



Female Trustees and University Financial Performance

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ABSTRACT

The board of trustees of a postsecondary educational institution has a similar role to a corporate board of directors. Trustees must represent stakeholder interests, have a role in governance, and are responsible for the continued financial success of the institution (Brown, 2014). The composition of the board is an important factor in university governance, just as it is in a corporation. Previous research has found that female board members do have an impact on the financial performance of their corporations. We apply that analysis to private, nonprofit colleges and universities and examine whether the gender composition of the board of trustees affects the financial performance of their institutions. Our results indicate that a higher percentage of women on the board of trustees increases the likelihood of having a passing financial responsibility composite score, as measured by the U.S. Department of Education.

Keywords: Gender Diversity, Trustees, University Boards, Financial Performance

JEL Classifications: L31, I23

1. INTRODUCTION

The 2007 to 2009 U.S. recession left a lingering impact on postsecondary education. A 2010 article in *Forbes* (Barrett, 2010) stated that “[i]n a break from the past, Moody’s Investors Services, the country’s leading bond-rating agency, so far this year has handed out many times more downgrades than upgrades to traditional nonprofit institutions of higher education with public debt. Cited reasons for the downgrades include investment and operating losses, and in some cases, weakening student demand” (para. 2). According to *The Chronicle of Higher Education* (Harris, 2017), Moody’s downgraded the higher education sector to a negative rating in 2013, upgraded to stable in 2015, and downgraded to negative again in 2017. The depth of the recession and its shallow, lingering recovery truly tested the fiduciary skills of college and university trustees.

In the aftermath of that severe recession that was caused by a crisis in the financial sector of the economy, researchers pondered the impact of female leadership on the corporate

boards and in the executive ranks on firm performance in the male dominated finance and banking industries. A popular question was “What if Lehman Brothers had been Lehman Sisters?” Examples of research that examined this issue come from van Staveren (2014), Adams and Rangunathan (2017), Barasinska (2010), Ghosh (2017), and Wu et al. (2018). In this same vein, we also ask what impact do female trustees have on the financial performance of their institutions when men outnumber women, on average, two to one on the board (Fain, 2010)? Our paper focuses on the effect that gender composition of the board of trustees of private, nonprofit colleges and universities plays in overseeing their institution’s financial performance. Our measure of financial performance is the U.S. Department of Education’s financial responsibility composite score, which determines if a private institution will be required to have financial oversight by the Department in order to participate in the federal student loan program. We hypothesize that a higher percentage of women on the board of trustees is associated with better financial performance of private, nonprofit colleges and universities.

The paper is organized as follows. In section 2, we review previous literature and develop our hypothesis. In section 3, we discuss data used in this research and describe testing models. Section 4 presents empirical results. In section 5, we conduct additional tests as a robustness check. Section 6 concludes.

2. LITERATURE REVIEW AND HYPOTHESIS DEVELOPMENT

A college or university board of trustees has the duty to oversee the financial management of their institution, such as ensuring educational quality, selecting a president, and shaping the institution's mission and vision. The Association of Governing Boards of Universities and Colleges developed a statement about board accountability in 2007 that declared "among the responsibilities of governing boards, maintaining fiscal integrity is fundamental. Boards bear ultimate legal responsibility for approving the institution's annual budget and monitoring the institution's fiscal welfare. The board is the ultimate fiduciary of the institution, even though day-to-day operations are properly delegated to the administration" (p. 3). Corporate boards and university boards are different, of course, in that one has a profit motive and one does not, but they both have fiduciary responsibilities.

There has been extensive research on the impact of female corporate board members on board policies and firm performance. Palvia et al. (2015) examine female CEOs and Chairwomen of commercial banks. They find that smaller banks with female CEOs and board Chairs were less likely to fail during the financial crisis. They attribute that result to women leaders being more risk averse. Studies that examine gender diverse corporate boards have found that firms with female directors exhibit higher earnings quality (Srinidhi et al., 2011); more effective governance by reflecting society at large (Zahra and Pearce, 1989); and have a more active and diverse set of skills which leads to better financial performance (Schwartz-Ziv, 2013). Adams and Ferreira (2009) study board composition and find that gender-diverse boards allocate more effort to monitoring. Yu et al. (2017) find that with a higher percentage of women executives and board members, bank risk decreased during the financial crisis.

