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Do the Choices of Family Business CEOs Affect Investment Decisions?

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Abstract

Family firms are a common organizational form in emerging economies. Almost 80% of firms are controlled by families and 40% of them are controlled by founder CEOs in Taiwan. Thus, family founders play an important role in complex financial decisions. In addition, the average age of family CEOs is around 60 years old, so now is a big time for the succeeding generation to make the right decisions leading to a successful family business. However, prior studies have contradictory conclusions about the relationship between family firms and investment policies. The sample is based on data from Taiwan family firms for whom the data was manually collected on annul reporting over a period of 2009-2015. Unlike the expectation of the entrenchment effect, we find that both family founder and family descendant CEOs have a propensity to undertake efficient investment decisions, which supports the socioemotional wealth perspective.

JEL classification numbers: G11, D61, J12.
Keywords: Investment efficiency, Over-investment, Family Founder, Family Descendants.

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1. Introduction

Family-controlled firms have a huge impact in Asian countries (Chang, 2003). In contrast to US (33%) or Western Europe (44%), in East Asia, including Taiwan, over 75% of firms are family controlled (Claessens et al., 2002). Almost 76% of the publicly listed companies in Taiwan are owned by family firms via pyramid schemes or cross-holdings ownership (Xie et al., 2001; Yeh et al., 2001). In Asia, an impressive 40% of the largest enterprises are founder-controlled businesses. In fact, the combination of the 30 biggest enterprises in Taiwan make a market value of 13 trillion New Taiwan Dollars, and more than 40% are controlled by family founder CEOs (Chen and Wang, 2009). Founder CEOs are generally accepted as being less sensitive to risk and uncertainty because starting up a business is a risky step, so entrepreneurs must be trained to face uncertainties (Caliendo et al., 2009). Thus, they tend to get used with risk and become confident in accepting indecisive investments (Jayaraman et al., 2000), which they may be more risk taking in investment behavior.

We mainly focus on emerging market family firms among Taiwanese publicly listed companies. Basically, it is unknown whether over-investment behavior in family founder CEOs stay high or lower after the inception stage and the company turns into a publicly held company (Wasserman, 2003). Most prior accounting studies use the agency theory (e.g., the entrenchment effect in agency problem) to represent the attitude of family owned companies regarding the poor financial reporting quality (Wang 2006; Ali et al., 2007). Lately, researchers start to accept new theories, such as socioemotional wealth (hereafter: SEW), focusing on noneconomic factors that influence family owned company's choices and attitude (Prencipe et al., 2014). In fact, emotional attachment is one of leading factors (e.g. Gómez-Mejia et al., 2011). Family controlled firms have a greater incentive to make decisions intended to protect their family SEW, including accumulating social capital (Arregle et al., 2007), gaining social support among multiple stakeholders (Stafford, et al. 1999), and creating a sense of pride for the ancestors which will be also passed on to future generations (Berrone et al., 2012). Prior empirical studies on family have shown that SEW is greatest in enterprises run by the founding family member (Stockmans et al., 2010). Thus, we investigate whether family founder CEOs positively (e.g., the SEW perspective) or negatively (e.g., the entrenchment effect in agency problem) affect investment efficiency once they become publicly listed firms.

It's a common knowledge that CEOs play an important part in deciding company decisions (Demerjian et al., 2013). It is why succession planning is very important for a firm. However, according to survey data provided by Chen and Kuo (2018), the average age of family CEOs in Taiwan is around 60 years old, so currently, the succeeding generation is in a position to make decisions that lead to a successful family business. Prior studies indicate that CEO succession in companies is important to the long run viability of the enterprise (Miller 1993; Ocasio 1999; Bills et al., 2017), where only small number of firms surpass more than two generations

(Morris et al., 1997). Furthermore, firm performance is also based on the company's successor and succession planning. Interestingly, Anderson et al., (2009) and Maury (2006) indicate that family descendants[5] as CEOs might also contribute to firm performance related to founding CEOs based on accrued market evidence. We investigate the unexplored issue as to how family descendant CEOs affect the degree of investment efficiency in family firms based on emerging capital evidence.

The analysis is conducted based on a data set from Taiwan that comprises 8,243 firms spanning the period from 2009 to 2015. We evidence that family founder or family descendant CEOs prefer to make an efficient investment decision, thus reducing the possibility of over-investment, which supports the SEW perspective. The above results are also robust when considering the endogenous sorting of executives to family firms, considering the sample from the electronics industry, as well as controlling for a set of corporate governance mechanisms.

This research might extend to the previous studies which are as followed: first, Zellweger (2017) indicate that there is little to be gained from creating a family/non-family firm dichotomy (e.g., overlooking simplifying the definition of family) and encourage future research to move beyond such simple divisions. As noted above, we systematically examine how the choices of family business CEOs affect their efficient investment decisions. Second, most prior studies focus on the effects of adverse selection between firm insider managers and outsider investors and on how to mitigate the information asymmetry between these two, such as using analyst forecast information or improving financial reporting quality, among other approaches (Biddle et al., 2009; McNichols and Stubben, 2008; Cheng et al., 2013; Chen et al., 2017; Chiu et al., 2019). In contrast, there has been little attention to family investment decision. Hsieh et al., (2010) have investigated how family involvement affect their firm innovation. Gu et al., (2016) have investigated how family involvement affect their new industry entry strategy and they proposal two distinguish SEW aspects: focused SEW (exercise of family influence) and broad SEW (succession of family dynasty). Our finding might contribute to broad SEW perspective that Taiwanese family CEOs have a propensity to undertake efficient long time horizon investment decision in order to maintain succession of family dynasty.

Third, most prior studies are based on markets, which are mature and standardized in developed countries (e.g., Anderson et al., 2009; Ramalingegowda, 2013; Chiu et al., 2019). Specifically, Anderson et al., (2009) indicate that family CEOs in Western European countries will outperform other firms only when the information environment is of high quality because they have better shareholder protections and country-level legal infrastructures. In comparison to Western European or U.S. firm, prior studies suggest that family firm's management decision problem in Asian family firms is more serious problem than in Western countries (Ali et al., 2007;

[5] Refers to CEOs related to family founder CEOs, also called 'family member CEOs', excluding family founder CEOs.

Prencipe et al., 2014). Consistent with the evidences in Western European or U.S. firm, we evidence that family CEOs positively affect efficient investment decisions based on Taiwanese data.

2. Theoretical background and hypotheses development

2.1 Theoretical background and related literature

In the neoclassical economic setting, the marginal Q ratio is the measurement of capital investment policies (e.g., Hayashi, 1982). Company tries to equalize the marginal benefits of an investment to its marginal cost, and then adding the capital of putting up the new capital. However, studies conclude that companies might choose suboptimal investment decisions which in turn lead to the likelihood of inefficient investment. Inefficient investments may be due problems arising between the controller and shareholders and the financial problems occurring in the company (Myers and Majluf, 1984), thereby causing principal agent problems to occur involving adverse selection and moral hazards related to these problems (Hoshi et al., 1991).

