrollable events outside the organization and the intervention of external personnel, management can timely discover problems in subsequent decisions, suspend innovative projects in a timely manner, or adjust organizational strategies, goals, and even concepts to avoid the same mistakes in subsequent enterprise development.

Cusin (2012) introduced a comprehensive four-stage model for deconstructing the learning process following instances of failure: the Definition of Failure, Interpretation and Analysis of Failure, Acquisition and Retention of Knowledge, and Extraction of Fresh Insights from Experience. During the initial stage of defining the failure, the realization that a recently acquired project has fallen short of expectations operates as a catalyst for managers to meticulously analyze the underlying causes of the merger's inadequacy. This pivotal realization propels the

transition to the subsequent learning stage characterized by interpreting and dissecting the failure. Fueled by the cognitive impacts of loss aversion, managers exhibit a heightened sensitivity towards failure, thereby motivating their active pursuit of performance enhancement. As expounded by Hussinger (2019), enterprises that fail to meet anticipated performance levels tend to initiate mergers and acquisitions as strategic responses. The managers responsible for these unsuccessful endeavors frequently seek to capitalize on novel business opportunities by embarking on fresh merger initiatives, all in a concerted effort to augment performance metrics. Consequently, these managers invest considerable attention in aggregating and gleaning insights from their past failure experiences.

In the subsequent stage - the accumulation of acquired knowledge - managers collate their merger-related experiences into compendious manuals and toolkits (Zollo & Singh, 2004), simultaneously instituting specialized merger committees (Trichterborn et al., 2016) to systematically document and store the wealth of insights gleaned from their unsuccessful merger ventures. Subsequently, managers delve into these meticulously preserved experience archives to glean new perspectives and insights that hold the potential to inform and enhance future merger performance. In this intricate interplay, the latent psychological mechanism of loss aversion serves as the trigger for a multifaceted learning process among managers, thereby engendering a distinct and valuable learning paradigm derived from instances of failure.

Following the encounter with the setback stemming from their initial merger endeavor, the psychological underpinnings of loss aversion, coupled with an innate reflexive anxiety response, heighten the propensity of management to leverage the aforesaid pedagogical tools. These tools encompass introspective compendiums and the guidance provided by merger or advisory committees. This strategic adjustment is orchestrated with the explicit intent of elevating the efficacy of their merger undertakings. Consequently, managers who have navigated the challenging terrain of inaugural merger failures exhibit an augmented drive to extract lessons from their experiences. They are poised to more meticulously select lucrative targets, devise judicious offers, and subsequently achieve enhanced synergistic integration in the aftermath of ensuing merger initiatives. Based on this analysis, the authors propose Hypothesis 2:

H2: Due to the psychological effects of loss aversion and the endowment effect, for companies that experienced first-time merger failures, the performance of their subsequent acquisitions exhibits a positive correlation with their acquisition experience.

## 3. Data and Design

### *3.1 Sample Selection*

The preliminary sample for this study is based on the CSMAR database and includes A-share listed companies in China that announced their first mergers or reorganizations between the years 2013 and 2019 (pre-COVID-19 period). Events selection criteria (a) exclude financial and insurance companies; (b) exclude unfinished merger transactions; (c) retain only mergers involving equity targets; (d) include transaction values exceeding five million Chinese yuan, as small-value transactions may have minimal impact on company performance; (e) retain only the first merger event in instances of multiple mergers initiated on the same day; and (f) delete samples with only one merger event between 2013 and 2019.

Furthermore, in line with the definition of learning-oriented managers, at least one accounting period was required between merger events to ensure that managers had sufficient time to learn. In other words, if a company conducted two acquisitions in the same year, all data related to these events were removed. The final sample consists of 360 companies with a total of 865 merger events.

### *3.2 Variables*

#### 3.2.1 The Dependent Variable: M&A Performance

Performance measurement in merger and acquisition (M&A) studies can be carried out using event study methodology and accounting-based measures. The event study methodology focuses on the announcement date as the central time axis and sets a specific "window period" around it, including a certain period before and after the announcement. It utilizes the stock market's reaction during the window period to calculate cumulative abnormal returns (Hayward, 2002; Renneboog et al., 2019). On the other hand, the accounting-based approach employs financial data of the involved companies to assess the performance changes before and after the M&A activity. Common indicators include total asset return, net asset return, operating profit margin, earnings per share, and Tobin's Q value. Some researchers also use change in operating performance (OP) before and after the merger to represent its impact (Zollo & Singh, 2004; Ding et al., 2021).

Conventionally, event studies are predominantly applied to scrutinize the short-term outcomes of M&A activities,

whereas accounting-based metrics offer a more apt framework for dissecting long-term performance dynamics (Ahmed et al., 2018). Given that the erudition gleaned by managers from preceding M&A engagements is likely to exert enduring ramifications on firm's performance, it is our contention that accounting-based indicators offer a more appropriate depiction of M&A efficacy. Leveraging methodologies reminiscent of those employed by Conn et al. (2004) and Faqin Lan (2022), we opt to gauge M&A performance through the assessment of variations in operating performance (OP) observed prior to and subsequent to the M&A event. Operating performance is defined as the total asset return of the company for the year after the acquisition (t+1) minus the total asset return for the year before the acquisition (t-1), which represents the change in operating performance (computed as follows):

$$OP_t = \text{Operating Profit / Total Assets}_{(t+1)} - \text{Operating Profit / Total Assets}_{(t-1)}$$

The change in OP serves as a crucial benchmark to measure the success or failure of the first acquisition.

3.2.2 The Independent Variable: M&A Experience

As an independent variable, the measurement of M&A experience is derived from the sequencing of the merger occurrences. A higher numerical order corresponds to more extensive experience. Theoretically, the spectrum of M&A experience spans from 1 to 7 for the period from 2013 to 2019. However, upon examination of the actual acquired sample, no company met the stipulation of having precisely one merger for each year between 2013 and 2019. Consequently, the maximum recorded M&A experience value within the sample stands at five.

Following a more comprehensive organization of the 865 merger events, the distribution of M&A event orders and their corresponding frequencies is outlined in Table 1.

