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The Effect Between Corporate Governance And Having Female Director

Mousa Albashrawi
Manning School of Business
University of Massachusetts LowellLowell, Massachusetts 01854

Abstract: *Women are taking more important roles in our daily business life; the number of women directors has increased in recent years across all industries. Although the finding seems to support that there is a positive association between corporate governance and having a woman director, some may argue and attribute this positive relationship to other organizational factors. Thus, this topic still needs further examination to confirm or oppose prior finding. However, the results show both confidential voting and limit ability to amend by are found to be predictors of having a woman director, but these predictors do not support our hypothesis.*
Keywords: *corporate governance, worldwide governance indicator (WGI), and a woman director*.

I. Introduction

Women are taking more important roles in the daily business life; the number of women directors has increased in recent years across all sizes of corporates. 48% of small organizations had one or more women directors in 2007 and the percent jumped to 50% in 2012. In the same vein, 33% of large organizations had one or more women directors in 2007 and the percent jumped to 40% in 2012 (Number of female directors on the increase, 2013). Also, over the past few years, the number of women directors showed an increase of 240,000(Pa.press, 2012). It is apparent that there is a growing trend to employ women as directors or in director board in small and large organizations. This leads to wonder whether having women directors will affect corporate governance in a positive way.McElhaney & Mobasseri (2012)studied 1,500 organizations and found that the organizations that have more women directors are more probable to demonstrate robust and solid governance, which in turn helps to evade large-scale controversy and to show a higher level of transparency. Although the finding seems to support that women directors have a positive impact on corporate governance, some may argue andattribute this positive relationship to other organizationalor environmental factors. Therefore, this issue still needs further exploration to confirm or oppose prior finding.

Our main objective of this paper is to investigate the relationship between having woman director and corporate governance. This investigation is carried out using Risk Metris dataset found in Wharton Research Data Services(WORDS).

Conceptual Framework

Governance is simply defined as a path taken by a company to control and direct its group of process, practices and regulations. Good governance is critical to accomplish objectives, goals and scope for any company (Investopedia, 2014). There are many indicators developed to measure governance; a well-established measure is worldwide governance indicator (WGI) which consists of six dimensions; these dimensions were identified as follows: "voice and accountability (VA)- measuring perceptions of the extent to which a country's citizens are able to participate in selecting their government, as well as freedom of expression, freedom of association and a free media". Other dimensions are political stability and absence of violence, government effectiveness, regulatory quality, rule of law, and control of corruption (Thomas, 2010).

It is more likely that having a woman director will influence corporate governance positively; this relationship was supprted in the work of McElhaney & Mobasseri(2012). In other words, more robust governance couldexist because of having a woman director. This guides us to develop the following hypothesis:

H1: Good governance is positively associated withhaving a woman director OR good governance leads to having a woman director.

The following model is to provide a conceptual framework which addresses the research question