In research about university boards of trustees, Michael et al. (2000) surveyed trustees on university and college boards in Ohio on their own perception of trustee effectiveness. They report that "...female trustees were more likely to value knowledge as an indicator of effectiveness than male trustees" (p. 118); that "...female trustees perceived trustees' influence as a more important indicator of effectiveness than the male trustees" (p. 118); and that "...female trustees indicated higher preference for trustee's personal support for the president and trustee's attention to budget details than their male counterparts" (p. 119). In examining differences between boards of different types of colleges or universities, they find that private college trustees gave a significantly higher mean score to attention to budget details as a measure of trustee performance. Harris (2014) did a national survey of nonprofit college and university trustees to examine board diversity and expertise of its

members on the nonprofit's performance. Her research did find a gender difference that boards with a greater percentage of female trustees were positively related to student retention and to student enrollment growth. But she found no significant relationship of the impact of female trustees on her measure of financial performance, which was total contributions.

In recent research examining the effect of gender of the board on nonprofit organizations, Buse et al. (2016) analyze board diversity on nonprofit governance practices. Their data came from various types of nonprofit organizations, including institutions of higher education. They conclude that "...a board that has greater gender diversity has more effective governance practices..." (pg. 187). Brown et al. (2012) explore the self-reported confidence that board members had in their monitoring and resource provision roles. Their data specifically excluded higher education institutions. They find that female board members reported being less confident and participating less in their monitoring role but there was no statistically significant gender difference in their level of confidence or participation in resource provision for their organization.

Given that there is evidence that organizational financial outcomes are influenced by gender, we hypothesize that a higher percentage of women on the board of trustees is more likely to result in a better financial performance for their university due to women leaders seeming to take on a greater monitoring role and tending to be more risk averse. Our hypothesis is therefore stated as:

Hypothesis: A higher percentage of women on the board of trustees is associated with an increased likelihood of better financial performance for institutions of higher education.

We distinguish our paper from the literature in two aspects. First, while previous research mostly uses survey or self-reported data to analyze gender issues in higher education, we conduct an econometric analysis to explore the association between trustees' gender diversity and financial performance. Second, we use a unique dependent variable, the financial responsibility composite score, which captures the financial health of the institution and the lingering impact of the recession on higher education. Prior to the recession, in 2006-2007, 54% of private, nonprofit colleges had the highest rating for a passing score for their composite score (measured as a "3" rating), but that percentage decreased to 49% in 2010-2011 and to 45% in 2013-2014.

3. METHODOLOGY

3.1. Data Sources

We obtained data from the U.S. Department of Education's Office of Federal Student Aid that reported the financial responsibility composite score for the two most recent academic years, 2013-2014 and 2014-2015, in order to increase our sample size. Each university was entered in the sample only once, with the information for our model variables included from the first year the school was listed. Financial data on the institutions was collected from the Integrated Postsecondary Education Data System (IPEDS) database maintained by the National Center for

Education Statistics (NCES) (IPEDS, 2015). Information on the number of trustees, and how many were women, was collected from the schools' Form 990s, obtained through GuideStar.org (GuideStar, 2015).

3.2. Dependent Variable and Sample Selection

Per Section 498(c) of the amended Higher Education Act of 1965, all private for-profit and nonprofit institutions that award federal student aid are required to demonstrate that they are financially responsible. Public colleges and universities only need to demonstrate financial responsibility with confirmation that their debt and liabilities are backed by the full faith and credit of their state or another government entity. For private institutions, a financial responsibility composite score is determined from the colleges' audited financial statements and each institution's composite score is based on a calculation of the ratios for primary reserve, equity, and net income (U.S. Department of Education, 2016). This composite score ranges from a maximum of 3.0 to a minimum of -1.0. As explained in the Report of the NAICU Financial Responsibility Task Force (2012), "institutions with scores of 1.5 or above "pass." The Department considers them financially responsible without the need of further oversight. Institutions below 1.5 "fail." (page 8). There is a stigma that colleges want to avoid that comes with having a score below 1.5 (Rivard, 2014; Quintana and Hatch, 2017; Chabotar, 2011). We will also use this distinction to divide our sample into institutions with "passing scores" of 1.5 or higher and those with "failing scores" of <1.5. Our dependent variable is the binary variable *PASSING*, which is 1 for having the passing financial responsibility composite score and 0 for a failing score. We will use a logistic regression model in order to examine whether the percentage of women on the board of trustees is significant in helping to classify, and potentially predict, the outcome of a college receiving a passing score.

