The Gender and Ethnic Diversity of US Boards and Board Committees and Firm Financial Performance

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ABSTRACT

Manuscript Type: Empirical
Research Question/Issue: We examine the business case for the inclusion of women and ethnic minority directors on the board. Specifically, we investigate the relationship between the number of women directors and the number of ethnic minority directors on the board and important board committees and financial performance measured as return on assets and Tobin's Q.
Research Findings/Insights: We do not find a significant relationship between the gender or ethnic diversity of the board, or important board committees, and financial performance for a sample of major US corporations. Our evidence also suggests that the gender and ethnic minority diversity of the board and firm financial performance appear to be endogenous.
Theoretical/Academic Implications: Reasonable theoretical arguments drawn from resource dependence theory, human capital theory, agency theory, and social psychology suggest that gender and ethnic diversity may have either a positive, negative, or neutral effect on the financial performance of the firm. Our statistical analysis supports the theoretical position of no effect, either positive or negative. Our results are consistent with a contingency explanation because the effect of the gender and ethnic diversity of the board may be different under different circumstances at different times. Over several companies and time periods, the results could offset to produce no effect.
Practitioner/Policy Implications: The results of our analysis do not support the business case for inclusion of women and ethnic minorities on corporate boards. However, we find no evidence of any negative effect either. Our evidence implies that decisions concerning the appointment of women and ethnic minorities to corporate boards should be based on criteria other than future financial performance.

Keywords: Corporate Governance, Financial Performance, Board Committees, Board Composition

INTRODUCTION

Evolving cultural, political, and societal views of corporate board membership are partially driving interest in the demographic diversity of corporate directors. In addition, the global desire for better corporate governance is a major factor. The Cadbury Report in the United Kingdom, the General Motors Board of Directors guidelines in the US, and the Dey Report in Canada illustrate an interest in improved governance in different countries (Monks &

Minow, 2004). The movement in the US for improved corporate governance following governance failures and a heightened awareness of the importance of corporate governance produced the Sarbanes-Oxley Act of 2002, a massive piece of legislation. Other countries have passed legislation and/or guidelines regulating corporate governance as well. Rose (2007) reports a significant interest in Scandinavian countries in increasing the number of women on corporate boards. Norway has a law that requires 40 per cent of the directors for a company to be women (Rose, 2007). Similar to Norway, Spain recently passed legislation requiring a quota for the number of female directors (Adams & Ferreira, 2009). The Higgs Report, commissioned by the British Department

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of Trade and Industry, suggests that demographic diversity increases board effectiveness and recommends that more women be included on boards (Adams & Ferreira, 2009). Hillman, Cannella, and Harris (2002) contend that one of the most important trends in US boardrooms over the past two decades is a shift toward the inclusion of women and ethnic minorities.

The phenomenon of the gender and ethnic diversity of corporate boards encompasses at least two significant, and interrelated, propositions. The first viewpoint holds that those competent women and ethnic minorities with the human capital, external networks, information, and other characteristics of importance to the corporation deserve opportunities to serve on corporate boards and in upper management. The second proposition suggests that gender and ethnic diversity of directors results in better governance which causes the business to be more profitable. Karen J. Curtin, a former executive vice president of Bank of America, describes the interaction of the two propositions of board diversity in the following statement, "There is real debate between those who think we should be more diverse because it is the right thing to do and those who think we should be more diverse because it actually enhances shareholder value. Unless we get the second point across and people believe it, we're only going to have tokenism" (Brancato & Patterson, 1999:7). Herman Bulls, CEO of a real estate advisory group and a director for Comfort Systems USA, states "When I'm sitting in that boardroom, my fiduciary responsibility is to the shareholders of that company – not social engineering. I can talk about diversity. But there ought to be a business case" (Dvorak, 2008:R4). The business case implies that competent women and ethnic minority directors are not substitutes for traditional corporate directors with identical abilities and talents but qualified women and ethnic minority directors have unique characteristics that create additional value.[1] The business case for board gender and ethnic diversity is a subset of the larger issue of good international corporate governance.

A realistic understanding of the nature of any relationship that may exist between the gender and ethnic diversity of the board and firm financial performance has important implications for both public policy and the governance of business firms. If there is no difference between competent women and ethnic minority directors and other qualified directors so that the gender and ethnic diversity of the board does not influence firm governance and performance, then the desirability of gender and ethnic minority diversity is primarily a public policy issue. However, if there is a positive relationship between the gender and ethnic diversity of the board and firm performance, the economic implications of board diversity are important. To the contrary, if the relationship is negative, the costs of inclusion of women and ethnic minority directors become a factor to be considered. Contingency theory (Fiedler, 1967; Lawrence & Lorsch, 1967) suggests a more complex link between the gender and ethnic diversity of the board and firm performance in that certain aspects of board diversity may be desirable in some organizations, and not others, and under different circumstances at different times.[2] Theories from economics, organization behavior, and social psychology provide some understanding of the nature of the link between the gender

and ethnic minority diversity of the board and firm financial performance but the empirical evidence on the link is mixed and limited.

