Performance of Family Firms During the Global Financial Crisis: Does Governance Matter?

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Abstract
We investigate whether better corporate governance impacts the performance of family versus non-family firms during the Global Financial Crisis (GFC). If good governance matters then its impact should be amplified during times of exogenous financial shocks. Furthermore the impact of governance will be more pronounced for family firms as family firms are more resilient, have greater access to survival capital and have a longer term decision making focus. We find that family firms have better governance but family firms have a lower earnings weight in valuation models. However we do find that better governance increased the variability in value however family firms lowered the impact of earnings on variability in value during the GFC.

1. Introduction

Family firm research rightly distinguishes itself from traditional corporate research and the specialist area of research known as small business research (Morck *et al.* 1988). The underlying premise of much of the family firm research is that family firms behave differently from non-family listed firms (Leenders and Waarts 2003; Brunello *et al.* 2003; Chen *et al.* 2005; McConaughy *et al.* 1998; Dornstein and Matalon 1989; Thomsen and Pedersen 2000; Anderson and Reeb 2003; Anderson and Reeb 2004; Wang 2006; Pérez-González 2006; Villalonga and Amit 2009; Chen *et al.* 2008; Maury 2006; Gibb Dyer 2006; Miller and Le Breton-Miller 2006; Miller *et al.* 2007; Heck *et al.* 2008; Morck *et al.* 1988). An associated area of research asserts that governance effects firm performance (Bebchuk *et al.* 2009; Laeven and Levine 2008; Miller *et al.* 2007; Manjon 2007; Kapopoulos and Lazaretou 2007; Caselli and Gatti 2007; Wang 2006; Maury 2006; Jennings *et al.* 2006; Black *et al.* 2006; Barontini and Caprio 2006; Yoshimori 2005; Suk-Yee Lee *et al.* 2005; Aman and Nguyen 2008; Berkman *et al.* 2010; Brown and Caylor 2009). This body of research finds some support for the proposition that firm performance is enhanced by better governance and for family firms. This paper seeks to add to both bodies of research and investigates whether better corporate governance strengthened the performance of family firms relative to non-family firms during the Global Financial Crisis (GFC). The GFC exposed firms to significant external shocks including drying up of finance, overnight failure of customers and markets, downturns in revenue and spikes in uncertainty and negative sentiment (Crottry 2009). Such adverse conditions test the ability of the firm, managers and owners to marshal resources and develop strategies to allow the firm to respond to the external shock and therefore survive and perform. If family firms are more resilient, have greater access to survival capital and have a longer term decision making focus, then during the GFC these factors should magnify any performance differences between family and non-family firms.

The remainder of the paper proceeds as follows. Section two reviews prior literature and distils the key theoretical relationships between corporate family firm and governance characteristics and firm performance and presents the testable hypothesis. Section three describes the research design which includes the sample, variable measures and the empirical methods used to the relationship between corporate governance and performance for family and non-family firms. Section four tests the hypothesis and presents the results of the data analyses. Finally, section five offers a discussion of the results and their implications as well as a conclusion to the paper.

2. Literature Review and Hypotheses Development

Our starting premise is that family firms outperform non-family firms due to distinct differences in management and control mechanisms and the unique bonds that link the family to the firm (Villalonga and Amit 2009; Adams *et al.* 2009; Manjon 2007; Bennedsen *et al.* 2007; Pérez-González 2006; Miller and Le Breton-Miller 2006; Maury 2006; Barontini and Caprio 2006; Liu and Sun 2005; Helland and Sykuta 2005; Chen *et al.* 2005; Booth *et al.* 2002; Mak and Roush 2000; Denis and Sarin 1999; McConaughy *et al.* 1998; Maug 1997; Blair 1996; Short 1994; Barnhart *et al.* 1994). The family firm literature has established factors such as decision making and intangible assets that differentiate family firms (Hasso and Duncan 2010). Furthermore, evidence suggests that family firm factors are associated with family firms outperforming non-family firms (Sirmon and Hitt 2003). Our proposition is that this relation holds true during the external GFC shock.