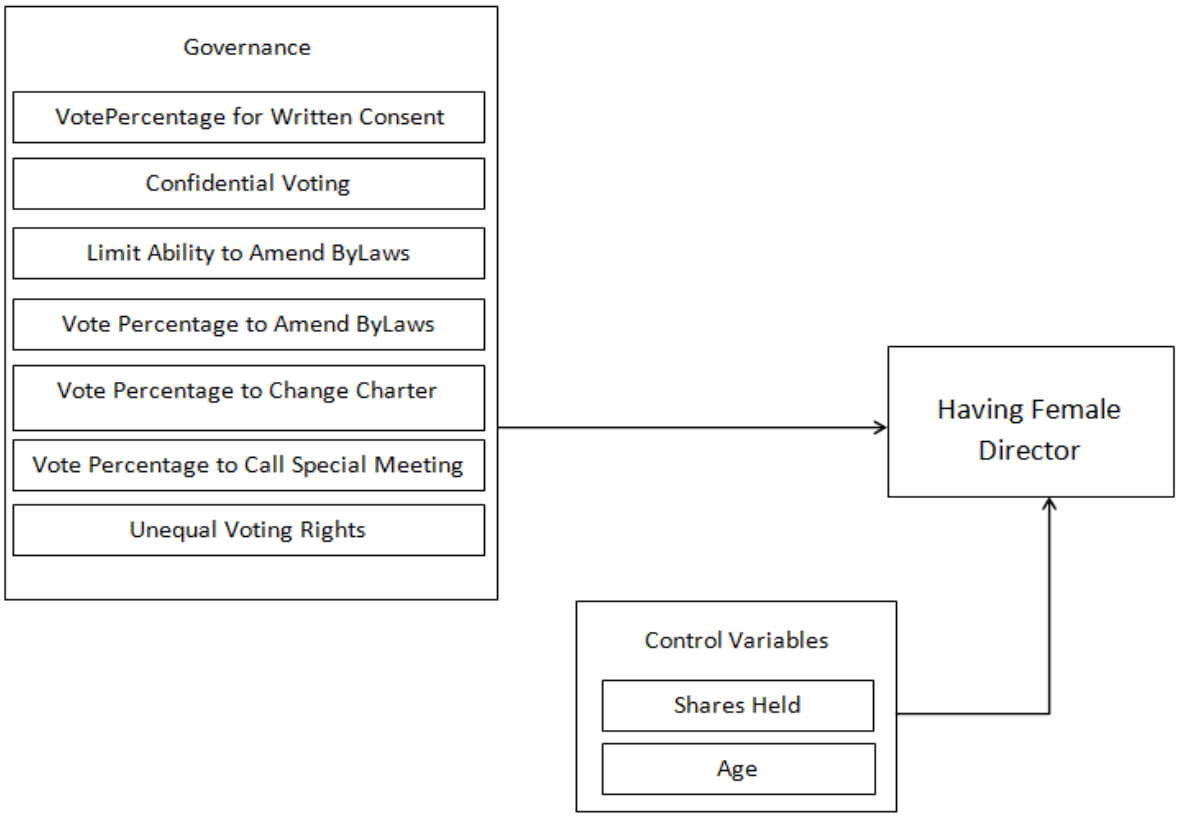

Figure 1: Research Model

Governance has well-established indicators in prior research (Kaufmann, Kraay, & Mastruzzi, 2005). The available dataset shows that our measures don't capture the six mentioned dimensionsof governance; they reflect the first dimension (voice and accountability) to a certain degree. As well, we are interested to investigate other factors to measure governance (not captured in WGI). Therefore, we included other variables extracted from "Director" dataset to control for their impact when having a woman director, such as age, shares held and ethnicity.

Data Description

Risk Metrics, housed in WRDS, is classified as a leading provider of corporate governance data. This data was first provided by IRRS but when ISS acquired IRRS, the method for collecting data was changed in 2007 in order to follow ISS specifications. Therefore, there are two datasets existed in Risk Metrics; one with the beginning of 2007 and the other before 2007 (legacy version). Risk Metrics has four groups of the datasets: director, governance, voting results and shareholder proposals.

The dataset of director has a time range of 1996 to 2012 while governance is a bit longer ranging from 1990 to 2012. In director data, variables give information about individual board directors such name, age, committee memberships, primary employer and title, number of other public company boards serving on and shares held. In governance data, the variables give information about corporate governance provisions for key US firms such as classified board, confidential voting, advanced notice and written consent. Both datasets are updated on a yearly basis. Also, firms of S&P 1500 index are included in both datasets.

Data Outline

This section mainly identifies characteristics of the data and defines the variables of interest.

- **Number of observations:** 10,437
- **Time period:** 2007
- **Number of variables:** 10 (not taking into account the identifying variables like year).
- **Dependent variable:** Female? ORhaving woman directoror not (binary).