Table 1. Distribution of M&A events

| Sequence Order | 1 | 2 | 3 | 4 | 5 | Total |
|---|---|---|---|---|---|---|
| Number of events | 360 (Note1) | 360 | 113 | 28 | 4 | 865 |
| Number of successful M&A | 181 | 165 | 54 | 14 | 3 | 417 |
| Number of failed M&A | 179 | 195 | 59 | 14 | 1 | 448 |

*Note.* This table presents the number of companies corresponding to the order of acquisitions, along with the distribution of these acquisition events across the dimensions of success and failure.

3.2.3 The Control Variables

Apart from M&A experience, M&A performance is also influenced by factors such as transaction and acquirer characteristics. To mitigate the impact of these factors, a set of control variables was devised following the research frameworks of Zhu (2016), Renneboog et al. (2019), and Hossain et al. (2021). The specific operationalizations of these control variables are detailed in Table 2.

Table 2. Control variables definitions

| Category | Variable Name | Code | Measurement Method |
|---|---|---|---|
| Acquirer characteristics | Asset size | Size | Natural logarithm of total assets |
| | Asset liability ratio | Debt | Total liabilities/total assets in the year before the acquisition |
| | Growth rate | Growth | Growth rate of the main business income in the year before the acquisition |
| Transaction characters | Private | Private | Private is 1; non-private is 0 |
| | Payment | Payment | Cash payment is 1; non-cash payment is 0 |
| | M&A relevance | Relevance | Correlation is 1; lack of correlation is 0 |
| Fixed effect | Year | Year | Time of first IPO |
| | Industry | Industry | SFC industry classification (according to the 2012 industry division standard) |

*3.3 Descriptive Statistics*

Table 3 presents the descriptive statistics for the data, covering a 7-year period from 2013 to 2019, allowing for a comprehensive view of M&A activities by Chinese enterprises listed in A-shared stocks. First, the average operating performance stands at approximately -0.0073, with a standard deviation of around 0.0749, indicating variations in performance before and after M&A activities. Second, the average experience level is approximately 1.7931, with a standard deviation of about 0.8221, signifying the accumulated experience during

the sample period. As a result, both dependent and independent variables within this study exhibit significant differences within the sample interval, underscoring the practical relevance and feasibility of the research.

Table 3. Descriptive statistics of variables

| Variable | Mean | Standard Deviation | Minimum | Maximum |
|---|---|---|---|---|
| OP | -0.0072731 | 0.0748981 | -0.3238746 | 0.2501506 |
| Experience | 1.793064 | 0.8221178 | 1 | 5 |
| Payment | 0.6184971 | 0.4860366 | 0 | 1 |
| Debt | 0.366529 | 0.1818024 | 0.04217 | 0.836508 |
| Growth | 0.3146346 | 0.6607421 | -0.404777 | 4.67031 |
| Size | 21.93841 | 1.009021 | 18.52395 | 26.04762 |
| Relevance | 0.3641618 | 0.4814727 | 0 | 1 |
| Private | 0.8473988 | 0.3598107 | 0 | 1 |

## 4. Results

The calculation process and regression analysis in this paper are completed using Stata 17.0. First, to ensure that the regression results do not increase the standard error of coefficients because of multiple collinearity among the variables and reduce the accuracy of the regression results, we use the variance inflation factor (VIF) to test the variables. The results are in Table 4, showing that the maximum VIF is 1.56, far less than 5, so there is no need to worry about the existence of multiple collinearity.

Table 4. Variance expansion factor for variables

| Variable | VIF | 1/VIF |
|---|---|---|
| Size | 1.56 | 0.642348 |
| Debt | 1.30 | 0.766706 |
| Experience | 1.18 | 0.848631 |
| Relevance | 1.17 | 0.855996 |
| Private | 1.14 | 0.877707 |
| Payment | 1.14 | 0.878352 |
| Growth | 1.03 | 0.971379 |

### *4.1 M&A Performance and Experience*

We divide the overall sample into two subgroups based on the outcome of the first M&A attempt: the first M&A success (overconfidence) group and the first M&A failure (loss aversion) group. Subsequently, we utilize ordinary least squares (OLS) and implement double fixed effects at the industry and year levels to test H1 and H2, as presented in Table 5.

Table 5. Performance and experience of serial acquisition

| | (1)<br>Full Sample | (2)<br>Overconfidence | (3)<br>Loss Aversion |
|---|---|---|---|
| Experience | -0.00201 | -0.0246*** | 0.0192*** |
| | (-0.59) | (-4.49) | (4.80) |
| Debt | 0.0744*** | 0.121*** | 0.0154 |
| | (4.39) | (4.65) | (0.72) |
| Growth | -0.00819** | 0.00226 | -0.0109** |
| | (-2.09) | (0.38) | (-2.24) |
| Size | -0.0120*** | -0.0202*** | -0.00522 |
| | (-3.57) | (-3.78) | (-1.27) |
| Payment | -0.0174*** | -0.0151* | -0.00737 |
| | (-3.07) | (-1.87) | (-1.00) |
| Relevance | 0.00345 | 0.00859 | -0.00357 |

| | | | |
|---|---|---|---|
| | (0.60) | (1.04) | (-0.47) |
| Private | -0.0140 | -0.00407 | -0.0116 |
| | (-1.62) | (-0.33) | (-0.91) |
| N | 865 | 426 | 439 |
| Adj.$R^2$ | 0.0475 | 0.1692 | 0.0425 |
| Year FE. | Yes | Yes | Yes |
| Industry FE. | Yes | Yes | Yes |

*Note.* This table illustrates the regression results of consecutive M&A performance and M&A experience. In Columns (1-3), we employ operating performance (OP) to represent M&A performance, which quantifies the difference between the company's total asset returns one year after and one year prior to the M&A event. The definitions of all other variables can be found in Table 2. Industry- and year-fixed effects are included in all models. The reported values in parentheses indicate t-statistics. ***, **, and * denote significance at 1%, 5%, and 10% levels, respectively. N denotes the number of observations. The sample period is from 2013 to 2019.

