The Effect of Independent Directors on Firm Value

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ABSTRACT:

Separation between management and ownership is the main reason for the rise of the different agency problems faced by many firms. The failure of giant firms such as, Enron and WorldCom, gave rise to a series of efforts to improve corporate governance. Reforms are imposed on companies in order to protect shareholders' rights. A major requirement was to increase the number of outsiders serving on the board of directors. However, the effectiveness of independent directors was and still is an important topic for researchers especially after the rush of adding more outsiders post the Sarbanes-Oxley act.

The research paper investigates whether current board structures are becoming more effective than before. And to investigate whether increasing the independent directors for a high managerial entrenched firm will have a higher impact on shareholders' wealth. The findings support the fact that when management is highly entrenched, an increase in outsiders will lower the negative impact of percentage independent directors on the firm value.

Keywords: corporate governance, firm value, independent directors, managerial entrenchment, Sarbanes Oxley act.

INTODUCTION

"Corporation law virtually carves the separation of ownership and control into stone." This is how Bainbridge (2008) explains it. We just can't deny that this separation of ownership facilitated the growth of large industrial corporations. However, this separation has crossed the red line and became a controversial issue understudy; it resulted with a central problem of corporate governance. Scientists later recognized that on the long run, this separation created a potential shareholder and managerial interests to diverge. As we clearly know it, shareholders have a claim on the corporation's earnings and profits but it's the managers who decide how to spend these earnings and not the shareholders; here where the problem of agency costs falls. Managers might choose to use these earnings to capitalize on projects benefiting themselves rather than distributing it as dividends for the shareholders. Then how can shareholders be protected? It's the responsibility of the board of directors to protect stockholders' rights and achieve the goal of maximizing shareholders' wealth. However, due to the minimal direct control of the shareholders on the board, they aren't able to prevent directors from abusing the companies' earning to the interest of managers.

Bainbridge (2008) raised an important question: "Will the board of directors in fact use its control of the corporation to further the selfish interest of the board members rather than pursue the shareholders' right of wealth maximization?" Surprisingly, many large corporations fell as a result of this greedy act. The scandal of Enron, WorldCom, and Tyco pushed the Congress to pass an Act know as Sarbanes-Oxley Act in order to empower the board to achieve the effective desired goals. As an effect of this act, the three important major exchanges: NYSE, NASDAQ and AMEX updated their corporate governance standards requiring listed companies to assign the majority of the board to be independent directors and to expand their powers and duties. As Rosenstein and Wyatt put it, "outside directors are those who are not affiliated with the firm in any way except in terms of his/her directorial duties."

Following this act, the effect of independent directors- also shall be referred as "outsiders" became a hot topic nowadays. Many researchers criticized this act as being harmful for the investors, while others encouraged this act. Throughout this paper, we study the effect of independent directors on firm value. Using an interactive variable between managerial entrenchment and outsiders, our empirical results suggest that when management is highly entrenched, an increase in independent directors will have less negative impact compared to a low entrenched firm. We further try to investigate whether firm performed better after the Sarbanes-Oxley act. In fact, after the huge rush of electing outsiders post the SOX, the desired outcome was achieved.

LITERATURE REVIEW

Many research findings on the effect of independent directors on shareholders' wealth were conducted. However, studies that examine this correlation between the percentage of independent directors and firm value yield many results.

Rosenstein and Wyatt (1990) studied a sample of two different board compositions. They investigated a sample of 1251 outside director announcements. The results came to show that an

increase in the portion of independent directors is positively correlated with the market value of the firm ($\rho= +0.51$). However, a negative correlation was detected upon increasing the percentage of inside directors ($\rho= -0.10$). They further investigated the impact of a replacement announcement of an insider by an outsider. Using an event study methodology, the authors suggest that substituting an outsider for an insider have a similar effect as expanding the board by an independent director; they both tend to increase the value of the firm. Thus they concluded their study by their hypothesis that "outside directors are selected, on average, in the interest of shareholders".

