# Post-Succession Performance of Family Firms and Its Determinants: Evidence from Taiwan

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## Abstract

This study investigates the long-run stock performance of Taiwanese family firms that undergo succession and identifies key factors affecting their post-succession performance. The results show that family firms tend to underperform their matching firms after succession, indicating that the drawbacks of familial inheritance outweigh the benefits. Key positive contributors to post-succession performance include heirs' elite education, difference in intergenerational backgrounds, and direct lineage to the departing leader, highlighting the significance of heir traits in succession. In addition, the duration that heirs serve as CEOs before assuming chairman roles and top management turnover are positively associated with post-succession performance, emphasizing the importance of heirs' experiences and effective personnel selection. Other factors impacting post-succession value include firms' profitability, control right structure, and changes in institutional ownership. In sum, these results suggest that the success of family succession relies not only on heirs (the "jockey") but also on firm fundamentals (the "horse").

Keywords: Family Firms, Succession, Heir Traits, Long-Run Performance

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# 1. Introduction

The financial literature documents that firms appointing family heirs to be CEOs have worse operating (accounting) performance than those hiring outsiders as CEOs after succession (e.g., Pérez-González (2006) for U.S. firms; Bennedsen, Nielsen, Pérez-González, and Wolfenzon (2007) for Danish firms; Cucculelli and Micucci (2008) for Italian firms; Bertrand,, Johnson,, Samphantharak, and Schoar (2008) for Thai firms). This finding indicates that there is no inherent superiority of family firms, implying that the disadvantage of heirs' lack of labor market competition dominates the advantages of family intergenerational transmission of managerial knowledge and better alignment of agency incentives.

In line with the above research, this study investigates the long-run performance of family firms that undergo succession and explores factors that influence their performance. In contrast to prior studies, our analyses lie on stock performance rather than operating performance. Furthermore, we undertake a comprehensive examination of factors that affect post-succession performance across three dimensions: heir traits, the way of succession, and firm characteristics. Gaining a deeper insight into these dual concerns helps the prediction of firms' performance after succession and enables families to effectively groom suitable heir(s) through a more informed perspective.

This study uses public family firms in Taiwan as the sample for several compelling reasons. First, family firms are prevalent in Taiwan, where leadership typically involves passing the baton to a descendant. This practice provides a rich pool of observations to investigate how this transition affects post-succession performance. Second, some founders who established firms during the 1970s and 1980s implemented a Japanese-style management system, while their successors received education in Western countries for several years. This divergence in cultural backgrounds is likely to generate distinct leadership styles that influence corporate operations. Finally, Taiwanese family firms commonly employ various ways to control the firm, such as holding companies, cross-holdings, and pyramidal structures, leading to notable disparities between voting and cashflow rights  This circumstance provides an opportunity to examine the impact of voting-to-cashflow deviation on firms' performance after succession.

The results show that family firms tend to exhibit worse stock performance than their matching firms after succession, a phenomenon that holds for both buy-and-hold abnormal returns (BHARs) and time-series abnormal performance measures. This finding indicates that family succession generally mitigates firms' values, which aligns with the finding of prior studies that inherited management within family businesses leads to diminished profitability. Moreover, the poor post-succession performance implies that the drawbacks of heirs' limited exposure to labor market competition and/or their inferior ability dominate the benefits of the intergenerational transmission of managerial skills and better alignment of agency incentives within family firms.

Several factors related to heir traits significantly affect post-succession performance. Hers' elite education has a positive impact on long-run performance, a phenomenon that might be ascribed to their greater competence compared to others without elite education. Family firms that adopt a Japanese-style management system and appoint heirs with Western education outperform their matching firms, suggesting that shifting leadership types from emphasizing work effort to efficiency can enhance overall performance. Moreover, firms succeeded by direct descendants (sons and daughters) of departing leaders exhibit better performance than those succeeded by other relatives (e.g., nieces and nephews). This underscores the value of transferring managerial knowledge from parents (or grandparents) to the next inherited generation.

The way of succession also influences post-succession performance. Specifically, the duration for which heirs serve as CEOs before assuming the chairman position has a positive impact on post-succession performance, suggesting that an arrangement that allows heirs to accumulate management experience can be beneficial for the effectiveness of post-succession operations. Moreover, top management turnover also contributes positively to post-succession performance, implying that the elimination of inept managers subsequent to succession can potentially enhance the firm's health.

As to firm characteristics, pre-succession profitability is positively associated with post-succession performance, implying that profitable firms are capable of keeping their edge after succession due to their strong earnings power from tangible and/or intangible assets. Family firms with high voting-to-cashflow deviation tend to deliver lower five-year BHARs, revealing that these firms might engage in entrenchment activities, leading to a decline in overall firm value. Furthermore, changes in institutional ownership ($\Delta$IO) have a positive impact on the three-year BHARs, implying that institutional investors possess the acumen to assess the ramifications of succession events on firms' values.

In summary, this study contributes to the literature not only by providing additional evidence of the erosion of firm values due to family succession, but also by shedding light on critical factors that affect the success of family firms' succession. We highlight the positive influences of heirs' education, succession preparedness, and profitability derived from firms' resources, all of which serve to enhance the successive firm's value. Akin to a skilled jokey (the successor) guiding a capable racehorse (the business), effective leadership transition needs a well-educated and practically trained heir leading a business with the ability to generate profits. These findings suggest that family firms should prioritize initiatives such as heirs' training and meticulous succession planning to ensure the seamless operation of the firm after succession. In addition, our discovery of the adverse impact of voting-to-cashflow deviation and the positive effect of changes in institutional ownership on post-succession performance offers valuable insights for long-run investors to assess family firms' prospects.

The remainder of this study is organized as follows. Section 2 summarizes the findings of related research papers and constructs the research hypotheses. Section 3 discusses our methodology,

including performance measures and variables that affect post-succession performance.  Section 4 describes the sample characteristics and reports the empirical results.  Finally, section 5 summarizes the results and provides a conclusion.

## 2. Literature Review and Research Hypotheses

### 2.1. The Firm Performance after Succession

There exist extensive empirical results shows that firms appointing family heirs as CEOs tend to exhibit worse operating (accounting) performance compared to those hiring external CEOs following succession. This pattern has been observed across various contexts, including U.S. firms (Pérez-González, 2006), Danish firms (Bennedsen, Nielsen, Pérez-González, and Wolfenzon, 2007), Italian firms (Cucculelli and Micucci, 2008), and Thai firms (Bertrand, Johnson, Samphantharak, and Schoar, 2008). These findings suggest that family firms do not possess an inherent advantage. Instead, the drawbacks of heirs' lack of labor market competition appear to outweigh the benefits of intergenerational transmission of managerial expertise and improved alignment of agency incentives.

In addition, the above studies identify a range of factors that affect firms' operating performance after a leadership transition.  Pérez-González (2006) shows that succeeding CEOs who graduated from selective undergraduate institutions tend to outperform those without such educational backgrounds.  Bennedsen et al. (2007) demonstrate significant underperformance in family firms that have large size and operate in industries with rapid growth and highly skilled labor force. Cucculelli and Micucci (2008) find that the decline in post-succession performance is most pronounced in firms that had strong performance prior to the succession, especially those operating in competitive sectors.  These results indicate that successors' ability plays a crucial role in firms' post-succession performance, in which lackluster heirs cannot well manage businesses in competitive and fast-growing environments. Therefore, the first research hypothesis is summarized as follows.

Hypothesis 1: The family firms tend to exhibit worse stock performance after succession

### 2.2. Factors in the Succession

There are three dimensions of factors considered in the empirical tests. For the first dimension of factors (heir traits), we consider four variables: gender, education, disparity in predecessor's and heir's backgrounds, and direct descendant.  Gender is a component of our analysis since female CEOs tend to exhibit lower risk propensity and greater work commitment than male CEOs.  The consideration of education is based on the finding that heirs' educational achievement is positively associated with firms' performance (e.g., Pérez-González, 2006).  Moreover, we posit that family firms adopting a Japanese-style management system would prioritize operational effectiveness over sheer work effort when an heir educated in Western countries assumes leadership.  In addition, we include direct descendants as a factor, an idea based on the premise that they can benefit from the advantage of acquiring management skills from their parents, thereby contributing to the firm's operational efficiency.

