

# CEO succession and Financing Constraints

## Evidence from China

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### Abstract

This study investigates the impact of Chief executive Officer (CEO) succession on firm's financial constraints. Using a panel data consisting of CEO turnover and non-turnover cases in China listed companies, we find that the new CEOs play a significant role in alleviating the firm's financial constraints. Especially, the level of cash holding, the investment to cash flow sensitivity, and the cash to cash flow sensitivity all decline following the new CEOs' succession. These effects are stronger in cases that the predecessors are forced-turnover and the firms are more financial constrained.

Key words: CEO succession; financial constraints; firm size; forced turnover

JEL Classification: G32 G39 G34 M12 M51

### Introduction

The impact of CEO succession on firm performance has received a great deal of attention, but the evidences regarding the role that a new CEOs play are mixed(Huson, Malatesta, & Parrino, 2004; Tushman & Rosenkopf, 1996; Y. Zhang & Rajagopalan, 2003). Recently, some studies recognized the importance of organizational and social contexts that affect the succession-performance relationship(Chiu, Johnson, Hoskisson, & Pathak, 2016; Chung & Luo, 2013; Shen & Cannella, 2002; Zhang & Rajagopalan, 2004).Using a top-down perspectives (Hornstein, 2013), these studies are useful on examining the overall quality of a firm's performance. However, there are fewer studies that focus on the specific channels through which the new CEOs can influence firm performance.

This study is an attempt to explore the role of new CEOs by examining the changes of financial constraints subsequent to the succession of the new CEOs. According to Bertrand & Schoar (2003), the managers directly influence the firm's investment, financial, and organizational practices to further influence firm performance. Driving by information asymmetry and agency problem, financial constraints becomes a prevailing phenomenon worldwide(Fazzari et al., 1988; Jensen, 1986; Myers and Majluf, 1984), especially in countries with less developed financial systems(Love & Zicchino, 2006). The existence of financial constraints will lead to the firm's deviating from their optimal investments level(Erel, Jang, & Weisbach, 2015). Given the universality and importance of financial constraints, we assume that the new CEOs will do something to alleviate financial constraints, especially the new CEOs who success after a

forced turnover and are in a more severe constrained firms will have more pressure and incentive to relieve financial constraints.

Using a sample of 1387 CEO turnover in Chinese listed company occurring from 2003 to 2012, we find that following the new CEOs' succession, the firm's cash holdings, investment-cash flow sensitivity, and cash-cash flow sensitivity significantly decrease indicating that the firm's financial constraints are alleviated. In addition, we propose that turnover type (forced vs. voluntary) and the degree of financial constraints also affect the new CEOs' decision on decreasing financial constraints. Consistent with our expectation, we find that these declines to be larger when the predecessors are forced departed and when the firms are more financial constrained.

Finally, for our robustness test we utilize the PSM (propensity score matching) to construct a control group which CEO turnover event didn't occur. We treat the control group as the "fake" CEO turnover group and estimate the similar equations. The placebo tests imply that the matched firms do not experience any of the changes in financial constraints as those in our "true" CEO turnover group, indicating that our results are robust.

This study contributes to the understanding on how new CEOs influence firm value. Some earlier studies included market-based consequences as dependent variables (see the review by Kesner & Sebra (1994) and Giambatista, Rowe, & Riaz(2005)). Then accounting-related performance have been examined(e.g., Chung & Luo, 2013, Chang & Wong, 2009, Huson et al., 2004,Tushman & Rosenkopf, 1996,etc.). However, all of these focus on the holistic performance, but little consensus was reached (Giambatista et al., 2005). The managers have to influence the specific business activities to further impact the firm performance. Although there are some studies focusing on the influence of CEO succession on investment decisions (Harrison & Fiet, 1999; Hornstein, 2013), there is very little evidence on the influence of CEO succession on firm financing activities.

Our findings show that, the new CEOs tend to alleviate the financial constraints which restraint the firm's development. These findings improve our understanding of the impact of succession on performance. More generally, it is related to how managers affects firm performance and firm policies, as discuss by Bertrand and Schoa (2003).