Regarding the adverse selection problem in investment efficiency, firm insiders have advanced information regarding the true value of the company, and they have the power to give out capital or overpriced capital. If such firms are successful in raising fund, this additional resource provides them with more funds with which to over-invest. Furthermore, such firms may forego profitable investment opportunities and depend on internally fund. Prior empirical studies suggest that the adverse selection problem may affect both equity financing (Easley and O'Hara, 2004). Lambert et al., (2012) and Bhattacharya et al., (2012) propose that capital cost can be lowered by giving out increased information to investors. Recent accounting studies suggest that enhanced financial reporting quality can help lessen information asymmetries and mitigate agency problems, thus increasing investment efficiency. Biddle et al., (2006, 2009), and Chen et al., (2011) evidence that firm with better financial reporting quality have better investment efficiency. Consistent with this stream of literature, García-Lara et al., (2016) find that conservatism reduces investment inefficiency. McNichols and Stubben (2008) suggest that revenues management leads to over-investment because it misrepresent the data. Chen et al., (2017) suggest that better quality of financial analysts increases firm investment efficiency by aiding capital providers and investors into the firm future prospects of investment behavior. Chiu et al., (2019) document that additional disclosure of customer risk factors (such as risk factor information in 10-K) help lessen the investment problems of the supplier.

The moral hazard problem in investment efficiency asserts that leaders who prioritize their own self results to poor and undesirable investments for the shareholders because of the moral hazard problem (Berle and Means, 1932; Jensen and Meckling, 1976). The typical principle-principal agency predicts that family CEOs engage in the entrenchment effect (e.g., Volpin, 2002; Claessens et al., 2002; Schulze et al., 2003; Wang, 2006;). For example, Chen and Hsu (2009) suggest that

family firms have lower R&D investment than non-family firms, which suggests greater managerial entrenchment among family firms. Some other studies indicate that family firms have poorer performance or worse financial quality (Le Breton-Miller et al., 2011; Wang, 2006) than non-family firms.

Adversely, family owned companies care about the preservation of their socioemotional wealth (SEW). For instance, family member may have the desire for intimacy, belongingness, and affection, or they may want to be recognized by their other family member, gain power or authority to make decisions for the company. They might also want to pass down and preserve the family name and social capital (Berrone et al., 2010). Therefore, we try to study about the picking of CEOs in family owned companies, and the investment efficiency of the company in a growing market regarding the entrenchment effect or SEW perspectives.

2.2 Hypotheses development

2.2.1 Family founder CEOs and investment efficiency

This study links family founders and investment decisions together based on the following possible reasons based on the perspective of overconfidence among founders: Drawing upon the entrepreneurial literature, a large body of studies suggests that there is an overconfidence bias among entrepreneurs (Shepperd et al., 1996). Moreover, business owners usually overconfidence the level of risk that they face (Meza and Southey, 1996). Le Breton-Miller and Miller (2008) found that predecessor do the “build” strategy, while the successors benefit from it by doing the “harvest” strategy. As a result, family firm founders tend to engage in over-investment.

The alternative perspective is based on socioemotional wealth (SEW), which suggests the highest SEW exists among family founders. Research suggests that founding family member act contrastingly than non-founding family member (Berrone et al., 2012). Therefore, the family founder will carefully engage in future investment decisions with the intention to maintain the long term viability of firms. Families might support information transparency practices, and avoid earnings management to inhibit their firm’s long-term value than non-family firms (Wang, 2006; Achleitner et al., 2014). Thus, the above studies suggest that family founder CEOs make essential investment decisions to capture every positive NPV project, which does not correspond to an over-investment problem. More specifically, as firms develop into publicly listed firm, the family has relinquished a larger portion of their family shares for public purchase. Family founder CEOs might incline to align shareholder interests with their decisions in order to increase investor confidence (Anderson and Reeb 2003), thus reducing investment inefficiency. The typical entrenchment effect in agency problem will be also reduced.

On average, it is unclear whether founding CEOs in family firms prefer to engage in more or fewer over-investment decisions. Therefore, Hypothesis 1 is nondirectional, and this issue is addressed empirically as follows:

Hypothesis 1: The likelihood of over-investment decision is systematically different between founding CEOs in family firms.

2.2.2 Family descendant CEOs and investment efficiency

This study links family descendant CEOs and investment efficiency together based on the following possible reasons: Mullins and Schoars (2016) based on 22 emerging countries data, and their results suggest that family descendant CEOs (sometimes called family-related CEOs) are usually attached to family founder CEOs in terms of their decisions, and they also continue strict management in the company. In addition, family descendant CEOs appear to favor continuing the firm's values over making changes. Based on publicly list firm in developed countries, both Maury (2006) and Anderson et al., (2009) and evidence that family descendant CEOs tend to make better decisions. Consistent with the SEW perspective, according to the statement above, it is expected that family descendant CEOs might be inclined to make efficient investment decisions.

There is an alternative perspective that suggests that compared with non-family descendant CEOs, such as professional CEOs, family descendant CEO firms might exhibit poorer firm performance. Thus, it is conjectured here that family descendant CEOs might have less professional knowledge than professional CEOs by which to identify highly uncertain investments and make optimal investment decisions. Consistent with the entrenchment effect in agency problem, the above point tends to support that family descendant CEOs are unable to make optimal or efficient investment decisions, thus increasing the possibility of their over-investing.

On average, it is also unclear whether descendant CEOs in family firms tend to make more or fewer over-investment decisions. Therefore, Hypothesis 2 is also nondirectional, and this issue is addressed empirically as follows:

Hypothesis 2: The likelihood of over-investment decision is systematically different between descendant CEOs in family firms.

3. Research method

3.1 Sample

We take the financial information from the Taiwan Economic Journal (*TEJ*), and relevant information regarding the family CEOs, such as the family founder CEOs or the family descendant CEOs was obtained manually[6]. This research uses Taiwan publicly held companies as the research object, while excluding special Taiwan Depository Receipts (*TDRs*) and F-shares listed on foreign stock markets in Taiwan in the total sample. A global financial crisis in 2007 to 2008 is prevented from affecting the research, so the variables were measured based on a sample period from 2009-2015.

[6] We identify each present CEO as related to family founder CEOs by blood or marriage, respectively.