Proposition 1: Family firms outperform non-family firms during the GFC.

To explore this proposition we employ Ohlson's (1995) valuation framework that models value as a function of earnings and book value, the core information signals that capture the performance of management be they family or non-family management teams.

$$MV_{it} = \gamma_0 + \gamma_1 X_{it} + \gamma_2 BV_{it} \quad (1)$$

Where MV_{it} is market value of firm *i* in period *t*, X_{it} is firm *i*'s earnings for period *t* and BV_{it} is the book value of equity for firm *i* at the end of period *t*. If we divide through by book value we get:

$$MV_{it}/BV_{it} = \gamma_2 + \gamma_0/BV_{it} + \gamma_1 X_{it}/BV_{it}$$

Define $\alpha_0 = \gamma_2 + \gamma_0/BV_{it}$ to be a fixed effect which reduces the value relationship to the following:

$$MV_{it}/BV_{it} = \alpha_0 + \gamma_1 X_{it}/BV_{it} \quad (2)$$

The family firm literature has tested two aspects of this relation namely whether the dependent variable, a measure of value, and the independent variable, a measure of performance, are different between family and non-family firms. Typically value has been operationalised as market to book value (or price to book value PB), a proxy for Tobin's *Q* (Black *et al.* 2006; Dwivedi and Jain 2005; Chen *et al.* 2003; Callahan *et al.* 2003; Morck *et al.* 1988; Lemmon and Lins 2003), the left hand side of equation (2) above. Similarly performance is typically operationalised as return on equity (the second term in equation (2)) or a derivation such as return on assets. What does this evidence tell us? If we consider equation (2) above it could be that the observed higher Tobin's *Q* for family firms is due to higher earnings or return on equity. However the conflicting earnings evidence (Hasso and Duncan 2010) suggests that the nature of the innovation is more complex or that there are other factors that are not specified. Nevertheless there is fairly consistent evidence that family firms exhibit higher Tobin's *Q* (Black *et al.* 2006; Dwivedi and Jain 2005; Chen *et al.* 2003; Callahan *et al.* 2003; Morck *et al.* 1988; Lemmon and Lins 2003). If this observed result is not due to earnings innovations (ROE or ROA) for family firms then equation (2) suggests an alternative argument that family firm factors impact the fixed effect or slope coefficients α_0 and γ_1. The latter slope parameter means that family firms enjoy a higher earnings capitalisation parameter or price earnings (PE) ratio.

The implication for valuation is that researchers need to focus on factors that impact the slope coefficient rather than earnings per se to better understand the drivers of family firm value. One such factor is the nature of the corporate governance adopted by the firm. We argue that

if governance has a role in increasing firm performance and value, as suggested by the prior theory and evidence (Brown and Caylor 2009; Klein 1998; Bebchuk *et al.* 2009; Miller *et al.* 2007; Kapopoulos and Lazaretou 2007; Miller and Le Breton-Miller 2006; Khurana and Raman 2006), then this effect should be most evident when the firms face adverse circumstances and be amplified for family firms. Often firms manage shocks that are endogenous while on other occasions they are completely exogenous such as the GFC. We expect that the governance impact during the GFC should manifest in greater monitoring and transparency, improved financial decision making, and improved risk assessment. Our proposition is that family firms with better corporate governance (more formal governance structures and process in place) will outperform all other firms.

Proposition 2: Better corporate governance will contribute to the performance difference of family firms during the GFC.