Second, we add to the small but vibrant line of research on how contexts influence the succession-performance relationship or management behavior(Chung & Luo, 2013; Shen & Cannella, 2002; Zhang & Rajagopalan, 2004). Our finding indicating that firm's financial constraints condition will have an impact on the new CEOs' financial behavior.

Third, our study enhances understanding of the role of corporate governance in regulating manager behavior. The forced departure of predecessor by the board of directors will prompt the new CEOs to act in a positive way.

The remainder of this study proceeds as follows. Section 2 develops testable hypotheses regarding CEO succession and its impact on financial constraints. Section 3 discusses the data, research methods and model specifications. Section 4 presents summary statistics, main empirical results and robustness test. Section 5 concludes.

## **2. Literature review and hypothesis development**

In a perfect market without financial friction, the firm's internal and external fund can perfectly substitute for each other and investment is irrelevant to their financing choice(Modigliani and Miller,1958). However, a perfect and complete capital market doesn't exist due to information asymmetry(Carpenter &

Guariglia, 2008; Fazzari et al., 1988; Myers and Majluf, 1984) and agency problem (Jensen, 1986; Pawlina & Renneboog, 2005). Using a panel data from 36 countries to study the dynamic relationship between firms' financial conditions and investment, Love & Zichino (2006) finds that financial constraints exist in almost all the firms, and even more severe in countries with less developed financial systems. As a counter-example of positive relationship between financial development and economic growth, China's less developed financial system seriously lags behind its thriving growth (Allen et al., 2005; Guariglia & Yang, 2016). China's external markets play a less efficient and limited role in financing and allocating resources (Guariglia & Yang, 2016; Tsai, Chen, Lin, & Hung, 2014) and Chinese listed firms can't obtain enough capital to support their fast development.

Bank loans and capital market are two main important sources of external financing. Nevertheless, the firms have difficulty in accessing to both of them. First, the bank capitals are mainly controlled by the dominated state-owned banks. The state-owned banks have to provide massive capital to state-owned enterprises (SOEs). More importantly, the SOEs are usually unprofitable which lead in plenty of nonperforming loans (Guariglia & Yang, 2016). Adding information asymmetry and the lack of property rights protection (Allen et al., 2005; Zheng & Zhu, 2013), private firms have significant difficulties in accessing to bank loan. Second, due to poor regulation and control from government, Chinese financial markets are small and can't also play an efficient way in supplying enough capital to relieve financial constraints (Guariglia & Yang, 2016; Wang, Wu, & Yang, 2009). Moreover, Chinese listed firms have limited internal financing capacity because their profitability is generally low (Lian, Su, & Gu, 2011). In this circumstance, financial constraints are more severe in Chinese firms. Higher financial constraints result in a higher cost of capital when assessing investment projects (Erel et al., 2015), therefore, firm's investment and development are constrained by the financing in China.

Given the significance and importance of financial constraints faced by Chinese firms, the new CEOs will have incentive and pressure to alleviate the firm's financial constraints by increasing the internally generated cash flow or raising capital externally through their social tie or ability. For example, Amore, Minichilli, & Corbetta (2011) shows that blood-unrelated professional CEOs tend to economically and statistically significantly increase the debt financing in family-controlled firms. Therefore, we propose the first hypotheses.

Hypotheses 1 After the succession of new CEOs, the firm's financial constraints will be relieved to some extent.

If the predicted remissions of financial constraints are due to the new CEOs' incentive and pressure, then these remissions should be larger following successions which exert more pressures and incentives to relieve financial constraints. This is, the type of CEO succession, forced vs. voluntary, may affect the extent to relieve financial constraints. After a forced turnover, the successor might make more changes to meet the expectation of shareholders and the board (Nakauchi & Wiersema, 2015). Gao, Harford, & Li (2012) found that a forced turnover of predecessor will make the new CEO to reduce investment and leverage, and improve performance, on average. More further, compared with the forced-turnover CEO, the relationship between the new CEO and the board may be more harmonious (Hornstein, 2013) and the new CEO may be conferred more discretionary power to improve performance. In addition, external pressures which influence the board's decision to dismiss the firm's executive (Wiersema & Zhang, 2011), are more likely to lead to a mandate for new CEOs to alleviate financial constraints. So we assume that the decline in cash holdings and both sensitivities should be larger following successors whose processors are forced departed. Hence, we propose hypotheses 2.