The sample selection process by year is shown in Panel A of Table 1. The sample selection procedure was based on the following criteria: First, initially there are 10,909 observations, and the samples of financial industry companies (306 observations), the sample who lack information related to investment variables (636 observations), and the sample who lack control variables are eliminated (1,395 observations). Second, in order to avoid extreme values affecting empirical results, this study excludes outliers (329 observations) for the following variables: operating cash flow (*CFO*), financial slack (*Slack*), and operating cycle (OC). A final total of 8,243 firm-year observations is obtained. The total number of family business samples is 5,140, as shown in Panel B of Table 1, and is approximately 62.3% of the total samples. Although the ratio has been decreasing annually, family companies still play a vital role in listed companies in Taiwan. By observing the percentage of family founders and family descendant successors in the family businesses in each year, Panel C of Table 1 shows the family founder ratio in 2009 from 58.9% has fallen to 55.5% in 2015. From this, it can be concluded that the proportion of family founders is declining. In the case of the family descendant CEOs ratio, it rose from 17.4% to 21.3%, thus indicating that Taiwan is currently facing the problem of retiring company founders and family generation successors.

Table 1: Sample composition

Panel A: Sample selection procedure								
Item/Year	2009	2010	2011	2012	2013	2014	2015	Total
Initial data	1,511	1,540	1,561	1,571	1,573	1,576	1,577	10,909
Less: Financial Industry	-43	-43	-44	-44	-44	-44	-44	-306
Lack of investment variables	-132	-156	-85	-66	-65	-66	-66	-636
Lack of controlling variables	-261	-240	-245	-214	-182	-145	-108	-1,395
Outlier values	-40	-34	-43	-43	-47	-62	-60	-329
Final sample	1,035	1,067	1,144	1,204	1,235	1,259	1,299	8,243
Panel B: Percentage of family and non-family business								
Item/Year	2009	2010	2011	2012	2013	2014	2015	Total
Obs. of Family Firms	679	690	724	750	765	761	771	5,140
% of Family	65.6%	64.6%	63.2%	62.2%	61.9%	60.4%	59.3%	62.3%
Obs. of Non-Family	356	377	420	454	470	498	528	3,103
% of Non-Family Firms	34.4%	35.3%	36.7%	37.7%	38.0%	39.5%	40.6%	37.6%
Total Sample	1,035	1,067	1,144	1,204	1,235	1,259	1,299	8,243
Panel C: Percentage of founder or family descendant in family business								
Item/Year	2009	2010	2011	2012	2013	2014	2015	Total
Founder	400	400	425	430	430	424	428	2,937
% of Founder	58.9%	57.9%	58.7%	57.3%	56.2%	55.7%	55.5%	57.1%
Family descendant	118	129	139	152	156	162	164	1,020
% of Family descendants	17.4%	18.8%	19.2%	20.3%	20.4%	21.3%	21.3%	19.9%
Other types of CEOs	161	161	160	168	179	175	179	1,183
% of Other types of CEOs	23.7%	23.3%	22.1%	22.4%	23.4%	23.0%	23.2%	23.0%
Family Sample	679	690	724	750	765	761	771	5,140

Panel A of Table 2 shows the annual portion of family businesses across industry and year. The statistics indicate that both the cement and paper industries are fully controlled (100%) by family businesses. Panel B of Table 2 shows the annual composition of founder and family descendant businesses across industries. The largest three founder CEOs in family firms are the agriculture technology industry, biomedical industry, and other electronics industry with 100%, 78.51% and 77.66%, respectively. In addition, the largest three family descendant CEOs in family firms are the auto industry, the glass ceramic industry, and the cement industry, with 100%, 100% and 83.33%, respectively.

Table 2: Family business CEOs classification by industry

Panel A: Family composition by industry and year											
Industry code	Industry	Year							Obs. of Family	Industry Firms	% of Family
		2009	2010	2011	2012	2013	2014	2015			
01	Cement	6	6	6	6	6	6	6	42	42	100%
02	Food	20	20	21	21	21	21	22	146	169	86%
03	Plastic	21	21	22	23	23	23	23	156	168	93%
04	Textile	36	36	36	41	42	44	44	279	340	82%
05	Electrical Machinery	42	44	46	46	50	52	54	334	479	69%
06	Electrical Cable	7	6	7	7	7	7	8	49	80	61%
08	Glass Ceramic	4	4	4	4	4	4	4	28	31	90%
09	Paper	6	6	6	7	7	6	6	44	44	100%
10	Metal	27	25	25	29	27	27	28	188	252	74%
11	Rubber	9	9	8	9	8	9	9	61	75	81%
12	Auto	3	3	3	4	4	4	4	25	32	78%
14	Construction	38	34	35	34	38	33	37	249	309	80%
15	Shipping	3	3	4	4	3	4	3	24	59	40%
16	Tourism	7	9	7	10	12	13	12	70	97	72%
18	Services	11	11	12	14	14	14	14	90	130	69%
20	Other	39	40	47	47	49	46	46	314	417	75%
21	chemical industry	23	23	24	24	24	23	24	165	239	69%
22	Biomedical	28	28	34	35	40	39	38	242	392	61%
23	Oil and gas	6	5	5	6	6	6	6	40	66	60%
24	Semiconductor	46	48	48	52	52	53	52	351	749	46%
25	Computer and Peripherals	44	47	48	50	47	49	48	333	638	52%
26	Photoelectric Industry	47	50	51	50	50	51	51	350	697	50%
27	Communication Network	22	22	23	23	25	25	26	166	481	34%
28	Electronic Components	107	112	118	119	120	120	121	817	1,247	65%
29	Electronic Pathway	17	17	20	20	20	20	20	134	239	56%
30	Information Services	12	12	13	13	13	10	12	85	192	44%
31	Other Electronics	39	40	40	41	41	40	41	282	451	62%
32	Cultural Innovation	8	8	10	10	11	11	11	69	104	66%
33	Agriculture Technology	1	1	1	1	1	1	1	7	9	77%
34	E-commerce	0	0	0	0	0	0	0	0	15	0%
	Total	679	690	724	750	765	761	771	5,140	8,243	