To explore this proposition we reformulate the value relationship as a returns analysis by taking first differences of equation (1), dividing by opening market value so that the dependant variable becomes the return for firm *i* in period *t*, R_{it} , to arrive at equation (3) where return is a function of change in earnings and earnings as follows:

$$R_{it} = \omega_0 + \omega_1 \Delta X_{it} + \omega_2 X_{it} \quad (3)$$

Our argument is that family factors (*FF*) and corporate governance (*GOV*) impact the slope coefficients ω_1 and ω_2 as follows:

$$\omega_1 = \delta_0 + \delta_1 FF_i + \delta_2 GOV_i$$

$$\omega_2 = \varphi_0 + \varphi_1 FF_i + \varphi_2 GOV_i$$

Substituting into equation (3) and rearranging (see Appendix A) we arrive at a reduced form model including controls for size, leverage, age, and industry dummies as follows:

$$R_{it} = \beta_0 + \beta_1 X_{it} + \beta_2 X_{it} FF_i + \beta_3 X_{it} GOV_i + \beta_4 Control_{ji} + \varepsilon_i \quad \text{Model (1)}$$

Model 1 suggests that returns for family firms will be impacted by family factors and governance factors via slope dummy variables. We also investigate several derivations of Model 1. In addition to returns analysis we also consider a two levels specification drawing on the Ohlson (1995) formulation again in Models 2 and 3 as follows:

$$P_{it} = \beta_0 + \beta_1 X_{it} + \beta_2 X_{it} FF_i + \beta_3 X_{it} GOV_i + \beta_4 BV_{it} + \beta_5 BV_{it} FF_i + \beta_6 BV_{it} GOV_i + \beta_7 Control_{ji} + \varepsilon_i \quad \text{Model (2)}$$

Where BV_{it} is Book Value of the net assets firm *i* in period *t*. Model 3 is Model 2 divided by total assets and assuming that the book value ratios are captured by the intercept we get Tobin's *Q* as a function of return on assert with slope dummies for family firms and governance (similar to equation (2) earlier).

$$TobinQ_{it} = \beta_0 + \beta_1 ROA_{it} + \beta_2 ROA_{it} FF_i + \beta_3 ROA_{it} GOV_i + \beta_4 Control_{ji} + \varepsilon_i \quad \text{Model (3)}$$

Finally we consider two properties of Tobin's *Q*: specifically whether family control and corporate governance impact the change in Tobin's *Q* and the variance in Tobin's *Q* during the GFC.

$$\Delta TobinQ_{i(t\ to\ t+n)} = \beta_0 + \beta_1 X_{i(t\ to\ t+n)} + \beta_2 X_{i(t\ to\ t+n)} FF_i + \beta_3 X_{i(t\ to\ t+n)} GOV_i + \beta_4 StdDevX_{i(t\ to\ t+n)} + \beta_5 Control_{ji} + \varepsilon_i \quad \text{Model (4)}$$

$$SDTobinQ_{i(t\ to\ t+n)} = \beta_0 + \beta_1 X_{i(t\ to\ t+n)} + \beta_2 X_{i(t\ to\ t+n)} FF_i + \beta_3 X_{i(t\ to\ t+n)} GOV_i + \beta_4 StdDevX_{i(t\ to\ t+n)} + \beta_5 Control_{ji} + \varepsilon_i \quad \text{Model (5)}$$

3. Data, Variables and Methodology

3.1 Sample

Our initial sample consists of 2293 non-financial companies listed on the Australian Securities Exchange (ASX). Excluding non-trading companies and those with missing of incomplete data reduces the final sample to 665. Of these 125 or about 23% are identified as family firms in prior research (Yupitun 2008). The data are collected from annual reports and database information from AspectHuntley's DatAnalysis and FinAnalysis and Thomson Reuters Tick History (TRTH).

Insert Table 1 about here

3.2 Variables

We define a firm to be a family controlled firm when the family is the largest shareholder and one officer or director (Yupitun 2008; Villalonga and Amit 2006). To capture this definition in our analysis we create a dummy family firm variable, *FF*, as follows:

$$FF_i = \begin{cases} 1 \text{ if firm}_i \text{ is a family firm} \\ 0 \text{ otherwise} \end{cases}$$

We employ fourteen individual governance variables to capture the multi-faceted governance concept, drawn from the prior literature and shown in Table 2 (Kent and Stewart 2008; Fama and Jensen 1983b, 1983a; Davidson *et al.* 2006; Daily and Dalton 1994; Ang *et al.* 2000). The individual governance measures include board independence, duality of the role of board chair and chief executive officer, board size, board meeting, the presence of a nomination committee, the presence of a remuneration committee, audit committee independence, financial expertise of the audit committee, audit committee meetings, size of audit committee, audit committee charter, identity of external auditor, blockholders and insider ownership.