Hypotheses 2 Compare to the successor after a voluntary-turnover, the forced-turnover successor will

alleviate financial constrain at a larger extent.

Furthermore, we expect these declines to be larger when firms confront more severe financing problem. Firm size can be a reasonable proxy for the degree of financial constraints experienced by firms(Carpenter & Guariglia, 2008; Hadlock & Pierce, 2010). Because Smaller firms face higher informational asymmetry problems and agency costs(Kadapakkam, Kumar, & Riddick, 1998), they display more significant constraints than large firms (Chan, Dang, & Yan, 2012; Erel et al., 2015; Gilchrist & Himmelberg, 1995). Therefore, the reduction in financial constraints appears to be most important for small firms. If it is, small firms might be observed more reductions in constraints. Hence, we propose hypotheses 3.

Hypotheses 3 compare the succession in large firms, succession in small firms can alleviate financial constraints at a larger extent.

### 3. Method

#### 3.1 Data

We obtain our CEO turnover data from the China Corporate Governance Research Database (CCGRD) and other data from the China Stock Market and Accounting Research (CSMAR) Database which are both developed by the GTA Information Technology Co.. We defined the persons as CEOs who are at the position of either General Manager or Chief Executive Officer. Financial institutions are excluded because the operating, investing, financing activities and disclosure requirements of these firms are distinct from others (Guariglia & Yang, 2016). We restrict the sample to those CEO turnovers occurring between 2003 and 2012. In line with previous studies, we keep only the first one if the firm underwent two or more turnovers in the same year. To compare the impact of successions versus non-succession on financial constraints, we also contain non-turnover data called by Giambatista et al.(2005).Our final panel data consist of 14006 firm-year observations. Table 1 reports the year distribution of CEO turnover for all of the listed firms. All variables are winsorized at 2%.

Table 1

Annual CEO turnover and forced-turnover rate in China's listed firms: 2003–2012

Deal Completion Year	No. of firms	No. of deals	Annual turnover rate (%)	No. of forced turnover	Annual forced turnover rate (%)
2003	1055	245	23.22	151	61.63
2004	1141	253	22.17	208	82.21
2005	1152	264	22.92	200	75.76
2006	1228	243	19.79	177	73.14
2007	1327	270	20.35	188	69.63
2008	1378	251	18.21	214	85.26
2009	1460	273	18.70	237	86.81
2010	1657	256	15.45	168	65.63
2011	1781	303	17.01	171	56.44
2012	1827	283	15.49	158	55.83
total	14006	2641	18.86	1872	70.88

The sample comprises 2641 CEO turnovers. Different from the finding by Chang & Wong(2009), we show a significant decrease in the annual turnover rate from 23.22% in 2003 to 15.49% in 2012. our average annual turnover rate is 18.86%, lower than that in Chang & Wong(2009) who show a 23.64% consolidated average annual turnover rate. However, this rate is significantly higher than the rates in other countries(Huson et al., 2004; Kang & Shivdasani, 1995).

### 3.2 Variables and model specifications

Several criteria have been proposed to identify the level of financial constraints faced by firms, nevertheless, there is no general agreement on which measure is the best proxy since each measure has limitations (Khatami, Marchica, & Mura, 2015). To decrease the concerns about measure error, we employ three measures to find if there will be similar results. Firstly, according to Opler et al. (1999), due to precautionary considerations firms would hold more cash to make sure that the investment can obtain enough capital when managers believe they face greater financial constraints. So, a decline in cash holding may indicate that the level of financial constraints would decrease (Erel et al., 2015). Second, as good measures of financial constraints (Heitor Almeida & Campello, 2007; Rauh, 2006), the sensitivity of investment to cash flow (Fazzari et al., 1988) is motivated by theory that is equally valid in all countries and for both public and private firms (Erel et al., 2015). In an imperfect market, investments are dependable on not only the value of the firm's investment opportunities but also the financing position. If the firms face financial constraints, their investment will be determined by the internal cash flow and the sensitivity of investment to cash flow will be high. On the contrary, a decline in this sensitivity might indicate to alleviate the financial constraints. Third, we utilize cash flow sensitivity of cash introduced by Almeida, Campello, & Weisbach (2004) to measure financing constraints. As a approach to reflect management's assessment of future constraints, cash flow sensitivity of cash captures the firm's propensity to save cash out of cash flows (Erel et al., 2015).