Panel B: Founder and family descendant composition by industry						
Industry code	Industry	Obs. of Family	Family founder	% of Founder	Family descendant	% of family descendant
01	Cement	42	7	16.67%	35	83.33%
02	Food	146	36	24.66%	54	36.99%
03	Plastic	156	45	28.85%	71	45.51%
04	Textile	279	107	38.35%	125	44.80%
05	Electrical Machinery	334	217	64.97%	79	23.65%
06	Electrical Cable	49	14	28.57%	32	65.31%
08	Glass Ceramic	28	0	0.00%	28	100.00%
09	Paper	44	9	20.45%	9	20.45%
10	Metal	188	86	45.74%	43	22.87%
11	Rubber	61	19	31.15%	21	34.43%
12	Auto	25	0	0.00%	25	100.00%
14	Construction	249	128	51.41%	34	13.65%
15	Shipping	24	6	25.00%	10	41.67%
16	Tourism	70	9	12.86%	36	51.43%
18	Services	90	51	56.67%	8	8.89%
20	Other	314	209	66.56%	46	14.65%
21	chemical industry	165	59	35.76%	45	27.27%
22	Biomedical	242	190	78.51%	26	10.74%
23	Oil and gas	40	8	20.00%	10	25.00%
24	Semiconductor	351	216	61.54%	60	17.09%
25	Computer and Peripherals	333	257	77.18%	20	6.01%
26	Photoelectric Industry	350	218	62.29%	45	12.86%
27	Communication Network	166	102	61.45%	21	12.65%
28	Electronic Components	817	544	66.59%	99	12.12%
29	Electronic Pathway	134	89	66.42%	7	5.22%
30	Information Services	85	42	49.41%	5	5.88%
31	Other Electronics	282	219	77.66%	22	7.80%
32	Cultural Innovation	69	43	62.32%	4	5.80%
33	Agriculture Technology	7	7	100.00%	0	0.00%
34	E-commerce	0	0	0.00%	0	0.00%
	Total	5,140	2,937	57.14%	1,020	19.84%

3.2 Empirical model

Following Chen et al., (2011), Chen et al., (2017), Chiu et al., (2019) and McNichols and Stubben (2008), the empirical regression model (1) used in this work is as follows:

$$\text{Investment}_{i,t+1} = \beta_0 + \beta_1 Founder_{i,t} + \beta_2 Founder_{i,t} \times Overfirm_{i,t} + \beta_3 Descendants_{i,t} +$$

$$\beta_4 Descendants_{i,t} \times Overfirm_{i,t} + \beta_5 Overfirm_{i,t} + \beta_6 Size_{i,t} + \beta_7 Leverage_{i,t} +$$

$$\beta_8 Cash_{i,t} + \beta_9 Slack_{i,t} + \beta_{10} Tangibility_{i,t} + \beta_{11} CFO_{i,t} + \beta_{12} OC_{i,t} + \beta_{13} Dividend_{i,t} +$$

$$\beta_{14} Loss_{i,t} + \beta_{15} ROA_{i,t} + \beta_{16} MTB_{i,t} + \beta_{17} Z - Score_{i,t} + \beta_{18} Big4_{i,t} + \beta_{19} Institutional_{i,t} +$$

$$\beta_{20} AGE_{i,t} + \Sigma Year_{i,t} + \Sigma Industry_{i,t} + \varepsilon_{i,t} \quad (1)$$

To examine the forms of dependence, OLS estimation with cluster-robust standard errors is used. The OLS approach is utilized for the estimation of regression parameters, and standard regression diagnostics are used for the evaluation of reliability (Greene, 1997).

3.3 Investment efficiency

The measurement of investment efficiency has been introduced in accounting studies (e.g., McNichols and Stubben, 2008; Biddle et al., 2009; Chen et al., 2011; Cheng et al., 2013; Bill et al., 2017). To test the above hypotheses, *Overfirm* variable is used to identify if the sample firm tend to over-invest or under-invest. Previous studies suggest that cash-rich and low-leverage companies tend to over-invest. Cash balances and negative leverage of the given companies are ranked at the end of year t-1 into two decile ranks. The two decile ranks are then averaged and scaled to range from zero to one. Therefore, we predict the interaction variable between *Overfirm* and *Founder, β_2*, are significant on investment in year $_{t+1}$ and the interaction variable between *Overfirm* and *Descendants, β_4,*, are significant on investment in year $_{t+1}$.

3.4 Founder and family descendant CEOs in family firms

First, family firm is defined as a company where the large portion of the controlling share is owned by a family member, and at least two family members are part of the board of directors or in senior management. A value of 1 (*Founder*) is assigned when the CEO is the founder's family member, and 0 otherwise. Second, a family descendant CEO is coded using an indicator variable that takes a value of 1 (*Descendants*) when the CEO is recruited from a descendant of family firm, and 0 otherwise.

3.5 Control variables

Based on prior studies (McNichols and Stubben, 2008; Chen et al., 2011, Chen et al., 2017 and other studies), this work includes the following control variables: *Size* is the size of the company, taking the natural logarithm of the total assets of the company. *Leverage* is the debt ratio; the company's total liabilities are divided by the total assets. *Cash* is the cash balance, and the company's cash balance is deducted from the total assets. *Slack* is financial slack, dividing the company's cash balance by the amount of real estate, plant and equipment. *Tangibility* is where the fixed assets, the company's real estate, plant and equipment are deducted from the total assets. *CFO* represents that the operating cash flow are divided by the gross sales. *OC* is the operating cycle and is measured as a natural logarithm of the average days of accounts receivable plus the average days of sales. *Dividend* is the cash dividend payments, where the value is 1 if the company paid cash dividends for that year, and 0 otherwise. *Loss* is an indicator variable of the company's loss, for which the value is 1 if the company's current net profit after tax is negative, and 0 otherwise. *ROA* is the return on assets. *MTB* is the growth opportunity measured as the company's market value divided by the amount of shareholder equity. *Z-Score* is the risk of bankruptcy (Altman 1968), Z-Score = 1.2 * working capital + 1.4 * retained surplus + 3.3 * net profit before tax + 0.6 * market value + 0.99 * gross revenue. *Big4* is an indicator variable, for which the value is 1 if the firms are auditing by the four major accounting firms in a given year, and 0 otherwise. *Institutional* is the percentage shares held by institutional investors. *Age* is the number of years the company has been listed on the stock exchange. *Year Effect* is defined as a categorical variable using the sample firm year. *Industry Effect* is defined as a categorical variable using the *TEJ* industry codes.

4. Empirical results

4.1 Descriptive summary

Table 3 shows the descriptive statistical results for all variables under consideration in this study. The average *Investment* $_{t+1}$ (median) of the companies is 0.061 (0.054), which shows that the total investment of the listed companies for the next period accounts for approximately 6% of the company's total assets. The average *Overfirm* value is 0.450, and because the variables are sorted, its value is between 0.0 and 0.9. 62.4% if the family business founders continue to participate in the operation and management of the business. Of the family descendant CEOs (*Descendants*), 19.8% have completed succession and entered the family business at the management level and participated in the company's decision-making and operations.