Moreover, Rosenstein and Wyatt (1991) conducted another test to stress on the credibility of their previous findings. This time, rather than concentrating on a sample of outsiders, they chose a sample of 170 inside director announcements either as an expansion of the board or as replacement of an insider by an outsider. Authors state that there is no benefit or a signal associated with the appointment of an inside director. Rather, the statistical analysis showed an abnormal negative return of -0.0009 indicating that on average, the stock market reaction is close to zero post to an insider appointment and thus validating their previous hypothesis.

Block (1996) expanded the study that was done by Rosenstein and Wyatt. However, his study gave a special attention to an important issue known as the incremental Value of adding one more outsider to the board. He concluded that the positive relation between firm value and percentage of independent directors tends to zero as outsiders increase. He argues that once the threshold of adding an outsider is met, the firm should stop hiring any additional outsider. His statistical results show that on average the impact of a new appointment is greatest in the 30 to 50 percent range and then starts to diminish throughout.

Harley and Wiggins (2003) explain that independent directors' earnings are based on equity and thus provide incentives closely aligned with those of the shareholders. That is to say, those outsiders protect shareholders' rights. However, when the board is being controlled by a large number of insiders, the firm is less likely to increase the equity-based incentives for their directors which may lead to an increase in agency problems in these firms due to lower compensation earned by the board.

In his study conducted in US, Australia and Europe, Ritchie (2007) argues about the fact that independent directors help improve corporate governance. He stresses on the idea that outsiders are not always beneficial for the corporation and supports the hypothesis that there is an indirect correlation between independent directors and company performance. He even adds that a negative correlation is detected when the majority of the boards are outsiders. Ritchie continues by adding that an independent director does not have any lasting positive effect on share prices because in his point of view, once outsiders become directors, they no more become a third party to the company and may start fighting for their best interest (such as not taking risks as they have nothing to gain). He finalizes his work criticizing outsiders' knowledge. He argues that most outsiders lack experience and expertise regarding the company's objective. In his point of view, inside managers are more effective and efficient when serving on the board.

Another study was held by Li, Wang, and Deng (2007). They tested a sample of several Chinese companies that encountered financial distress in year 1985 through 2005. A series of five hypotheses were generated and one of them studied the assumption that "independent directors are negatively related to financial distress". The results came to be significant and Li, Wang and Deng concluded that companies with higher portion of independent directors are less

likely to encounter financial distress as outsiders enjoy "monitor and control" power over the management. A similar study was also conducted in Korea by Choi, Park and Yoo (2006). They tested the effect of increasing the percentage of outsiders on the firm value measured by Tobin's Q after the Asian financial crisis. A positive significant relation was detected between independent directors and firm value, while an insignificant correlation between increasing grey directors and shareholders' wealth was also noticed. Moreover, a recent study in Japan was done by Chunyan, Jianlei and Uchida (2010). Their hypothesis covered two parts; the first one studied the correlation between management turnover and independent directors, while the second one tested the correlation between outsiders and dividend payments. The authors chose a sample of 804 firms listed on the TSE (Tokyo stock Exchange) that experienced a 33% performance decline during the financial crisis. They came up with two different conclusions. First, that the fraction of outsiders over total board is positively related to the frequency of management turnover. They argued that independent directors critically monitor management, making turnovers more sensitive to poor firm performance. The final result showed that increasing the portion of outsiders is negatively related to the likelihood that a corporation will decrease its dividend payments. This suggests that independent boards discipline management and protect shareholders' wealth.

Two studies were done by Bhagat and Black (2000 and 2002) on whether board independence improves firm performance. Their results came to show that a negative relation exists between board independence and shareholder's wealth. They argue that insiders do have a positive effect on firm value due to their knowledge and expertise about the corporation. They add that although inside directors are conflicted, but they are well informed. However, independent directors are not conflicted, but are relatively ignorant about the company. They also mention the idea that due to the trivial number of shares most outsiders have, they tend to have minimal incentives to monitor. The authors end by suggesting that an optimal mix should be done between insiders and outsiders rather than a dominant number of independent directors. Moreover, Hermalin and Weisbach (1988) mentioned that there is no evidence that outsiders exercise control except in major crisis. Another study by Bhagat and Bolton (2008) adds to the idea that independent directors negatively affect firm value. They argue that board directors should only be added to discipline management in poorly performed firms. However, just adding outsiders on the board will have a bad effect on shareholder's wealth.