By using three different measures, we can estimate whether the succession can alleviate financial constraints and examine if the effect is robust across different measures. According to Cleary (1999) and other studies, we employ net capital expenditures to measure the quantity of firm's investments. Following the overlap-performance insight from Chang & Wong (2009) and Huson, Parrino, & Starks (2001), we use current year cash holding, investment and cash flow if a turnover occurred in the first six months of the year and next year cash holding, investment and cash flow if a turnover occurred in the last six months of the year, which can also help to partially deal with the issue of endogeneity (Chang & Wong, 2009).

In particular, we estimate the following specifications:

$$\text{Cash}/\text{Assets} = \alpha + \beta_1 \text{Turnover} + \gamma \text{Controls} + \varepsilon \quad (1)$$

$$\begin{aligned} \text{investment}/\text{Assets} \\ = \alpha + \beta_1 \text{Turnover} + \beta_2 \text{Cash flow}/\text{Assets} + \beta_3 \text{Turnover} * \text{Cash flow}/\text{Assets} \\ + \gamma \text{Controls} + \varepsilon \end{aligned} \quad (2)$$

$$\begin{aligned} \Delta(\text{Cash}/\text{Assets}) \\ = \alpha + \beta_1 \text{Turnover} + \beta_2 \text{Cash flow}/\text{Assets} + \beta_3 \text{Turnover} * \text{Cash flow}/\text{Assets} \\ + \gamma \text{Controls} + \varepsilon \end{aligned} \quad (3)$$

Where *Turnover* is a dummy variable that equals to 1 if there was a CEO succession in the firm at a fiscal year. To model (2) and (3), we also include an interaction term for the turnover dummy with cash flow. A significantly negative  $\beta_1$  in model (1) suggests that the cash holding will be decreased and a significantly negative  $\beta_3$  in model (2) and (3) indicates that the succession can decline the investment to cash flow sensitivity and the cash to cash flow sensitivity to alleviate the financial constraints. In the group analysis, we follow Chang & Wong (2009) who studied the performance-turnover relationship in China to distinguish between forced and voluntary turnover. In the CSMAR database, more than ten items are given for the department reason, including change a job, retirement, contract expiration, change in controlling shareholders, resignation, dismissal, health problem, personal reasons, corporate governance reform, legal disputes, completion of acting duties and no reason given. We define the turnover as forced if the stated

reasons are change a job, resignation, dismissal, personal reasons and no reason given. In table 1, we also report the number and the rate of forced turnover in every year.

We introduce a set of control variables. First, we control for the firm size, the natural logarithm of total assets. In the group analysis, we classify the sample into two groups based on the firm size. We also control list, the number of years elapsed since its listing; LROA, its lagged return on assets; Leverage, the ratio of its short-term and long-term debt to total assets; and sales growth.

## 4. Results

### 4.1 Descriptive statistics and univariate analysis

Table 2 reports the mean and median of the main variables as one year before and averages of two years after the CEO turnover. Consistent with previous study, we find that the investment significantly decrease(Harrison & Fiet, 1999) and ROA significantly increase(Huson et al., 2004). In addition, firm size and leverage increase following the turnover, as both the mean of total asset and leverage are higher in the two years after the turnover compared with the mean value before the turnover, indicating that the new CEOs may increase bank loans to alleviate the firms' financial constraints. We don't find significantly difference in cash holding, cash flow and sale growth. However, it is difficult to draw causality from this table. To evaluate the effect of CEO succession on firms' financial and investment policies, we use multivariable regression that include relevant control variables.