For the control variables, Table 3 also shows that the mean and median values of firm size (*Size*) are 15.313 and 15.103, respectively. The mean (median) debt ratio (*Leverage*) is 0.403 (0.404); the mean (median) of *Cash* is 0.189 (0.154); the mean (median) of fixed assets (*Tangibility*) is 0.274 (0.258); the mean (median) cash flow (*CFO*) from operating activities is 0.067 (0.077); the mean (median) operating cycle (*OC*) is 4.997 (4.997); the mean (median) profitability (*ROA*) is 0.038 (0.042); the

mean (median) growth opportunity (*MTB*) is 1.690 (1.290); the mean (median) of institutional corporate holdings (*Institutional*) is 0.354 (0.320), and the mean number (median) of years listed (*Age*) is 13.503 (12). In the descriptive analysis based on the variables stated above, it can be seen that the mean of the variables is close to the median, and it is also shown that the variables referenced above in this study tend to be normally distributed. the mean (median) financial slack (*Slack*) is 2.780 (0.625), and the standard deviation is 9.555, showing that the degree of financial easing of the sample companies in this study is different. The mean cash dividend payment (*Dividend*) is 0.695, which shows that the number of cash dividends issued by the sample company that year reached approximately 70%. The average loss (*Loss*) was 0.222, showing that approximately 20% of the total sample company suffered a loss in a given year. The mean number of bankruptcy risks (*Z-Score*) is 4.049, which is greater than the critical value of 2.675 found in the Altman model (Altman, 1968), indicating that the companies in this study are generally in good financial condition and are unlikely to declare bankruptcy; the average audit quality (*Big4*) is 0.857, which indicates that the majority of the sample companies are audited by the four major accounting firms, indicating that the audit market in Taiwan is dominated by large firms.

Table 3: Descriptive statistics

Variable	*Mean*	*Median*	*St. Deviation*	*Q1*	*Q3*
Investment$_{t+1}$	0.061	0.054	0.147	0.017	0.104
Overfirm	0.450	0.500	0.287	0.200	0.700
Family	0.624	1	0.485	0	1
Founder	0.571	1	0.495	0	1
Descendants	0.198	0	0.399	0	0
Size	15.313	15.103	1.435	14.330	16.100
Leverage	0.403	0.404	0.172	0.274	0.522
Cash	0.189	0.154	0.141	0.086	0.255
Slack	2.780	0.625	9.555	0.274	1.607
Tangibility	0.274	0.258	0.171	0.139	0.390
CFO	0.067	0.077	0.191	0.011	0.152
OC	4.997	4.997	0.717	4.692	5.282
Dividend	0.695	1	0.460	0	1
Loss	0.222	0	0.415	0	0
ROA	0.038	0.042	0.091	0.007	0.082
MTB	1.690	1.290	1.920	0.882	1.973
Z-Score	4.049	2.938	5.753	1.881	4.580
Big4	0.857	1	0.350	1	1
Institutional	0.354	0.320	0.223	0.171	0.513
Age	13.503	12.000	7.942	9.000	16.000

Note: There are 5,140 observations for *Founder* and *Descendants* variables and there are 8,243 observations for other variables. *Investment* $_{t+1}$ is composed of the long-term investment of an enterprise deducting the total assets from the capital expenditure, R&D expenditures, acquisition expenditures, and the disposal amount of real estate, plant and equipment in t + 1 period. *Family* is an indicator variable of a family business, where the value is 1 if the business is a family business, and 0 otherwise. *Founder* indicates the percentage of family founder CEOs. *Descendants* indicates the percentage of descendant family CEOs in the sample of family firms. *Size* is the size of the company, taking the natural logarithm of the total assets of the company. *Leverage* is the debt ratio, where the company's total liabilities is divided by the total assets. *Cash* is the cash balance, where the company's cash balance is deducted from the total assets. *Slack* is financial slack, dividing the company's cash balance by the amount of real estate, plant and equipment. *Tangibility* is the fixed asset, where the company's real estate, plant and equipment are deducted from the total assets. *CFO* represents that the operating cash flow are divided by the gross sales. *OC* is the operating cycle measured as a natural logarithm of the average days of accounts receivable plus the average days of sales. *Dividend* is the cash dividend payments, for which the value is 1 if the company paid cash dividends for that year, and 0 otherwise. *Loss* is an indicator variable of the company's loss, where the value is 1 if the company's current net profit after tax is negative, and 0 otherwise. *ROA* is the return on assets. *MTB* is the growth opportunity measured as the company's market value divided by the carrying amount of shareholders' equity. *Z-Score* is the risk of bankruptcy (Altman, 1968), Z-Score = 1.2 * working capital + 1.4 * retained surplus + 3.3 * net profit before tax + 0.6 * market value + 0.99 * gross revenue. *Big4* is an indicator variable for which the value is 1 if the firms is auditing by the four major accounting firms in that year, and 0 otherwise. *Institutional* is the percentage shares holding by institutional investors. *Age* is the number of years the company has been listed on stock exchange.

The correlation coefficient analysis of this study is shown in Table 4. The values in the lower left and upper right corners are the Pearson and Spearman correlation coefficient tests, respectively. The family variables are negatively associated with next year's investment.