Hypothesis 2: Heir traits in succession, such as gender, education, disparity in predecessor's and heir's backgrounds, and direct descendant, significantly affect post-succession performance

Our second set of factors contains three variables concerning the family succession process: the duration of the heir's CEO service, management turnover, and the heir's involvement in a scam. Some heirs serve as CEO before assuming the position of board chairman, a sequence that may contribute to the accumulation of heirs' experiences that enhance firms' performance. Furthermore, we examine the impact of the rate of dismissal among top managers on firms' post-succession performance. A positive effect arises when incumbent managers' departures stem from their inability to fulfill their roles, while a negative effect can be observed when departures result from strained personal relationship with the heir. We also acknowledge that an heir's involvement in a scam can be a significant factor, often indicating a lack of integrity and negatively affecting post-succession performance. In our analysis, we treat instances of scams as a control variable since they are typically known sometime after succession.

Hypothesis 3: The way of succession, such as the duration of the heir's CEO service, management turnover, and the heir's involvement in a scam, influences post-succession performance

The third facet of factors comprises five firm characteristics: profitability, property, plant, and equipment (PP&E), voting-to-cashflow deviation, institutional ownership, and changes in institutional ownership. Cucculelli and Micucci (2008) measure firms' performance by returns on assets (ROA) and find that family firms with high pre-succession ROAs tend to experience lower post-succession ROAs. This finding seems to imply that firms with greater ROAs tend to have poor stock performance after succession. To examine this inference, we include pre-succession ROAs adjusted by industry median in our analysis. Furthermore, we use PP&E over total assets to account for the potential challenges that family heirs may encounter in managing firms with substantial fixed assets. In such cases, firms with higher PP&E ratios may perform less favorably than those with lower ratios. These variables are control variables in the empirical analysis.

We also include the controlling family's voting right over cashflow right in our analysis, because a significant deviation between these two rights may incentivize the family to exploit minority shareholders, potentially leading to poor firm performance. In addition, we consider pre-succession institutional ownership (IO) and changes in IO (ΔIO), since institutional investors can play a significant role in monitoring family firms after succession (Huson, Malatesta, and Parrino, 2004) and they may sell shares before succession if they have a negative outlook of family successors' abilities (Parrino, Sias, and Starks (2003). For a more detailed discussion of the above factors, please refer to section 3.3.

# 3. Methodology

## 3.1. Performance Measures

Prior studies commonly evaluate the family post-succession performance by comparing changes in operating performance (e.g., ROA) between family and outsider succession firms. In this context, performance is measured by gauging the difference in the pre- and post-succession profitability over a three-year window before and after the leadership transition. However, this approach could give rise to two potential problems.

First, the contrast in performance between the family and outsider groups can be influenced, at least in part, by their inherent diversity, including factors such as different numbers of firms, succession timing, industry and firm characteristics, and preferences in business activities. For instance, consider a scenario where the manufacturing sector experiences a profitability upswing during the sample period. If the outsider group contains a higher proportion of manufacturing firms than the family group, the former might outperform the latter. Another example is that if the family heirs tend to expand their firm's assets after succession but outsiders do not, the former may experience a decline in post-succession ROAs but the latter may not.

Second, evidence (e.g., Weisbach, 1988; Fee and Hadlock, 2004) shows that top management turnover is negatively related to firms' pre-turnover profitability and stock returns. Huson, Malatesta, and Parrino (2004) find that firms' operating performance deteriorates prior to CEO turnover and improves afterward. These findings reveal that CEOs' poor performance can be the main reason for their dismissal. We argue that this scenario is more likely to occur in outsider succession than in family succession. The rationale behind this argument is that family leaders typically encounter less pressure to relinquish their positions due to poor performance than outsider CEOs. Consequently, the shifts in profitability observed within firms undergoing outsider succession tend to outperform those in their family succession counterparts. In such cases, the underperformance of family succession firms could be a misleading conclusion.

To avoid the heterogeneity between two comparison groups, we employ the propensity score method to select the matching firms that have similar size and book-to-market ratios to and operate in the same industry as the family succession firms. We then examine the difference in post-succession stock returns between family succession firms and their non-succession matching firms to evaluate their performance. Specifically, we evaluate a portfolio's performance by buy-and-hold abnormal returns (BHAR), which can be expressed as follows:

$$BHAR_p = \frac{1}{N} \sum_{j=1}^{N} [ \prod_{\tau=1}^{T} (1 + R_{j,\tau}) - \prod_{\tau=1}^{T} (1 + R_{matching,\tau})], \tag{1}$$

where $R_{j,\tau}$ and $R_{matching,\tau}$ denote firm j's return and its matching firm's return on day $\tau$, respectively, and N is the number of firms. Return is calculated from the succession day to day T by taking the convention of 252 trading days per annum (T = 756 for three years). If a firm is delisted, returns are compounded until the delist date.

We employ the propensity score matching method proposed by Li and Zhao (2006) to construct the matching sample.   Specifically, we use a logit model by setting the dependent dummy equal to 1 and 0 for succession and non-succession firms, respectively.   The non-succession firms must have no succession three years before and after the succession year and operate in the same industry as the succession firm.   The independent variables include firm size, book-to-market ratio, and cumulative excess returns six months before the succession.   We estimate the propensity score model every year and compute each firm's score.   The non-succession firm with the closest score to the succession firm is included in the matching sample.

The event-time methodology (e.g., BHAR) has been criticized for overstating firms' long-run underperformance (e.g., Schultz (2003)).   To address this concern, we employ the Fama-French (2016) five-factor model to conduct time-series regressions, which can be written as

$$R_{p,t} - R_{f,t} = \alpha_{p,T} + \beta_1\, RMRF_t + \beta_2\, SMB_t + \beta_3\, HML_t + \beta_4\, RMW_t + \beta_5\, CMA_t + \varepsilon_t, \qquad (4)$$

where $R_{p,t}$ is return on the portfolio in month t, $R_{f,t}$ is the risk-free rate, $RMRF_t$ is market return minus risk-free rate, $SMB_t$ is return on a portfolio of small firms minus return on a portfolio of large firms, $HML_t$ is return on a portfolio of high BM firms minus return on a portfolio of low BM firms, $RMW_t$ is return on a portfolio of firms with robust operating profitability minus return on a portfolio of firms with weak operating profitability, $CMA_t$ is return on a portfolio of conservative investment firms minus return on aggressive investment firms, and subscript t indicates month t.   The intercept ($\alpha_p$) is the estimate of monthly abnormal performance.

### 3.2. Firm Succession in Taiwan

Traditionally, a significant portion of Taiwanese firms, established in the 1950s-70s, has adopted Japanese-style organizational structures, since their founders had received Japanese education or had experience working in Japanese firms.   In such structures, the board chairman is responsible for corporate strategies, crucial investment decisions, and financing choices, while the CEO is tasked with strategy implementation and the management of business operations.   This configuration positions the board chairman as the real leader in the firm.   By contrast, some firms, especially those operating in hi-tech industries, opt for a US-style management framework where the CEO plays the central role as the primary decision maker.

In alignment with the above scenarios, we empirically outline the following conditions as indicative of family succession: (1) the ascent of a family descendant who has served as a board director or CEO to the role of board chairman, (2) the assumption of directorship by a family successor concurrently fulfilling the CEO role, (3) the appointment of a family member, formerly holding a director position, to the CEO position, and (4) the election of a family member, presently devoid of a directorship or CEO role, to the chairman position.