After the Sarbanes-Oxley Act was passed, the effect of outside directors on shareholders' wealth became even more important than before. A major reason for that is whether this act has changed the effect of increasing independent directors. To investigate more about this topic, Uzan (2007) examined the stock market effect both prior and post the Sarbanes-Oxley Act. His results showed that the market response to the announcement of an independent director did not change after the act and hence, the Sarbanes Oxley Act did not influence shareholders' response to the announcement of an additional independent director. Moreover, a study done by Wade (2008) five years after the enactment of SOX showed that the advantages of adding more independent directors to the board did not increase and might even lead to a negative effect on the long run. Wade argues that most business communities have deemed SOX illegitimate. Referring to a survey done in CFO magazine, the author concluded that 94% of executives from 217 different companies in 2005 agreed that the cost of compliance outweigh the benefits of the SOX. He went on adding that more than half of the directors in America want SOX abolished because most business people perceive that most provisions present in the Act provide little or no protection for investors due to the high costs imposed on the corporations.

Studies concerning the effect of independent directors on shareholders' wealth come to no end. We have reviewed some of the research done by scholastic authors. However, the debate on whether shareholders enjoy higher returns as the percentage of outside increase has not been settled yet. We shall try to explore this relation further throughout this paper and see if our conclusion is consistent with any of the above results.

HYPOTHESIS:

The research paper examines three different hypothesis.

Hypothesis 1: There is a statistically significant relationship between firm value and percentage outsiders serving on the board.
Tobin's Q = α + $\beta1$percentage independent directors + $\beta2$RDexp/A + $\beta3$CAPEX/A + $\beta4$Sales/A + $\beta5$TDC + $\beta6$E-index + $\beta7$Boardsize + $\beta8$ROA.
IF $\beta1 > 0$, then a positive relation between percentage independent directors and shareholders' wealth exists.

Hypothesis 2: There is a greater marginal impact of an increase in percentage of independent directors for firms that are highly entrenched.
Tobin's Q = α + $\beta1$percentage independent directors + $\beta2$RDexp/A + $\beta3$CAPEX/A + $\beta4$Sales/A + $\beta5$TDC + $\beta6$E-index + $\beta7$Boardsize + $\beta8$ROA + $\beta9$Edum.Independent.
When management is low or not entrenched = $\beta1$
When management is entrenched = $\beta1 + \beta9$. If $|\beta1 + \beta9| > 0$, then when management is entrenched, an increase in percentage of independent directors by 1% will have a greater impact ($\beta1 + \beta9$) then the case when management is not entrenched ($\beta1$).

Hypothesis 3: There is a greater marginal impact of an increase in percentage of independent directors for firms after the Sarbanes Oxley act.
Tobin's Q = α + $\beta1$percentage independent directors + $\beta2$RDexp/A + $\beta3$CAPEX/A + $\beta4$Sales/A + $\beta5$TDC + $\beta6$E-index + $\beta7$Boardsize + $\beta8$ROA + $\beta9$YearDum.Independent.
If $|\beta1 + \beta9| > 0$, then an increase in percentage of independent directors by 1% post SOX will have a greater impact ($\beta1 + \beta9$) then the case before SOX ($\beta1$).

RESEARCH METHODOLOGY:

The data extracted from three major databases; CompuStat, ExecuComp and IRRC governance. CompuStat was used to collect data concerning firms' financial information such as rate of returns, capital expenditures, sales, and research & development expenses. Moreover, ExecyComp was used to acquire information regarding CEO titles and total compensation paid for the CEO. Finally, we gathered information regarding governance variables through IRRC governance database. Such variables include, board size, percentage independent directors, and managerial entrenchment. Our data consists of 24,479 observations covering the period between 1996 and 2009. We define the variables used throughout the paper as follows:

Tobin's Q: is used as a proxy for shareholder's wealth. It is calculated as follows:
(Market Value of Common Stocks + Value of Preferred Shares + Inventory's Book Value + Book Value of Long Term Debt + Current Liabilities – Current Assets) / Total Assets.