Table 4: Correlation matrix

	V1	*V2*	*V3*	*V4*	*V5*	*V6*	*V7*	*V8*	*V9*	*V10*	*V11*	*V12*	*V13*	*V14*	*V15*	*V16*	*V17*	*V18*
V1.Investment $_{t+1}$		**0.26**	**-0.15**	**-0.02**	**-0.17**	**0.28**	**0.09**	**0.08**	**0.21**	**-0.04**	**0.12**	**-0.11**	**0.19**	**0.27**	**0.25**	**0.13**	**0.04**	**-0.25**
V2.Overfirm	**0.26**		**-0.22**	**-0.33**	**-0.55**	**0.83**	**0.73**	**-0.43**	**0.17**	**-0.14**	**0.16**	**-0.14**	**0.30**	**0.39**	**0.67**	**0.10**	**-0.04**	**-0.35**
V3.Family	**-0.09**	**-0.22**		0.01	**0.06**	**-0.21**	**-0.2**	**0.12**	**-0.04**	**0.05**	**-0.13**	**0.06**	**-0.09**	**-0.11**	**-0.15**	**-0.15**	**-0.04**	**0.25**
V4.Size	0.01	**-0.33**	-0.01		**0.34**	**-0.21**	**-0.16**	**0.08**	**0.11**	**-0.13**	**0.27**	**-0.22**	**0.15**	**-0.16**	**-0.21**	**0.11**	**0.40**	**0.37**
V5.Leverage	**-0.17**	**-0.55**	**0.06**	**0.32**		**-0.38**	**-0.22**	**0.04**	**-0.26**	0.01	**-0.12**	**0.10**	**-0.19**	**-0.11**	**-0.68**	-0.02	**0.09**	**0.15**
V6.Cash	**0.2**	**0.83**	**-0.19**	**-0.21**	**-0.39**		**0.76**	**-0.33**	**0.2**	**-0.18**	**0.15**	**-0.10**	**0.21**	**0.22**	**0.46**	**0.16**	**-0.06**	**-0.31**
V7.Slack	**0.05**	**0.73**	**-0.06**	**-0.12**	**-0.07**	**0.34**		**-0.8**	-0.01	**-0.08**	**0.12**	**-0.13**	**0.21**	**0.20**	**0.42**	**0.09**	**-0.03**	**-0.22**
V8.Tangibility	-0.01	**-0.43**	**0.12**	**0.10**	**0.05**	**-0.36**	**-0.35**		**0.2**	**-0.04**	**-0.06**	**0.12**	**-0.14**	**-0.12**	**-0.27**	0.01	0.01	**0.05**
V9.CFO	**0.11**	**0.17**	**-0.05**	**0.13**	**-0.16**	**0.14**	**-0.05**	**0.18**		**-0.04**	**0.30**	**-0.33**	**0.44**	**0.19**	**0.28**	**0.09**	**0.13**	**-0.07**
V10.OC	**-0.02**	**-0.14**	**0.07**	**-0.06**	**0.04**	**-0.21**	0.01	**-0.13**	**-0.22**		**-0.07**	**0.09**	**-0.13**	**-0.11**	**-0.21**	**-0.07**	**-0.18**	**-0.05**
V11.Dividend	**0.11**	**0.16**	**-0.12**	**0.26**	**-0.12**	**0.11**	**-0.03**	**-0.07**	**0.26**	**-0.06**		**-0.48**	**0.49**	**0.13**	**0.33**	**0.11**	**0.17**	**-0.03**
V12.Loss	**-0.11**	**-0.14**	**0.06**	**-0.2**	**0.1**	**-0.08**	**-0.02**	**0.13**	**-0.29**	**0.06**	**-0.48**		**-0.71**	**-0.20**	**-0.38**	**-0.05**	**-0.17**	**-0.03**
V13.ROA	**0.13**	**0.30**	**-0.06**	**0.19**	**-0.17**	**0.17**	**0.04**	**-0.10**	**0.38**	**-0.08**	**0.44**	**-0.67**		**0.49**	**0.59**	**0.08**	**0.22**	**-0.09**
V14.MTB	**0.07**	**0.39**	**-0.06**	**-0.1**	0.01	**0.16**	**0.06**	**-0.07**	0.01	**-0.09**	**0.03**	**-0.05**	**0.14**		**0.56**	**0.06**	**0.17**	**-0.28**
V15.Z-Score	**0.14**	**0.67**	**-0.09**	**-0.14**	**-0.45**	**0.35**	**0.16**	**-0.15**	**0.06**	**-0.06**	**0.08**	**-0.10**	**0.24**	**0.24**		**0.08**	**0.05**	**-0.25**
V16.Big4	**0.09**	**0.10**	**-0.15**	**0.12**	**-0.02**	**0.13**	**-0.02**	0.01	**0.10**	**-0.07**	**0.11**	**-0.05**	**0.08**	**0.02**	**0.05**		**0.11**	**-0.15**
V17.Institutional	**0.03**	**-0.04**	**-0.04**	**0.43**	**0.09**	**-0.03**	**0.02**	0.02	**0.07**	**-0.13**	**0.16**	**-0.17**	**0.19**	**0.14**	0.01	**0.11**		**0.11**
V18.Age	**-0.11**	**-0.35**	**0.23**	**0.39**	**0.11**	**-0.28**	**-0.07**	**0.1**	**-0.02**	**-0.02**	-0.01	**-0.04**	**-0.02**	**-0.13**	**-0.15**	**-0.11**	**0.16**	

Note: There are 8,243 observations. The above table shows the correlation coefficient results for each variable. The lower left corner is the Pearson correlation coefficient; the upper right corner is the Spearman correlation coefficient. The definitions of the variables are the same as in Table 3. The bold text represent significance of 5% level.

4.2 The main findings

Panel A of Table 5 shows the results of the regression analysis conducted in this study, comparing the differences in investment efficiency of family businesses and non-family businesses. The coefficient result for *Family×Overfirm* is -0.0196, showing a negative correlation (p <0.1), which indicates family business restrains company investments and lowers the degree of excessive investment. Panel B of Table 5 also shows the impact of the existence of family business founders and the succession of family descendant successors on investment efficiency. This study examines the effects of family founders and family descendant successors on over-investment. The results showed that the *Founder×Overfirm* coefficient is -0.0514, which is negatively correlated (p <0.01), explaining that when the founder of the family business still manages the company, attempts are made to reduce the investment amount of the company over the next period. Therefore, the findings for Hypothesis 1 support the SEW argument (Arregle et al., 2007; Stockmans et al., 2010; Gómez-Mejia et al., 2011; Berrone et al., 2012) suggesting that the founding family will carefully choose the firm's future investments in order to maintain the long-term viability of the family firm and thus reduce over-investment inefficiency. In addition, Panel B of Table 5 also shows the *Descendants×Overfirm* coefficient is -0.0695, showing a negative correlation (p <0.01), indicating that when the family founder is not in the company, the family descendant successors can inherit the founder's goals for the family business. If the company is in an over-investment situation, they reduce the company's investments in the next period, which is more efficient than the investment of non-family descendant successors. The above empirical results regarding Hypothesis 2 also support the SEW argument (Arregle et al., 2007; Stockmans et al., 2010; Gómez-Mejia et al., 2011; Berrone et al., 2012), suggesting that descendant CEOs in family firms are inclined to make efficient investment decisions that are in the best interest of family shareholders, thus reducing the possibility of over-investing.

Table 5: Family business CEOs and investment efficiency

Panel A: Full Sample

$$Investment_{i,t+1} = \beta_0 + \beta_1 Family_{i,t} + \beta_2 Family_{i,t} \times Overfirm_{i,t} + \beta_3 Overfirm_{i,t} + \beta_4 Size_{i,t} + \beta_5 Leverage_{i,t} + \beta_6 Cash_{i,t} + \beta_7 Slack_{i,t} + \beta_8 Tangibility_{i,t} + \beta_9 CFO_{i,t} + \beta_{10} OC_{i,t} + \beta_{11} Dividend_{i,t} + \beta_{12} Loss_{i,t} + \beta_{13} ROA_{i,t} + \beta_{14} MTB_{i,t} + \beta_{15} Z-Score_{i,t} + \beta_{16} Big4_{i,t} + \beta_{17} Institutional_{i,t} + \beta_{18} AGE_{i,t} + \Sigma Year_{i,t} + \Sigma Industry_{i,t} + \varepsilon_{i,t}$$