### *3.3. Factors Affecting Post-Succession Performance*
### *3.3.1. Heir Traits*

(1) Gender (DGender). Prior studies (e.g., Martin, Nishikawa, and Williams, 2009; Khan and Vieito, 2013) find no significant difference in returns upon the appointment of female and male CEOs, suggesting that the market does not exhibit gender bias. Nevertheless, female CEOs tend to exhibit less risk-taking behavior (Powell and Ansic, 1997) and work harder (more working hours) (Danes, Stafford, and Loy, 2007) than male CEOs, which could potentially affect post-succession performance. To examine this possibility, we include heir gender in our analyses.

(2) Elite Education (DElite). Pérez-González (2006) shows that CEOs who attended relatively competitive undergraduate institutions tend to outperform those who did not, highlighting the correlation between better education and enhanced managerial competence. A reasonable explanation for this phenomenon is that individuals with a superior education may possess better cognitive abilities, broader social network, and stronger self-discipline than their peers who lack such educational advantages.

Education is highly valued in Taiwan and particularly emphasized by numerous successful entrepreneurs. Consequently, many heirs have achieved a high level of education. To gauge the effect of education, we introduce a dummy (DElite) equal to 1 if the heir received a Master's degree from one of the top 100 institutions listed in the QS World University Ranking (2021/07) to assess its impact on post-succession performance.[2]

(3) Difference in Intergenerational Backgrounds (DΔBackground). We infer that a family firm will experience significant changes in leadership styles if the predecessor and the heir have distinct educational and work backgrounds. This situation happens to a number of Taiwanese firms when the heir who received education in Western countries for an extended period takes the reins of the family firm that initially adopted a Japanese-style management system.

Japanese enterprises typically adhere to hierarchical organizational structures and emphasize values such as employee loyalty and group harmony. Within these cultural contexts, firms tend to evaluate employees based on individual experiences, working attitudes, and cohesive dynamics within the organization. By contrast, firms in Western countries often prioritize corporate effectiveness and competitiveness in the market, resulting in a leadership style that places greater emphasis on both team contributions and the individual performance of employees.

We postulate that when an heir with a Western educational background takes the helm of a firm entrenched in the Japanese-style management system, the firm is likely to experience in a shift in leadership style from one that focuses on work effort to one that emphasizes efficiency. This transition in leadership style may influence firms' post-succession performance. To examine this

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[2] The website address of the QS World University Rankings 2022 is https://www.topuniversities.com/ university-rankings/world-university-rankings/2022.

argument, we incorporate the disparity in educational and working backgrounds between the predecessor and the heir into our analyses.

(4) Descendant.   In many Taiwanese family firms, the controlling shareholder typically designates a direct descendant (son, daughter, grandson, or granddaughter) as the heir to the business. Nevertheless, some departing leaders opt for a relative (e.g., nephew and niece) to take on this role. A direct descendant not only inherits ownership of the firm but also benefits from the transfer of their parents' management skills and specialized knowledge.   In such scenarios, a direct descendant may perform better than a non-descendant relative after succession.   However, individuals from affluent backgrounds might exhibit ambitious aspirations but limited capabilities due to being overly indulged in their privileged upbringing.   In such circumstances, a direct descendant's performance is likely to fall short of expectations.

### 3.3.2. The Way of Succession

(5) CEO Experience.   Some family firms choose to appoint prospective heirs as CEOs before they ascend to the role of board chairman.   Throughout this transition period, the departing parents retain the chairman position, utilizing it to pass on their insights and proficiency concerning the firm's functioning.   Intuitively, this shift can enrich the heirs' managerial acumen and accumulate valuable experiences.   The literature (e.g., Smith and Amoako-Adu, 1999) also suggests that family heirs with limited management experience can mitigate the firm value.   Hence, we include the duration for which the heir held the CEO (president) position prior to succeeding the chairman mantle to examine its effect on post-succession performance.

(6) Management Turnover.   Fee and Hadlock (2004) find a positive relation between the rate of dismissal for non-CEO executives and the removal of the CEO.   When these dismissed executives resurface at a new employer, they often end up taking positions and benefits inferior to the status of their prior employment.   This suggests that that firms consistently evaluate their managers and take steps to remove underperforming individuals.

It is not surprising that a new heir dismisses some or all of the top management team after succession in a family firm.   This decision can be motivated by managers' quality or their relationship with the heir, the former generating a positive impact on the post-succession performance while the latter a negative impact.   To examine this effect, we calculate the turnover rate of senior managers holding positions above the assistant vice president level (this information is available in the annual shareholder meeting report) one year after the succession.

(7) Scam (DScam).   The engagement of a family heir in fraudulent activities can result in a severe deterioration in the firm's value after succession.   To account for this effect, we construct a binary dummy variable (DScam) equal to 1 if the heir is involved in a reported scam or a fraud lawsuit covered by the media three years before and after the succession.   The fraudulent activities considered encompass illegal insider trading, financial fraud, embezzlement, and deliberate

underselling of fixed assets at substantially reduced prices.    Note that this variable serves as a control variable rather than a predictor, as it contains future information.

### 3.3.3. Firm Characteristics

(8) Adjusted ROA.    Cucculelli and Micucci (2008) show that Italian family firms with high pre-succession returns on assets (ROA) adjusted by industry, size, and area tend to experience lower post-succession ROAs.    This finding implies that firms with high adjusted ROAs may have poor stock performance after succession.    To investigate this argument, we examine the effect of family firms' industry-adjusted ROAs (ROA minus the industry's median ROA) over three years before succession on the subsequent stock performance after succession.

(9) PP&E.    We suspect that family firms' post-succession performance may be influenced by their fixed assets, since new heirs may face challenges in effectively managing capital expenditure for equipment renewal and replacement and adjustments in production capacity.    To investigate this idea, we examine the impact of property, plant, and equipment (PP&E) over total assets on the performance after succession.

(10) Voting-to-Cashflow Deviation.    The financial literature finds that a significant deviation between control rights and cash flow rights can produce agency problems.    Specifically, when controlling shareholders have a large discrepancy from control rights to cash flow rights, it can drive them to engage in entrenchment activities (e.g., self-dealing) at the expense of minority shareholders, ultimately resulting in poor firm performance (Claessens, Djankov, and Lang, 2000 and 2002; Cronqvist and Nilsson, 2003).    Based on this insight, we infer that the voting-to-cashflow deviation in family firms is likely to have a negative association with their post-succession performance.

(11) Institutional ownership (IO).    Huson, Malatesta, and Parrino (2004) show a positive relation between the level of institutional ownership and the operating performance of firms after CEO succession, a phenomenon that can be attributed to the monitoring role played by institutional investors.    Accordingly, we posit that succession firms with high institutional ownership are likely to have better post-succession performance than those with low institutional ownership, in that institutional investors can provide support and guidance during family succession, thereby reducing the likelihood of selecting inappropriate successor candidates.

(12) Changes in IO (ΔIO).    Parrino, Sias, and Starks (2003) show that institutional investors tend to sell shares when a firm replaces its CEO with a member of the founding family.    This trend highlights a concern among institutional investors that such transitions to family heirs might result in subpar performance after the succession.    Within this insight, we posit a positive relation between changes in institutional ownership and the long-run post-succession performance.

Detailed definitions and data sources of the above variables can be found in the Appendix for further clarity and reference.

# 4. Empirical Results

## 4.1. Data

Our sample consists of family firms as defined in the Taiwan Economic Journal (TEJ) database: entities where a single family holds more than 10% ownership and occupies a minimum of half the seats on the board. To identify succession events, we use the market observation post system (MOPS) established by the Taiwan Stock Exchange (TWSE), focusing on instances where family firms replace their chairman or CEO positions from 2000 to 2017. The specific date of the succession event is collected from the "material information" section in the MOPS, which serves as a platform for public firms to disclose significant information, including changes in board chairmen, CEOs (presidents), or independent directors.

Family heirs' gender and education backgrounds are extracted from the TEJ database. The relationship between the departing leader and the succeeding heir, the duration for which heirs serve as CEOs, and the turnover of top managers are collected from the annual shareholder meeting reports. In addition, we gather news on family scams and the professional experiences of departing leaders from the United Daily News (UDN) database and other relevant websites.

