CEO DUALITY AND FIRM PERFORMANCE–AN ENDOGENOUS ISSUE

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Abstract

Whether dual CEO leadership structure is better for corporations is one of the most hotly debated issues in corporate finance. This paper uses a recent data to re-examine the relationship between CEO duality and firm performance, controlling for other important variables such as firm characteristics, ownership structure, CEO compensation, and agency costs. We find a recent trend of increased number of firms converting from dual to non-dual CEO structure. However, our empirical results do not show a significant relationship between CEO duality and firm performance nor improvement in firm performance after change in leadership structure. We find evidence of endogeneity, and we attribute the insignificance of the relationship between CEO duality and firm performance to the possibility that CEO duality is endogenously and optimally determined given firm characteristic and ownership structure.

Keywords: Corporate governance, CEO duality, Leadership structure, endogeneity

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1. Introduction

In the period from 1999 to 2003 hundreds of firms converted from dual CEO leadership structure to non-dual structure, while a much smaller number of firms converted in the opposite direction. This recent trend is partly due to several high-profile cases where powerful dual CEOs were found to abuse their tremendous power at the expenses of the company and shareholders. However, empirical evidence is scant and inconclusive on whether non-dual, as versus dual, CEO leadership structure is associated with better firm performance.

The objective of this paper is to re-examine this important issue in corporate finance by using a more recent data set as well as methodologies to control for potential selection bias and endogeneity, thus providing clear and timely evidence on this important issue. In addition to providing evidence on the relationship between CEO duality and firm performance, we attempt to answer the research question as to, given firm characteristics, whether leadership structure in term of CEO duality is in fact endogenously determined.

Theoretical studies provide no consensus as to whether firms with split titles (CEO and chairman of the board) outperform firms with combined titles. Fama and Jensen (1983) and Jensen (1993) suggest that CEO duality may hinder board's ability to monitor management and thereby increase the agency cost. As a result, splitting the titles of CEO and Chairman of the Board will improve firm performance. In contrast, Stoeberl and Sherony (1985) and Anderson and Anthony (1986) argue that CEO duality provides clear-cut leadership in strategy formulation and implementation and will therefore lead to better firm performance. Splitting titles may create information sharing costs, conflicts between CEO and non-CEO chairman and inefficiency: It will be costly to communicate firm-specific information to others in a timely manner; decision making process and execution may both be less efficient when there are two versus one key leader; it may be more difficult to assign blame for bad company performance.

Whether combining or separating the leadership is beneficial to the firm is then an empirical question. However, the empirical evidence is mixed and inconclusive. Pi and Timme (1993) find that there is negative relationship between CEO duality and accounting performance measures in banking industry. Baliga, Moyer, and R. Rao (1996) found no evidence of performance changes surrounding changes in the duality status. Daily and Dalton (1997) find that there is no significant difference in performance between dual CEO and non-dual CEO firms. Dahya and Travlos (2000) document a positive association between CEO duality and firm

performance. Dahya (2005) show that splitting the titles of CEO and Chair of the Board among U.K companies is not associated with performance improvement. Faleye (2007) find that CEO duality is positively related to organizational complexity, CEO reputation and managerial ownership. His results suggest that firms do consider the costs and benefits of alternative leadership structure. As a result, the observed sample of firms that have chosen one type of leadership structure over the other are not random, consequently the OLS estimates are biased and inconsistent. Prior studies on leadership structure and performance fail to control for such potential selection bias. In this paper we use Heckman two-step procedure and control for the selection bias. We also use the fixed-effect model to control for unobservable factors, which may affect the relationship between CEO duality and firm performance.

Furthermore, we examine the difference between sub-samples of firms announcing new dual CEOs versus non-dual CEOs without CEO replacements. By looking at only title change, without CEO replacements, we provide a clear view as to whether combined titles really affect firm performance. We then use multivariate analyses to examine CEO duality and firm performance controlling for potential endogeneity. We also examine changes in firm performance within the 3-year period surrounding leadership structure changes. We find consistent evidence that there is no significant relationship between CEO duality and firm performance. We find that firms may change their leadership structure (from duality to non-duality or vice versa) in response to deteriorating performance. However, after change in the leadership structure, there is no improvement in firm performance. Our results suggest that the leadership structure in firms is endogenously and optimally determined given firm characteristic and ownership structure.

This paper proceeds as follows. Section 2 describes methods and data. Section 3 presents recent trend in firms' leadership structure. Section 4 reports our empirical tests, and section 5 concludes.