Insert Table 2 about here

Consistent with previous literature, the we compute a corporate governance composite that summarises the fourteen individual corporate governance variables into a single index of governance (Gompers *et al.* 2003; Defond *et al.* 2005). All governance variables are transformed to a binary scale by allocating a value of one if the individual corporate governance variable is above the sample median and zero otherwise. The fourteen dichotomous variables are summed to produce a governance composite, *GovIndex*, which has a maximum value of fourteen (indicating strong corporate governance) and a minimum value of zero (indicating weak corporate governance) (Defond et al. 2005) as follows:

$$GovIndex_i = \sum_{j=1}^{14} CorpGov_{ji}$$

Where:

$GovIndex_i$ = Aggregate index of corporate governance for firm *i*.
$CorpGov_{ji}$ = *j*th individual corporate governance variable for firm *i* (see Table 2).

We also include controls for age, leverage, size and industry in the estimation models. Company age, *AGE* is the number of years since incorporation (Pittman and Fortin 2004; Diamond 1989). Leverage, *LEV*, is measured as total debt divided by total assets (Ashbaugh-Skaife *et al.* 2006; Klock *et al.* 2005). Company size, *SIZE*, is the log of total assets (Pittman and Fortin 2004; Sengupta 1998). Finally, industry is measured using a fixed effect model where a dummy variable is created for each of the industries in the market (Anderson *et al.* 2004; Pittman and Fortin 2004).

3.3 Methodology

Prior research indentifies governance to be endogenously determined.[1] Hence we employ a two stage methodology to explicitly control for potential endogeneity issues. Research suggests governance is a function of the nature of the firm including its capital structure, complexity, size, ownership and control structures (Bhagat and Bolton 2008). To capture these relationships, stage one of our analysis regresses the governance index (*GovIndex*) on *LEV*, *SIZE* and *FF* (a dummy variable for the firm either being family firm, coded as one, or non-family firm, coded as zero). We save the estimated governance scores, $\widehat{GOV}$, for each firm from the stage one regression and employ this estimated proxy for governance in all subsequent models.

4. Analysis and Results

4.1 Descriptive Statistics

Descriptive statistics for the main variables in the models are reported in Table 3 for the pooled sample and for the family and non-family firm sub-samples. We also report the results for an ANOVA testing the equivalence of the variable means for family and non-family firms. The only variable that is significantly different for the family firms is *GovIndex*. Family firms have a greater governance score on average compared to non-family firms. This is largely driven by more frequent remuneration committees and higher prevalence of quality financial oversight characteristics (i.e. Audit Committee characteristics).

Insert Table 3 about here

The average return for 2008 is negative for all firms and the sub-samples reflective of the down turn due to the GFC. As shown in Figure 1 the 2006-2007 period was very prosperous on average for firms but that the GFC affected returns in 2008 and 2009 only to bounce back in 2010.

Insert Figure 1 about here

4.2 Stage One: Governance Estimation

In stage one of the analysis we regress our corporate governance composite, *GovIndex*, on a series of instrumental variables, namely *LEV*, *SIZE* and *FF*, to estimate our proxy governance

[1] Endogeneity issues plague much of the governance (see Brown et al. (2011) for a review) and more generally accounting (see Larcker and Rusticus (2010) for a review) and finance see Bhagat and Bolton (2008)).

variable, $\widehat{GOV}$. The results for this estimation are presented in Table 4 and show *GovIndex* is positively related to the three instrumental variables at the one percent significance level. Higher governance firms tend to be larger, more highly levered and to a less extent family controlled. The estimated values for governance ($\widehat{GOV}$), are saved and used in the next phase of the analysis.