Accounting data (e.g., net income, assets, PP&E, and book values of debt and equity), stock returns, market capitalization, institutional ownership, and voting-to-cashflow deviation are obtained from the TEJ database.

## 4.2. Summary of the Sample

Table 1 reports the number of Taiwanese family firms that undergo succession between 2000 and 2017. As shown in Panel A, there are 172 succession firms in total.3 Among these firms, the heirs of 158 firms (92%) are male and those of 140 firms (81%) are direct descendants, indicating a predominant phenomenon of passing down leadership positions to male offspring within the family. Furthermore, 22 heirs have been involved in a scam and 49 heirs earned a Master's degree from prestigious universities (elite education).

<div align="center">Table 1.</div>

Panel B summarizes the number of firms based on additional factors. There are 18 instances of Japanese-style firms that experience succession by heirs with Western education (labeled as "different backgrounds"), 72 cases involve heirs succeeding in the chairman position, 138 firms operate in manufacturing industries, and 79 firms exhibit returns on assets (ROAs) greater than the median of their respective industries in the fiscal year preceding the succession.

## 4.3. Firm Characteristics and Profitability

Panel A of Table 2 presents the average and median values of several key firm characteristics. The median size of the family sample stands at NT\$3.71 billion (an approximate exchange rate of

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3 Among our sample firms, there is one particular firm that experienced two successions, covering a span of seven years.

new Taiwanese dollar 30 per US dollar in 2020), which is close to that of the matching sample (NT$3.57 billion). The median book-to-market (BM) ratio of the family sample is 0.99, indicating that book and market values are quite close. This number suggests that the market places little premium on firms' values in the sample period.

Furthermore, there is no significant difference in the medians of PP&E/Assets and deviation between the family and matching samples. For instance, the median deviations are 1.02 and 1.09 for the family and matching firms, respectively. The median number of years for which heirs serve as CEOs before assuming the chairman position is 0.0, indicating that more than half of the leadership transitions involve a direct move to the chairman position without prior CEO experience. In addition, the median management turnover rate is 16.70%, revealing that a majority of incumbent managers stay in their roles following succession.

<div align="center">Table 2.</div>

Panel B lists the median returns on assets (ROAs) of both the sample and matching firms from year $-3$ to year 3 relative to the succession year. The median ROAs of the family firms exhibit a slight downward trend before succession, starting at 8.69% in year $-3$ and declining to 7.07% in year $-1$. However, this decline becomes significant after succession, with ROA dropping to 6.55% in year 1. The difference in ROAs between the pre- and post-succession periods is significant at 1% (the p-value is shown in the last column). By contrast, the matching firms do not exhibit a clear decrease in ROAs, with their median ROAs decreasing from 9.61% in year $-3$ to 7.56% in year 3. These numbers indicate that the profitability of the family firms tends to decrease after succession, which is consistent with similar trends observed in prior studies (e.g., Pérez-González, 2006; Bennedsen et al., 2007; Cucculelli and Micucci, 2008).

Panel C demonstrates that family firms have a median industry-adjusted ROA of $-0.31\%$ before succession, which subsequently drops to $-1.82\%$ after succession. This decline is statistically significant at the 5% level, reinforcing the notion that family firms tend to experience a reduction in profitability after succession.

### 4.4. BHARs

Panel A of Table 3 shows three- and five-year mean and median buy-and-hold returns (BHRs) of the sample and matching firms. The succession firms deliver lower three-year BHR (mean 36.5%) than their matching firms (45.4%). Their difference (BHAR) is $-8.9\%$, which is significant at the 10% level. Similarly, there is a significant difference of $-10.3\%$ in five-year BHARs between these two groups. These numbers indicate that family heirs tend to underperform their non-succession peers, a phenomenon that is consistent with the explanation that family heirs possess limited management experience (Smith and Amoako-Adu, 1999) and/or have limited exposure to the competition in the labor market (Pérez-González, 2006).

Table 3.

Panel B separates the succession firms into the elite and non-elite groups according to heirs' education. The elite-education group and its matching group generate three-year BHRs of 67.0% and 57.3%, respectively, resulting in insignificant BHAR of 9.7%. By contrast, BHRs of the non-elite-education and matching groups are 24.4% and 40.7%, respectively, which differ significantly at the 5% level (BHAR −16.3%).

For a more extended period of five years, the contrast between the elite-education and non-elite-education groups becomes more pronounced. Specifically, the elite-education group significantly outperforms its matching group (five-year BHARs 43.5%), while the non-elite-education group underperforms (−56.0%). These results underscore that heirs with elite education do not underperform their peers three years after succession and outperform their peers five years after succession.

Panel C classifies the sample firms into two groups based on their pre-succession industry-adjusted ROA (Adj-ROA): the positive (i.e., greater than 0) and negative Adj-ROA groups (less than 0). The positive Adj-ROA group and its matching counterpart generate three-year mean BHRs of 33.6% and 40.5%, respectively, with an insignificant difference (BHAR of −6.9%).

On the other hand, three-year mean BHAR of the negative Adj-ROA group is −10.7% and significant at the 10% level. This situation is similar for five-year BHARs, where the positive group does not significantly underperform the matching group (BHAR of −10.7%) but the negative group does (−18.8%). These numbers show that firms with low profitability are more likely to underperform after succession.

### 4.5. Fama-French Five-Factor Regressions

Table 4 reports the estimation results of the Fama-French (FF) five-factor regression, in which the intercept measures the monthly abnormal performance. Panel A uses three-year returns of the sample and matching firms to form portfolios. The coefficients of the market-risk-premium (RMRF), size (SMB), and BM (HML) factors are positive and significant, but those of the profitability (RMW) and investment (CMA) factors are not significant. The intercepts of the succession and matching portfolios are −0.661% and −0.261%, respectively, the former being significant but the latter not. Their difference (−0.400%) is statistically significant, indicating that family firms underperform their matching counterparts.

Table 4.

Panel B demonstrates the abnormal performance of five-year returns. The intercept of the family portfolio (−0.617%) is more negative than that of the matching portfolio (−0.228%), the former being significantly lower than the latter. This finding further accentuates the trend of family firms displaying long-run underperformance after succession.

### 4.6. Correlation Matrix

Table 5 presents the correlation coefficients between our primary variables. Among these variables, the industry-adjusted ROA (Adj-ROA) is significantly correlated with several other variables. For instance, the correlation coefficient between Adj-ROA and management turnover is significantly negative (−0.217), indicating that firms with high profits are less likely to dismiss managers after succession. Furthermore, Adj-ROA shows a negative correlation with the BM ratio (coefficient −0.445). This correlation is expected because profitable firms often have lower BM ratios, as the market typically assigns higher values to such firms.

<center>Table 5.</center>

However, the above correlations raise concerns about multilinearity, as both variables might capture related aspects of firm performance. It is crucial to recognize that BM ratio may contain information not captured by management turnover and adj-ROA, potentially affecting the dependent variable (e.g., see returns). For instance, Fama and French (2008) suggest that BM ratio contains independent information about expected cashflows that can enhance estimates of expected returns. Hence, excluding BM ratio from multivariate analysis may introduce omitted variable bias, leading to an incorrect interpretation of the results. To address this concern, we include both management turnover (or Adj-ROA) and BM in subsequent regressions to ensure a more comprehensive analysis.

### 4.7. Regressions: Factors Affecting BHARs

To examine the effects of related factors on the long-run performance of family firms that undergo succession, we use three- and five-year BHARs as the output variables to perform regressions with the fixed yearly effect, respectively. The input factors contain heir traits, the way of succession, and firm characteristics as discussed in section 2.3.

Table 6 reports the regression results and we focus on discussing variables that are statistically significant. Among the heir trait variables, heir's elite education (DElite) significantly affects both three- and five-year BHARs (e.g., 0.340 and 0.947 in models 1 and 5, respectively), a phenomenon consistent with Pérez-González's (2006) finding that successors who attended relatively competitive undergraduate institutions exhibit better operating performance than those who did not. A plausible explanation for this result is that family heirs who earned a Master's degree from an elite institution may possess enhanced management capabilities, contributing to their superior performance.