2. Methods and Data

A firm's leadership structure should maximize its value. Each type of leadership structure has its own benefits and costs. A non-duality leadership structure provides better oversight on CEOs and thereby reduces managerial agency costs. But in the mean time, it may generate information sharing costs, create rivalry between CEO and non-CEO chairman, lead to inefficient strategy formulation and implementation. In cases when the costs of maintaining a non-duality leadership structure exceed its monitoring benefits, a duality leadership structure should be preferred. The leadership structure of a firm should be considered an endogenous outcome that maximizes firm valuation given firm's characteristics. Evaluating the impact of leadership structure should also account for the endogeniety of choice of leadership structure. Following Campa and Kedia (2002), we use an endogenous self-selection model and Heckman's (1979) two-step procedure to control for the selection bias.

$$D_{it}^{*} = \alpha Z_{it} + \mu_{it} \quad (1)$$

Where D_{it}^{*} is an unobservable latent variable about the type of leadership structure, Z_{it} is a set of firm characteristics that may affect leadership structure. Suppose a duality leadership structure is chosen if $D_{it}^{*} > 0$, and a non-duality leadership structure is chosen if $D_{it}^{*} \leq 0$. We can only observe whether a firm has a dual CEO or none-dual CEO.

We model a firm's performance (measure by Tobin's Q, the ratio of market value to book value of assets. Market value of assets is computed as market value of equity plus book value of assets minus book value of equity.) as a function of leadership structure and a set of firm characteristics as Equation (2):

$$Q_{it} = \beta_0 + \beta_1 D_{it} + \beta_2 X_{it} + v_{it} \quad (2)$$

Where D_{it} is a CEO duality dummy variable, which equals one if CEO is also the chairman of the board, and is 0 otherwise. The OLS estimation on β_1 will be biased if there is correlation between the error term in equation (1)—μ_{it}, and the error term in equation (2)—v_{it}. We employ a treatment-effects model based on Heckman's (1979) two-step procedure that corrects for self-selection bias. The model accounts for the possibility that some firm specific characteristics that affect leadership structure may also affect firm performance. We first estimate equation (1) using a probit model to get consistent estimates of α, which are then used to get estimates of selectivity correction λ_{it} (lambda, or inverse of Mill's ratio). Then we model firm performance as a function of leadership structure, firm characteristics and selectivity correction as shown in equation (3):

$$Q_{it} = \beta_0 + \beta_1 D_{it} + \beta_2 X_{it} + \beta_3 \lambda_{it} + v_{it} \quad (3)$$

If β_3, the coefficient of λ_{it} is significant, it indicates the existence of self-selection bias. We also use the fixed-effect model to control for unobservable firm characteristics that may affect firm performance.

Besides comparing firm characteristics and performance among firms with different leadership structure, we specifically examine firms changing their leadership structure without replacing their CEOs, which hasn't been done in prior researches. Without controlling for whether CEOs are replaced or not when leadership structure changes, it will be difficult to decide whether the change in firm performance is due to change in CEO or the leadership structure or both, since the new CEOs might have different characteristics or skills, which may affect firm performance as well. Our method therefore provides a better test on the impact of leadership. We collect CEO duality, CEO career information, and compensation data from Standard and Poor's ExecuComp database from 1999 to 2003. ExecuComp includes executive compensation data for firms in the S&P 1500 index, which comprises the S&P 500, the S&P 400 mid cap, and the S&P 600

small cap indices.[41] We obtain accounting data and stock return from COMPUSTAT and Center for Research in Security Prices (CRSP) respectively. Board structure and ownership data are obtained from Compact Disclosure database and proxy statements.

To investigate the effect of CEO duality, we include variables related to corporate governance mechanisms, firm characteristics, agency costs, and compensation structure. For corporate governance mechanisms, we measure the CEO ownership, institutional ownership, board size, percentage of independent directors, financial leverage, G-index,[42] CEO age, and chairman age. These variables reflect the degree of agency problems and internal or external monitoring mechanisms.

Firm characteristics include firm size, firm age, number of business segments, R&D expenses scaled by annual sales, and sales growth in percentage. Firm size is the market value of each firm calculated by stock price at the end of the year times the common shares outstanding. Sales growth is the percentage of sales growth in the last 3 years. These variables provide measures to check if combined or split titles are related to certain type of firms. We follow Ang et al. (2000) in using operating expense ratio and asset utilization to capture agency costs. Operating expense ratio is operating expense scaled by annual sales. Asset utilization ratio is annual sales divided by total assets. Agency costs are inversely related to asset utilization ratio but positively related to expense ratio.