Our goal in building the sample was to find matching failing and passing institutions that are nonprofit and offer a general 4-year degree. We eliminated from our sample for-profit institutions, seminaries or other religious institutions and "specialty" colleges (such as 2-year colleges, or schools just for a specific type of degree) since their missions and financial models can be very different from traditional nonprofit colleges and universities. In the 2013-2014 data from the U.S. Department of Education, there were 158 failing colleges listed on the financial responsibility report. Of these, 71 were for-profit institutions, and another 43 were 2-year, religious and "specialty" schools, which were removed from the sample. This reduced our sample to 44 institutions that are private, nonprofit and offering a general 4-year degree. The Form 990s were not found for 12 of these institutions, which resulted in a sample size of 32 failing institutions. To extend our sample, we then obtained the list for the financial responsibility composite score for the 2014-2015 academic year. After going through the same process of eliminating for-profit institutions, schools with specialty degrees and religious institutions, we were able to add another 11 private, 4-year nonprofit institutions to our sample. This brought our final sample size for schools with a failing score to 43 institutions (see sample description in Table 1).

Table 1: Sample selection description

Sample building process	No of obs. failing schools	No of obs. passing schools
2013-2014 list	158	1701
Less: For-profit institutions	-71	-413
2-year, religious, "specialty" schools	-43	-322
Form 990 not found	-12	-0
Total private, 4-year not-for-profit - 2013-2014	32	966
Add: 2014-2015 private, 4-year not-for-profit	11	61
Total sample	43	1027

To build the sample of matching institutions with passing scores, we followed the same procedure that we used to build the sample of institutions with failing scores. Our final sample is 1027 institutions with a passing score (Table 1).

To control for self-selection bias, and to enable us to provide a more direct comparison between "failing" and "passing" colleges, we developed a propensity score matched sample. Propensity score matching has been proposed as a method used to design observational studies that approximates random trial, in order to reduce bias in the estimation of treatment effects in the data set (Rosenbaum and Rubin, 1983; Rubin, 2008). Because many private institutions are heavily dependent on tuition revenue (Chabotar, 1989), we believe that a match on enrollment as the best determination of equivalent colleges. Enrollment in private colleges overall decreased from 5.89 million in 2012, to 5.76 million in 2013, to 5.55 million in 2014 and 5.41 million in 2015 (Statista.com, 2014). Declining enrollment is a main source of financial strain for nonprofit colleges. To derive the matched sample, we use the procedure developed by Thoemmes (2012) for SPSS, which uses the 1:1 nearest neighbor technique. The propensity score is the probability of receiving the treatment (a "failing" score) based on enrollment as a co-variate. We match to the closest "passing" college with a maximum difference in propensity score (caliper) of 15 percent. Our final sample matches 43 "failing" with 43 "passing" private, nonprofit colleges or universities.

3.3. Independent Variables and Empirical Model

For our independent variables, we use return on investment (*ROI*) as a measure of profitability, which is calculated as the change in net assets from the previous year, divided by total assets. *lnASSETS* is the natural log of the institution's assets, to control for their size. We use the natural log transformation for this skewed variable so that it more closely approximates a normal distribution. To examine liabilities, we define the variable *TOTLIABILITIES_TOTASSETS* as total liabilities divided by total assets. We would expect that a college with lower amounts of liabilities would have a higher financial responsibility composite score. We measure long-term debt separately as *LTDEBT_TOTASSETS*, long-term debt divided by total assets. To determine if there is an effect on financial health due to the size of the board of trustees, we measure the *lnBOARD_SIZE* as the natural log of the number of trustees. We use the natural log to measure the board size so