E- index: is used as a proxy to measure managerial entrenchment versus shareholders' wealth, where higher E-index relates to low shareholder's wealth/ higher managerial entrenchment and vice versa.

Percentage Independent Directors: the percentage outside directors serving on the board.

Sales to Asset Ratio: The ratio of the companies' Sales to Total Assets.

R&D expenditure: spending on research and development during the year.

R&D/A: research and development spending to asset ratio.

CAPEX: Capital Expenditure during the year.

CAPEX/A: capital expenditure to asset ratio.

Board Size: total number of directors serving on the board.

TDC: Total Compensation paid for the company's CEO during a year.

ROA: Return on Assets calculated by the ratio of (Earnings before Interest, Taxes, Depreciation, and Amortization) / Total Assets.

EDum: a dummy variable that takes a value of "1" when E-index ranges from 4 to 6, and a value of "0" otherwise.

EDum.Independent: interaction variable that is calculated by the product of Edum and percentage independent directors.

YearDum: a dummy variable that takes a value of "1" when year ranges from 2002 to 2009 and a value of "0" otherwise.

YearDum.Independent: interaction variable that is calculated by the product of YearDum and percentage independent directors.

DESCRIPTIVE ANALYSIS:

In order to understand the effect of increasing independent directors on firm value, we performed a series of cross tabulations that give us the average Tobin's Q with respect to percentage independent directors versus several parameters. Moreover, relative to our huge data, we split the independent directors into two categories. We approximated the mean to be around 70% and then conducted our analysis based on whether the percentage of outsiders are less than 70% or greater/equal to 70%.

Table 1 (Appendix) show that the results are not consistent with Rosenstein and Wyatt (1990). While they insisted that firm value increase as the percentage of outsiders increase, table 1 indicates the opposite. When the percentage of independent directors increases to 70% or more, average Tobin's Q, that is the firm value, tends to decrease. We further subdivided these two categories into four in table 2 (Appendix). This was done to show that on average, Tobin's Q is declining as percentage of outsiders increase.

Table 3 (Appendix) cross tabulates the percentage of independent directors against the E-index (taken from a scale of 0 to 6, where 6 is the highest level for entrenchment). It shows that when management is highly entrenched, that is low shareholder's rights, average Tobin's Q tends to decrease. In other words, we notice a negative relation between the E-index and the firm value. Moreover, table 3 also indicates that when management is not entrenched (high shareholder's right), increasing the percentage of outsiders lifted Tobin's Q up. However, when managerial entrenchment starts to rise, increasing outsiders will decrease shareholders wealth.

Table 4 (Appendix) reemphasizes the fact mentioned in the above tables, that is, on average Tobin's Q decreases with an increase of independent directors. However, firm value appears to have a positive relationship with the sales to asset ratio. The two different groups

shown in table 4, indicates that when Sales to Asset ratios increases beyond the average Sales/Asset ratio, Tobin's Q rises.

Table 5 (Appendix) cross tabulates R&D to Asset Ratio with percentage independent directors, while table 6 (Appendix) cross tabulates Capital expenditures with percentage outsiders. The results in table 5 are consistent with the study done by Queiroz, Pindado, and Torre (2010). Firm value tends to have a positive relationship with R&D/Asset. Moreover, table 6 also indicates that shareholder's wealth increases as capital expenditure rises. Furthermore, the negative correlation between firm value and percentage independent directors still prevails.

Another variable that is cross tabulated against the percentage outsiders is the board size. It turned out that the average board size extracted from the data is around 10. Hence, we subdivided the board size into two categories; those with size less than 10 and those higher than 10. Table 7 (Appendix) indicates that when board size increases, average Tobin's Q tends to decrease. Therefore, a negative relation between board size and firm value seems to prevail. Moreover, table 7 also confirms the inverse relation between firm's value and percentage independent directors.

Finally, Table 8 (Appendix) presents the association between firm's value and CEO total compensation. The results are consistent with the study done by Wallsten (2000). There is a positive correlation between shareholder's wealth and total CEO compensation. As Wallsten puts it, top executives receive large raises when firm performs well and vice versa, and this is inline with our findings. The negative relation between independent directors and shareholder's wealth remains valid.