As shown in Table 5, results in Column (1) show a negative and statistically insignificant coefficient for M&A experience, indicating no significant observed correlation between M&A experience and M&A performance. However, when we divide the overall serial M&A sample into subgroups based on the success or failure of the first M&A attempt, we observe an asymmetric learning effect of M&A experience on M&A performance in these two groups.

In the overconfidence group, representing initial M&A success, the coefficient of M&A experience in Column (2) of Table 5 is statistically significant at the 1% level with a negative sign. This indicates that management did not effectively learn from the successful M&A experience. The success of the first M&A deal reinforces the inherent self-attribution bias of management, further amplifying their overconfidence. As the number of M&A experiences increases, the performance of continuous M&A activities deteriorates, despite accumulating more M&A experience. This is consistent with our previous finding and supports Hypothesis 1, suggesting that after the first M&A success, overconfidence commonly observed among Chinese corporate management is triggered, leading to more risk-taking M&A decisions and overestimation of the value of M&A targets. Following that, during the post-M&A phase, there appears to be a tendency to overlook the insights garnered from previous encounters. As a result, overconfident managers demonstrate a diminished capacity to effectively extract lessons from their recurrent M&A involvements. Consequently, the accumulation of M&A experience correlates with a gradual wane in their M&A performance.

In the loss aversion group, representing an initial M&A failure, the coefficient of M&A experience in Column (3) of Table 5 is 0.0192, and is statistically significant at the 1% level, indicating that management did learn from the failure. The experience of the first M&A failure triggers a heightened sensitivity to "loss" due to loss aversion and endowment effect. In order to avoid future losses, management tends to conduct a comprehensive review and learn from past experiences, seeking ways to improve performance. As a result, in subsequent M&A activities, with the increase of M&A experience, management's learning from failure becomes evident, leading to a gradual improvement in M&A performance. This lends support to Hypothesis 2, suggesting that when the first M&A attempt fails, the combination of loss aversion and endowment effect prompts management to be more attentive to failure and engage in a thorough learning process, thus adopting more effective strategies to enhance performance in future M&A activities. Consequently, the continuous increase in M&A experience contributes to a steady rise in M&A performance.

### *4.2 Robustness Test*

In this subsection, we assess the robustness of our basic analysis using alternative variables, endogeneity tests, and the Influence Threshold for Collinear Variables (ITCV) test.

#### 4.2.1 Substitution Variable Testing: Use of CAR to Measure M&A Performance

We use the ‘event study method’ to calculate short-term acquisition performance (Osiichuk et al., 2021). In particular, for companies with successive acquisitions from 2013-2019, cumulative abnormal returns (CAR) are calculated for one trading day before and one trading day after the announcement of the first acquisition - in other words, using a [-1, 1] window. The use of this window reduces the influence of noise not correlated with the acquisition on its performance (Cai et al., 2022).

Trading day abnormal returns $AR_{it} = R_{it} - R_{mt}$, in which $R_{it}$ indicates the daily rate of return for company i in time t, and $R_{mt}$ indicates the equally weighted average rate of return for cash dividend reinvestment in time t. The

t used took [-1, 1] as the window (Note 2) to calculate cumulative abnormal returns $CAR = \sum_{t=-1}^{1} AR_{it}$. Using CAR as the dependent variable, multiple regression analyses are performed on the acquisition sequence as presented in Table 6.

Table 6. Performance and experience of serial acquisition

| | (1)<br>Full Sample | (2)<br>Overconfidence | (3)<br>Loss Aversion |
|---|---|---|---|
| Experience | -0.00407 | -0.0303*** | 0.0403*** |
| | (-0.70) | (-4.67) | (4.44) |
| Debt | 0.0349 | 0.0465* | 0.0268 |
| | (1.49) | (1.83) | (0.72) |
| Growth | -0.00471 | -0.00425 | 0.00129 |
| | (-0.84) | (-0.68) | (0.15) |
| Size | -0.00817* | -0.00708 | -0.00522 |
| | (-1.78) | (-1.41) | (-0.71) |
| Payment | -0.0573*** | -0.0603*** | 0.0119 |
| | (-6.95) | (-6.85) | (0.83) |
| Relevance | 0.00568 | 0.0105 | -0.00849 |
| | (0.69) | (1.21) | (-0.62) |
| Private | 0.00234 | 0.0100 | -0.0110 |
| | (0.21) | (0.84) | (-0.57) |
| N | 865 | 607 | 258 |
| Adj.R2 | 0.1550 | 0.2791 | 0.0682 |
| Year FE. | Yes | Yes | Yes |
| Industry FE. | Yes | Yes | Yes |

*Note.* The table presents the robustness tests of our baseline results. In Columns (1-3), we proxy deal performance using CAR, which is the cumulative abnormal return over three days around the announcement date. The definitions of all other variables can be found in Table 2. Industry- and year-fixed effects are included in all models. The reported values in parentheses indicate t-statistics. ***, **, and * denote significance at 1%, 5%, and 10% levels, respectively. N denotes the number of observations. The sample period is from 2013 to 2019.

In Table 6, we segregate the cumulative abnormal returns (CAR) associated with inaugural M&A events transpiring between the years 2013 and 2019. CAR values exhibiting a positive trajectory are allocated to the domain characterized by managerial overconfidence (Column 2), while those evincing a negative trajectory are assigned to the realm associated with managerial loss aversion (Column 3). Upon meticulous scrutiny of the dataset embodied in Columns 2 and 3 of Table 6, congruent patterns akin to those expounded in Table 5 emerge, thereby concretely buttressing the underpinnings of Hypotheses H1 and H2.

In a more nuanced exposition, the findings underscore that successful inaugural M&A ventures tend to instigate a phenomenon of heightened managerial overconfidence. This cognitive disposition subsequently gives rise to a suboptimal propensity for organizational learning derived from the spectrum of M&A experiences. Consequently, a discernible inverse relationship between the accretion of M&A experience and the resultant trajectory of M&A performance becomes discernible. Conversely, the results shed light on the fact that instances of unsuccessful inaugural M&A endeavors accentuate the pre-existing managerial loss aversion orientation. This, in turn, engenders an active proclivity for deriving instructive insights from historical experiences, thereby culminating in an augmentation of M&A performance as the reservoir of M&A experience expands.