The purpose of this empirical analysis is to explore the relationship between the gender and ethnic minority diversity of the board and the financial performance of the firm. Our research is unique because we consider both ethnic diversity and gender diversity in this analysis that is not common in the literature. We could locate only one other empirical investigation that directly considered the link between the ethnic minority diversity of the board and financial performance of the firm. The empirical relationship between the gender of corporate directors and financial performance has received much more attention in the literature than other aspects of the demographic diversity of corporate directors, possibly because of the availability of data. However, we believe that gender diversity and ethnic diversity are not the same phenomenon and will not affect the firm in identical ways. We base this conjecture on the following: (1) previous empirical evidence on the nature of board diversity (Hillman et al., 2002; Peterson & Philpot, 2007; Peterson, Philpot, & O'Shaughnessy, 2007); (2) theory, especially resource dependence theory and human capital theory, which suggests significant differences between women directors and ethnic minority directors; and (3) the evidence presented in this analysis which suggests a difference between women directors and ethnic minority directors. Furthermore, our study is unique because we explore the relationship between the gender and ethnicity of the members of important board committees and financial performance which has not been done before. We investigate the hypothesis of Klein (1998) that an analysis of committee membership and financial performance provides a different, and perhaps stronger, test of the link between board diversity and firm performance. Our third contribution is that we implement econometric approaches that have not been used extensively in previous investigations. As the empirical analysis of board diversity and firm performance has progressed, more and more sophisticated analytical methods are being applied with new data sets. Our research contributes to this research stream by using improved statistical tests and variables. All of the previous empirical research we could find uses the percentage of women and/or percentage of ethnic minorities on the board as the independent variable of interest. Our investigation uses the number of women directors and the number of ethnic minority directors. We implement a five-year panel of data and associated panel data methodology. We use a firm fixed effect methodology that has only been used once in previous research. Our statistical models tested a lagged relationship between diversity measures and financial performance that is rare in previous investigations.

The paper is organized as follows. We review applicable theory in the first section. In the second section, we discuss some of the previous evidence on the link between board diversity and the financial performance of the firm. We present the hypotheses tested in the third section and discuss our sample, data, variables, and statistical methods in Section 4. We present the results of the statistical analysis in section five and provide concluding comments in the last section of the paper. The research is conducted with data

from the major US corporations listed in the Standard and Poor's 500 index.

THEORETICAL PERSPECTIVES ON THE DIVERSITY-PERFORMANCE RELATIONSHIP

The board of directors is generally believed to have at least four important functions – monitoring and controlling managers, providing information and counsel to managers, monitoring compliance with applicable laws and regulations, and linking the corporation to the external environment (Mallin 2004; Monks and Minow 2004). A large body of the theory on boards addresses these functions in one way or another. One basic proposition is that the composition of the board affects the way the board performs these functions that partially determine firm performance.[3] This concept offers the possibility that board composition in general, with the gender and ethnic minority diversity of the board a subset of board composition, is linked to firm performance.

No single theory directly predicts the nature of the relationship between board diversity and financial performance but several theories from various fields provide insight into the issue.[4] We adopt an interdisciplinary approach and draw from four important theories taken from organization theory, economics, and social psychology to provide the theoretical basis for the hypotheses tested.

Resource Dependence Theory

Pfeffer and Salancik (1978) argue that boards serve to link the corporation to other external organizations in order to address environmental dependencies. Pfeffer and Salancik (1978) suggest four primary benefits for the external linkages: (1) provision of resources such as information and expertise; (2) creation of channels of communication with constituents of importance to the firm; (3) provision of commitments of support from important organizations or groups in the external environment; and (4) creation of legitimacy for the firm in the external environment. Hillman, Cannella, and Paetzold (2000) expand these four benefits into a taxonomy of director types that provide various resources to the firm: insiders, business experts, support specialists, and community influentials. Hillman et al.'s (2000) extension of resource dependence theory suggests that different types of directors will provide different beneficial resources to the firm. As a result, a more diverse board will provide more valuable resources, which should produce better firm performance.

Furthermore, the type of diversity appears to be important. For example, Booth and Deli (1999) find that the presence of a commercial banker on the board is positively related to the total debt of the firm and they conclude that commercial bankers provide expertise on, and links to, the bank debt market. Agrawal and Knoeber (2001) find that outside directors with political and legal backgrounds are more likely to be on the boards of companies that sell to the government or face government regulation. Similarly, women directors and ethnic minority directors bring different benefits and resources. Hillman et al. (2002) find that

female African-American directors are less likely to be business experts than male African-American directors and that both female and male African-American directors are less likely to be business experts than Caucasian female directors. Caucasian male directors are much more likely to be business experts than either African-American or female directors.[5] Gender and ethnicity appear to be separate dimensions under resource dependence theory because women and ethnic minorities have different backgrounds and different human capital which results in the ability to address different environmental dependencies.[6]

Resource dependence theory provides the basis for some of the most convincing theoretical arguments for a business case for board diversity. Diversity holds the potential to improve the information provided by the board to managers due to the unique information held by diverse directors. Differences in gender and ethnicity will very likely produce unique information sets that are available to management for better decision making. Diverse directors provide access to important constituencies in the external environment. The creation of this important link is crucial because over half of the pool of human capital available to the firm is composed of women and ethnic minorities. As a result, diverse organizations have access to more talent. Board diversity sends important positive signals to the labor market and product market, although Caucasian women directors send a different signal to these markets than ethnic minorities. Diverse directors may bring diverse perspectives and nontraditional approaches to problems as they are less likely to be insiders or business experts. The ability of an ethnically diverse board to provide legitimacy for the corporation with both external and internal constituencies is particularly important in countries like the US because of increasing growth in the proportion of ethnic minority groups.