<center>Table 6.</center>

The dummy for the difference in generational backgrounds (DΔBackground) is positively associated with the long-run performance of succession firms, showing significance in terms of 3-year BHARs (e.g., 0.380 in model 1) and marginal significance for 5-year BHARs (e.g., 0.555 in model 5). This finding suggests that heirs who introduce Western-style management practices to

Japanese-style firms can increase values, a situation that might arise from the operational efficiency emphasized by Western-style management.

The coefficients of the direct descent dummy (DDirect) are positive (e.g., 0.393 and 0.236 in models 1 and 5, respectively), which are significant for three-year BHARs but not for five-year BHARs. This result signifies that direct descendants of the departing leaders exhibit superior performance compared to non-descendant relatives, possibly due to the acquisition of enhanced management skills from their parents. However, the insignificance of the coefficients of five-year BHARs reveals that this advantageous impact diminishes over time.

The three variables related to the way of succession are all significant. The number of years that the heir serves as CEO (president) before succeeding the chairman role (CEO_YR) has a positive and significant impact on three-year BHAR (e.g., coefficient 0.042 in model 1), but this effect disappears for five-year BHAR (e.g., coefficient −0.005 in model 5). These numbers show that the CEO experiences of heirs can enhance firms' values in the medium run, rather than the long run.

Management turnover rate is positively and significantly associated with both three-year and five-year BHARs (e.g., 0.575 and 0.834 in models 1 and 5, respectively), implying that dismissal of top managers who are incompetent in their positions can enhance firm value. The scam dummy (DScam) has a negative effect on three- and five-year BHARs (e.g., −0.114 and −0.445 in models 1 and 5, respectively), the latter being significant but the former not. This finding suggests that a deficiency in heir and/or family integrity can severely impair firms' values.

Among firm characteristics, pre-succession Adj-ROA has a positive impact on both three- and five-year BHARs (e.g., 0.023 and 0.048 in models 1 and 5, respectively), implying that profitable firms have better stock performance after succession, as they maintain advantages due to their strong human and physical capital. Cash/Voting deviation exhibits a negative relation to BHARs (e.g., −0.091 and −0.184 in models 1 and 5, respectively), which is not significant for three-year BHAR but significant for five-year BHAR. This result is consistent with the interpretation that high cash-to-voting deviation leads the controlling shareholders to take advantage of minority shareholders, which can result in poor firm performance (Claessens, Djankov, and Lang, 2000 and 2002; Cronqvist and Nilsson, 2003).

Changes in institutional ownership within the twelve months prior to the succession ($\Delta IO(-12,0)$) are positively and significantly associated with three-year BHAR (e.g., coefficient 0.020 in model 1), but not significantly with five-year BHAR (e.g., 0.016 in model 5). This result suggests that institutional investors would increase (decrease) their shares when they hold a positive (negative) view of incoming heirs, which is associated with relatively better medium-run performance.

Furthermore, we extend our analyses to explore several interactive effects. The interactive dummy of elite education and positive Adj-ROA (DElite × DHigh-ROA) yields a positive effect on both three- and five-year BHARs (coefficients 0.371 and 0.704 in models 2 and 6, respectively).

This suggests that when profitable firms are succeeded by heirs with elite education, they tend to outperform their peers in the long run. In addition, the interaction between elite education and changes in institutional ownership (DElite × ΔIO(−12,0)) is positively associated with five-year BHAR (coefficient 0.088 in model 8). This implies that firms achieve strong performance after succession if institutional investors hold a positive view of heirs with elite education.

In summary, our regression results highlight several key findings concerning the factors influencing post-succession performance. Among heir traits, elite education, difference in intergenerational backgrounds, and being a direct descendant of the departing leader exert a positive impact on post-succession performance. Furthermore, the way of succession, including the duration that heirs serve as CEOs and the degree of management turnover, is associated with enhanced post-succession performance. In addition, firms with high profitability and pre-succession increases in institutional ownership also contribute positively to overall performance.4

# 5. Conclusion

This study investigates the long-run stock performance of family firms after succession and seeks to identify the factors that influence their post-succession performance. By addressing these dual concerns, this study can contribute to an enriched understanding of how these firms perform after succession, providing insights for predicting their future performance. Furthermore, it offers valuable guidance to families in grooming suitable heirs through a more informed perspective on the determinants of post-succession success.

Using a sample of 172 Taiwanese family firms that experience business succession, we find that heirs' elite education, difference in intergenerational backgrounds, and the status of heirs as direct descendants of the departing leader are positively associated with post-succession performance. These findings imply that heirs' quality stemming from their education, capability to institute leadership changes within family firms, and the knowledge acquired from their families can collectively enhance firm value. Among these three factors, heirs' quality is the most important determinant, in that it generates a long-run impact on post-succession performance.

Our analysis further reveals that the duration for which the heir serves as CEO (president) before assuming the chairman position and the extent of management turnover right after succession positively influence post-succession performance. These findings suggest that heirs' management experiences and decisions regarding the removal of incumbent managers can contribute to enhancing firms' values.

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4 In addition to variables presented in Table 6, we further examine the impacts of several other factors on post-succession performance, including family conflicts during succession (e.g., instances where siblings vie for the controlling position such as chairman or CEO and consequently split into opposing sides), CEO duality, pyramidal and crossholding organizational structures, pre-succession stock returns and prices, and industries. However, our analysis indicates that these variables do not yield statistically significant effects on post-succession values.

We also find that several firm characteristics significantly affect post-succession performance. Firms with high Adj-ROAs before succession demonstrate superior performance compared to those with low Adj-ROAs, implying that profitable firms possess the ability to maintain their advantages after succession due to their robust human and physical capital.   In addition, cash-to-voting deviation does not significantly influence in the medium run but turns to negatively affect firms' post-succession performance in the long run.   This finding reveals that controlling shareholders with high cash-to-voting deviation are more likely to exploit minority shareholders.   Finally, firms with pre-succession increases in institutional ownership tend to have better medium-run performance, suggesting that institutional investors would increase their shares when they have a positive outlook of incoming heirs.

In summary, this study contributes to the literature by highlighting the crucial roles played by heirs' quality and backgrounds and succession preparedness in the context of family firm succession. These findings underscore the importance of family firms prioritizing initiatives such as heir training and deliberate succession planning to ensure the smooth operation of the firm after succession.   This guidance assists family firms in navigating the complex landscape of succession and making informed decisions to enhance long-run success.

For investors, the insights derived from this study suggest considering family firms characterized by high-quality heirs, strong profitability, and an increase in institutional ownership prior to succession.   Analogous to betting on a skilled jokey guiding a capable racehorse that attracts a professional audience, investors can benefit from choosing firms with well-educated and practically trained heirs at the helm of a profitable business, coupled with increased institutional ownership. Such a strategic approach proves advantageous for investors seeking to make informed investment decisions in family firms.