Insert Table 4 about here

4.3 Stage Two: Model Estimation

Stage two of the analysis estimates the returns and levels models developed in the theory section to test whether better corporate governance impacts the performance of family versus non-family firms during the GFC. Table 4 reports the results for the five models estimated. However, we are unable to empirically test the theoretical models as specified earlier due to multicolinearity. The variance inflation factors for any specification of a governance slope dummy and an independent variable are outside the normal bounds.[2] Hence for all the stage two models in Table 4 we replace the governance slope dummy variables with the estimated governance proxy, $\widehat{GOV}$.

Model 1 examines the relationship between 2008 returns, earnings and the impact of family and governance factors. The results show that returns are negatively related to $\widehat{GOV}$at the one percent significance level and positively related to AGE at the five percent significant level. Given that governance is driven largely by size this suggests that smaller firms with lower governance performed better in terms of return during the drop in 2008. However the explanatory power of the model is low at two percent and thus the majority of the explanation is simply the larger exogenous impact of the GFC on market prices in 2008.

In Model 2 we explore a levels model to explore the relationship between share price, earnings and book value. The results in Table 4 indicate that share price is positively related to earnings and book value at the one and ten percent levels respectively. This is consistent with the standard Ohlson (1995) valuation framework. The negative earnings-family firm slope dummy suggests that the earnings for family firms have less valuation relevance than for non-family firms. However the positive slope dummy for book value for family firms suggests assets have a higher weighting than for non-family firms. Furthermore governance has a positive impact over and above the earnings and book value components. Finally firm age is negatively related to price that the ten percent level.

We also test another levels specification in Model 3 where we explore the relationship between Tobin's *Q* and earnings, governance and the impact of family control. The analysis in Table 4 shows that firms with higher governance have a higher Tobin's *Q* or market to book ratio. This is consistent with the results for Model 2 where family firms (which have a higher governance score) are valued more on book value of assets than earnings relative to non-family firms. Older firms are also more likely to have a higher market to book ratio at the five percent level.

Finally Models 4 and 5 test properties of the Tobin's *Q* levels valuation specification. Model 4 tests whether change in Tobin's *Q* between 2007 and 2010 (taking end of 2006 as the start point) is related to aggregate earnings and standard deviation in earnings, a variation on the Easton Harris and Ohlson's (1992) long events window analysis. The results show that

[2] For every governance slope dummy combination the VIF is greater than 5-10, see Gujarati and Porter (2009).

change in Tobin's *Q* is negatively related to aggregate earnings in the corresponding period at the ten percent level. Furthermore family firms have the same earnings impact as non-family firms as the slope dummy is insignificant. Earnings variability is the most significant driver of the change in Tobin's *Q*. Firms with higher earnings variability during the period of the GFC (i.e. from 2007-2010) had significantly lower changes in Tobin's *Q* at the one percent level. Governance also had a negative impact on the change in Tobin's *Q* during the GFC in that firms with higher governance had a lower absolute change in Tobin's *Q* from before to after the GFC (i.e. between the end of 2006 and end of 2010).

The final model we tested, Model 5, examines the drivers of variability in Tobin's *Q*. Firms with higher governance, higher aggregate earnings, and higher variability in earnings tend to have higher variability in Tobin's *Q* (significant at five percent or below). However the earnings impact is lower for family firms, reflective of the lower weighting on earnings evidenced for family firms in Model 2. Older firms have lower Tobin's *Q* variability.

5. Discussion and Conclusion

Contrary to our expectations, we find that family firms have statistically significantly better governance but that family firms have a negative impact on the earnings coefficient for our valuation model. That is, investors do not see earnings announcements by family firms as more reliable than for non-family firms but in fact they are less reliable. This is consistent with the only other study of an exogenous financial impact on firm performance. Lemmon and Lins (2003) studied the effect of ownership structure on firm value during the East Asian financial crisis that began in July 1997. The crisis was also a negative shock to the investment opportunities of firms in these markets. They find that corporate ownership structure played an important role in determining the incentives of insiders to expropriate minority shareholders during the times of declining investment opportunities presumably leading to mistrust by investors of family firm earnings disclosures under those conditions.