It should be noted that the type of diversity that will be important in a particular country or culture may vary widely. We observe that gender diversity is emphasized in Scandinavian countries and some other countries in Europe such as Spain, possibly because of greater ethnic homogeneity. However, some European countries are experiencing increasing ethnic diversity as well. Other types of demographic diversity, including religion and age, may have more importance in different national and cultural settings.

Human Capital Theory

Terjesen, Sealy, and Singh (2009) indicate that human capital theory is derived from the work of Becker (1964) that addresses the role of a person's stock of education, experience, and skills that can be used to the benefit of an organization. Furthermore, differences in gender results in directors having unique human capital (Terjesen et al., 2009). If human capital of corporate directors is influenced by gender, it is reasonable to hypothesize that the human capital of ethnic minorities would be unique relative to both Caucasian men and women. Human capital theory complements some of the concepts associated with board diversity derived from resource dependence theory.

One question raised by the fact that women and ethnic minorities have unique human capital is, "the claim that women lack the 'right' human capital for directorships."

(Terjesen et al., 2009:325). The evidence on the human capital of women suggests that women are just as well qualified as men in terms of several important qualities including level of education but women are less likely to have experience as business experts (Terjesen et al., 2009).[7] Peterson et al. (2007) find that African-American directors assume different roles on the board relative to Caucasian directors which is possibly tied to their unique human capital. This appears to be the same for women directors as well (Hillman et al., 2002; Peterson, Philpot, & O'Shaughnessy 2007). The net result is that human capital theory predicts that the performance of the board will be affected by board diversity as a result of diverse and unique human capital but the effect could be either positive or negative from a financial performance perspective. Contingency theory (Fiedler, 1967; Lawrence & Lorsch, 1967) is relevant as well in that human capital that may be useful in one organization at some point in time but may not be useful under different internal and external circumstances.

Agency Theory

The board function of monitoring and controlling managers is a fundamental concept from agency theory (Jensen & Meckling, 1976). Carter, Simkins, and Simpson (2003) suggest that a more diverse board may be a better monitor of managers because board diversity increases board independence but they go on to say that agency theory does not provide a clear prediction of the link between board diversity and financial performance. Diverse directors are less likely to be beholden to managers according to this view, for example TIAA-CREF adopts this proposition in their policy statements (Carleton, Nelson, & Weisbach, 1998). Furthermore, factors such as ownership position in the firm may have a more powerful influence on board monitoring than independence. Jensen (1993) and Monks Minow (2004) argue that high equity ownership by directors is a more important factor in increasing the willingness of directors to monitor than independence. In general, agency theory does not provide as strong support for the financial benefits of board diversity as does a resource dependence perspective but agency theory does not rule out the possibility that board diversity is beneficial.

Social Psychological Theory

Westphal and Milton (2000) address the opposing views that the presence of demographic minorities on boards is often viewed favorably by corporate stakeholders but the academic literature is more pessimistic about the extent to which demographic minority directors can successfully influence group decisions. They further suggest that a central finding of the literature is that demographic differences lower social cohesion between groups and that the social barriers reduce the probability that minority viewpoints will influence group decisions (Westphal & Milton, 2000). Westphal and Milton (2000) indicate that this social psychological concept of minority status is derived from social impact theory. This theory predicts that individuals who have majority status have the potential to exert a disproportionate amount of influence in group decisions

(Westphal & Milton, 2000). Thus it may be that diverse directors will not influence the board as a result of the internal group dynamics of the board.[8]

Some research has suggested that minority group members may encourage divergent thinking in the decision-making process (Westphal & Milton, 2000). However, Campbell and Minguez-Vera (2008) draw from the work of Lau and Murnighan (1998) to argue that greater gender diversity among board members generates more diverse opinions and critical thinking that makes decision-making more time-consuming and less effective. Williams and O'Reilly (1998) conclude that the evidence suggests that diversity may produce more conflict and employee turnover as well as creativity and innovation. Forbes and Milliken (1999) conclude from a review of the evidence that board effectiveness probably depends significantly on social-psychological processes and they argue that each facet of board demography is likely to have many complex and conflicting effects on the processes that affect board performance. Kim, Burns, and Prescott (2009) argue that board diversity is positively related to the breadth and speed of top management team strategic action capability in their theoretical analysis of the strategic role of the board of directors.

In summary, the theory and evidence on group dynamics suggests that board diversity may have both positive and negative effects on firm performance.

EMPIRICAL RESEARCH ON THE DIVERSITY-PERFORMANCE RELATIONSHIP

The link between the diversity of corporate boards and the financial performance of the firm has attracted the attention of scholars around the world. However, we located only nine empirical studies that specifically tested the link between board diversity and the financial performance of the firm. This is a rather limited amount of evidence given the amount of discussion on the topic and the volume of empirical investigation devoted to other topics of major interest.