# Appendix

## Table A1. Variable Definition

|  | Definition | Data |
|---|---|---|
| Family Firms | A single family holds more than 10% ownership of a firm and occupies a minimum of half the seats on the board. | TEJ |
| Family Succession Events | (1) A family member who has served as a board director or CEO assumes the role of board chairman. | The market observation post system (MOPS) |
|  | (2) A family member who serves as CEO is elected as a board director. |  |
|  | (3) A family member who formerly held a director position is appointed to the CEO position. |  |
|  | (4) A family member who is presently devoid of a directorship or CEO role is elected as the chairman. |  |

| Variables | Notation | Definition | Data |
|---|---|---|---|
| **Heir Traits** |  |  |  |
| Gender | $D_{Gender}$ | $D_{Gender} = 1$ if the heir is male | TEJ |
| Elite education | $D_{Elite}$ | $D_{Elite} = 1$ if the heir received a Master's degree from top 100 institutions listed in the QS World University Ranking | TEJ |
| Difference in intergeneration backgrounds | $D_{\Delta Background}$ | $D_{\Delta Background} = 1$ if the heir who received Western education succeeds a Japanese-style family firm | TEJ and UND |
| Direct descendant | $D_{Direct}$ | $D_{Direct} = 1$ if the heir is one of the departing leader's direct descendants | TEJ |
| **The Way of Succession** |  |  |  |
| CEO experience | *CEO-YR* | The number of years during which the heir served as CEO before assuming the chairman position | Annual report |
| Management turnover | Turnover | $\dfrac{\text{Number of Top Management Dismissed}}{\text{Number of Top Mangement}}$ (in the year following succession) | Annual report |
| Scam | $D_{Scam}$ | $D_{Scam} = 1$ if the family heir got involved in a scam around succession | UND |
| **Firm Characteristics** |  |  |  |
| ROA adjusted by industry median | *Adjusted-ROA* | $ROA_j$ − Median ROA of firm *j*'s industry | TEJ |
| PP&E ratio | PP&E/Assets | Property, plant, and equipment over assets | TEJ |
| Voting-to-cashflow deviation | Deviation | Voting right over the cash-flow right of the control family | TEJ |
| Institutional Ownership | *IO* | The level of the institutional ownership one month before the succession | TEJ |
| Changes in IO | $\Delta IO(-12, -1)$ | Changes in *IO* from month −12 to month −1 relative to the succession. | TEJ |

TEJ refers to the Taiwan Economic Journal database. UDN is the United Daily News database. Annual report is annual shareholder meeting report.

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Table 1. Number of the Sample

This table summarizes the number of Taiwanese family firms that undergo succession in 2000-2017.   Panel A shows the number of succession firms and the number of firms according to the heir's gender, whether the heir is a direct descendant of the departing chairman (versus other relatives), whether the heir earned a Master's degree from a prestigious university (elite education), and whether the heir got involved in a scam.   Panel B reports the number of firms whether the heir of a Japanese-style firm received Western education (different backgrounds), whether the heir succeeded the chairman position, whether the family firm operates in a manufacturing industry, and whether the returns on assets of the succession firm is greater than the median of its industry in the fiscal year preceding the succession (Adj-ROA > 0).

| Panel A. Number of Firms | | | | | | |
|---|---|---|---|---|---|---|
| Year | Succession Firms | Gender | | Direct Descendant | Elite Education | Scam |
| | | Male | Female | | | |
| 2000 | 6 | 6 | 0 | 5 | 2 | 0 |
| 2001 | 4 | 4 | 0 | 4 | 0 | 0 |
| 2002 | 6 | 5 | 1 | 6 | 0 | 2 |
| 2003 | 9 | 9 | 0 | 6 | 2 | 3 |
| 2004 | 9 | 9 | 0 | 6 | 3 | 2 |
| 2005 | 7 | 7 | 0 | 5 | 1 | 0 |
| 2006 | 10 | 10 | 0 | 8 | 3 | 2 |
| 2007 | 11 | 11 | 0 | 8 | 2 | 3 |
| 2008 | 7 | 7 | 0 | 5 | 1 | 1 |
| 2009 | 12 | 11 | 1 | 11 | 5 | 2 |
| 2010 | 17 | 16 | 1 | 15 | 8 | 2 |
| 2011 | 7 | 7 | 0 | 6 | 1 | 1 |
| 2012 | 3 | 3 | 0 | 2 | 1 | 0 |
| 2013 | 17 | 16 | 1 | 14 | 5 | 0 |
| 2014 | 16 | 13 | 3 | 16 | 5 | 4 |
| 2015 | 11 | 8 | 3 | 7 | 4 | 0 |
| 2016 | 10 | 8 | 2 | 8 | 3 | 0 |
| 2017 | 10 | 8 | 2 | 8 | 3 | 0 |
| Total | 172 | 158 | 14 | 140 | 49 | 22 |

| Panel B. Number of Firms according to Firm Characteristics | | | |
|---|---|---|---|
| Different Backgrounds | Succeeding Chairman | Manufacturing | Adj-ROA > 0 |
| # of Firms                     18 | 72 | 138 | 79 |

Table 2. Firm Characteristics

This table summarizes the characteristics of Taiwanese family firms that undergo succession in 2000-2017. Each sample firm has a matching firm selected by Li and Zhao's (2006) propensity score method. In Panel A, size (capitalization) and book-to-market (BM) ratio are data prior to the succession. PP&E/Assets is property, plant, and equipment over total assets. Deviation is the voting right over the cash-flow right of the control family. CEO-YR is the number of years that the heir served as managers before she/he succeeds CEO/chairman. Management turnover is the percentage of top management removal in the year following succession. Panels B reports the median returns on assets (ROAs) of the succession and matching firms from year $-3$ to year 3 relative to the succession year (year 0). Panel C lists the median institutional ownership (IO) of the succession and matching firms from year $-3$ to year 3 relative to the succession year (year 0), respectively. Numbers in parentheses in the row are the p-values of the Wilcoxon rank-sum test for the difference in variables between the succession and matching firms equal to 0. Numbers in the last column are the p-values of the Wilcoxon matched-pairs signed-rank for the difference in variables in the post-succession and pre-succession periods equal to 0. Superscripts *, **, and *** indicate statistical significance at the 10%, 5%, and 1% level, respectively.

| Panel A. Firm Characteristics | | | | |
|---|---|---|---|---|
| | Succession | | Matching | |
| | Mean | Median | Mean | Median |
| Size ($NT Billion) | 12.37 | 3.71 | 11.97 | 3.57 |
| BM Ratio | 1.00 | 0.99 | 1.01 | 0.94 |
| PP&E/Assets (%) | 34.61 | 33.35 | 31.36 | 30.67 |
| Deviation | 1.24 | 1.02 | 2.08 | 1.09 |
| CEO-YR | 2.19 | 0.00 | – | – |
| Management Turnover (%) | 20.40 | 16.70 | – | – |

| Panel B. Median ROA (%) | | | | | | | |
|---|---|---|---|---|---|---|---|
| | Year | | | | | | |
| | $-3$ | $-2$ | $-1$ | 0 | 1 | 2 | 3 | Difference |
| Succession | 8.69 | 8.07 | 7.07 | 7.06 | 6.55 | 6.69 | 6.76 | (0.001***) |
| Matching | 8.98 | 7.79 | 7.40 | 8.16 | 8.43 | 8.73 | 9.06 | (0.647) |
| p-value | (0.857) | (0.508) | (0.828) | (0.180) | (0.016**) | (0.014**) | (0.021**) | |

| Panel C. Industry-Adjusted Median ROA (%) | | | |
|---|---|---|---|
| | Pre-Succession | Post-Succession | Difference |
| Succession | $-0.31$ | $-1.82$ | (0.034**) |
| Matching | 0.40 | 0.75 | (0.586) |
| p-value | (0.423) | (0.047**) | |

Table 3. Three- and Five-Year BHARs after Successions

This table reports mean and median three- and five-year buy-and-hold abnormal returns (BHARs) of 172 Taiwanese family firms that experienced succession during 2000-2017. BHARs are calculated as follows: $\frac{1}{N} \sum_{j=1}^{N} [\prod_{t=1}^{T} (1 + R_{j,t}) - \prod_{t=1}^{T} (1 + R_{Match,t})]$, where $R_{j,t}$ and $R_{Match,t}$ are returns on the succession and matching portfolios, respectively, and $N$ is the number of firms. Panel A shows BHARs of the whole sample. Panels B and C separate the firms into two groups according to heir's elite education and pre-succession ROA (positive and negative), respectively. Numbers in parentheses are the p-values of the t test and the Wilcoxon signed rank test for mean and median BHARs equal to 0, respectively. Superscripts *, **, and *** indicate statistical significance at the 10%, 5%, and 1% level, respectively.