Compensation structure measures how the CEO is compensated. Salary, bonus, value of restricted stock granted, and value of stock options granted are all measured in thousands of dollars. Value of stock options granted is calculated by S&P using the Black and Scholes methodology. Percentage of options granted is calculated by value of stock options granted divided by total compensation. Total compensation is the variable TDC1 extracted from ExecuComp database. It includes salary, bonus, other annual compensation, value of restricted stock granted, value of stock options granted, long-term incentive payouts, and all other total. These variables provide information on whether dual and non-dual CEOs are compensated differently in both dollar amount and in the structure of their compensation, which might result in different incentive for CEO to work hard.

3. Recent trend in CEO duality

Most previous work related to CEO duality focuses on the period of 1980s and early 1990s and find U.S firms are more likely to have combined titles compared with European firms, the percentage of dual CEOs firms is around 80% and there is no evidence of a decline in the popularity of the duality leadership structure in the U.S. (Baliga, Moyer, and Rao, 1996; Brickley, Coles and Jarrel, 1997, among others).[43] Different from previous studies, we investigate CEO duality with a relatively large sample from recent years. Before directly testing the relation among CEO duality, firm characteristics, and firm performance, it is of interest to examine the recent trend in CEO duality. Despite the mixed evidence of superiority of non-duality over duality leadership structure in firm performance, corporations have been facing increasingly stronger pressure from regulators, exchanges, and or shareholders to separate CEO and chairman duties after corporate scandals since 2001. For example, in the U.S., the number of shareholders proposal calling for non-duality leadership structure increase from 3 in 2001 to 20 in 2003, and 32 in 2004 (Faleye, 2007). Table 1 shows a tendency that duality leadership structure is becoming less and less popular in the U.S. Part I of Table 1 shows that the proportion of firms with combined titles drop from about 65.5 percent in 1999 to just over 60 percent in 2003, compared the stable level of 80 percent in the 1980s and early 1990s. More and more firms switch their leadership structure from duality into non-duality as shown in Part II. Among firms that changed their leadership structure, the proportion of firms switching from duality to non-duality increased from 55 percent in 1999 to nearly 70 percent in 2003.

4. Empirical Results

4.1 CEO duality and firm characteristics

Table 2 compares firm characteristics and performance measures for dual versus non-dual CEO firms. We find significant differences in most of the variables.

For corporate governance mechanisms, dual-CEO firms have higher G-index and larger board size, suggesting that dual CEO firms have poorer governance and more inefficient board. Interestingly, dual CEO firms also have higher CEO ownership, which might be required to more strongly align the interests of CEO and shareholders. Dual-CEO firms also have higher institutional ownership and financial leverage, indicating more external monitoring, which also might be required to reduce agency problem resulting from the increased power of dual-CEOs. Similarly, we found a relatively high percentage of independent directors in dual CEO firms. The results suggest that dual CEO firms might suffer poor corporate governance from the board, however, alternative mechanisms (CEO ownership, oversight from institutional investors, more independent board

[41] ExecuComp also contains information on firms that are not currently in the S&P500, the S&P400, and the S&P600 indices, but were previously included in one the aforementioned indices. Thus, the number of observations in each year could be different.

[42] G-index, or governance index as developed by Gompers, Ishii and Metrick (2003), is obtained from http://finance.wharton.upenn.edu/~metrick/governance.xls.

[43] Dahya, and Travlos (2000) provides clear summary of previous studies related to CEO duality.

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members, creditors, etc.) might come to play and reduce the agency costs for CEO duality. There is no significant difference in operating expense ratio between non-dual CEO and dual-CEO firms, while dual-CEO firms have significantly higher asset utilization ratio than non-dual CEO firms. The results indicate that the agency costs of dual-CEO firms are not higher than those of non-dual CEO firms.

Table 1. Distribution of firms with different leadership structure from 1999 to 2003

Table 1 provides the number of Dual and Non-dual CEOs in each year from 1999 to 2003 on part I. Part II provides the distribution of firms that changed their leadership structure in each year.