Seven of these nine investigations examined the link between the gender diversity of the board and firm performance. Campbell and Minguez-Vera (2008) investigate the relationship between the gender diversity of the board and financial performance for a sample of companies from Spain. They find that board gender diversity has a positive effect on firm value as measured by Tobin's Q. Carter et al. (2003) examine a sample of US firms and find a positive relationship between board gender diversity and Tobin's Q. Adams and Ferreira (2009) find that more gender diverse boards devote more effort to monitoring managers but also find a negative relationship between the proportion of women on the board and Tobin's Q in an analysis of US firms. Smith, Smith, and Verner (2006) find a negative relationship between gender diversity of the board and gross profits to sales for a sample of Danish firms but no statistically significant relationship between board gender diversity and several other accounting measures of financial performance. Rose (2007) does not find a significant relationship between board gender diversity and Tobin's Q for a different sample of Danish firms. Farrell and Hersch (2005) use Poisson regressions and an event

study to investigate the addition of female directors to US boards. They find no evidence that addition of a female to the board affects return on assets or market returns to shareholders. Shrader, Blackburn, and Iles (1997) find no significant relationship between the percentage of female directors on the board and profit margin, return on assets, or return on equity for a sample of US companies.

The implications of the aforementioned investigations of the link between women on the board and financial performance are difficult to deduce. First, the results are mixed. Two investigations find a positive relationship, three find no relationship, and two find a negative relationship. Second, the statistical methods, data, and time periods investigated vary greatly so that the results are not easily comparable. In essence, the overall meaning of the body of research rests on the efficacy of the research methodology employed in each paper. The paper by Adams and Ferreira (2009) is convincing but more investigation of this topic is warranted.

Two investigations examined the link between a diversity measure consisting of both women and ethnic minorities and firm performance. Zahra and Stanton (1988) conduct a canonical correlation analysis with a sample of US firms and find no relationship between the percentage of females plus ethnic minorities on the board and return on assets, profit margin, sales to equity, earnings per share, and dividends. Erhardt, Werbel, and Shrader (2003) find a significant positive link between the percentage of females plus ethnic minorities on the board and return on assets and return on equity for a sample of US firms. We only located one investigation that examined the relationship between the ethnicity of directors and financial performance. Carter et al. (2003) find a significant positive relationship between the percentage of ethnic minority directors on the board and Tobin's Q.

THEORETICAL PREDICTIONS OF THE DIVERSITY-PERFORMANCE RELATIONSHIP

Diversity of Overall Board and Firm Performance

Resource dependence theory and human capital theory do not specifically predict a link between board diversity and the financial performance of the firm but they are highly suggestive of a positive relationship. Furthermore, the type of diversity should be important based on resource dependence theory and human capital theory. Because women and ethnic minorities have different human capital and external connections to the environment, we predict that they will not have the same effect on board functions and, ultimately, firm performance. Brammer, Millington, and Pavelin (2007) analyze the gender and ethnic diversity of a sample of UK companies and conclude that "board diversity is influenced by a firm's external business environment and particularly an imperative to reflect corresponding diversity among its customers." Brammer et al. (2007) find significant cross-sector variation in gender diversity across industries while variation in ethnic diversity is much less pronounced. The empirical evidence developed by Hillman et al. (2002), Peterson and Philpot (2007), and Peterson et al. (2007) sup-

ports the idea that women directors and ethnic minority directors may have different functions on the board.

Agency theory offers the possibility that diverse directors may be better monitors of management. While agency theory suggests a link between board diversity and firm performance, the nature of the link is not clear. More and tougher monitors may be either positive or negative as suggested by Adams and Ferreira (2009).

Theories from social psychology suggest that diverse (out-group) directors may not have an influence on board decisions due to the internal group dynamics of the board. Furthermore, more diverse members on the board may promote creative and innovative ideas but decision making may be slower and more conflicted with diverse directors.

In summary, an interdisciplinary set of theories provide a solid indication that a link between board diversity and firm financial performance is a realistic possibility. However, the relationship may either be positive or negative based on the theory. Furthermore, the limited amount of empirical evidence on the relationship does not provide clear support for the direction of the link being either positive or negative. As a result, we state the hypotheses in null format and perform two-tailed statistical tests. The basic hypotheses are

Hypothesis 1. All else being equal, the number of ethnic minority directors on the board is not related to the financial performance of the firm.

Hypothesis 2. All else being equal, the number of women on the board is not related to the financial performance of the firm.

Diversity of Board Committees and Firm Performance

Bilimoria and Piderit (1994) submit that previous research indicates the delegation of corporate governance to board committees facilitates effective board and corporate functions. They explain that board committees provide a means and structure for effective governance by facilitating special tasks and addressing important corporate concerns (Bilimoria & Piderit, 1994). Jiraporn, Singh, and Lee (2009) argue board effectiveness is accomplished through board committees. Kesner (1988) argues the most important decisions of the board are initiated at the committee level. If the above arguments are correct, the possibility exists that diverse directors may have more influence through board committees than board membership. Simply being a part of a smaller group may increase the influence of diverse directors. Kesner (1988) argues that boards would not elect women to the board's most powerful and influential committees merely for the sake of firm image (tokenism) without consideration for women's potential contributions.