that the distribution of the variable approximates the normal distribution. Our test variable is *PCT_FEM_TRUSTEES*, which is the percentage of female trustees on the board. The empirical equation for our model is represented as follows:

$$\Pr(PASSING) = \alpha + \beta_1(ROI) + \beta_2(\ln ASSETS) + \beta_3(TOTLIABILITIES_TOTASSETS) + \beta_4(LTDEBT_TOTASSETS) + \beta_5(\ln BOARD_SIZE) + \beta_6(PCT_FEM_TRUSTEES) + \varepsilon \quad (1)$$

4. RESULTS

Table 2, Panel A shows the descriptive statistics for our variables for the failing colleges and Panel B shows the descriptive statistics for the passing colleges. The asterisks in Panel B note which variables have statistically significant differences between the failing and passing colleges. The average total assets for failing colleges are \$40.567 million, compared to \$86.640 million for passing colleges. The average financial responsibility composite score is 0.733 for the failing colleges and 2.563 for passing colleges. These two variables have statistically significant differences in the means between the passing and failing colleges. *ROI* averages 2.0% for failing colleges and 2.5% for passing colleges and is not statistically significant

In terms of the structure of the board of trustees, the failing colleges have an average board size of 22.98 members, compared to 22.44 members for the passing colleges. These numbers do not represent a significant difference in board size. As a comparison to university boards in general, Brown (2014) quotes statistics from the American Council on Education (ACE) that report an average board size of 25.52 members for all private institutions in a 1968 sample, compared to an average size of 32.89 members in a 2005 sample. When we examine the differences in our sample regarding the number of female trustees, Table 2 shows that failing colleges have an average of 5.42 female members of the board, compared to 7.63 members for passing colleges, a statistically significant difference. The percentage of female board members is significantly different as well, with an average of 23.8% of female members on boards of failing colleges versus an average of 33.8% of female members on boards of passing colleges. This average for the passing colleges is similar to results by Ehrenberg and Main (2009) who found from a 2008

survey of private colleges that on average their boards had 31% female trustees.

Table 3 shows the results of the logistic regression analysis that tests our hypothesis. The *ROI* variable is not statistically significant. The negative and significant coefficient for our debt ratio (*TOTLIABILITIES_TOTASSETS*) indicates that passing colleges are more likely to have a lower level of liabilities in relation to their assets. Our variable for board size (*lnBOARD_SIZE*) is also negative and significant, indicating that colleges with passing scores are more likely to have a smaller board of trustees. The positive and significant result on long-term debt (*LTDEBT_TOTASSETS*) means that passing colleges are more likely to have more long-term debt in relation to their assets, an indication of an ability to secure such financing due to their financial health. The passing colleges are also more likely to have higher assets (*lnASSETS*). Our test variable, *PCT_FEM_TRUSTEES*, is positive and significant, which indicates that a higher percentage of female trustees is associated with a higher likelihood of receiving a passing score.

Although the independent variables that we depict in our equation are slightly different than those used in the calculation of the composite score, in order to address concerns of multicollinearity we perform a test using variance inflation factors. The test systematically compares the coefficient of each variable on the left-hand side of the equation with all other variables on the right-hand side of the equation. If the variance inflation factor is less than 10, it means that the regression coefficients are not biased due to multicollinearity (Wooldridge, 2002). Our results in Table 4 indicate that our variables do not exhibit multicollinearity.

5. ROBUSTNESS TESTING

To further evaluate our results, we provide two additional analyses. First, following Cumming et al. (2015), we can graph this relationship between the female board ratio and the probability of a college with a passing score. We compute the natural log of (1 + the percentage of female trustees) and compare to the predicted probability for each college in our sample. As shown in Figure 1, our outcomes represent a non-linear relationship. The figure indicates that as the percentage of women on the board