4.2.2 Endogenous Test

(1) Instrumental Variable Method

To address potential endogeneity issues due to omitted variables, we used Two-Stage Least Squares (2SLS) method for more robust coefficient estimates. Enterprise age (Firmage) and cumulative value of past mergers and acquisitions (Value) are used as instrumental variables. In Table 7, Column (1) shows the results of the first-stage regression, demonstrating that the coefficients associated with the instrumental variables exhibit significant positive values. Furthermore, the observed F-values surpass the conventional threshold of 10, affirming the instrumental variables meet the assumption of relevance. Overidentification test p-value >0.05 confirms validity of all instrumental variables. Weak instrumental variable test indicates no issues, with all statistics exceeding

critical values. Identification test p-values <0.001 confirm no identification issues. In the second-stage regression, the coefficient of M&A experience remains significant at 1%, indicating that even after controlling for potential endogeneity bias, the hypothesis still holds true.

Table 7. Instrumental variable method

| Variable | (1)<br>Experience | (2)<br>Full Sample | (3)<br>Overconfidence | (4)<br>Loss Aversion |
|---|---|---|---|---|
| Firmage | 0.1193**<br>(2.38) | | | |
| Value | 0.0624***<br>(26.90) | | | |
| Experience | | -0.00281<br>(-0.66) | -0.0320***<br>(-4.55) | 0.0262***<br>(5.10) |
| Controls | Yes | Yes | Yes | Yes |
| Year/Industry FE. | Yes | Yes | Yes | Yes |
| N | 865 | 865 | 426 | 439 |
| Adj.$R^2$ | 0.640 | 0.087 | 0.234 | 0.112 |

*Note.* This table illustrates the regression outcomes examining the relationship between the performance of consecutive M&As and M&A experience, following the adjustment for endogeneity through the application of the instrumental variable (IV) method. In Column (1), the results of the first-stage regression are displayed, validating the effectiveness of the chosen instrumental variables. Columns (2-4) illustrate the results of second-stage regression analyses conducted across different subsamples. Industry- and year-fixed effects are included in all models. The reported values in parentheses indicate t-statistics. ***, **, and * denote significance at 1%, 5%, and 10% levels, respectively. N denotes the number of observations.

(2) Propensity Score Matching (PSM)

Due to the potential endogeneity arising from the self-selection bias, where firms achieving success in their initial M&A endeavors might display a heightened proclivity for engaging in subsequent M&A activities while those experiencing failure in their maiden M&A pursuits might exhibit a reduction in their M&A undertakings, we resort to employing the propensity score matching (PSM) methodology. This enables us to counterbalance the inherent bias in our sample. Specifically, we conduct a 1:2 nearest neighbor matching within the sample, leveraging variables such as the logarithm of assets, asset-liability ratio, revenue growth rate, payment method, M&A relatedness, and firm-specific attributes as yardsticks for matching the outcomes of initial M&A attempts.

Turning to the findings encapsulated in Table 8, the equilibrium examination conducted through the prism of the PSM approach demonstrates that the P-values corresponding to the matching variables are appreciably higher than the critical threshold of 0.1. This intriguingly applies both prior to and following the matching procedure. The elevation of these P-values signifies that there exists a marked similarity between the treatment group and the control group in both pre-matched and post-matched scenarios, thereby establishing the veracity of the balance assumption. Consequently, the categorical distinction between M&A success and failure within this study remains robust. Moreover, the incipient endogeneity concerns stemming from self-selection bias are deemed to exert a nominal impact on the fidelity of the research outcomes.

Table 8. Balance test

| Variable | Unmatched<br>Matched | Mean<br>Treated | Control | Bias<br>(%) | Reduct \|bias\|<br>(%) | T | P |
|---|---|---|---|---|---|---|---|
| Debt | U | 0.36443 | 0.36856 | -2.3 | -13.0 | -0.33 | 0.739 |
| | M | 0.36443 | 0.35976 | 2.6 | | 0.37 | 0.709 |
| Growth | U | 0.31414 | 0.31512 | -0.1 | -4627.8 | -0.02 | 0.983 |
| | M | 0.31483 | 0.36099 | -7.0 | | -0.97 | 0.334 |
| Size | U | 21.944 | 21.933 | 1.1 | -322.5 | 0.17 | 0.867 |
| | M | 21.939 | 21.988 | -4.8 | | -0.72 | 0.474 |
| Payment | U | 0.57512 | 0.66059 | -17.6 | 95.9 | -2.59 | 0.010 |
| | M | 0.57647 | 0.058 | -0.7 | | -0.10 | 0.917 |
| Relevance | U | 0.37793 | 0.03508 | 5.6 | 74.0 | 0.83 | 0.408 |
| | M | 0.37647 | 0.36941 | 1.5 | | 0.21 | 0.832 |
| Private | U | 0.84038 | 0.85421 | -3.8 | 32.0 | -0.57 | 0.572 |
| | M | 0.84235 | 0.85176 | -2.6 | | -0.38 | 0.703 |

4.2.3 ITCV Test

To further test the robustness of the empirical findings, the authors employ the Influence Threshold for Collinear Variables (ITCV) index to scrutinize the model for latent variables or potential endogenous issues. The ITCV index was devised to gauge whether endogeneity could wield an impact on the regression outcomes of the model. This index is established as the minimum value of the product between the partial correlation involving the dependent variable (Y) and the confounding variable and the partial correlation between the independent variable (X) and the same confounding variable. It signifies the minimum threshold at which changes in results become significant. If the computed impact value falls below the ITCV threshold, it signifies the detected endogeneity issue lacks the requisite strength to sway the ordinary least squares (OLS) regression outcomes. Derived from the outcomes presented in Table 9, it is conspicuous that within each distinct regression subgroup, the impact values of all variables conspicuously fall beneath their corresponding ITCV thresholds. Consequently, the empirical results can be affirmed as possessing a robust quality (Note 3).