Evidence supports the idea that many important decisions are made in board committees and those decisions affect the performance of the firm. Newman and Mozes (1999) find that the relationship between CEO compensation and performance is more favorable to the CEO if the compensation committee has more insiders on it. Sun and Cahan (2009) examine the influence of compensation committee quality on the relationship between CEO cash compensation and accounting earnings. They find that CEO cash compensation

is more positively associated with earnings for firms with higher quality compensation committees. Adams (2003) finds that board committees of diversified companies devote more effort to monitoring and board committees of growing firms devote more effort to strategic issues. Garcia-Meca and Sanchez-Ballesta (2009) complete a meta-analysis of 35 studies on earnings management and conclude that audit committee independence is one of the major mechanisms to constrain earnings management and assure the credibility of a firm's financial statements. Adams, Hermalin, and Weisbach (2008) contend that the evidence on audit committees supports the concept that the make-up of the committee is correlated with better accounting quality. Goh (2009) finds that the audit committee plays an important role in monitoring the remediation of material weaknesses in internal control under the regulations of the Sarbanes-Oxley Act.[9]

There is little direct evidence that the composition of board committees is more important than the composition of the board in terms of producing better firm performance. We could find only one investigation that addressed this issue. Klein (1998) studied the Standard and Poor's (S&P) 500 firms for 1992 and 1993 and came to the following conclusion, "I find little association between firm performance and overall board composition. However, by going into the inner workings of the board via board committee composition, I am able to find significant ties between firm performance and how boards are structured." Klein (1998) argues that membership on board committees provides a more accurate picture of each director's role on the board which should lead to a more accurate test of the relationship between board composition and board effectiveness. Klein (1998) considers committee membership to be a proxy for the duties, i.e., functions, of a director on the board. Directors have a stronger and more direct impact on executive compensation, new director selection, and other important actions that significantly affect corporate performance if they serve on board committees with primary responsibility for these functions. Any unique advantages or disadvantages that might exist for women and ethnic minorities relative to board process are hypothesized to have a more direct effect through committee assignments. At the minimum, the composition of board committees provides a valuable way to corroborate the relationship between board composition and firm performance. Based on Klein's conjecture plus empirical evidence and continuing with our null format, we hypothesize that

Hypothesis 3. All else being equal, the number of ethnic minority directors on a major board committee is not related to the financial performance of the firm.

Hypothesis 4. All else being equal, the number of women directors on a major board committee is not related to the financial performance of the firm.

RESEARCH DESIGN

Sample and Data

Our sample includes firms in the S&P 500 index for the five-year period 1998–2002. We obtain data on directors and other corporate governance variables from the *Investor Responsibility Research Center* (IRRC), which is now affiliated with *RiskMetrics*. Wharton Research Data Services (WRDS) is a partner with the IRRC and describes the IRRC as the world's leading source of impartial and independent information on corporate governance. The IRRC gathers most of the data from proxy statements (Securities and Exchange Commission statement DEF 14A). Data to compute the natural logarithm of total assets, the return on assets, and Tobin's Q are taken from the COMPUSTAT database. Table 1 provides a description of each of the variables.

IRRC data is provided for each director individually and approximately 5,500 directors are included in the IRRC database each year for the S&P 500 firms. A majority of the sample firms appear each year but a few firms migrate in and out of the index over time due to mergers, spin-offs, bankruptcy, and changes in the index by S&P. The IRRC database contains data on the following number of firms each year of the investigation: 1998 – 474 firms, 1999 – 473 firms, 2000 – 472 firms, 2001 – 472 firms, and 2002 – 487 firms. We extract information from proxy statements for all five years for any firm that may be on the S&P 500 list at least once during the period 1998–2002 to mitigate potential sample bias due to changes in the S&P index. The final data set consists of an unbalanced panel of 641 unique firms and 2,563 firm-years.

The IRRC data for the gender of a director is complete. Gender is relatively easy to determine from information in the proxy statements and company annual reports. However, the proxy statement does not specifically identify gender or ethnicity, but the staff of the IRRC observes titles, such as he or she, and other indirect evidence to determine gender and ethnicity. Data collected by the IRRC on ethnicity is collected from the proxy statement, annual reports, and other external sources. Like gender, the ethnicity of directors is not a part of the proxy statement or other SEC filings but the proxy statement may contain information that indirectly suggests ethnicity. However, ethnicity is more difficult to determine.[10] For the years of this investigation (1998–2002), the IRRC identified the ethnicity of approximately 80 per cent of the directors each year. As a result, we could identify the ethnicity of the total board and board committees for 314 firms and 1,040 firm years. We only used firms that we could identify the ethnicity of all of the directors. This is a strict screen but we believe this is the appropriate means to address the ethnicity of each board. When we used lagged variables, the sample was reduced to approximately 2,300 firm years for the gender sample and 950 firm years for the ethnic minority sample. The ethnic minority sample is a sub-sample of the gender sample.

We investigate the nature of the data with missing ethnicity indicators by selecting a random sample of 100 directors from the directors in the IRRC database for the years 1998–2002 without an ethnicity indicator. Then we complete an exhaustive search through LinkedIn, Lexis-Nexis, Bloomberg, company websites, annual reports, and phone calls to companies to find the ethnicity of the directors in the sample of 100 directors with unidentified ethnicity. Our analysis indicates that the sample of 100 directors with missing IRRC ethnicity indicators had a distribution of ethnicity almost the same as those directors in the IRRC database with identified ethnicity.