Variables	*Expected Sign*	*Coefficient*	*t-value*	*VIF*
Intercept	?	-0.2352***	-5.20	
Family	+ / -	0.0020	0.30	4.50
Family×Overfirm	+ / -	-0.0196*	-1.66	5.26
Overfirm	+	0.0187	1.34	6.89
Size	+	0.0071***	4.48	2.18
Leverage	-	-0.0690***	-5.18	2.24
Cash	+	0.1341***	6.71	3.39
Slack	+	0.0003*	1.74	1.32
Tangibility	+	0.0815***	6.62	1.89
CFO	+	0.0044	0.46	1.43
OC	+ / -	0.0121***	4.20	1.84
Dividend	-	0.0077*	1.87	1.52
Loss	-	-0.0212***	-4.03	2.04
ROA	-	0.0568**	2.26	2.23
MTB	-	0.0025***	2.81	1.27
Z-Score	+	0.0005	1.38	1.55
Big4	-	0.0149***	3.21	1.12
Institutional	-	0.0090	1.11	1.42
AGE	-	-0.0011***	-3.90	1.99
Year		*Included*		
Industry		*Included*		
Number of Samples		*8,243*		
F-Value		*19.39****		
Adjustments R^2		*10.57%*		
Wald test: $\beta_1+\beta_2=0$		*F=6.24*** *(p=0.01)*		

Panel B: Family Business Sample

$$\begin{aligned}\text{Investment}_{i,t+1} = {} & \beta_0 + \beta_1 Founder_{i,t} + \beta_2 Founder_{i,t} \times Overfirm_{i,t} \\ & + \beta_3 Descendants_{i,t} + \beta_4 Descendants_{i,t} \times Overfirm_{i,t} \\ & + \beta_5 Overfirm_{i,t} + \beta_6 Size_{i,t} + \beta_7 Leverage_{i,t} \\ & + \beta_8 Cash_{i,t} + \beta_9 Slack_{i,t} + \beta_{10} Tangibility_{i,t} + \beta_{11} CFO_{i,t} + \beta_{12} OC_{i,t} \\ & + \beta_{13} Dividend_{i,t} + \beta_{14} Loss_{i,t} + \beta_{15} ROA_{i,t} + \beta_{16} MTB_{i,t} \\ & + \beta_{17} Z - Score_{i,t} + \beta_{18} Big4_{i,t} + \beta_{19} Institutional_{i,t} + \beta_{20} AGE_{i,t} \\ & + \Sigma Year_{i,t} + \Sigma Industry_{i,t} + \varepsilon_{i,t}\end{aligned}$$

Variables	*Expected Sign*	*Coefficient*	*t-value*	*VIF*
Intercept	?	-0.2630***	-3.89	
Founder	+	0.0331***	3.43	5.58
Founder×Overfirm	+/−	-0.0514***	-2.85	7.36
Descendants	+/−	0.0338***	3.23	4.27
Descendants×Overfirm	+/−	-0.0695***	-2.88	3.23
Overfirm	+	0.0577***	2.74	8.84
Size	+	0.0096***	4.49	2.28
Leverage	−	-0.0651***	-3.45	2.50
Cash	+	0.1178***	4.18	3.41
Slack	+	0.0007**	2.53	1.30
Tangibility	+	0.0783***	4.87	1.88
CFO	+	0.0111***	3.00	1.90
OC	+/−	0.0141	1.19	1.40
Dividend	−	0.0077	1.48	1.51
Loss	−	-0.0230***	-3.42	2.02
ROA	−	0.0087	0.27	2.19
MTB	−	-0.0001	-0.02	1.49
Z-Score	+	0.0011*	1.88	1.81
Big4	−	0.0151***	2.70	1.14
Institutional	−	0.0212*	1.89	1.49
AGE	−	-0.0011***	-3.07	2.15
Year Effect		*Included*		
Industry Effect		*Included*		
Number of Samples		*5,140*		
F value		*9.37****		
Adj. R^2		*8.09%*		
Wald test: $\beta_1+\beta_2=0$		*F=2.52 (p=0.11)*		
Wald test: $\beta_3+\beta_4=0$		*F=4.04** (p=0.04)*		

Note: ***, **, * represent significance of 1%, 5%, and 10%, respectively. The definitions of the variables are the same as in Table 3.

The main challenge faced in this study is that being family-owned is an endogenous choice made by CEOs in order to satisfy the need for family control rights. In order to control for the potential endogeneity problem, we re-run the empirical results

using Heckman's two procedure in Panel A of Table 6. For the first step, a *Probit Model* is used to show a regression for observing the significant outcome of the dependent variable. The inversed Mill's ration calculates the estimated parameters, which acts as a further explanatory variable in the OLS estimation (Greene 1997). In addition, Panel B of Table 6, we also re-run a propensity score matched (PSM) sample by making the treatment (family firms) and benchmark firms (non-family firms). Rerunning with Heckman's two procedure, Panel A of Table 6 shows that the coefficient of *Founder×Overfirm* and *Descendants×Overfirm* all have the expected negative sign, which is consistent with prior findings. Rerunning using propensity score matching, Panel B of Table 6 also shows that family descendant CEOs also make efficient investment decisions, thus reducing the possibility of over-investing.

Table 6: The empirical results by solving the sample selection problem

Panel A: Using Heckman's Two-Stage				
Variables	*Expected Sign*	*Coefficient*	*t-value*	*p-value*
Intercept	?	-0.2730***	-4.02	<0.01
Founder	+	0.0337***	3.49	<0.01
Founder×Overfirm	+/−	-0.0528***	-2.94	<0.01
Descendants	+/−	0.0342***	3.27	<0.01
Descendants×Overfirm	+/−	-0.0690***	-2.87	<0.01
Overfirm	+	0.0580***	2.77	<0.01
Size	+	0.0075***	2.68	<0.01
Leverage	−	-0.0607***	-3.14	<0.01
Cash	+	0.1018***	3.23	<0.01
Slack	+	0.0006**	2.41	0.01
Tangibility	+	0.0938***	4.43	<0.01
CFO	+	0.0135***	3.15	<0.01
OC	+/−	0.0117	0.96	0.33
Dividend	−	0.0020	0.28	0.77
Loss	−	-0.0219***	-3.21	<0.01
ROA	−	0.0300	0.79	0.42
MTB	−	-0.0005	-0.25	0.80
Z-Score	+	0.0010*	1.67	0.09
Big4	−	0.0069	0.75	0.45
Institutional	−	0.0174	1.48	0.13
AGE	−	-0.0002	-0.24	0.81
Invers Mill		0.0457	1.14	0.26
Year Effect		*Included*		
Industry Effect		*Included*		
Number of Samples		*5,140*		
Adj. R^2		*8.09%*		