Table 9. ITCV test on endogenous problems of the empirical results in Table 5

| | Full Sample | | | Overconfidence | | | Loss Aversion | | |
|---|---|---|---|---|---|---|---|---|---|
| | Coefficient (t-Statistic) | ITCV | Impact | Coefficient (t-Statistic) | ITCV | Impact | Coefficient (t-Statistic) | ITCV | Impact |
| Experience | -0.00201 (-0.59) | 0.0445 | | -0.0246 (-4.49) | -0.1364 | | 0.0192 (4.80) | 0.1500 | |
| Debt | 0.0744*** (4.39) | | -0.0141 | 0.121 (4.65) | | -0.0535 | 0.0154 (0.72) | | 0.0015 |
| Growth | -0.00819 (-2.09) | | -0.0066 | 0.00226 (0.38) | | -0.0054 | -0.0109** (-2.24) | | 0.0007 |
| Size | -0.012*** (-3.57) | | -0.0408 | -0.0202 (-3.78) | | -0.1101 | -0.00522 (-1.27) | | 0.0051 |
| Payment | -0.017*** (-3.07) | | -0.0107 | -0.0151 (-1.87) | | -0.198 | -0.00737 (-1.00) | | -0.0005 |
| Relevance | 0.00345 (0.60) | | 0.0023 | 0.00859 (1.04) | | 0.0001 | -0.00357 (-0.47) | | 0.0034 |
| Private | -0.0140 (-1.62) | | -0.0082 | -0.00407 (-0.33) | | -0.005 | -0.0116 (-0.91) | | -0.0059 |

*4.3 Additional Analysis*

We adopt a behavioral psychology approach to categorize managers involved in serial M&A activities into two distinct classifications: "overconfidence" and "loss aversion." Previous empirical investigations demonstrate that the overconfidence phenomenon encompasses three distinct dimensions: overestimation, overprecision, and overplacement. Notably, scholarly studies have highlighted a positive correlation between the age of a person and the dimensions of overprecision (Moore et al., 2018) and overplacement (Friehe et al., 2019). It has been observed that older executives tend to exhibit an inclination towards overprecision and overplacement due to their perception of having accumulated extensive management experience and knowledge. This accumulated experience can lead to an inflated sense of confidence in their abilities and insights, potentially causing them to overlook opportunities for learning from novel experiences.

Conversely, an alternate line of research suggests that advanced age is linked to heightened levels of loss aversion in CEOs as compared to their younger counterparts (He et al., 2022). With the passage of time and the accrual of experience, senior executives tend to adopt a more comprehensive approach to problem-solving and analysis. This enhanced cognitive perspective equips them to discern potential risks within the context of M&A processes more effectively. Consequently, they tend to exercise a higher degree of caution and prudence when making critical M&A decisions, thereby acting as safeguards for the overall performance of their companies.

Taking into account the potential influence of executive age on their psychological attributes of "overconfidence" and "loss aversion" (Gächter, 2022), we incorporate executive age as a variable in our regression analysis, aiming to delve deeper into its potential effects on the efficacy of learning within the context of successive M&A undertakings.

We acquire the age data of chief executive officers (CEOs) from the CSMAR database and subsequently align it with our dataset pertaining to M&A activities. In instances of missing data, a meticulous manual data collection process was conducted by the authors. Given the relatively recent establishment of the CEO system in China and the absence of standardized designations for CEOs, the approach outlined by Lu et al. (2016) is adopted.

Accordingly, a distinct "CEO" title is not exclusively defined. Instead, designations such as "President" and "General Manager" are deemed to be analogous to the CEO role, collectively falling under the umbrella term of CEOs. The age of the CEO is introduced into the multiple regression analysis as a moderating factor, and the corresponding outcomes are delineated in Table 10 for reference.

Table 10. Performance, experience of serial acquisition, and CEO age

| | (1)<br>Full Sample | (2)<br>Overconfidence | (3)<br>Loss Aversion |
|---|---|---|---|
| Experience | -0.00251 | -0.0270*** | 0.0195*** |
| | (-0.74) | (-4.98) | (4.88) |
| Experience* Age | 0.00163*** | 0.00243*** | 0.00108* |
| | (3.51) | (3.67) | (1.84) |
| Age | 0.000236 | 0.000526 | -0.000148 |
| | (0.63) | (1.02) | (-0.28) |
| Debt | 0.0719*** | 0.111*** | 0.0157 |
| | (4.26) | (4.32) | (0.74) |
| Growth | -0.00860** | 0.00178 | -0.0111** |
| | (-2.21) | (0.30) | (-2.27) |
| Size | -0.0116*** | -0.0181*** | -0.00544 |
| | (-3.46) | (-3.40) | (-1.33) |
| Payment | -0.0183*** | -0.0164** | -0.00810 |
| | (-3.25) | (-2.06) | (-1.10) |
| Relevance | 0.00289 | 0.00809 | -0.00429 |
| | (0.50) | (0.99) | (-0.57) |
| Private | -0.0147* | -0.00441 | -0.0132 |
| | (-1.71) | (-0.36) | (-1.04) |
| N | 865 | 426 | 439 |
| Adj.R2 | 0.0596 | 0.1950 | 0.0460 |
| Year FE. | Yes | Yes | Yes |
| Industry FE. | Yes | Yes | Yes |

*Note*. The table presents the regression results illustrating the role of CEO age in the relationship between M&A experience and M&A performance. In Columns (1-3), we employ operating performance (OP) to represent M&A performance, which quantifies the difference between the company's total asset returns one year before and one year after the M&A event. Given the potential presence of multicollinearity in the interaction term regression, CEO age and M&A experience are centered prior to analysis, aiming to mitigate potential coefficient biases. The definitions of all other variables can be found in Table 2. Industry- and year-fixed effects are included in all models. The reported values in parentheses indicate t-statistics. ***, **, and * denote significance at 1%, 5%, and 10% levels, respectively. N denotes the number of observations. The sample period is from 2013 to 2019.