TABLE 1
Variable Definitions

Financial Performance (Dependent Variables)	
Tobin's Q	Tobin's Q (Chung and Pruitt approximation)
Return on Assets (ROA) (%)	Annual net income divided by the book value of total assets at the end of the year
Diversity (Independent Variables of Primary Interest)	
Number of Female Directors	Total number of female directors on the board
Number of Females on Nom. Com.	Total number of female directors on the nomination committee of the board
Number of Females on Audit Com.	Total number of female directors on the audit committee of the board
Number of Females on Comp. Com.	Total number of female directors on the compensation committee of the board
Number of Minority Directors	Total number of Black and Hispanic directors*
Number of Min. Dir. On Nom. Com.	Total number of Black and Hispanic directors on the nomination committee of the board*
Number of Min. Dir. on Audit Com.	Total number of Black and Hispanic directors on the audit committee of the board*
Number of Min. Dir. on Comp. Com.	Total number of Black and Hispanic directors on the compensation committee of the board*
Control Variable	
Natural Log of Firm Total Assets	Natural logarithm of the book value of year-end total assets
Governance Control Variables	
Number of Directors on the Board	Total number of directors on the board
Percentage Ownership of the Board	Total number of common shares owned by all directors divided by the total number of common shares outstanding (multiplied by 100)
Average Additional Directorships	Average number of directorships held by each director on the board(in addition to the sample firm directorship) calculated as: the sum of the number of additional directorships for all directors divided by the total number of directors on the board
Average Age of the Directors	Sum of the ages of all directors divided by the total number of directors
Combined CEO-Chairman of the Bd.	Dichotomous variable equals 0 if the chief executive officer and the chairperson of the board are not the same person and 1 if a single individual holds both offices
Number of Independent Directors	Total number of independent directors as defined by IRRC
Meeting Attendance of Directors	Total number of directors that attended less than 75 per cent of the board meetings

*Note: Black and Hispanic women were considered ethnic minorities.

The regression results provided in Table 3 also provide evidence of the comparability of the ethnicity data sample and gender data sample. Models 1 and 4 are estimated with the smaller ethnic minority sample and Models 2 and 5 are estimated with the larger, complete gender sample. The only difference between the variables in Models 1 and 4 and Models 2 and 5 is the number of ethnic minority directors is not available in the larger, complete gender sample. Most of the regression coefficients are similar and those coefficients that are significant are very similar.

The IRRC data for the ethnicity of directors is the only data we are aware of that is publically available to any investigator through the WRDS platform and provides the basis for replication. Jiraporn et al. (2009) use the IRRC ethnicity data in their investigation. Some investigators have developed or acquired specialized ethnicity data sets but the process is so time consuming that they only have one year of data (Carter et al., 2003; Peterson et al., 2007, and Brammer et al., 2007).

Model

The fundamental model tested is

$$\text{Perform} = \alpha + \beta_1 \text{ Diversity} + \beta_2 \text{ Previous Perform} + \beta_3 \text{ Firm Size} + \beta_4 \text{ Governance} + \beta_5 \text{ Firm} + \beta_6 \text{ Time Period} + \varepsilon \tag{1}$$

where *Perform* is the financial performance of the firm measured by either Tobin's Q or return on assets, *Diversity* is a measure of either the gender diversity or ethnic diversity of the board and the board's major committees, *Previous Perform* is a lagged value of Tobin's Q or return on assets, *Firm Size* is the natural log of the total assets of the company, *Governance* is a corporate governance characteristic of the firm, and *Firm* is a unique time-invariant unobservable firm characteristic based on firm level fixed effects in the regression estimation, and *Time Period* is the time period in the panel for that observation. The coefficient of primary interest is β_1 and $H_0: \beta_1 = 0$ and $H_a: \beta_1 \neq 0$.

We estimate two statistical versions of this model, a single ordinary least squares (OLS) regression equation with firm and time fixed effects and a three stage least squares (3SLS) regression analysis with firm and time fixed effects. Hermalin and Weisbach (2003) argue that the relationship of most board characteristics and firm performance are jointly endogenous. Adams and Ferreira (2009) suggest that endogeneity problems arise because of omitted variables that affect both the selection of diverse directors and firm performance. Adams and Ferreira (2009) employ firm fixed effects in their analysis and they demonstrate that firm fixed effects have a significant impact on the results. Garay and Gonzalez (2008) use a single equation model with lagged dependent variables to address the problem of endogeneity. We follow a similar approach with lagged dependent variables and add fixed effects for the firm and time period. We consider the fixed effects estimates very important because they help to mitigate omitted variables and address unobserved changes over time. The firm fixed effects account for differences in the industry and financial leverage used by the firm, among other firm specific dimensions. We use the differential intercept dummy technique for the time period and within-group estimation for the firm fixed effects in this two-way fixed effects model (Gujarati & Porter, 2009). Furthermore, we use robust standard errors in all of the panel data models (Gujarati & Porter, 2009).[11]

A second problem associated with endogeneity is reverse causality (Adams & Ferreira, 2009). The number of diverse directors may affect performance but it is also possible that financially successful firms may select diverse directors. We address the question of reverse causality with 3SLS estimation. We use 3SLS estimation instead of 2SLS estimation because 3SLS accounts for cross-equation correlation that exists in our data (Pindyck & Rubinfeld, 1998). Jackling and Johl (2009) argue for 3SLS regression over 2SLS because 3SLS addresses both potential endogeneity and cross-correlation between equations. The technique of 3SLS regression is used in several recent corporate governance investigations (Bebchuk, Cremers, & Peyer, 2007; Bhagat & Bolton, 2008; Jackling & Johl, 2009; Prevost, Rao, & Hossain, 2002; Setia-Atmaja, 2009).