Year	1999	2000	2001	2002	2003	Average %
I: Distribution of duality and non-duality firms						
Number of firms with dual CEOs	1186	1137	1031	1029	904	62.56
	(65.49)	(63.45)	(61.74)	(61.88)	(60.23)	
Number of firms with non-dual CEOs	625	655	639	634	597	37.44
	(34.51)	(36.55)	(38.26)	(38.12)	(39.77)	
II: Distribution of firms that changed their leadership structure						
Number of firms switching from non-duality to duality	184	150	90	68	67	37.19
	(44.99)	(41.90)	(35.29)	(33.17)	(30.59)	
Number of firms switching from duality to non-duality	225	208	165	137	152	62.81
	(55.01)	(58.10)	(64.71)	(66.83)	(69.41)	

Table 2. Comparisons of Dual and Non-dual CEO Firms

Table 2 provides summary statistics for the whole sample firms and compares firm characteristics between duality and non-duality firms. CEO ownership, insider ownership, institutions ownership, blockholder ownership are the proportions of common stocks held by CEOs, corporate insiders, institutional investors and blockholders respectively. G-index is the governance index constructed by Gompers, Ishii and Metric (2003) to proxy for the level of shareholder rights. Board size is measured by the number of directors. Independent directors are directors whose only connection to the corporation is their directorship. The ratio of independent directors is the number of independent directors divided by the number of directors. Leverage is long-term debt divided by book value of total assets. Tobin's q is the ratio of market value to book value of assets. Market value of assets is computed as market value of equity plus book value of assets minus book value of equity. Return on asset is net income divided by book value of asset. Return on equity is net income divided by book value of common equity. Firm size is natural logarithm of the book value of total assets. Operating income before depreciation, R&D expenses, advertising expenses, capital expenditure, tangible assets are all scaled by book value of total assets. Operating expense scaled by annual sales and asset utilization ratio are measures of agency costs. Salary, bonus, and value of restricted stock granted, Black-Scholas value of options granted, and total compensations are in thousands of dollars. Levels of significance for the t- and Wilcoxon tests are indicated by a, b, and c for 1%, 5%, and 10% respectively. The value in parenthesis is the number of observations.

	All sample firms (5154)		Non-dual CEO firms (1800)		Dual CEO firms (3354)		Differences	
	Mean	Median	Mean	Median	Mean	Median	t-test	Wilcoxon
Corporate governance mechanisms								
CEO ownership	0.026	0.003	0.020	0.002	0.029	0.004	-5.21[a]	-8.44[a]
Insider ownership	0.068	0.018	0.077	0.025	0.063	0.014	3.80[a]	9.87[a]
Institutional ownership	0.651	0.687	0.642	0.671	0.655	0.695	-2.13[b]	-2.67[a]
Blockholder ownership	0.344	0.323	0.380	0.359	0.325	0.301	8.46[a]	8.81[a]
Board size	9.270	9	8.905	9	9.467	9	-7.61[a]	-13.7[a]
Ratio of independent directors	0.650	0.667	0.607	0.625	0.673	0.7	-12.9[a]	-13.3[a]
Leverage	0.200	0.194	0.188	0.169	0.206	0.205	-3.70[a]	-5.35[a]
CEO age	55.26	55	53.67	53	56.12	56	-10.4[a]	-11.6[a]
G-index	9.319	9	8.754	9	9.613	10	-6.94[a]	-7.05[a]
	(1968)	(1968)	(674)	(674)	(1294)	(1294)		
Agency costs								
Operating expense scaled by annual sales	0.263	0.219	0.263	0.224	0.263	0.215	0.034	1.43
	(4261)	(4261)	(1572)	(1572)	(2689)	(2689)		
Asset utilization ratio	1.052	0.895	1.089	0.903	1.032	0.891	2.41[a]	1.39