Table 2: Descriptive statistics of college and board variables

Panel A – Failing college	Mean	Standard deviation	Min.	Median	Max.
No. of trustees	22.98	8.08	7	23	38
No. of female trustees	5.42	3.67	0	5	21
Percent of female trustees (%)	23.8	13.3	0.000	20	70
Financial responsibility composite score	0.733	0.598	-0.900	0.900	1.400
Total assets ¹	\$40,567.864	\$36,358.217	\$83.943	\$28,871.766	\$152,000
<i>ROI</i> (%)	2	2.9	-3.8	1.1	10.3
Panel B – Passing college	Mean	SD	Min.	Median	Max.
No. of trustees	22.44	8.84	3	23	46
No. of female trustees	7.63**	5.26	0	7	23
Percent of female trustees (%)	33.8***	17.4	0	31.6	76.7
Financial responsibility composite score	2.563***	0.411	1.700	2.600	3.000
Total assets ¹	\$86,640.941**	\$131,000	\$1,462.051	\$51,927.649	\$725,000
<i>ROI</i> (%)	2.5	2.9	-1.3	1.6	13.8

significant at 5%; *significant at 1%, ¹Total assets is in thousands (\$). *ROI*: Return on investment

increases, the likelihood of a college receiving a passing financial responsibility composite score increases.

Next, we test our sample using an ordinal regression model. Because our financial responsibility composite score is not continuous, we are able to use the Polytomous Universal Model to run ordinal regression in SPSS. Since we have multiple outcomes for the score, we can represent our model in terms of the odds (Θ), or probability, of observing a particular score *or less* (Norusis, 2011). The equation for the ordinal logistic model then becomes:

$$\ln(SCORE) = \alpha + \beta_1(ROI) + \beta_2(\ln ASSETS) + \beta_3(TOTLIABILITIES_TOTASSETS) + \beta_4(LTDEBT_TOTASSETS) + \beta_5(\ln BOARD_SIZE) + \beta_6(PCT_FEM_TRUSTEES) + \epsilon \quad (2)$$

Table 3: Logistic regression results

Model 1	
Dependent Variable (1=Passing, 0=failing)	
ROI	-11.238
lnASSETS	0.707*
TOTLIABILITIES_TOTASSETS	-8.257***
LTDEBT_TOTALASSETS	5.093**
lnBOARD_SIZE	-2.172*
PCT_FEM_TRUSTEES	3.867**
Constant	-4.222
Pseudo R ²	0.476
N	86

*significant at 10%; **significant at 5%; ***significant at 1%. ROI: Return on investment

Table 4: Collinearity diagnostics

Variable	VIF	SQRT VIF	Tolerance	R-squared
ROI	1.19	1.09	0.8407	0.1593
LnASSETS	1.85	1.36	0.5397	0.4603
TOTLIABILITIES_TOTASSETS	1.62	1.27	0.6158	0.3842
LTDEBT_TOTASSETS	1.49	1.22	0.6700	0.3300
lnBOARD_SIZE	1.71	1.31	0.5854	0.4146
PCT_FEM_TRUSTEES	1.14	1.07	0.8768	0.1232

ROI: Return on investment

Each logit, or probability, will have its own α value, but the same coefficient β . In the regression output, SPSS refers to this as a threshold value, similar to the intercept in a linear regression (Norusis, 2011). The coefficients of the independent variables are referred to as location variables. Table 5 shows the output from equation 2, with the *PCT_FEM_TRUSTEES* as our test variable. The coefficient of *PCT_FEM_TRUSTEES* is positive and significant, indicating that a higher percentage of female trustees is associated with an increasing odds of a higher composite score.

6. CONCLUSION

Our paper examines the association between the percentage of female members on the board of trustees and the college’s financial health, as measured by the financial responsibility composite score from the U.S. Department of Education’s Office of Federal Student Aid. We find statistical evidence that a higher percentage of women on the board of trustees is associated with an increased likelihood of a passing score on the financial responsibility composite score, which corresponds with previous research that has shown that women take their monitoring or fiduciary role very seriously (Yu et al., 2017; Eagly and Carli, 2003; Robinson and Dechant, 1997). The results from Michael et al. (2000) may explain this result when they found that female board members are more likely to believe that attention to the institution’s budget details and approval process is an important performance measure for a trustee. Contrary to the findings from Harris (2014), we did