Panel B: Using Propensity Score Matching				
Variables	*Expected Sign*	*Coefficient*	*t-value*	*p-value*
Intercept	?	-0.1736**	-2.37	0.02
Founder	+	0.0206*	1.81	0.07
Founder×Overfirm	+/−	-0.0243	-1.23	0.22
Descendants	+/−	0.0346***	2.69	<0.01
Descendants×Overfirm	+/−	-0.0579**	-2.11	0.04
Overfirm	+	0.0187	0.82	0.41
Size	+	0.0059***	2.57	<0.01
Leverage	−	-0.0591***	-2.82	<0.01
Cash	+	0.1050***	3.75	<0.01
Slack	+	0.0006**	2.43	0.02
Tangibility	+	0.0692***	3.81	<0.01
CFO	+	0.0076*	1.84	0.07
OC	+/−	0.0063	0.43	0.66
Dividend	−	0.0105*	1.79	0.07
Loss	−	-0.0229***	-3.07	<0.01
ROA	−	-0.0433	-1.27	0.20
MTB	−	0.0079***	4.54	<0.01
Z-Score	+	0.0006	1.09	0.27
Big4	−	0.0035	0.48	0.63
Institutional	−	0.0192	1.58	0.11
AGE	−	-0.0011**	-2.22	0.03
Year Effect		*Included*		
Industry Effect		*Included*		
Number of Samples		*3,004*		
F value		*7.54****		
Adj. R^2		*10.53%*		

Note: ***, **, * represent significance of 1%, 5%, and 10%, respectively. The definitions of the variables are the same as in Table 3.

4.3 Subsample analysis

In Taiwan, the electronics industry accounts for about 53% of the market. The industries with characteristics such as industry concentration and changing electronic technologies are different from those of traditional industries. This study investigates whether the relationship to investment decisions is affected by industry specifics and thus will lead to different results. Panel A of Table 7 shows the regression analysis results for the additional tests in this research. It is found that the 2,518 samples in the electronics industry that are family businesses have the same results as the main regression analysis results. The coefficient of *Founder×Overfirm* is -0.143, showing a negative correlation (p <0.01), and the coefficient of *Descendants×Overfirm* is -0.164, also showing a negative correlation (p <0.01), which is consistent with major findings. However, in the additional test

results in the 2,622 samples of the traditional industries that are family businesses, the effect is not significant.

Table 7: Subsample results

Panel A: Electronics versus Traditional Industries			**Panel B: Including Corporate Governance**	
Variables/Sample	Electronics	Traditional	Variables	Coefficient
Intercept	-0.320**	-0.141*	*Intercept*	-0.284**
Founder	0.088**	0.015	*Founder*	0.033**
Founder×Overfirm	-0.143**	-0.009	*Founder×Overfirm*	-0.053**
Descendants	0.105**	0.011	*Descendants*	0.032**
Descendants×Overfirm	-0.164**	-0.032	*Descendants×Overfirm*	-0.065**
Overfirm	0.140**	0.019	*Overfirm*	0.053*
Size	0.018**	0.002	*Size*	0.010**
Leverage	-0.123**	-0.031	*Leverage*	-0.069**
Cash	0.096*	0.124**	*Cash*	0.108**
Slack	0.001*	0.001**	*Slack*	0.001*
Tangibility	0.017**	0.105**	*Tangibility*	0.077**
CFO	0.016**	0.007*	*CFO*	0.010**
OC	0.046	-0.001	*OC*	0.013
Dividend	0.005	0.007	*Dividend*	0.007
Loss	-0.026**	-0.018*	*Loss*	-0.023**
ROA	-0.051	0.096*	*ROA*	0.008
MTB	0.005	-0.005*	*MTB*	-0.001
Z-Score	-0.002*	0.002**	*Z-Score*	0.001
Big4	0.034**	-0.003	*Big4*	0.014*
Institutional	-0.007*	0.047**	*Institutional*	0.018
AGE	-0.005**	-0.001	*AGE*	-0.001
			DUAL	0.009
			INDE%	0.019
			DEV	-0.003
			DUAL×Overfirm	-0.020
			INDE%×Overfirm	0.062
			DEV×Overfirm	0.029
Year Effect	*Included*	*Included*	*Year Effect*	*Included*
Industry Effect	*Included*	*Included*	*Industry Effect*	*Included*
N	*2,518*	*2,622*	*N*	*5,140*
F-value	*8.79***	*6.85***	*F-value*	*8.70***
Adj. R^2	*9.26%*	*9.31%*	*Adj.* R^2	*8.25%*

Note: **, *represent significance of 1% and 5%, respectively. The classification of the electronics industry in this study is based on the Taiwan Economic Journal (*TEJ*). The definitions of the variables are the same as in Table 3.

This study additionally focuses on the relationship between CEO choices as they relate to investment efficiency. Prior family studies suggest that corporate governance mechanisms such as outsider directors or independent directors as members of firm boards of directors will mitigate the agency problem. Therefore,

we also include the moderating effect of governance mechanisms and *Overfirm*. Panel B of Table 7 show the empirical results. After considering corporate governance factors, the moderating effect of the coefficient for *Founder*×*Overfirm* and the coefficient for *Descendants*×*Overfirm* all have the predicted signs and are significant.

5. Conclusion

Prior investment efficiency literature focuses on the problem of adverse selection. However, researches have rarely forged an explicit path toward theorizing and conducting empirical investigations of family CEOs as it relates to investment efficiency. Based on emerging market Taiwanese companies from 2009 to 2015, we address this limitation by indicating that founder CEOs prefer to make efficient investment decisions. This result supports the socioemotional wealth argument, indicating that a founder CEOs are conservative in terms of avoiding over-investing as their family firms become bigger (or publicly traded) than during their inception period. In addition, the empirical results also support that family descendant CEOs also prefer to engage in efficient investment. Thus, family descendant successors can properly adjust the amount of each subsequent investment in the business regardless of the possibility of over-investment.

Finally, this study considers that different industries may have different impacts on investment decisions. The empirical results show that family owned businesses in the electronics industry consistent with the main test results, which also corresponds with the broad SEW theory. However, this premise is not supported in the case of traditional industries. Practically, our results do not guarantee that family descendant succession planning is an unnecessary issue for family owners. Instead, our findings suggest that family CEOs (both founder and family descendant successors) can still make optimal investment decisions intended to avoid over-investing in the electronics industry, even though this industry is characterized as highly volatile and fast-growing, with short product lifecycles.

Based on some limitations, the following suggestions are proposed for future researchers: we only include public listed firm in Taiwan and those firm comprising many of the largest, most successful firms in Taiwan. Thus, such family firms might have higher financial information transparency, so the difference in management of public to private family firms must be carefully considered. Future studies can thus enrich the literature on corporate investment efficiency issues in private family firms.

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