In Columns (1-2) of Table 10, the interaction coefficient between CEO age and M&A experience is significantly positive at the 1% level. This indicates that when the CEOs of serial M&A companies are older, the probability of them exhibiting overconfidence tendencies decreases and the negative impact of M&A experience on M&A performance weakens. In other words, the propensity for overconfidence diminishes among older CEOs, which is conducive to enhancing the learning effect of M&A experience. In Column (3) of Table 10, the interaction coefficient between CEO age and M&A experience is significantly positive at the 10% level. This suggests that when CEOs of serial M&A companies are older, their psychological tendencies towards loss aversion are reinforced and the positive effect of M&A experience on M&A performance is amplified. This implies that under the influence of older CEOs, the mechanism of loss aversion comes into play, thus improving the learning effect of M&A experience. Taken together, these findings indicate that older managers are indeed more skilled at learning from M&A experience.

## 5. Conclusions

In this study, we initially construct an analytical framework to delve into the asymmetrical learning effects arising from consecutive acquisitions, highlighting that the learning effect stemming from managerial experience in past M&A endeavors necessitates distinct examination under diverse circumstances. The essence of the learning effect hinges on the managerial stance—whether marked by overconfidence or loss aversion. The former, characterized by overconfidence, impedes the assimilation of experiential lessons, whereas, the latter, encapsulating loss aversion, spurs learning from experience.

Leveraging a dataset encompassing M&A events involving Chinese A-share listed companies between 2013 and

2019, we proceed to empirically scrutinize the full sample, a subset of initially successful M&A firms (overconfident sample) and a subset of firms encountering initial M&A failures (loss-averse sample). By employing multiple linear regression analysis while controlling for financial attributes, M&A transaction specifics, and fixed effects across industries and years, our hypotheses receive empirical validation. The findings underscore that managers of first-time successful M&A entities not only fail to glean insights from their experience but also attribute their inaugural success to personal acumen and decisiveness, rendering them overconfident managers. Such overconfident managers exhibit diminished learning effects within the realm of recurrent M&A, leading to waning performance in subsequent M&A pursuits.

Conversely, managers at the helm of initial M&A failures marshal all available resources to pinpoint lucrative prospects, ascertain more judicious valuations, and intensify their focus on post-M&A integration to achieve synergistic outcomes, transforming into loss-averse managers. This subset demonstrates more pronounced learning effects in the continuum of M&A activities, culminating in improved performance in subsequent M&A initiatives. These observations underscore the presence of asymmetric learning behavior among managers during ongoing M&A endeavors.

Further exploration indicates that the age attributes of managers influence their inclination toward overconfidence or loss aversion. Irrespective of initial triumphs or setbacks, advancing managerial age is conducive to imbibing lessons from M&A experience. As the composite of life and managerial wisdom expands, executives learn to adopt an ethos of being "humble in victory and tenacious in defeat," thereby optimizing the asymmetric learning effects of managers engaged in continuous M&A.

These findings accentuate the significance of management vigilance towards the propensity for overconfidence following success. Mitigation of overconfidence and the dedication of resources to learning from experience is advocated. Concurrently, this study underscores that the learning effect of management bears greater significance within the subset of first-time M&A failures, thereby lending credence to the adage: "Failure is the mother of success!"

**Informed consent**

Obtained.

**Ethics approval**

The Publication Ethics Committee of the Canadian Center of Science and Education.

The journal and publisher adhere to the Core Practices established by the Committee on Publication Ethics (COPE).

**Provenance and peer review**

Not commissioned; externally double-blind peer reviewed.

**Data availability statement**

The data that support the findings of this study are available on request from the corresponding author. The data are not publicly available due to privacy or ethical restrictions.

**Data sharing statement**

No additional data are available.



**References**

Ahmed, Y., & Elshandidy, T. (2018). Why do over-deviated firms from target leverage undertake foreign acquisitions? *International Business Review, 27*(2), 309-327. https://doi.org/10.1016/j.ibusrev.2017.08.005

Alesina, A., & Passarelli, F. (2019). Loss aversion in politics. *American Journal of Political Science, 63*(4), 936-947. https://doi.org/10.1111/ajps.12440

Apicella, C. L., Azevedo, E. M., Christakis, N. A., & Fowler, J. H. (2014). Evolutionary origins of the endowment effect: Evidence from hunter-gatherers. *American Economic Review, 104*(6), 1793-1805.

https://doi.org/10.1257/aer.104.6.1793

Bartra, O., McGuire, J. T., & Kable, J. W. (2013). The valuation system: a coordinate-based meta-analysis of BOLD fMRI experiments examining neural correlates of subjective value. *Neuroimage, 76*, 412-427. https://doi.org/10.1016/j.neuroimage.2013.02.063

Brosnan, S. F., & Wilson, B. J. (2023). Comparative economics: how studying other primates helps us better understand the evolution of our own economic decision making. *Philosophical Transactions of the Royal Society B, 378*(1876), 20210497. https://doi.org/10.1098/rstb.2021.0497

Byrne, A., Hewitt, D., Henderson, J., Newton-Fenner, A., Roberts, H., Tyson-Carr, J., ... & Stancak, A. (2022). Investigating the effect of losses and gains on effortful engagement during an incentivized Go/No Go task through anticipatory cortical oscillatory changes. *Psychophysiology, 59*(5), e13897. https://doi.org/10.1111/psyp.13897

Cai, C., Li, H., & Zhou, H. (2022). Learning-by-doing: the experience effect in mergers and acquisitions. *Accounting & Finance, 62,* 1189-1229. https://doi.org/10.1111/acfi.12821

Chatterjee, A., & Hambrick, D. C. (2007). It's all about me: Narcissistic chief executive officers and their effects on company strategy and performance. *Administrative science quarterly, 52*(3), 351-386. https://doi.org/10.2189/asqu.52.3.351

Chib, V. S., De Martino, B., Shimojo, S., & O'Doherty, J. P. (2012). Neural mechanisms underlying paradoxical performance for monetary incentives are driven by loss aversion. *Neuron, 74*(3), 582-594. https://doi.org/10.1016/j.neuron.2012.02.038

Cusin, J. (2012). Disillusionment from failure as a source of successful learning. *Canadian Journal of Administrative Sciences/Revue Canadienne des Sciences de l'Administration, 29*(2), 113-123. https://doi.org/10.1002/cjas.227

Ding, Y., Zhang, X., & Liu, Z. (2021). Differences in returns to cross-border M&A in the short and long run: Evidence from Chinese listed firms. *Journal of Asian Economics, 74*, 101299. https://doi.org/10.1016/j.asieco.2021.101299

Dmytro Osiichuk & Paweł Wnuczak (2022) Shareholders' indifference… short-term market reaction to firms' first and subsequent acquisitions: evidence from China. *Economic Research-Ekonomska Istraživanja, 35*(1), 3490-3511. https://doi.org/10.1080/1331677X.2021.1997621

Faqin Lan, Wenting Guo. (2022). The Matching Effect in Enterprise Mergers and Acquisitions—Research on the Influence of Mergers and Acquisitions Premium and Target Company's Earnings Quality on Mergers and Acquisitions Performance. *Economic Theory and Economic Management, 42*(5), 50.