Independent Variable	Data Type	Description
Confidential Voting	Binary	Shareholders are able to vote in proxy card with unaware management side and inspectors are in charge of checking individual votes.
Limit Ability to Amend By Laws	Binary	The ability to change by laws is restricted (Yes or No).
Unequal Voting Rights	Binary	Do they have unequal voting rights for male and female (Yes or No).
Vote % Required to Amend By Laws	Numeric	Percent needed to change by laws.
Vote % Required to Call Special Meeting	Numeric	Percent needed to call special meeting.
Vote % Required for Written Consent	Numeric	Written consent occurs when shareholders are able to take action without having a meeting.
Vote % Required to Amend Charter	Numeric	Percent needed to change charter.
Age	Numeric	Director age in year
Shares held	Numeric	How many shares are owned by director?

Table 1: Description of Independent Variables

Data Processing and Analysis

Two datasets were merged (director and governance) into one dataset that has a primary key identifying each observation uniquely.A range of potential independent variables was selected, however, the variables that have a very large number of missing values are dropped from the dataset. Also, the variables considered irrelevant to our research topic are dropped.

For the missing values, the following rule is implemented(Abu-bader, 2011):

- Excluding cases (observations) with missing values: If only 5% or less of cases have missing values at random.
- Replacing missing values: If the number of cases with missing values is large (> 5%) or if they are not randomly missing.

This rule can ensure that our results will not be affected (not biased) when removing the observations with the missing values if they are 5% or smaller (Abu-bader, 2011). Based on the above rule, we excluded observations with missing values of 5% or less while replacing with the mean the observations with missing values ofmore than 5%. However, some variables did not have applicable values like "NA"; those were also excluded. Allcategorical variables of interest were converted to numerical ones so we can run the regression.And we created dummy variables, labeled as yes = 1 and no = 0, for binary ones.

II. Method

Since our dependent variable is binarywhile independent variablesare numeric and categorical, logistic regression was a suitable technique to be implemented. It is also known as "binary logistic regression"; used to predict a single outcome (DV) based on multiple factors (IVs). When using this technique, the assumptions of normality of dependent variable and residual, linearity, and homoscedasticity are not required to be fulfilled. In the other hand, the assumptions of sample representative, and multicollinearity are required to be fulfilled (Abu-bader, 2011);

- Sample representative: we have 10,437 observations which is a tremendous sample size. Thus, the first assumption is satisfied. The number of observations is very suitable for the maximum likelihood estimation method to be applied.
- Multicollinearity: we evaluated this assumption by observing variance inflation factor (VIF); this method showed that all VIFs are less than 5 which indicates no multicollinearity exists (Figure 1); this is also supported by the correlation table (Figure 2).

The logistic regression equation is as follows:

Women director = 1/ (1 + e^(**B_0** + **B_1**Shares held + **B_2**Vote % to Amend By Laws + **B_3**Vote % to Call Special Meeting + **B_4** Vote % for Written Consent + **B_5** Confidential Voting + **B_6**Limit Ability to Amend By Laws + **B_7**Vote % to amend charter+ **B_8**Unequal Voting Rights + **B_9** Dire_Age)).

III. Results

The following table shows descriptive statistics for all variables which gives a summaryof the overall dataset used in the analysis.

Variable	N	Mean	Std Dev	Minimum	Maximum
sheresheld	10437	797130.05	4262324.16	0	92686695.00
percentbylaw	10437	49.2316827	23.1928603	0	80.0000000
percentspemeeting	10437	30.7954184	13.0183968	0	100.0000000
percentwritconsent	10437	38.0558565	19.1046156	0	100.0000000
confvote	10437	0.0890103	0.2847722	0	1.0000000
age	10437	34.2341669	8.3439713	2.0000000	68.0000000
limibylaw	10437	0.6251796	0.4840997	0	1.0000000
uneqvote	10437	0.0022995	0.0479003	0	1.0000000
percentbycharter	10437	4.1611869	0.1468075	3.9120200	4.5538800
female	10437	0.1235987	0.3291390	0	1.0000000

Table 2: Descriptive Statistics

The -2 Log L of 7807.595 (the smaller, the better) and Wald (337.3803) examine the fit of the overall model (observed and predicted models) besides other tests (Figure 3). The Wald test and likelihood ratio follow approximately a chi-square distribution.Those tests show that the overall model is statistically significant.