We find a positive effect (at the ten percent level) for both governance and family firm influence in the Balance Sheet's contribution to market value. The fact that family firms effect the reliability placed on the Balance Sheet disclosures suggest the market perceives that it is easier to manipulate earnings in times of crisis that it is the Balance Sheet. Contrary to prior studies (McConnell and Servaes 1990; Morck *et al.* 1988), we do not find that family firms display a significantly higher Tobin's *Q* than do non-family firms. Firms displaying *Q*'s greater than unity are judged as using scarce resources effectively and those with *Q*'s less than unity as using resources poorly (Lewellen and Badrinath 1997). Family firms are no more efficient during the GFC than are other firms.

The resultant research question from this study is whether family firms can make changes to their governance structure that would reduce the perception that expropriations may be made during times of financial crisis. Specifically, would ensuring the Chair of the Board and the Chair of the Audit Committee are not members of the "family" increase the perception of the independence of the governance structures?

TABLE 1
Sample Details

Nonfinancial Firms	2293	
Cases with no Revenue (non trading firms)	1022	
Missing Data: Governance, Value, Age, Financial and Performance	606	
Final Sample	665	
Family Firms	125	(23%)
Non-Family Firms	540	(77%)

TABLE 2
Corporate Governance Measures

Variable Name	Variable Description
BDSIZE	Number of directors on the board.
BDMEET	Number of board meetings.
INDP	Proportion of non-executive independent directors on the board.
DUAL	One if the CEO is separate from chair of the board, and zero otherwise.
NOM	One if the company has a nomination committee, and zero otherwise.
REM	One if company has a remuneration committee, and zero otherwise.
AUDCHRT	One if the company has an audit committee charter, and zero otherwise.
AUDIND	Proportion of non-executive independent members on the audit committee.
AUDEXP	Proportion of audit committee members with accounting and finance qualifications.
AUDSIZE	Number of directors on audit committee.
AUDMEET	Number of audit committee meetings.
AUDITOR	One if the auditor is a Big Four, and zero otherwise.
BLOCK	Percentage of shares owned by investors owning 5 percent or more of the company's shares.
INSIDER	Percentage of company's shares owned by insiders.