Figure 1: Marginal effects for regression in Table 3

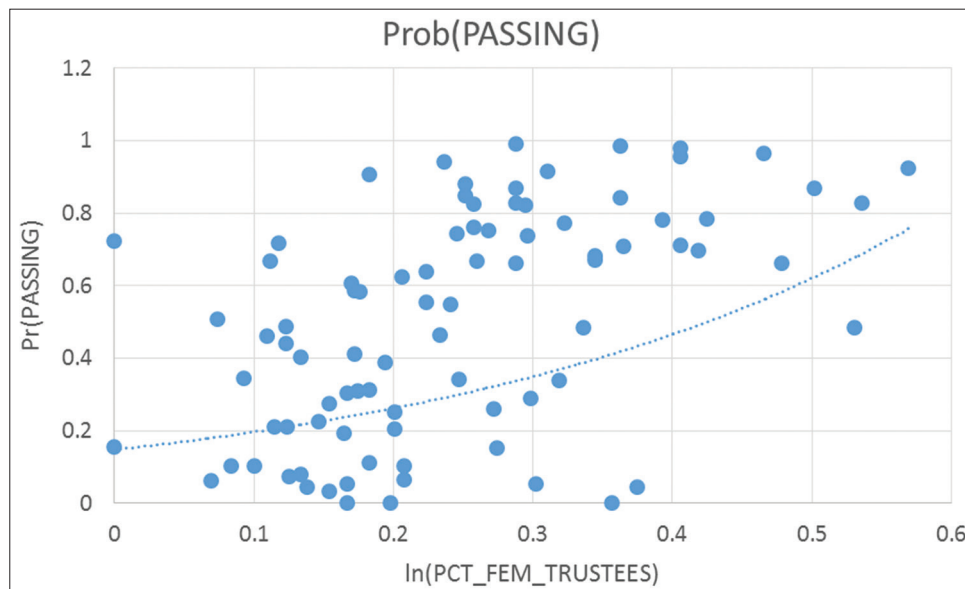


Table 5: Ordinal regression results

Dependent variable (Score)	
Score=-0.9	-1.285
Score=-0.7	-0.491
Score=-0.6	0.686
Score=-0.3	1.234
Score=0.1	1.693
Score=0.3	2.352
Score=0.5	2.771
Score=0.6	3.331
Score=0.7	3.862
Score=0.8	4.050
Score=0.9	4.386*
Score=1.0	4.699*
Score=1.1	5.001*
Score=1.2	5.145**
Score=1.3	5.291**
Score=1.4	5.710**
Score=1.7	5.912**
Score=1.9	6.049**
Score=2.0	6.116**
Score=2.1	6.185**
Score=2.2	6.408**
Score=2.3	6.568**
Score=2.4	6.811***
Score=2.5	7.227***
Score=2.6	7.397***
Score=2.7	7.750***
Score=2.8	7.951***
Score=2.9	8.301***
ROI	-5.551
lnASSETS	0.722***
TOTLIABILITIES_TOTASSETS	-5.139***
LTDEBT_TOTASSETS	-0.247
lnBOARD_SIZE	-1.703***
PCT_FEM_TRUSTEES	2.363*
Adj R square	0.523
N	86

*significant at 10%; **significant at 5%; ***significant at 1%. ROI: Return on investment

find evidence of female trustees having an impact on the college's financial performance.

A limitation of our analysis is that by using publicly available data, some of our data had to be collected for each institution individually from their Form 990, which makes it difficult to construct a larger dataset. Further, not all of the independent variables that we would want to use are available. Another limitation is that due to potential endogeneity, we can only claim a positive association and cannot claim that having more female trustees causes better financial performance.

The increased consideration to women on academic boards grants fresh challenges to governance performance research. To strengthen the link, it is suggested that future research be done to explore the characteristics of women and how their characteristics would impact their decision making as trustees. While our research shows an association and not a causation, an argument could also be made from an equity perspective that boards of trustees should endeavor to recruit female members. Further exploration of the causality between female board members and the financial performance of higher education

institutions will help to increase the meaningfulness of this research to stakeholders.

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