Dependent Variables: Having a Female Director			
Independent Variables	**Coefficient**	**Stand. Error**	**Wald Chi-Square**
Shares held	**-7.01*** **	**1.76**	**15.93**
Vote % to Amend By Laws	**-0.00**	**0.00**	**0.00**
Vote % to Call Special Meeting	**-0.00**	**0.00**	**0.26**
Vote % for Written Consent	**0.00**	**0.00**	**0.23**
Vote % to amend charter	**0.36**	**0.22**	**2.61**
Confidential Voting	**0.51*** **	**0.10**	**27.12**
Limit Ability to Amend By Laws	**-0.12***	**0.07**	**3.29**
Unequal Voting Rights	**-0.41**	**0.75**	**0.30**
Dire_Age	**-0.07*** **	**0.00**	**310.40**

P < 0.10 **P < 0.05P < 0.01**

Table 3: Logistic regression analysis

The above table indicates three factors (shares held, confidential voting and director age) are highly significant, whereas one factor is marginally significant (limit ability to amend bylaws); the whole table is shown in the appendix (Figure 4). Moreover, these factors show good exponents for prediction and classification.It is apparent that the two control variables (num. of shares and age) are significant while only two indicators of governance (confidential voting and limit ability to amend by laws) were found to be significant. Figure 5 in the appendix shows the percent for agreement and non-agreement of the observed and predicated responses; it could be considered as a classification table. However, the interceptions for each factor as follows taking into account keeping all other factors fixed:

- For one more share held by the director, the log odds of female decreases by 7.01; in other words, having an additional share given to the director, that director is less likely to be a female (a negative relationship)or more likely to be a male.
- The director is less likely to be a female for every one year increase in age (a negative relationship). So males have more chance than females to be directors when they get old.
- Having the policy of confidential voting in place is a significant predictor to have a female director. However, this governance indicatordoes not supportourhypothesis, since it helps to have non-transparent work environmentin the organization which in turn leads to bad governance.
- Having restriction on the ability to change by laws is a weak predictor to have a female director. In other words, the limited ability to change by law is more associated with a male director. This indicator of governance also doesn't support our hypothesis because the organization should have a specific kind of limitation to avoid undesirable changes.

Limitation and Conclusion: There are several limitations to be found in this paper. First, not all control variables, such as committee member of different group, ethnicity, financial expertise and length of service, were included in the analysis. Second, the items we used address only one dimension of governance, which is voice and accountability; this calls for more investigation on how other five dimensions affect having a woman director. A number of organizations may seek an answer of whether good governance is related to having women directors. Based on this analysis, although only two indicators of governance were found to be

predictors of having the woman director, they indicate that male director is better than female one, but this case is not always true as suggested by McElhaney & Mobasseri (2012).

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Appendix:

Parameter Estimates

Variable	DF	Parameter Estimate	Standard Error	t Value	Pr > |t|	Tolerance	Variance Inflation
Intercept	1	0.20496	0.09454	2.17	0.0302	.	0
sheresheld	1	-2.67457E-9	7.44292E-10	-3.59	0.0003	0.99790	1.00210
percentbylaw	1	-0.00001705	0.00014742	-0.12	0.9079	0.85916	1.16393
percentspemeeting	1	-0.00011501	0.00024920	-0.46	0.6444	0.95425	1.04794
percentwritconsent	1	0.00006284	0.00018026	0.35	0.7274	0.84684	1.18086
confvote	1	0.05767	0.01136	5.07	<.0001	0.95906	1.04269
age	1	-0.00681	0.00038011	-17.92	<.0001	0.99839	1.00162
limibylaw	1	-0.01168	0.00698	-1.67	0.0946	0.87842	1.13841
uneqvote	1	-0.03873	0.06631	-0.58	0.5592	0.99539	1.00463
percentbycharter	1	0.03802	0.02318	1.64	0.1011	0.86692	1.15351