Table 2 continued

Firm performance and characteristics								
Tobin's q	2.519	1.937	2.638	2.049	2.455	1.866	2.83[a]	6.01[a]
Return on asset	0.025	0.042	0.018	0.043	0.028	0.042	-1.69[c]	-0.96
Return on equity	-0.065	0.109						
	(5153)	(5153)	0.008	0.098	-0.105	0.116	0.475	-6.24[a]
Firm size	7.541	7.358	7.105	6.961	7.776	7.609	-15.5[a]	-14.4[a]
Number of business	2.974	3	2.643	2	3.148	3	-8.93[a]	-9.31[a]
segments	(4618)	(4618)	(1591)	(1591)	(3027)	(3027)		
Firm age	20.55	17	18.13	15	21.84	20	-10.4[a]	-9.13[a]
R&D expenses	0.030	0	0.036	0	0.026	0	5.34[a]	3.04[a]
Advertising expenses	0.011	0	0.010	0	0.012	0	-1.93[c]	-1.98[b]
Operating income before depreciation	0.132	0.130	0.129	0.129	0.134	0.130	-1.69[c]	-1.47
Capital expenditure	0.004	0.041	0.058	0.041	0.054	0.042	2.28[b]	0.723
Sales growth	0.930	0.262	0.695	0.294	1.056	0.246	-1.10	1.218
Tangible assets	0.300	0.241	0.298	0.233	0.302	0.245	-0.63	-1.67[c]
Compensation structure								
Salary	666.7	618.7	552.3	500.6	728.2	696	-19.5[a]	-19.7[a]
Bonus	753.1	383.1	509.0	257.0	884.2	488	-9.59[a]	-11.2[a]
Value of restricted stock granted	534.9	0	385.7	0	614.9	0	-3.11[a]	-6.00[a]
Value of stock	3439.4	951.9	3251.2	716.8	3540.0	1084.6	-0.63	-6.72[a]
options granted	(5135)	(5135)	(1792)	(1792)	(3343)	(3343)		
Total compensation	5828.1	2713.9	4911.2	1964.9	6319.5	3123.8	-2.92[a]	-12.9[a]
	(5135)	(5135)	(1792)	(1792)	(3343)	(3343)		

For firm performance, non-dual CEO firms have mean (median) Tobin's Q of 2.64 (2.05), while dual-CEO firms have mean (median) Tobin's Q of 2.46 (1.87), the differences in mean and median are both significant at the one percent level. Non-dual CEO firms have higher mean return on assets (ROA) than dual-CEO firms but there is no significant difference in median. In contrast, non-dual CEO firms have lower median return on equity (ROE) than dual-CEO firms but there is no significant difference in mean return on equity.[44] In terms of firm characteristics, larger and older firms tend to give combined titles to their CEOs. Firms with combined titles have relatively more business segments. These firms tend to have less growth opportunity, spend less in R&D expenditure, and carry more tangible assets. For CEO compensation structure, dual CEOs have significantly higher total compensation, with higher salary, higher restricted stock, and higher bonuses, while there is no significant difference in stock option.

In the univariate tests we find non-dual-CEO firms have significantly higher Tobin's Q than dual-CEO firms. However, without controlling for other factors that may impact firm performance, we cannot be confident whether leadership structure affects firm performance or not. Since a firm's leadership structure might be an endogenous outcome of its characteristics, we apply Heckman's two-step procedure to control for the endogeneity of leadership structure and examine its impact on firm performance

4.2 Determinants of CEO duality

Table 3 reports a probit regression on the relation between CEO duality and firm characteristics. Model one includes Tobin's Q as a measure of performance. Faleye (2007) finds that organization complexity, CEO reputation, and managerial ownership increase the probability of CEO duality. We find firm size, CEO-age, and CEO-ownership to increase the probability of CEO duality. In addition we find that board independence and institutional ownership are positive determinants, while block ownership is a negative determinant on CEO duality. The performance variable Tobin's q is insignificant, although positive.

[44] Harris and Helfat (1998) located 13 studies providing statistical evidence regarding impact of CEO duality on firm performance. Only three of those studies find negative impact of CEO duality on firm performance. Pi and Timme (1993) examine the banking industry only. Berg and Smith (1978) find a negative impact of CEO duality on return on investment but not on return on equity. Rechner and Dalton (1991) find a negative effect of duality on return on investment and return on equity. We will focus on Tobin's Q, which is a widely used firm performance measure in finance literature.

Table 3. Determinants of CEO duality

This table reports probit regression results of firm performance and characteristics on CEO duality dummy. Firm performance is measured by Tobin's q, return on asset and return on equity. CEO duality dummy equals one if CEOs also act as chairs of the boards of directors and equals zero otherwise. Levels of significance are indicated by a, b, and c for 1%, 5%, and 10% respectively.