Financial Performance and Diversity Variables

Refer to Table 1 for a complete description of each of the variables used in the analysis. We create four measures of women's participation on the board for each firm in the sample from the IRRC database – the number of women on the board of directors and the number of women directors on the audit committee, nomination committee, and compensation committee. Similarly, we construct four ethnic minority variables from the IRRC designations of ethnicity – the total number of Black and Hispanic directors on the board of directors and the total number of Black and Hispanic directors on the audit committee, nomination committee, and compensation committee. Women directors that were identified as Black or Hispanic were counted as ethnic minorities not women. We use count data instead of percentages because two diverse directors out of 14 total directors on the board may have more of an effect on firm performance than one diverse director out of six total directors.[12]

We calculate two measures of financial performance – Tobin's Q and ROA. These measures are commonly used in governance investigations as measures of performance but they are not interchangeable or identical. They each measure a significantly different aspect of firm performance. Tobin's Q in its original formulation is the market value of the firm's assets divided by the replacement value of the firm's assets. Computations of Tobin's Q seen in the literature today often use Chung and Pruitt's (1994) approximation which equals [market value of firm's common stock + liquidating value of preferred stock + book value of debt (adjusted for net working capital)] divided by the book value of total assets. Chung and Pruitt (1994) argue that their approximation explains 96.6 per cent of the variability in the more theoretically correct calculation of Tobin's Q by Lindenberg and Ross (1981). We use the Chung and Pruitt (1994) calculation that is basically the market value of the securities issued by the firm divided by the book value of the assets. This measure is an indication of the wealth position of the major providers of funds to the firm: shareholders and creditors. If Tobin's Q is greater than one, then the market value of the shareholders and creditors investment is greater than the amortized historical cost of the assets. Because Tobin's Q is a market based measure to some degree, the metric embodies a forecast of future cash flows produced by the firm and a market assessment of the investment opportunity set of the firm. In theory, Tobin's Q is a more complex measure of performance than ROA. Bhagat and Bolton (2008) argue that stock market based measures are susceptible to investor anticipation. They contend that if investors anticipate an effect of a governance characteristic on financial performance, long-term stock returns will not be correlated with the governance characteristic, even if a real association exists (Bhagat & Bolton, 2008). Bhagat and Bolton (2008) rely primarily on accounting metrics although they also present Tobin's Q and stock returns.

On the other hand, the ROA is an indication of the ability of the firm to produce accounting based revenues in excess of actual expenses from a given portfolio of assets measured as amortized historical costs. ROA is an indication of the accounting income produced for the shareholders if ROA is calculated as net income divided by the book value of total assets.[13] Tobin's Q and ROA are shown to be related statistically by Yermack (1996) and Carter et al. (2003). The correlation between the two measures in our data is approximately 0.6. In summary, Tobin's Q measures wealth and ROA measures income.

Predetermined Variables

The 3SLS procedure is a simultaneous equation method that assumes that firm performance and board diversity are endogenous and the other variables in the system model are predetermined (Pindyck & Rubinfeld, 1998). Unfortunately, many of the variables of interest in corporate governance investigations are not truly exogenous, determined completely outside the model system, but endogenous (Hermalin & Weisbach, 2003). However, we can use the lagged values of the endogenous variables as predetermined variables even though they are not determined completely outside of the system of equations (Pindyck & Rubinfeld, 1998). Jackling and Johl (2009) follow the suggestion of Bhagat and Bolton (2008) and use the lagged value of Tobin's Q and ROA as instruments. We include the lagged value of Tobin's Q and ROA in all of our estimations.[14]

Size of the firm is often used as a control variable in an analysis of financial performance and is shown to be related to market returns by Fama and French (1992), among others. Multiple studies show that asset size is related to Tobin's Q (Faleye, 2007; Prevost et al., 2002; Yermack, 1996). We include the value of the natural log of total assets in the regressions to control for the size of the firm.

We create a second set of variables that measure various aspects of the governance mechanisms of the firm. These have been shown to be related to firm performance in previous investigations.