| Panel A. The Whole Sample | | | | | | |
|---|---|---|---|---|---|---|
| | Succession | | Matching | | Difference | |
| 3-year | BHR | p-value | BHR | p-value | BHAR | p-value |
| Mean | 0.365*** | (<0.001) | 0.454*** | (<0.001) | −0.089* | (0.087) |
| Median | 0.137*** | (<0.001) | 0.423*** | (<0.001) | −0.134** | (0.041) |
| 5-year | | | | | | |
| Mean | 0.709*** | (<0.001) | 0.812*** | (<0.001) | −0.103* | (0.094) |
| Median | 0.360*** | (<0.001) | 0.708*** | (<0.001) | −0.318*** | (<0.001) |

| Panel B. BHARs according to Heir's Education | | | | | | | |
|---|---|---|---|---|---|---|---|
| | Elite | Succession | | Matching | | Difference | |
| 3-year | Edu. | BHR | p-value | BHR | p-value | BHAR | p-value |
| Mean | Yes | 0.670*** | (<0.001) | 0.573*** | (<0.001) | 0.097 | (0.320) |
| | No | 0.244*** | (<0.001) | 0.407*** | (<0.001) | −0.163** | (0.035) |
| Median | Yes | 0.349*** | (<0.001) | 0.402*** | (<0.001) | 0.057 | (0.430) |
| | No | 0.063*** | (0.003) | 0.324*** | (<0.001) | −0.154** | (0.041) |
| 5-year | | | | | | | |
| Mean | Yes | 1.357*** | (<0.001) | 0.922*** | (<0.001) | 0.435** | (0.040) |
| | No | 0.451*** | (<0.001) | 0.768*** | (<0.001) | −0.560*** | (<0.001) |
| Median | Yes | 0.575*** | (<0.001) | 0.493*** | (<0.001) | 0.089 | (0.285) |
| | No | 0.291*** | (<0.001) | 0.394*** | (<0.001) | −0.092* | (0.087) |

| Panel C. BHARs according to Pre-Succession ROA | | | | | | | |
|---|---|---|---|---|---|---|---|
| | Adj- | Succession | | Matching | | Difference | |
| 3-year | ROA | BHR | p-value | BHR | p-value | BHAR | p-value |
| Mean | Pos. | 0.336*** | (<0.001) | 0.405 | (<0.001) | −0.069 | (0.475) |
| | Neg. | 0.389*** | (<0.001) | 0.496 | (<0.001) | −0.107* | (0.062) |
| Median | Pos. | 0.149*** | (<0.001) | 0.363 | (<0.001) | 0.130 | (0.347) |
| | Neg. | 0.125*** | (<0.001) | 0.423 | (<0.001) | −0.302*** | (0.001) |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 5-year | | | | | | | | |
| Mean | Pos. | 0.791*** | (<0.001) | 0.794 | (<0.001) | −0.107 | (0.582) | |
| | Neg. | 0.639*** | (<0.001) | 0.827 | (<0.001) | −0.188* | (0.075) | |
| Median | Pos. | 0.361*** | (<0.001) | 0.632 | (<0.001) | −0.184 | (0.332) | |
| | Neg. | 0.360*** | (<0.001) | 0.729 | (<0.001) | −0.502*** | (<0.001) | |

This table reports the results of the Fama-French five-factor model using a sample of 172 Taiwanese family firms that experienced succession during 2000-2017.   The model can be expressed as:

$$R_{p,t} - R_{f,t} = \alpha_{p,T} + \beta_1\, RMRF_t + \beta_2\, SMB_t + \beta_3\, HML_t + \beta_4\, RMW_t + \beta_5\, CMA_t + \varepsilon_t,$$

where $R_{p,t}$ is return on the (equally weighted) portfolio, $R_{f,t}$ is risk-free rate, $RMRF_t$ is market return minus risk-free rate, $SMB_t$ is return on a portfolio of small firms minus return on a portfolio of large firms, $HML_t$ is return on a portfolio of high book-to-market (BM) firms minus return on a portfolio of low BM firms, $RMW_t$ is return on a portfolio of firms with robust operating profitability minus return on a portfolio of firms with weak operating profitability, $CMA_t$ is return on a portfolio of conservative investment firms minus return on aggressive investment firms, and subscript $t$ indicates month $t$. Each succession firm is matched with a non-merging firm with the closest propensity score (Li and Zhao, 2006).   The regression uses 216 observations.   Numbers in parentheses are *p*-values. Superscripts *, **, and *** indicate statistical significance at the 10%, 5%, and 1% level, respectively.

Table 4. Fama-French Five-Factor Regressions

| | Intercept (%) | *RMRF* | *SMB* | *HML* | *RMW* | *CMA* | Adj. $R^2$ |
|---|---|---|---|---|---|---|---|
| 3-year | | | | | | | |
| Succession | −0.661*** | 0.911*** | 0.582*** | 0.304*** | −0.080 | 0.012*** | 0.817 |
| | (0.002) | (0.000) | (0.000) | (0.011) | (0.568) | (0.934) | |
| Matching | −0.261 | 0.955*** | 0.560*** | 0.334*** | 0.003 | 0.089 | 0.851 |
| | (0.182) | (0.000) | (0.000) | (0.003) | (0.980) | (0.510) | |
| Diff. in Intercept | −0.400* | (0.066) | | | | | |
| 5-year | | | | | | | |
| Succession | −0.617*** | 0.876*** | 0.549*** | 0.243*** | −0.170* | 0.049 | 0.846 |
| | (0.000) | (0.000) | (0.000) | (0.016) | (0.099) | (0.675) | |
| Matching | −0.228 | 0.956*** | 0.543*** | 0.367*** | 0.063 | 0.114 | 0.860 |
| | (0.181) | (0.000) | (0.000) | (0.000) | (0.505) | (0.335) | |
| Diff. in Intercept | −0.389** | (0.026) | | | | | |

This table reports the Pearson correlation coefficients between each pair of variables of 172 Taiwanese family firms conducting succession during 2000-2017.   DGender, DElite, DΔBackground, and DDirect are dummies equal to 1 if the heir is male, if the heir earned a Master's degree from an elite university, if the heir received Western education and succeeds a Japanese-style family firm, and if the heir is one of the departing chairman's direct descendants, respectively.   CEO-YR is the number of years that the heir served as CEO before assuming the chairman position. Turnover is the percentage of top management turnover in the year immediately following the

succession.　DScam is a binary variable equal to 1 if the family heir got involved in a scam around succession.　Adj-ROA is the difference in returns on assets between the succession firm and the median of its industry in the fiscal year preceding the succession.　PP&E/Assets is property, plant, and equipment over total assets.　IO is the level of the institutional ownership one month before the succession and $\Delta$IO$(-12, -1)$ is changes in IO from month $-12$ to month $-1$ relative to the succession. Deviation is the voting right over the cash-flow right of the control family.　DHi-ROA is a dummy equal to 1 if the succession firm's adjusted ROA is positive.　Superscripts *, **, and *** indicate statistical significance at the 10%, 5%, and 1% level, respectively.