EMPIRICAL ANALYSIS:

H1: There is a statistically significant relationship between firm value and percentage of outsiders serving on the board of directors.

This research attempts to investigate the relation between percentage of independent directors and Tobin's Q, that is, the firm value. Table 9 (Appendix) shows the results of the Panel Data Regression with industry fixed effect. Our results show a negative relation between percentage independent directors and shareholder's wealth with a coefficient of -0.002 indicating that The rush by firms to substitute outside directors for inside ones is probably exaggerated , and the valuable contribution of inside directors lost, at the margin, over weights the benefits obtained from adding an independent director. An increase in the percentage of outsiders leads to a decline in the value of the firm. Our results are consistent with that of Bhagat and Black (2002) where they also concluded that board independence showed a negative correlation with firm performance. Other control variables are also reported in table 9. A significant positive relation exists between Tobin's Q and each of the following variables: Research and Development expenditures to asset ratio, capital expenditure, total compensation paid to CEO per year, and Return on Assets. Moreover, a significant negative relationship is seen between Tobin's Q and each of the following: Sales to asset ratio, Entrenchment, and board size.

H2: There is a greater marginal impact of an increase in percentage of independent directors for firms that are highly entrenched.

This research hypothesis question refers to the effect of the interaction between managerial entrenchment and percent independent directors. We try to study the effect of firm value when increasing the number of independent directors in an entrenched management firm. Table 10 (Appendix) shows that a positive statistically significant relation still exists between the firm value and each of Research and development expenditure, capital expenditures, return on assets and total compensation paid to the CEO. Moreover, sales to asset ratio, entrenchment, percentage independent directors and board size have the same negative effect on shareholder's wealth. However, the coefficient of the interactive variable "Edum.Indpendent" tells us an important story; the positive sign of the interactive variable states that there is an advantage of increasing outsiders for shareholders when the firm management is entrenched. In other words, when management is highly entrenched (low shareholders' rights), increasing the independent directors will have a less negative marginal impact on shareholders' wealth compared to its effect when management is low or not entrenched. Our research indicates that a 1% increase in independent directors for firms characterized by low managerial entrenchment will decrease Tobin Q by 0.002. However, 1% increase in independent directors in firms with high managerial entrenchment will lower this negative effect by 0.001 indicating that independent directors are more effective for firms suffering from low shareholders' rights (high managerial entrenchment).

H3: There is a greater marginal impact of an increase in percentage of independent directors for firms after the Sarbanes Oxley act.

In table 11 (Appendix), we included an interactive variable between the year and percentage independent directors. This was done to see the effect of the rush in electing outsiders after the Sarbanes Oxley act during 2002. A statistically positive coefficient for this interactive variable shows that after the Sarbanes Oxley act, the negative marginal impact of an increase in percentage of independent directors on firm value is lower. Our results are consistent with that of Li, Pincus and Rego(2008) . The researchers show that there is a statistically significant abnormal stock returns post SOX. They argue that after the Sarbanes-Oxley act, more effective monitoring was noticed resulting in more reliable financial reports.

CONCLUSION:

Separation between management and ownership is the main reason for the rise of the different agency problems faced by many firms. The failure of giant firms such as, Enron and WorldCom, gave rise to a series of efforts to improve corporate governance. Reforms are imposed on companies in order to protect shareholders' rights. A major requirement was to increase the number of outsiders serving on the board of directors. However, the effectiveness of independent directors was and still is an important topic for researchers especially after the rush of adding more outsiders post the Sarbanes-Oxley act. This paper, therefore, investigates whether current board structures are becoming more effective than before.

The data used in our research shows that the observations had a mean of around 70% independent directors. Our findings support the existence of a significant negative relation between outsiders and firm value. Moreover, we try to investigate whether increasing the independent directors for a high managerial entrenched firm will have a higher impact on shareholders' wealth. Our research supports the fact that when management is highly entrenched,

an increase in outsiders will lower the negative impact of percentage independent directors on the firm value.