Figure 1: Test for multicollinearity

Pearson Correlation Coefficients, N = 10437
Prob > |r| under H0: Rho=0

	sheresheld	percentbylaw	percentspemeeting	percentwritconsent	confvote	age	limibylaw	uneqvote	percentbycharter
sheresheld	1.00000	-0.00184 0.8509	0.00242 0.8045	-0.03231 0.0010	-0.00368 0.7068	-0.00743 0.4479	-0.01334 0.1728	-0.00606 0.5360	-0.02243 0.0219
percentbylaw	-0.00184 0.8509	1.00000	-0.00764 0.4350	0.15215 <.0001	-0.08474 <.0001	-0.00507 0.6043	0.07093 <.0001	-0.02273 0.0202	0.33757 <.0001
percentspemeeting	0.00242 0.8045	-0.00764 0.4350	1.00000	0.19790 <.0001	-0.04129 <.0001	0.01565 0.1099	-0.00377 0.7003	-0.01967 0.0444	0.01334 0.1730
percentwritconsent	-0.03231 0.0010	0.15215 <.0001	0.19790 <.0001	1.00000	-0.06575 <.0001	0.02215 0.0236	-0.26297 <.0001	-0.05199 <.0001	0.14040 <.0001
confvote	-0.00368 0.7068	-0.08474 <.0001	-0.04129 <.0001	-0.06575 <.0001	1.00000	0.02413 0.0137	0.16835 <.0001	-0.01501 0.1253	0.00132 0.8930
age	-0.00743 0.4479	-0.00507 0.6043	0.01565 0.1099	0.02215 0.0236	0.02413 0.0137	1.00000	0.00800 0.4140	-0.00566 0.5630	0.01177 0.2293
limibylaw	-0.01334 0.1728	0.07093 <.0001	-0.00377 0.7003	-0.26297 <.0001	0.16835 <.0001	0.00800 0.4140	1.00000	0.03717 0.0001	0.09543 <.0001
uneqvote	-0.00606 0.5360	-0.02273 0.0202	-0.01967 0.0444	-0.05199 <.0001	-0.01501 0.1253	-0.00566 0.5630	0.03717 0.0001	1.00000	0.00211 0.8294
percentbycharter	-0.02243 0.0219	0.33757 <.0001	0.01334 0.1730	0.14040 <.0001	0.00132 0.8930	0.01177 0.2293	0.09543 <.0001	0.00211 0.8294	1.00000

Figure 2: Correlation table

Model Fit Statistics		
Criterion	Intercept Only	Intercept and Covariates
AIC	7809.595	7461.902
SC	7816.848	7534.433
-2 Log L	7807.595	7441.902

Testing Global Null Hypothesis: BETA=0			
Test	Chi-Square	DF	Pr > ChiSq
Likelihood Ratio	365.6923	9	<.0001
Score	348.0927	9	<.0001
Wald	337.3803	9	<.0001

Figure 3: Model fit statistics

Analysis of Maximum Likelihood Estimates						
Parameter	DF	Estimate	Standard Error	Wald Chi-Square	Pr > ChiSq	Exp(Est)
Intercept	1	-1.2396	0.9092	1.8591	0.1727	0.289
shareshold	1	-7.01E-8	1.757E-8	15.9304	<.0001	1.000
percentbylaw	1	-0.00012	0.00142	0.0073	0.9317	1.000
percentspemeeting	1	-0.00122	0.00240	0.2568	0.6123	0.999
percentwritconsent	1	0.000826	0.00174	0.2259	0.6346	1.001
confvote	1	0.5084	0.0976	27.1092	<.0001	1.663
age	1	-0.0658	0.00374	310.3975	<.0001	0.936
limlbylaw	1	-0.1210	0.0667	3.2940	0.0695	0.886
uneqvote	1	-0.4075	0.7487	0.2962	0.5863	0.665
percentbycharter	1	0.3604	0.2232	2.6078	0.1063	1.434

Figure 4: Logistic regression analysis

Association of Predicted Probabilities and Observed Responses			
Percent Concordant	67.0	Somers' D	0.350
Percent Discordant	32.0	Gamma	0.353
Percent Tied	1.0	Tau-a	0.076
Pairs	11799630	c	0.675

Figure 5: Percent for agreement and non-agreement