Table 2

Summary Statistics on the Financial Variables before and after the succession

This table presents summary statistics for the accounting variables of the firms as one year before and averages of the two available years after the succession. Variable definitions are provided in the Appendix A. Total Assets are in million. We assess the differences in means using the mean difference test. The symbols \*\*\*, \*\*, and \* denote statistical significance at the 1%, 5%, and 10% levels, respectively.

	Before				after				diff
	obs.	Mean	SD	Median	obs.	Mean	SD	Median	
Cash/ Assets	2536	0.208	0.758	0.135	2566	0.250	1.392	0.141	0.036
Investment/ Assets	2528	0.065	0.118	0.035	2541	0.059	0.065	0.038	-0.008***
Cash Flows/ Assets	2536	0.041	0.674	0.046	2566	-0.104	7.993	0.046	-0.165
Total Asset	2880	670	3360	185	2897	761	5460	173	173***
ROA	2905	0.016	0.074	0.025	2880	0.021	0.058	0.025	0.006***
Sales Growth	2536	0.100	0.342	0.111	2567	0.125	0.260	0.122	0.006
leverage	2897	0.520	0.219	0.518	2880	0.529	0.215	0.531	0.013***

### .2 Multivariable analyses

In this section, we estimate the above regression model to investigate how the CEO successors affect the financial constraints. We estimate these equations on the entire panel of firm-years for which we have both turnover and non-turnover data. The estimation results are presented in Table 3.

The estimate in the cash holdings in column (1) is significant negative which indicate that the new CEO reduce the firm's cash holdings after succession. The coefficient on the dummy variable is -0.016, implying a drop of 1.6% in the cash-to-asset ratio following the succession. Column (2) and (3) present the estimation of equation (2) to examine the investment to cash flow sensitivity at the time of the succession. To evaluate whether the firms were constrained before a CEO turnover, we focus on the coefficients on

cash flow. These coefficients on *Cash Flow/Assets* (0.022 and 0.063) are all positive and statistically significantly different from zero, indicating that there were financial constraints before the succession. The estimation result of financial constraints before CEO succession is consistent with Fazzari *et al.*(1988) and Erel *et al.*(2015), suggesting that the existence of financial constraints is a common phenomenon. The coefficient on interaction item is significant negative, indicating that the cash flow sensitivity of investment declines following the succession. The magnitude of the coefficients on this interaction term is -0.047, almost the opposite of the coefficient indicating the cash flow sensitivity before the succession. The sum of the coefficients on cash flow and on interaction item is very close to, and not statistically different from, zero, suggesting that firms appear to be essentially unconstrained after CEO succession comparing to financial constraints they faced before the CEO succession.

We then report estimates of the equation of cash to cash flow sensitivity in columns (4) and (5).

The coefficients on *turnover* and *Turnover\* Cash Flow* are negative and statistically significant, suggesting that the cash flow sensitivity of cash is lower subsequent to the turnover. Following Almeida *et al.*(2004), the usual interpretation of this result is that financial constraints are eased after the succession. Combined with the results for cash holding levels and investment to cash flow sensitivity, we can draw a conclusion that the new CEOs relieve the firm's financial constraints, supporting Hypothesis 1.

As we predict, if the decline in financial constraints is incurred by the succession of new CEOs, the reduction is likely to be higher for which the new CEOs confront more pressure and incentive, e.g. CEO whose predecessor are forced departure and who success in a more constrained small firms.

To evaluate the impact of different turnover type, we follow Chang & Wong(2009) to distinguish the turnover into forced and voluntary subsample and separately re-estimate the specifications (2) and (3). We report the estimates of the cash flow sensitivity of investment and the cash flow sensitivity of cash in Table 4, respectively.

The results suggest that firms after a forced turnover faced a lower investment to cash flow sensitivity and cash to cash flow sensitivity. In the cash flow sensitivity of investment, the coefficient on *Cash Flow/Assets* for forced-turnover group is 0.017, which is significantly smaller than that for voluntary-turnover group (0.181). In the cash flow sensitivity of cash, the coefficients on *Cash Flow/Assets* are insignificant for forced-turnover group and significantly positive for voluntary-turnover group (0.062 and 0.209, respectively). These estimates suggest that the declines in measures of financial constraints are larger in succession which the predecessors are forced-departure, consistent with the view that the successors who face more pressure will alleviate the financial constraints at a larger extent, supporting hypothesis 2.