FIGURE 1
Average Firm Return 2006-2010

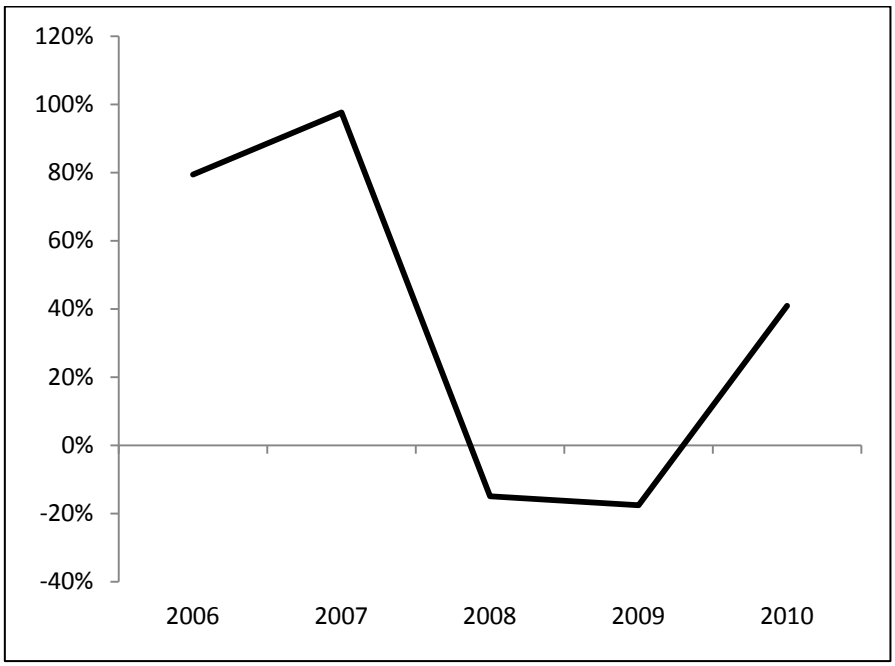

TABLE 3
Descriptive Statistics and ANOVA Test

		Pooled		*Family Firms*		*Non-Family Firms*		*ANOVA*[a]	
Variables	*Definition*	*Mean*	*Std.Dev.*	*Mean*	*Std.Dev.*	*Mean*	*Std.Dev.*	*F*	*Sig.*
GovIndex	Governance Index summated scale, 0 to 14	7.17	3.71	7.88	3.56	7.01	3.73	5.61**	.018
SIZE	Log of Total Assets	7.63	.87	7.61	.79	7.64	.89	.12	.732
LEV	Leverage - Debt to Assets	.33	.24	.35	.22	.33	.24	1.06	.304
AGE	Years	20.51	17.59	18.54	14.65	20.97	18.19	1.95	.163
P_{it}	Price per share, t = 2008	1.89	5.11	1.63	3.22	1.95	5.45	.40	.527
R_{it}	Return = $(P_t-P_{t-1})/P_{t-1}$, t = 2008	-.15	1.08	-.23	.76	-.13	1.14	.90	.34
$TobinQ_t$	Tobin's *Q* = (Market value equity + Short term debt + Long term debt)/Total Assets, t = 2008	2.43	6.26	2.16	4.13	2.49	6.66	.29	.590
X_t	Earnings Before Interest and Tax divided by weighted number of shares, t = 2008	.15	.47	.16	.37	.15	.50	.09	.769
BV	Book Value of Net Assets/weighted no. of shares	.84	1.98	.85	1.43	.83	2.08	.01	.938
ROA_t	Return on Assets, t = 2008	-.21	.97	-.11	.78	-.23	1.00	1.49	.223
$X_{i(t\ to\ t+n)}$	EBIT per share summed for t = 2007 to 2010	.56	1.68	.64	1.38	.54	1.74	.35	.555
$StdDevX_{i(t\ to\ t+n)}$	Standard deviation EBIT/ share, t = 2007 to 2010	.08	.18	.07	.09	.09	.19	.98	.322
$\Delta TobinQ_{i(t\ to\ t+n)}$	Change in Tobin's *Q*, t = 2007 to 2010	-.88	3.69	-.88	3.13	-.88	3.81	.00	.998
$SDTobinQ_{i(t\ to\ t+n)}$	Standard deviation Tobin's *Q*, t = 2007 to 2010	.81	1.99	.83	1.53	.81	2.08	.01	.911

Notes:
The sample consists of 125 family and 540 non-family firms that were listed on the ASX during the financial years of 2007-2010.
All variables are measured at fiscal year-end 2007 (unless otherwise indicated).
[a] ANOVA compares family and non-family firms for all variables.
***, **, * Significant at 1, 5, and 10 percent levels respectively