Feng, T., Zhao, W., & Donnay, G. F. (2013). The endowment effect can extend from self to mother: Evidence from an fMRI study. *Behavioural Brain Research, 248*, 74-79. https://doi.org/10.1016/j.bbr.2013.04.005

Friehe, T., & Pannenberg, M. (2019). Overconfidence over the lifespan: Evidence from Germany. *Journal of Economic Psychology, 74*, 102207. https://doi.org/10.1016/j.joep.2019.102207

Fukunaga, R., Brown, J. W., & Bogg, T. (2012). Decision making in the Balloon Analogue Risk Task (BART): anterior cingulate cortex signals loss aversion but not the infrequency of risky choices. *Cognitive, Affective, & Behavioral Neuroscience, 12*, 479-490. https://doi.org/10.3758/s13415-012-0102-1

Gächter, S., Johnson, E. J., & Herrmann, A. (2022). Individual-level loss aversion in riskless and risky choices. *Theory and Decision, 92*(3-4), 599-624. https://doi.org/10.1007/s11238-021-09839-8

Gamache, D. L., McNamara, G., Mannor, M. J., & Johnson, R. E. (2015). Motivated to acquire? The impact of CEO regulatory focus on firm acquisitions. *Academy of Management Journal, 58*(4), 1261-1282. https://doi.org/10.5465/amj.2013.0377

Glaser, M., Schäfers, P., & Weber, M. (2008, October). Managerial optimism and corporate investment: Is the CEO alone responsible for the relation? In AFA 2008 New Orleans Meetings Paper. https://doi.org/10.2139/ssrn.967649

Graebner, M. E., Heimeriks, K. H., Huy, Q. N., & Vaara, E. (2017). The process of postmerger integration: A review and agenda for future research. *Academy of Management Annals, 11*(1), 1-32. https://doi.org/10.5465/annals.2014.0078

Gressgård, L. J., & Hansen, K. (2015). Knowledge exchange and learning from failures in distributed

environments: The role of contractor relationship management and work characteristics. *Reliability Engineering & System Safety, 133*, 167-175. https://doi.org/10.1016/j.ress.2014.09.010

Guest, P. M., Cosh, A., Hughes, A., & Conn, R. L. (2004, August). Why must all good things come to an end? the performance of multiple acquirers. In Academy of Management Proceedings (Vol. 2004, No. 1, pp. S1-S6). Briarcliff Manor, NY 10510: Academy of Management. https://doi.org/10.5465/ambpp.2004.13863814

Hayward, M. L. (2002). When do firms learn from their acquisition experience? Evidence from 1990 to 1995. *Strategic management journal, 23*(1), 21-39. https://doi.org/10.1002/smj.207

He, Q., Carrilero-Castillo, A., & Gonzalez-Garcia, J. (2021). Do CEO characteristics influence a firm's investment in brand equity? Evidence from Chinese listed firms. *International Entrepreneurship and Management Journal*, 1-15. https://doi.org/10.1007/s11365-020-00721-7

Hossain, M. M., Pham, M. D. M., & Islam, N. (2021). The performance and motivation of serial acquisitions: Evidence from Australia. *International Review of Financial Analysis, 77*, 101827. https://doi.org/10.1016/j.irfa.2021.101827

Huo, H., Zhang, R., Seger, C. A., Feng, T., & Chen, Q. (2020). The effect of trait anxiety on risk-taking: Functional coupling between right hippocampus and left insula. *Psychophysiology, 57*(10), e13629. https://doi.org/10.1111/psyp.13629

Hussinger, K., & Issah, A. B. (2019). Firm acquisitions by family firms: A mixed gamble approach. *Family Business Review, 32*(4), 354-377. https://doi.org/10.1177/0894486519885544

Hwang, H. D., Kim, H. D., & Kim, T. (2020). The blind power: Power-led CEO overconfidence and M&A decision making. The North American Journal of Economics and Finance, 52, 101141. https://doi.org/10.1016/j.najef.2019.101141

Ismail, A., & Abdallah, A. A. (2013). Acquirer's return and the choice of acquisition targets: does acquisition experience matter? *Applied Economics, 45*(26), 3770-3777. https://doi.org/10.1080/00036846.2012.732688

Ismail, A., & Mavis, C. P. (2022). A new method for measuring CEO overconfidence: Evidence from acquisitions. *International Review of Financial Analysis, 79*, 101964. https://doi.org/10.1016/j.irfa.2021.101964

Kai-Ineman, D. A. N. I. E. L., & Tversky, A. (1979). Prospect theory: An analysis of decision under risk. *Econometrica, 47*(2), 363-391. https://doi.org/10.2307/1914185

Kunz, J., & Sonnenholzner, L. (2023). Managerial overconfidence: promoter of or obstacle to organizational resilience? *Review of Managerial Science, 17*(1), 67-128. https://doi.org/10.1007/s11846-022-00530-y

Larcker, D. F., & Rusticus, T. O. (2010). On the use of instrumental variables in accounting research. *Journal of accounting and economics, 49*(3), 186-205. https://doi.org/10.1016/j.jacceco.2009.11.004

Lejarraga, T., Schulte-Mecklenbeck, M., Pachur, T., & Hertwig, R. (2019). The attention–aversion gap: how allocation of attention relates to loss aversion. *Evolution and Human Behavior, 40*(5), 457-469. https://doi.org/10.1016/j.evolhumbehav.2019.05.008