Intercept	-2.755[a]	-2.755[a]
Tobin's q	0.00007	
Firm size	0.146[a]	0.146[a]
Sales growth	0.008	0.008
Tangible asset	-0.108	-0.108
CEO age	0.020[a]	0.020[a]
CEO ownership	3.606[a]	3.606[a]
Ratio of independent directors	1.336[a]	1.336[a]
Insider ownership	-0.323	-0.323
Insider ownership square	0.736	0.736
Institutional ownership	0.713[a]	0.713[a]
Blockholder ownership	-0.593[a]	-0.593[a]
Leverage	0.093	0.093
Yeas dummies	Yes	Yes
Industry dummies	Yes	Yes
No. of observations	5154	5154
LR Chi2	658.8	658.8
Pseudo R^2	0.099	0.099

4.3 CEO duality and firm performance

Table 4 reports the effect of CEO duality on firm performance based on OLS regression, a regression using Heckman self-selection model to control for selection bias, and a fixed effect model to control for impacts of non-observable firm characteristics. While many of the firm characteristics variables are statistically significant, our key variable, the dual-CEO dummy variable, is insignificant for all three models. This is strong and robust evidence that, cross-sectionally, there is no evidence that CEO-duality significantly affects firm performance.

Table 4. CEO duality on firm performance

This table reports results of CEO duality on firm performance based on OLS regression which does not control endogeniety of CEO duality, regression using Heckman self-selection model, and fixed effect model to control for the endogenity of CEO duality. Levels of significance are indicated by a, b, and c for 1%, 5%, and 10% respectively.

	OLS	Self-selection	Fixed effects
Intercept	1.993[a]	-1.603[a]	12.67[a]
CEO duality dummy	-0.044	0.014	0.095
Board size	-0.069[a]	-0.070[a]	-0.064[b]
Insider ownership	0.862[c]	0.967[c]	-2.728[a]
Insider ownership square	1.362[c]	3.833[a]	6.823[a]
Institutional ownership	-0.113	0.719[a]	-0.129
Blockholder ownership	-0.249[c]	-1.265[a]	0.177
Firm size	0.065[a]	0.207[a]	-1.352[a]
Leverage	-2.099[a]	-3.416[a]	-1.436[a]
R&D expenses	9.641[a]	9.611[a]	-2.228
A&D expenses	2.385[a]	2.370[a]	3.698
Operating income before depreciation	7.030[a]	7.054[a]	7.121[a]
Capital expenditure	0.094	0.028	0.286
Lambda		3.864[a]	
Yeas dummies	Yes	Yes	No
Industry dummies	Yes	Yes	No
No. of observations	5154	5154	5154
F-Statistic	78.57	79.53	44.75
R^2	0.277	0.287	0.054

4.4 CEO duality change and firm performance

To further investigate the relationship between CEO duality and firm performance, we identify a sample of firms that changed their leadership structure (from dual to non-dual or vice versa). We focus only on firms with new announcement of dual or non-dual CEOs without changing the CEO to avoid the potential contaminating impact of CEO replacement on firm performance. Table 5 reports the effect of CEO duality on firm performance for firms changing their leadership structure without replacing CEOs. Here we use only two of the three earlier regression models, as the fixed effect model is not applicable due to insufficient number of observations.

We again find the CEO duality dummy to be statistically insignificant, though positive, confirming earlier regression results. We note that the existence of endogeneity is indicated in both Table 4 and 5,

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where the coefficients of lambda are both significant at one percent level. This suggests that firms endogenously choose their leadership structure as a part of the broader firm characteristics and ownership structure decision. To provide some evidence of the endogeneous relationship between firm performance and CEO duality, we investigate the time patterns of firm performance around a CEO-duality change.

Table 5. Effects of CEO duality on firm performance for firms changing their leadership structure without replacing CEOs

Fixed-effect model is not applicable due to insufficient number of observations.

	OLS	Self-selection
Intercept	4.573	10.17[a]
CEO duality dummy (1 = dual CEO)	1.076	0.505
Board size	-0.365[b]	-0.354[b]
Insider ownership	-15.17[b]	-16.98[a]
Insider ownership square	35.65[a]	34.31[a]
Institutional ownership	-3.750[b]	-8.182[a]
Blockholder ownership	0.976	1.966
Firm size	0.134	0.035
Leverage	-2.439	-2.336
R&D expenses	6.462[a]	4.530
A&D expenses	38.59[a]	35.02[b]
Operating income before depreciation	7.882[a]	8.729[a]
Capital expenditure	-3.186	-1.108
Lambda		-7.276[a]
Yeas dummies	Yes	Yes
Industry dummies	Yes	Yes
No. of observations	254	254
F-Statistic	4.70	4.95
Adjusted R^2	0.340	0.362

Table 6. Tobin's Q surrounding change in leadership structure

Table 6 reports measures of firm performance from three years before occurrence of change in leadership structure until three years after the change in leadership structure. Firms included are firms that changed their leadership structure without replacing their CEOs. Year 0 is the year in which firms changed their leadership structure.