TABLE 4
Governance, Family Control and Valuation

	Stage One	*Stage Two Models*				
Variables	*GovIndex*	*(1) Return*	*(2) Price*	*(3) TobinQ*	*(4) ΔTobinQ*	*(5) SDTobinQ*
Intercept	-11.252*** (-10.580)	0.140 (0.544)	-0.967** (-1.991)	(-10.768)*** (-10.975)	1.529** (2.470)	-0.390 (1.642)
FF	0.889*** (3.052)				0.052 (0.144)	0.133 (0.984)
SIZE	2.306*** (15.644)					
LEV	1.995*** (3.674)					
$\widehat{GOV}$		-0.064*** (-2.678)	0.106* 1.888	1.541*** (14.622)	-0.264*** (-3.557)	0.086*** (3.147)
X		0.013 (1.233)	9.195*** (25.390)			
XFF		-0.029 (-0.111)	-4.396*** (-4.395)			
BV			0.159* (1.899)			
BVFF			0.426* (1.731)			
ROA				(-0.242) (-1.028)		
ROAFF				0.306 (0.476)		
$X_{(2007\text{-}2010)}$					-0.204* (1.892)	0.595*** (14.910)
$X_{(2007\text{-}2010)}FF$					0.118 (0.521)	-0.207** (-2.478)
$StdDevX_{(2007\text{-}2010)}$					-7.624*** (-8.694)	4.563*** (14.069)
AGE		0.006** (2.421)	(-.010)* (-1.655)	0.031** (2.511)	0.019** (2.395)	-0.015*** (-5.115)
Industry Fixed Effects	No	Yes	Yes	Yes	Yes	Yes
Adjusted R^2	0.357	0.023	0.771	0.297	0.236	0.640
F	133.78***	2.32**	160.55***	24.40***	15.56***	85.25***

Notes:

***, **, * Significant at 1, 5, and 10 percent levels respectively

The table reports stage-one governance estimation and stage-two returns and levels model estimations.
Model 1 is a returns model while Models 2 and 3 are levels models.
Models 4 and 5 test properties of Model 3 namely change and variance.

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Appendix A – Model Analytics

To explore proposition two we reformulate the value relationship as a returns analysis by taking a first difference of equation (1).

$$MV_{it} - MV_{it-1} = (\gamma_0 - \gamma_0) + (\gamma_1 X_{it} - \gamma_1 X_{it-1}) + (\gamma_2 BV_{it} - \gamma_2 BV_{it-1})$$

If we divide by opening market value the dependant variable becomes the return for firm *i* in period *t*, R_{it} , and if we add a fixed effect ω_0 (which in theory should be zero) and define $\omega_1 = \gamma_1 / MV_{it-1}$ and $\omega_2 = \gamma_2 / MV_{it-1}$ we get:

$$R_{it} = \omega_0 + \omega_1 (X_{it} - X_{it-1}) + \omega_2 (BV_{it} - BV_{it-1})$$

Recognising that change in book value is earnings we can restate to get equation 3 as follows:

$$R_{it} = \omega_0 + \omega_1 \Delta X_{it} + \omega_2 X_{it} \quad (3)$$

Our argument is that family factors (*FF*) and corporate governance (*GOV*) impact the slope coefficients ω_1 and ω_2 as follows:

$$\omega_1 = \delta_0 + \delta_1 FF_i + \delta_2 GOV_{ij}$$
$$\omega_2 = \varphi_0 + \varphi_1 FF_i + \varphi_2 GOV_{ij}$$

Substituting into equation (3) we get:

$$R_{it} = \omega_0 + (\delta_0 + \delta_1 FF_i + \delta_2 GOV_{ij}) \Delta X_{it} + (\varphi_0 + \varphi_1 FF_i + \varphi_2 GOV_{ij}) X_{it}$$

Multiplying through and collecting terms gives us:

$$R_{it} = \omega_0 + \delta_0 \Delta X_{it} + \varphi_0 X_{it} + \delta_1 FF_i \Delta X_{it} + \varphi_1 FF_i X_{it} + \delta_2 GOV_{ij} \Delta X_{it} + \varphi_2 GOV_{ij} X_{it}$$

Substituting aX_{it} for ΔX_{it} and we get:

$$R_{it} = \omega_0 + (\delta_0 a + \varphi_0) X_{it} + (\delta_1 a + \varphi_1) X_{it} FF_{ij} + (\delta_2 a + \varphi_2) X_{it} GOV_{ij}$$

To test this model we will estimate the final reduced form model including controls for size, leverage, age, and industry dummies as follows:

$$R_{it} = \beta_0 + \beta_1 X_{it} + \beta_2 X_{it} FF_{ij} + \beta_3 X_{it} GOV_{ij} + \beta_4 Controls_{ij}$$

The model suggests that returns for family firms will be impacted by family factors and governance factors via slope dummy variables.