Finally, several studies have proved the idea that a board consisting mostly of outsiders can harm shareholders. In order for us to go deep on this issue, we performed a study post the SOX where a rush of independent directors were detected. Our study shows that after the implementation of SOX, an increase in independent directors positively affected the firm value. Our results show that although some researches such as Linck, Netter and Yang (2007) argue that SOX caused an increase in costs, ours show that the Sarbanes Oxley act had a positive impact on firm value. Specifically, the negative marginal impact of the percentage of independent directors on firm value prior to Sarbanes Oxley Act has turned to positive after SOX.

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APPENDIX:

Table 1	% independent directors		
Data	**<70%**	**>70%**	**Grand Total**
Count of Tobin's Q	8449	9406	18089
Average of Tobin's Q	1.51	1.28	1.39
StdDev of Tobin's Q	1.85	1.28	1.58

Tobin's Q information by percentage independent directors.

Table 2	% independent directors				
Data	**0<%≤50%**	**50%<%<70%**	**70%≤%≤85%**	**85%<%≤100%**	**Grand Total**
Count of Tobin's Q	3243	5206	6516	3124	18089
Average of Tobin's Q	1.62	1.45	1.31	1.21	1.39
StdDev of Tobin's Q	2.22	1.57	1.34	1.15	1.58

Tobin's Q information by percentage independent directors.

Table 3		% independent directors		
E-index	**Data**	**<70%**	**>70%**	**Grand Total**
0	**Count of Tobin's Q**	987	325	1312
	Average of Tobin's Q	1.76	2.06	1.83
1	**Count of Tobin's Q**	1394	1035	2429
	Average of Tobin's Q	1.59	1.37	1.48
2	**Count of Tobin's Q**	1827	2082	3909
	Average of Tobin's Q	1.58	1.31	1.44
3	**Count of Tobin's Q**	1717	2750	4467
	Average of Tobin's Q	1.30	1.24	1.26
4	**Count of Tobin's Q**	860	1789	2649
	Average of Tobin's Q	1.13	1.11	1.12
5	**Count of Tobin's Q**	233	679	912
	Average of Tobin's Q	0.98	0.94	0.95
6	**Count of Tobin's Q**	40	107	147
	Average of Tobin's Q	0.95	0.92	0.93
Total Count of Tobin's Q		7058	8767	15825
Total Average of Tobin's Q		1.45	1.25	1.34

Cross tabulation of Tobin's Q by percentage independent directors and E-index.

Table 4		% independent directors		
Sales-to-Assets (S/A)	Data	<70%	>70%	Grand Total
S/A<1	Count of Tobin's Q	4769	5908	10677
	Average of Tobin's Q	1.50	1.20	1.33
	StdDev of Tobin's Q	2.09	1.25	1.69
S/A>1	Count of Tobin's Q	3679	3732	7411
	Average of Tobin's Q	1.52	1.40	1.46
	StdDev of Tobin's Q	1.46	1.33	1.40
Total Count of Tobin's Q		8448	9640	18088
Total Average of Tobin's Q		1.51	1.27	1.38
Total StdDev of Tobin's Q		1.85	1.28	1.58

Cross tabulation of Tobin's Q by % independent directors and the ratio of sales to assets.

Table 5		% independent directors		
R&D/Assets	Data	<70%	>70%	Grand Total
0<R&D/A<0.05	Count of Tobin's Q	2716	3641	6357
	Average of Tobin's Q	1.43	1.27	1.34
	StdDev of Tobin's Q	1.22	0.96	1.08
0.05<R&D/A<0.1	Count of Tobin's Q	716	924	1640
	Average of Tobin's Q	2.61	1.97	2.25
	StdDev of Tobin's Q	3.85	1.86	2.92
R&D/A>0.1	Count of Tobin's Q	783	813	1596
	Average of Tobin's Q	2.69	2.28	2.48
	StdDev of Tobin's Q	2.71	2.18	2.46
Total Count of Tobin's Q		4215	5378	9593
Total Average of Tobin's Q		1.86	1.54	1.68
Total StdDev of Tobin's Q		2.28	1.45	1.87

Cross tabulation of Tobin's Q by % independent directors and the ratio of R&D to assets.