Table 3

The Effect of CEO turnover on the cash holding, investment to cash flow and cash to cash flow sensitivities

This table reports the estimates of equations (1), (2) and (3) predicting in which the dependent variables are cash holdings normalized by total assets in columns (1), gross investment normalized by total assets in columns (2) through (3), and changes in the ratio of cash holdings to total assets in column (4) and (5). *Turnover* is a dummy variable that take a value of 1 for the years which occur CEO turnover, otherwise 0. See the Appendix A for definitions of independent variables. Year dummies are included in all regressions, but the coefficients on year dummies are suppressed for brevity. In parentheses are t statistics adjusted for heteroscedasticity and clustering at firm level. The symbols \*, \*\*, and \*\*\* denote significance at the 10%, 5%, and 1% level (two-tailed), respectively.

	(1)	(2)	(3)	(4)	(5)
	Cash/ Assets	Investment/ Assets		$\Delta$ (Cash/Assets)	
Turnover	-0.016***	-0.004***	-0.004***	-0.016***	-0.018***

	(-5.23)	(-2.83)	(-2.96)	(-3.98)	(-4.43)
Cash Flow/Assets		0.022**	0.063***	0.068	0.411***
		(2.41)	(7.16)	(1.29)	(14.55)
Turnover* Cash Flow			-0.047***		-0.389***
			(-4.68)		(-11.60)
LROA	0.152***	0.216***	0.216***	-0.069	-0.079
	(3.94)	(15.31)	(15.40)	(-1.30)	(-1.55)
List	-0.016**	-0.007**	-0.007**	-0.001	-0.008***
	(-1.96)	(-2.10)	(-2.19)	(-0.10)	(-7.14)
Size	0.034***	0.011***	0.011***	0.045***	0.043***
	(5.99)	(5.81)	(5.90)	(6.37)	(6.06)
leverage	-0.238***	0.003	0.005	-0.104***	-0.088***
	(-11.59)	(0.44)	(0.64)	(-4.56)	(-3.84)
Sale Growth	0.062***	0.027***	0.026***	0.048***	0.037***
	(10.78)	(12.29)	(12.18)	(6.49)	(5.60)
_cons	-0.279*	0.125***	0.125***	-0.940***	-0.825***
	(-1.83)	(3.00)	(3.04)	(-5.47)	(-5.64)
<i>N</i>	10633	14785	14785	9287	9287
<i>r</i> <sup>2</sup> <sub>between</sub>	0.158	0.199	0.209	0.004	0.015

Table 4

Regression result of subsamples of forced and voluntary turnover

This table presents estimates of equations (2), (3) for subsamples based on turnover characteristics.

The results in columns (1) and (2) represent the estimates of investment to cash flow sensitivity and the results in columns (3) and (4) represent the estimates of cash to cash flow sensitivity. This group analysis can't be applied to study the impact on cash holdings because of collinearity, so we don't present the estimates. The coefficients on the *Cash flow/Assets* variables represent the extent of financial constraints which the firms faced after different type of turnover. Definitions of the other variables are provided in the Appendix A. Year fixed effects are included in all regressions. In parentheses are t statistics adjusted for heteroscedasticity and clustering at firm level. The symbols \*\*\*, \*\*, and \* denote statistical significance levels of 1%, 5%, and 10%, respectively.

	Investment/ Assets		$\Delta$ (Cash/Assets)	
	Forced	Voluntary	Forced	Voluntary
Cash Flow/Assets	0.017***	0.181***	0.062	0.209***
	(6.66)	(4.68)	(0.75)	(3.39)
LROA	0.078***	0.068	-0.131	-0.060
	(2.75)	(1.02)	(-1.04)	(-0.36)
List	-0.002**	-0.001	0.011	0.015
	(-2.12)	(-0.97)	(0.16)	(0.71)
Size	0.004	0.001	-0.012	-0.016
	(0.88)	(0.11)	(-0.49)	(-0.91)
Leverage	-0.039**	-0.031	-0.067	0.041
	(-1.99)	(-0.79)	(-0.70)	(0.49)
Sale Growth	0.016**	0.038***	0.021	-0.011
	(2.55)	(2.61)	(0.77)	(-0.23)