Li, Y. J., Kenrick, D. T., Griskevicius, V., & Neuberg, S. L. (2012). Economic decision biases and fundamental motivations: How mating and self-protection alter loss aversion. *Journal of personality and social psychology, 102*(3), 550. https://psycnet.apa.org/doi/10.1037/a0025844

Malhotra, S., Reus, T. H., Zhu, P., & Roelofsen, E. M. (2018). The acquisitive nature of extraverted CEOs. *Administrative Science Quarterly, 63*(2), 370-408. https://doi.org/10.1177/0001839217712240

Malmendier, U., & Tate, G. (2005). CEO overconfidence and corporate investment. *The Journal of Finance, 60*(6), 2661-2700. https://doi.org/10.1111/j.1540-6261.2005.00813.x

Merkle, C. (2020). Financial loss aversion illusion. *Review of Finance, 24*(2), 381-413. https://doi.org/10.1093/rof/rfz002

Meschi, P. X., & Métais, E. (2015). Too big to learn: The effects of major acquisition failures on subsequent acquisition divestment. *British Journal of Management, 26*(3), 408-423. https://doi.org/10.1111/1467-8551.12101

Moore, D. A., & Schatz, D. (2017). The three faces of overconfidence. *Social and Personality Psychology Compass, 11*(8), e12331. https://doi.org/10.1111/spc3.12331

Moore, D. A., Dev, A. S., & Goncharova, E. Y. (2018). Overconfidence across cultures. *Collabra: Psychology, 4*(1), 36. https://doi.org/10.1525/collabra.153

Palmer, C., Niemand, T., Stöckmann, C., Kraus, S., & Kailer, N. (2019). The interplay of entrepreneurial orientation and psychological traits in explaining firm performance. *Journal of Business Research, 94*, 183-194. https://doi.org/10.1016/j.jbusres.2017.10.005

Qiao, L., Adegbite, E., & Nguyen, T. H. (2022). Chief financial officer overconfidence and stock price crash risk. *International Review of Financial Analysis, 84*, 102364. https://doi.org/10.1016/j.irfa.2022.102364

Renneboog, L., & Vansteenkiste, C. (2019). Failure and success in mergers and acquisitions. *Journal of Corporate Finance, 58*, 650-699. https://doi.org/10.1016/j.jcorpfin.2019.07.010

Schumacher, C., Keck, S., & Tang, W. (2020). Biased interpretation of performance feedback: The role of CEO overconfidence. *Strategic Management Journal, 41*(6), 1139-1165. https://doi.org/10.1002/smj.3138

Schumacher, G., Van de Wardt, M., Vis, B., & Klitgaard, M. B. (2015). How aspiration to office conditions the impact of government participation on party platform change. *American Journal of Political Science, 59*(4), 1040-1054. https://doi.org/10.1111/ajps.12174

Selart, M., Schei, V., Lines, R., & Nesse, S. (2020). Can mindfulness be helpful in team decision-making? A framework for understanding how to mitigate false consensus. *European Management Review, 17*(4), 1015-1026. https://doi.org/10.1111/emre.12415

Sheng, J., Xu, S., An, Y., & Yang, J. (2021). Dynamic portfolio strategy by loss-averse fund managers facing performance-induced fund flows. *International Review of Financial Analysis, 73*, 101609. https://doi.org/10.1016/j.irfa.2020.101609

Trichterborn, A., Zu Knyphausen-Aufseß, D., & Schweizer, L. (2016). How to improve acquisition performance: The role of a dedicated M&A function, M&A learning process, and M&A capability. *Strategic Management Journal, 37*(4), 763-773. https://doi.org/10.1002/smj.2364

Ucbasaran, D., Shepherd, D. A., Lockett, A., & Lyon, S. J. (2013). Life after business failure: The process and consequences of business failure for entrepreneurs. *Journal of management, 39*(1), 163-202. https://doi.org/10.1177/0149206312457823

Yamakawa, Y., Peng, M. W., & Deeds, D. L. (2010). Revitalizing and learning from failure for future entrepreneurial growth. *Frontiers of Entrepreneurship Research, 30*(6), 1.

Yamakawa, Y., Peng, M. W., & Deeds, D. L. (2015). Rising from the ashes: Cognitive determinants of venture growth after entrepreneurial failure. *Entrepreneurship Theory and Practice, 39*(2), 209-236. https://doi.org/10.1111/etap.12047

Yao, L., & Cha, L. (2016). CEO's influence on the board of directors and violations and crimes of listed companies. *Journal of Financial Research, 427*(1), 176-191.

Zhang, X., Yao, H., & Du, X. (2021). The Peer Effect of Serial Mergers and Acquisitions and the Internal Control of Enterprises. *Journal of Northeastern University (Social Science), 23*(6), 22.

Zhang, Y., He, X., Lian, Y., (2013). Crisis Impact, Loss Avoidance, and Support from Large Family Shareholders. *Journal of Finance and Economics, 39*(7), 122-133.

Zollo, M., & Singh, H. (2004). Deliberate learning in corporate acquisitions: post-acquisition strategies and integration capability in US bank mergers. *Strategic Management Journal, 25*(13), 1233-1256. https://doi.org/10.1002/smj.426

Zollo, M., Reuer, J. J., & Singh, H. (2002). Interorganizational routines and performance in strategic alliances. *Organization science, 13*(6), 701-713. https://doi.org/10.1287/orsc.13.6.701.503

**Notes**

Note 1. The occurrence of the term "360" signifies that out of the entire pool of 865 M&A events, there are 360 instances where the sequential order of the M&A event is 1.

Note 2. We replace the cumulative abnormal returns (CAR) calculated using both 2-day and 5-day windows in the regression analysis, yielding largely consistent outcomes.

Note 3. When the independent variable is the cumulative abnormal return (CAR) of the stock market, computed using the event study methodology, the results of the Integrated Time Series Cross-Sectional Variation (ITCV) test remain consistent, and no evident issues of endogeneity are observed.