Table 6		% independent directors		
CAPEX/Assets	Data	<70%	>70%	Grand Total
CAPEX/A<0.02	Count of Tobin's Q	2073	2423	4496
	Average of Tobin's Q	1.20	0.94	1.06
	StdDev of Tobin's Q	1.43	0.95	1.20
0.02<CAPEX/A<0.05	Count of Tobin's Q	2657	3461	6118
	Average of Tobin's Q	1.56	1.36	1.46
	StdDev of Tobin's Q	2.25	1.38	1.81
CAPEX/A>0.05	Count of Tobin's Q	3336	3372	6708
	Average of Tobin's Q	1.78	1.52	1.65
	StdDev of Tobin's Q	1.72	1.36	1.55
Total Count of Tobin's Q		8066	9256	17322
Total Average of Tobin's Q		1.56	1.31	1.43
Total StdDev of Tobin's Q		1.86	1.29	1.59

Cross tabulation of Tobin's Q by % independent directors and the ratio of Capital expenditures to sales.

Table 7		% independent directors		
BoardSize	Data	<70%	>70%	Grand Total
Boardsize < 10	Count of Tobin's Q	5109	4829	9938
	Average of Tobin's Q	1.70	1.43	1.57
	StdDev of Tobin's Q	2.16	1.42	1.85
Boardsize > 10	Count of Tobin's Q	3340	4811	8151
	Average of Tobin's Q	1.23	1.12	1.17
	StdDev of Tobin's Q	1.16	1.10	1.13
Total Count of Tobin's Q		8449	9640	18089
Total Average of Tobin's Q		1.51	1.28	1.39
Total StdDev of Tobin's Q		1.85	1.28	1.58

Cross tabulation of Tobin's Q by % independent directors and Board size.

Table 8		% independent directors		
TDC	**Data**	**<70%**	**≥70%**	**Grand Total**
TDC < 5260	**Count of Tobin's Q**	6553	6461	13014
	Average of Tobin's Q	1.39	1.16	1.28
	StdDev of Tobin's Q	1.44	1.13	1.30
TDC ≥ 5260	**Count of Tobin's Q**	1848	3147	4995
	Average of Tobin's Q	1.96	1.51	1.68
	StdDev of Tobin's Q	2.82	1.53	2.11
Total Count of Tobin's Q		8401	9608	18009
Total Average of Tobin's Q		1.52	1.28	1.39
Total StdDev of Tobin's Q		1.85	1.28	1.57

Cross tabulation of Tobin's Q by % independent directors and total compensation paid to CEO.

Table 9		Coefficients[a]	
Model		B	Sig.
1	(Constant)	.739	.000
	R&D/A	8.25	.000
	CAPEX/A	.532	.014
	Sales/Assets	-.115	.000
	TDC	1.37×10^{-5}	.000
	E-index	-.062	.000
	Board Size	-.025	.000
	Percentage Independent Directors	-.002	.000
	ROA	6.52	.000

a. Dependent Variable: Tobin Q
Panel data with Industry Fixed Effect.
Year Dummies are included but not reported for convenience.

Table 10		Coefficients[a]	
Model		B	Sig
1	(Constant)	.768	.000
	R&D/A	8.26	.000
	CAPEX/A	.537	.013
	Sales/Assets	-.116	.000
	ROA	6.52	.000
	TDC	1.37E-5	.000
	Percentage Independent Directors	-.002	.000
	E-index	-.078	.000
	Edum.Independent	.001	.011
	Board Size	-.025	.000

a. Dependent Variable: Tobin Q
Panel data with Industry Fixed Effect.
Year Dummies are included but not reported for convenience.

Table 11		Coefficients[a]	
Model		B	Sig.
1	(Constant)	0.85	.000
	R&D/A	8.25	.000
	CAPEX/A	.527	.015
	Sales/Assets	-.115	.000
	ROA	6.527	.000
	TDC	1.36E-5	.000
	Percentage Independent Directors	-.003	.000
	Board Size	-.025	.000
	YearDum.Independent	.0025	.025
	E-index	-.0.06	.000

a. Dependent Variable: Tobin Q
Panel data with Industry Fixed Effect.
Year Dummies are included but not reported for convenience.