_cons	-0.008 (-0.08)	0.053 (0.31)	0.148 (0.14)	0.120 (0.27)
<i>N</i>	1914	812	1035	466
r2_b	0.184	0.135	0.010	0.087

Another view is that firm's financial constraints condition can influence the financial behavior of the new CEOs. Previous studies present evidence suggesting that firm size is particularly useful predictors of financial constraint levels (Carpenter & Guariglia, 2008; Hadlock & Pierce, 2010). To test this hypothesis, we divided our sample into two subsamples based on whether the firm size is above (below) the median of the whole sample and re-estimate our equations (1)-(3) to examine the impact on cash holdings, the cash flow sensitivity of investment, the cash flow sensitivity of cash. We present the result in Table 5. In cash holdings, the coefficients on *turnover* are -0.011 and -0.020 for small and large firms and are respectively significant at 5% and 1% level, suggesting that there are some, but not significant difference between the two types of firms. In the cash flow sensitivity of investment and cash flow sensitivity of cash, the coefficients on interaction term are significant for small firms (-0.033 and -0.393), but we don't find the similar results in large firms, suggesting that the declines in sensitivities of investment and cash are statistically significantly different between these subsamples and are more significant for the small firms. In general, these results indicate that the successor in more constrained firms, e.g. small firms, will mitigate the financial constraints at a larger extent, supporting Hypothesis 3.

Table 5

Regression result for small and large firms

This table reports the regression results for the subsamples of small and large firms. The sample are divided into two subsample based on the firm size. The results in columns (1) and (2) represent the estimates of cash holdings, in columns (3) and (4) represent the estimates of investment to cash flow sensitivity and in columns (5) and (6) represent the estimates of cash to cash flow sensitivity. *Turnover* is a dummy variable that equals to 1 if there was a CEO succession in the firm at a fiscal year. The coefficients on interaction term represent the impact of succession on the sensitivities of investment and cash. Definitions of the other variables are provided in the Appendix A. Year fixed effects are included in all regressions. In parentheses are t statistics adjusted for heteroscedasticity and clustering at firm level. The symbols \*\*\*, \*\*, and \* denote statistical significance levels of 1%, 5%, and 10%, respectively.

	Small	Large	Small	Large	Small	Large
	Cash/ Assets		Investment/ Assets		$\Delta$ (Cash/Assets)	
Turnover	-0.011** (-2.44)	-0.020*** (-5.23)	-0.004** (-2.09)	-0.003* (-1.76)	-0.016** (-2.28)	-0.019*** (-4.01)
Cash Flow/Assets			0.048*** (4.08)	0.066*** (5.30)	0.411*** (9.24)	0.456*** (13.13)
Turnover*Cash Flow			-0.033*** (-2.73)	-0.016 (-0.77)	-0.393*** (-8.43)	-0.071 (-0.99)
LROA	0.090* (1.94)	0.260*** (3.49)	0.151*** (10.96)	0.349*** (12.34)	-0.143** (-2.20)	0.070 (0.97)
List	-0.004*** (-2.66)	-0.010*** (-6.85)	-0.002*** (-5.89)	-0.006*** (-10.88)	-0.009*** (-5.21)	-0.010*** (-7.70)
Size	0.036*** (3.28)	0.030*** (3.49)	0.006* (1.77)	0.014*** (4.16)	0.086*** (7.07)	0.045*** (5.78)
Leverage	-0.262***	-0.197***	-0.027***	0.042***	-0.112***	-0.067**

	(-8.82)	(-6.24)	(-3.21)	(3.12)	(-3.68)	(-2.20)
Sale Growth	0.052***	0.073***	0.020***	0.029***	0.025**	0.049***
	(6.32)	(9.17)	(7.43)	(9.39)	(2.53)	(5.70)
_cons	-0.405*	-0.312*	-0.033	-0.220***	-1.684***	-0.900***
	(-1.84)	(-1.72)	(-0.52)	(-3.20)	(-6.95)	(-5.40)
N	5177	5456	7184	7601	4535	4752
r2_b	0.265	0.080	0.294	0.082	0.034	0.001