Table 5. Correlation Matrix

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1. $D_{Gender}$ | 1 | | | | | | | | | | | | | |
| 2. $D_{Elite}$ | 0.047 | 1 | | | | | | | | | | | | |
| 3. $D_{\Delta Background}$ | 0.102 | 0.079 | 1 | | | | | | | | | | | |
| 4. $D_{Direct}$ | −0.033 | 0.004 | 0.115 | 1 | | | | | | | | | | |
| 5. CEO_YR | 0.082 | 0.057 | −0.029 | −0.086 | 1 | | | | | | | | | |
| 6. Turnover | 0.038 | −0.083 | −0.040 | −0.014 | 0.029 | 1 | | | | | | | | |
| 7. $D_{Scam}$ | 0.114 | 0.144$^{*}$ | −0.017 | 0.075 | 0.094 | 0.006 | 1 | | | | | | | |
| 8. Adj-ROA | −0.099 | 0.163$^{**}$ | 0.143$^{*}$ | 0.088 | 0.040 | −0.217$^{***}$ | −0.004 | 1 | | | | | | |
| 9. PP&E/Assets | 0.099 | −0.133$^{*}$ | 0.045 | 0.055 | 0.189$^{**}$ | 0.098 | 0.095 | −0.024 | 1 | | | | | |
| 10. Deviation | 0.076 | 0.293$^{***}$ | −0.009 | 0.049 | 0.038 | 0.032 | 0.172$^{**}$ | 0.059 | 0.067 | 1 | | | | |
| 11. IO | 0.064 | 0.117 | 0.028 | 0.101 | −0.020 | −0.015 | 0.060 | 0.018 | −0.114 | 0.143$^{*}$ | 1 | | | |
| 12. ΔIO(-12,0) | −0.055 | 0.032 | −0.005 | −0.003 | −0.063 | 0.009 | −0.126$^{*}$ | 0.013 | −0.129$^{*}$ | −0.013 | 0.082 | 1 | | |
| 13. BM | 0.110 | −0.052 | −0.112 | −0.014 | −0.057 | 0.209$^{***}$ | 0.056 | −0.445$^{***}$ | 0.240$^{***}$ | −0.035 | −0.014 | 0.079 | 1 | |
| 14. Size | 0.033 | 0.152 | 0.040 | −0.141 | 0.255 | −0.048 | 0.001 | 0.226 | 0.071 | 0.012 | 0.051 | 0.016 | −0.239 | 1 |

This table uses 3- and 5-year BHARs as the output variables to perform regressions with the yearly effect, respectively. The sample contains 172 Taiwanese family firms that experience succession during 2000-2017. DGender, DElite, DΔBackground, and DDirect are dummies equal to 1 if the heir is male, if the heir earned a Master's degree from an elite university, if the heir received Western education and succeeds a Japanese-style family firm, and if the heir is one of the departing chairman's direct descendants, respectively. CEO-YR is the number of years that the heir served as CEO before assuming the chairman position. Management turnover is the percentage of top management turnover in the year immediately following the succession. DScam is a binary variable equal to 1 if the family heir got involved in a scam around succession. Adj-ROA is the difference in returns on assets between the succession firm and the median of its industry in the fiscal year preceding the succession. PP&E/Assets is property, plant, and

equipment over total assets. IO is the level of the institutional ownership one month before the succession and $\Delta\text{IO}(-12, -1)$ is changes in IO from month $-12$ to month $-1$ relative to the succession. Deviation is the voting right over the cash-flow right of the control family. DHi-ROA is a dummy equal to 1 if the succession firm's adjusted ROA is positive. Size and BM ratio are data prior to the succession. Superscripts *, **, and *** indicate statistical significance at the 10%, 5%, and 1% level, respectively.

Table 6. Regressions: Factors Affecting Post-Succession Performance

| | 3-year BHAR | | | | 5-year BHAR | | | |
|---|---|---|---|---|---|---|---|---|
| | Model 1 | Model 2 | Model 3 | Model 4 | Model 5 | Model 6 | Model 7 | Model 8 |
| **Heir Traits** | | | | | | | | |
| $D_{Gender}$ | −0.124 | −0.123 | −0.123 | −0.132 | 0.161 | 0.163 | 0.166 | 0.137 |
| | (0.339) | (0.346) | (0.347) | (0.311) | (0.632) | (0.618) | (0.619) | (0.669) |
| $D_{Elite}$ | 0.340*** | 0.189 | 0.433** | 0.332*** | 0.947*** | 0.661*** | 1.328*** | 0.923*** |
| | (0.003) | (0.181) | (0.040) | (0.003) | (0.000) | (0.001) | (0.000) | (0.000) |
| $D_{ABackground}$ | 0.380* | 0.341* | 0.385* | 0.348* | 0.555 | 0.482 | 0.576 | 0.458 |
| | (0.056) | (0.091) | (0.054) | (0.090) | (0.125) | (0.189) | (0.110) | (0.187) |
| $D_{Direct}$ | 0.393*** | 0.384*** | 0.393*** | 0.389*** | 0.236 | 0.219 | 0.239 | 0.225 |
| | (0.007) | (0.009) | (0.007) | (0.007) | (0.266) | (0.299) | (0.260) | (0.287) |
| **The Way of Succession** | | | | | | | | |
| CEO-YR | 0.042*** | 0.045*** | 0.042*** | 0.043*** | −0.005 | 0.001 | −0.003 | −0.002 |
| | (0.002) | (0.001) | (0.002) | (0.002) | (0.811) | (0.975) | (0.855) | (0.901) |
| Management Turnover | 0.575** | 0.555** | 0.585** | 0.558** | 0.834* | 0.796* | 0.871* | 0.779 |
| | (0.038) | (0.048) | (0.036) | (0.049) | (0.078) | (0.090) | (0.067) | (0.105) |
| $D_{Scam}$ | −0.114 | −0.106 | −0.107 | −0.113 | −0.445** | −0.431** | −0.415** | −0.442** |
| | (0.402) | (0.430) | (0.428) | (0.399) | (0.030) | (0.037) | (0.040) | (0.029) |

(Table 6 Continued)

**Firm Characteristics**

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| *Adjusted-ROA* | 0.023** | 0.017* | 0.023** | 0.022** | 0.048*** | 0.037** | 0.047*** | 0.046*** |
| | (0.013) | (0.096) | (0.015) | (0.017) | (0.007) | (0.041) | (0.009) | (0.007) |
| PP&E/Assets | −0.147 | −0.131 | −0.073 | −0.104 | −0.407 | −0.375 | −0.101 | −0.272 |
| | (0.637) | (0.677) | (0.844) | (0.746) | (0.383) | (0.417) | (0.857) | (0.567) |
| Deviation | −0.091 | −0.111 | −0.087 | −0.097 | −0.184* | −0.223** | −0.170* | −0.206** |
| | (0.198) | (0.110) | (0.204) | (0.176) | (0.066) | (0.037) | (0.070) | (0.036) |
| Institutional Ownership | 0.001 | 0.001 | 0.001 | 0.002 | 0.004 | 0.003 | 0.004 | 0.005 |
| | (0.602) | (0.749) | (0.639) | (0.544) | (0.362) | (0.482) | (0.432) | (0.275) |
| $\Delta IO(-12, -1)$ | 0.020*** | 0.019** | 0.020*** | 0.015* | 0.016 | 0.014 | 0.015 | −0.000 |
| | (0.008) | (0.016) | (0.009) | (0.061) | (0.283) | (0.332) | (0.296) | (0.976) |

**Cross Effects**

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| $D_{Elite} \times D_{Hi\text{-}ROA}$ | | 0.371* | | | | 0.704** | | |
| | | (0.088) | | | | (0.049) | | |
| $D_{Elite} \times (PP\&E/Assets)$ | | | −0.297 | | | | −1.214 | |
| | | | (0.567) | | | | (0.177) | |
| $D_{Elite} \times \Delta IO(-12, -1)$ | | | | 0.029 | | | | 0.088** |
| | | | | (0.204) | | | | (0.011) |

**Control Variables**

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Size | 0.035 | 0.055 | 0.028 | 0.032 | −0.137 | −0.099 | −0.162 | −0.146 |
| | (0.721) | (0.582) | (0.772) | (0.741) | (0.471) | (0.598) | (0.402) | (0.438) |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| BM | −0.017 | −0.034 | −0.016 | −0.013 | 0.020 | −0.010 | 0.026 | 0.033 |
| | (0.517) | (0.279) | (0.548) | (0.616) | (0.732) | (0.870) | (0.675) | (0.597) |
| Constant | −0.625*** | −0.612*** | −0.651*** | −0.620*** | −0.664 | −0.640 | −0.773* | −0.652 |
| | (0.003) | (0.005) | (0.004) | (0.004) | (0.123) | (0.131) | (0.068) | (0.114) |
| *Adj. $R^2$* | 0.210 | 0.220 | 0.206 | 0.213 | 0.213 | 0.225 | 0.214 | 0.231 |