Year	From dual to non-dual (# of observations)	From non-dual to dual (# of observations)	Mean Difference (t-test, H_0: Diff = 0)
-3	3.144 (54)	2.806 (307)	0.338 (0.862)
-2	3.418 (55)	2.937 (324)	0.482 (0.817)
-1	2.919 (54)	2.902 (323)	0.017 (0.040)
Pre-change average	3.162(163)	2.883 (954)	0.279 (1.006)
0	2.423 (52)	2.768 (323)	-0.345 (-0.927)
1	2.312 (50)	2.454 (319)	-0.142 (-0.634)
2	2.041 (45)	2.394 (302)	-0.353 (-1.758[c])
3	2.422 (40)	2.242 (253)	0.179 (0.524)
Post-change average	2.254 (135)	2.372 (874)	-0.110 (-0.770)
Difference (t-test)	0.908 (3.177[a])	0.511 (3.919[a])	

Table 6 shows Tobins' Q from three years before an announcement of change in leadership structure to three years after the change in leadership structure. As in Table 5, firms included are firms that changed their leadership structure without replacing their CEOs. Figure 1 plots the changes in Tobin's Q. We observe in Table 6 and Figure 1 that firms switching from duality to none duality or vice versa were experiencing deterioration in performance prior to leadership change announcements, and the deterioration in performance continues even after change in leadership structure. For example, for firms that switched from dual CEOs into non-dual CEOs, their three-year average pre-change Tobin's Q is 3.162, exceeding the three-year average post-change Tobin's Q by 0.91. And the difference is significant at the one percent level. Similar results can be found among firms switching from non-dual to dual CEOs. The time pattern in Tobin's q illustrate clearly that CEO duality changes are motivated by firms in response to deteriorating performance, in support of the notion that firm leadership structure is endogenously determined.

Our results therefore cast doubt on the arguments for the non-duality leadership structure, which has been more prevalent after recent corporate scandals.

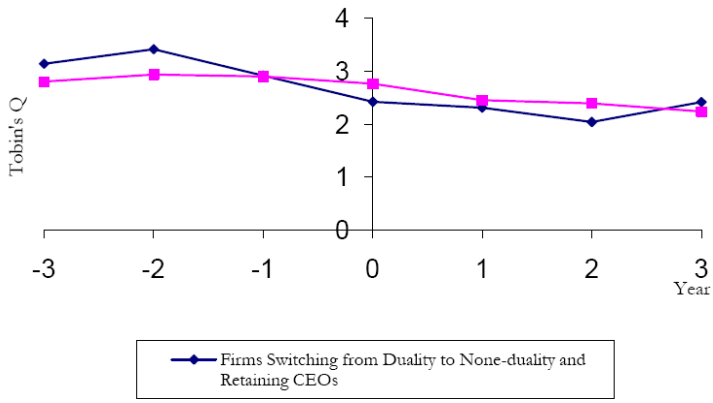

Figure 1. Tobin's Q Surrouding Change in Leadership Structure

5. Conclusion

Both theoretical and empirical studies are inconclusive as to which might be better: vesting both CEO and Chair of the Board positions into one person, or splitting the titles. However, in many countries including the U.S., regulators and investors have become more and more strongly recommending separation of CEO and chairman duties. In this paper, we utilize a more recent set of data and investigate the issue of CEO duality in relation to firm characteristics, ownership characteristics, agency costs, and firm performance. We apply methodology to control for endogeineity of leadership structure.

Our empirical findings provide clear answers to the research question that we raise in the beginning of the paper. We find significant differences in firm characteristics between dual and non-dual CEO firms. However, our multivariate tests find no evidence that CEO duality has a significant effect on firm performance. It is important to note that we find the existence of endogeneity in CEO duality, indicating that the corporate leadership structure is endogenously and optimally determined, given firm characteristic and ownership structure. Our evidence casts doubt on the notion that firms changing from dual to non-dual leadership structure would improve performance. It seems that, given firm characteristics and ownership structure, firms endogenously and optimally determine their choice of dual or non-dual CEO structure. This paper contributes new evidence to this important issue in corporate finance.

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