## 4.2 Robustness test

To make sure that the changes in financial constraints are caused by the CEO succession but no other reasons, we further observe the financial policies of firms similar to the turnover firms but there was not a CEO turnover in it. We construct a group of firms similar to the turnover firms. Specifically, we match the firm which has a CEO turnover with non-turnover firms from GSMAR from the same year and industry as the turnover-firm. We require the two firms to have book value of total assets one year prior to the CEO turnover as close as possible. To test the robustness, we re-estimate the equations (1)-(3) using the sample of matched firms rather than turnover-firms. These estimation results are presented in table 6.

The results in this table are significantly different from those for the turnover-firms. In column (1), the coefficient on *turnover* is positive and not statistically significant, suggesting the “fake” turnover don’t have a significant impact on cash holdings. While there is a significant decrease in investment and cash to cash flow sensitivity for turnover-firms, there is a significant increase in cash to cash flow sensitivity and investment to cash flow sensitivity for the matched firms. On the whole, although the matched firms which have the most similar characteristics with those turnover-firms, they do not experience any of the changes in financial constraints as those in turnover-firms. Therefore, we can conclude that the relieves in financial constraint are caused by CEOs’ succession.

Table 6

	(1)	(2)	(3)
Dependent Variable	Cash/ Assets	Investment/ Assets	$\Delta$ (Cash/Assets)
Turnover	0.002	-0.003*	0.002
	(0.79)	(-1.91)	(0.56)
Cash Flow/Assets	0.040	0.021**	0.065
	(1.23)	(2.46)	(1.27)
Turnover* Cash Flow		0.024	0.175***
		(1.42)	(2.89)
LROA	0.150***	0.226***	-0.094*
	(3.90)	(16.03)	(-1.80)
List	-0.007***	-0.003***	-0.009***
	(-6.52)	(-10.68)	(-7.96)
Size	0.033***	0.037***	0.044***
	(5.88)	(6.01)	(6.22)
Leverage	-0.241***	0.004	-0.101***
	(-11.65)	(0.49)	(-4.44)
Sale Growth	0.063***	0.028***	0.045***

	(11.04)	(12.94)	(6.47)
_cons	-0.365***	0.078***	-0.823***
	(-3.17)	(18.77)	(-5.59)
N	10633	14785	9287
r2_between	0.178	0.238	0.032

## 5. Conclusions

This study fills a void in the literature by showing how the new CEOs influence financial constraints. Specifically, I investigate if the cash holding, the investment to cash flow sensitivity and the cash to cash flow sensitivity change subsequent to the CEO succession. Using a panel data including the case of CEO succession and non-succession, we find that the cash holding, the investment to cash flow sensitivity, the cash to cash flow sensitivity significantly decline after the succession suggesting that the new CEOs alleviate the firm's financial constraints. We also show that these declines in financial constraints are larger in the condition which the predecessors are forced departure and the firms confront more severe financial constraints before the succession. Overall, the analyses and results contribute to deepen our understanding of how the successor influences firm performance.

We only pay attention to the short term, e.g. financing activities one year after the succession; however, in the long run manager's behavior will be impacted by other factors and will differ. It's meaningful to trace the change of manager's behavior. Doing so would greatly add to our understanding of the relationship between manager and firm value.

### Appendix A

#### Definition of variables

Variable	Definition and calculation method
Turnover	Dummy variable that equals to 1 if there was a CEO succession in the firm at a fiscal year.
Cash/Assets	Cash and cash equivalents (CASH)/Total assets.
Investment/Assets	[Purchase of non-current assets – Proceeds from disposal of non-current assets]/ Total Assets.
$\Delta$ (Cash/Assets)	Cash flows/Total assets – lagged (Cash flows/Total assets).
Cash Flow/Assets	Cash flows /Total assets.
LROA	Lagged (EBITDA/Total assets).
List	The number of years elapsed since the firm listed
Size	Natural logarithm of total assets.
Leverage	Total liabilities/Total assets.
Sale Growth	(Current Sales – Lagged Sales)/Lagged Sales

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