Yermack (1996) finds that board size and Tobin's Q are inversely related. However, Jackling and Johl (2009) find a strong positive relationship between board size and financial performance that supports evidence from Dalton, Daily, Ellstrand, and Johnson (1998) and Pearce and Zahra (1992). The argument for a positive association between board size and financial performance is that larger boards will bring better information because of greater knowledge from more directors to firm decision making (Jackling & Johl, 2009). Nicholson and Kiel (2007) and Van den Berghe and Levrau (2004) also argue that increasing the number of directors provides a larger pool of information that should translate into better performance (Jackling & Johl, 2009). The positive association between board size and financial performance flows from resource dependency theory while Yermack (1996) makes an agency theory argument for a negative relationship. Both theory and empirical evidence indicate that we should include the number of directors on the board in the financial performance equation. This variable is also important as a control variable because we use the number of women directors and the number of ethnic minority directors instead of the percentage of women and ethnic minority directors. Carter et al. (2003) find that larger boards are more likely to have more women and ethnic minority directors suggesting that having a larger number of women and/or ethnic minority directors could be related to the size of the board, not the financial performance of the firm. Other investigations have all used the percentage of women and ethnic minority directors that adjusts for the number on the board within the variable.

Past studies have found that the leadership structure of the firm and power of the CEO will have an impact on financial performance. Therefore, we control for this by adding a dummy variable to represent if the CEO and Chair of the Board are combined. Brickley, Coles, and Jarrell (1997) find that a combined CEO-Chair leads to lower cash flows and market value while Goyal and Park (2002) find that CEO turnover after poor financial performance is lower if the CEO and Chair are the same person. However, Adams, Almeida, and Ferreira (2005) find no evidence that CEO duality is related to a firm's stock returns. Elsayed (2007) finds no relationship between CEO duality and financial performance except when the performance of the firm is low and then he finds a positive relationship.

The effect of independent directors on the board is a major area of interest in the corporate governance literature. Numerous investigators have explored this issue and reach a mix of conclusions, but some find a relationship (Baysinger & Butler, 1985; Bhagat & Bolton, 2008; Jackling & Johl, 2009; Rosenstein & Wyatt, 1990). We include the number of independent directors as a control variable and use the IRRC definition of an independent director. Independent directors are defined by the IRRC as not an executive or employee and not linked in some other way. The IRRC has a list of conditions that create a link including being a family member of an executive or a former employee. Executives of the firm compose the largest segment of the directors that are not independent in our sample.

The ownership position of the board is expected to affect financial performance but the exact nature of this relationship is subject to some debate (Demsetz & Villalonga, 2001). Monks and Minow (2004) argue that higher board ownership results in better monitoring and a more involved board. However, higher ownership may result in an entrenched board that does not promote the interests of all stakeholders. We include the percentage of the total shares outstanding that are owned by the board in the financial performance equations.

Fich and Shivdasani (2006) find that firms with a majority of the outside directors serving on three or more boards have lower market-to-book ratios, lower profitability, and lower sensitivity of CEO turnover to firm performance. Thus, a busy board may mean that directors are over-committed and are not good monitors for the shareholders. On the other hand, some investigations have found a positive effect on firm performance if directors have additional directorships (Ferris, Jagannathan, & Pritchard, 2003). Directors with multiple directorships have more networking and contacts that may produce benefits for the firm through more extensive capabilities to access the external environment. The number of additional board memberships of current directors is used as a predetermined variable in the financial performance equation.

Vafeas (1999) reports evidence that board meeting frequency and firm performance are related and concludes that board activity is an important dimension of board process. Jackling and Johl (2009) find no relationship between board meetings and financial performance in a sample of Indian firms. We hypothesize that meeting attendance by directors is an indication of the quality of board process and include the percentage of the total number of directors that attended less than seventy-five per cent of board meetings in the financial performance equation. This variable captures a different dimension of board process than the number of board

meetings and is considered a better measure of director involvement than simply the number of board meetings held.

Lagged Variables

We use lagged variables in the fixed effect single equations models because we hypothesize that the effect of board diversity on financial performance will occur over time. Theory does not predict the length of time required for an effect. In addition, only one other previous investigation uses lags and those are one period (Farrell & Hersch, 2005). The number of lags becomes an empirical question without direction from theory. We estimate the equations with a one-year lag and a two-year lag. The results are essentially the same but we lose data with the two-year lag. So we report

regression estimates with the one-year lag. We did not lag the diversity variables in the 3SLS regressions because they were hypothesized to be simultaneous and endogenous. The predetermined variables were lagged values of endogenous variables in the 3SLS regressions.

EMPIRICAL RESULTS

Descriptive Statistics

Table 2 provides descriptive statistics for our sample. The measures of financial performance indicate that the firms in the sample were financially successful on average over the five-year period investigated but there was wide variation in the performance variables. The mean Tobin's Q was 1.19, which is above one and suggests the market value of the firm

TABLE 2
Descriptive Statistics

Variables	Firm Years	Mean	Std. Dev.	Min.	Max.
Panel A: Women Directors Sample					
Tobin's Q	2,563	1.19	1.17	.14	4.54
Return on Assets (%)	2,563	3.90	5.22	−7.88	14.97
Number of Female Directors	2,563	1.30	.93	0	6
Number of Females on Nom. Com.	2,563	.48	.65	0	4
Number of Females on Audit Com.	2,563	.65	.69	0	4
Number of Females on Comp. Com.	2,563	.43	.60	0	4
Natural Log of Firm Total Assets	2,563	8.35	2.19	2.03	13.87
Number of Directors on the Board	2,563	11.21	3.15	4	32
Percentage Ownership of the Board	2,563	5.85	12.84	0	100
Average Additional Directorships	2,563	1.36	.73	0	4.62
Average Age of the Directors	2,563	59.35	3.24	43.33	70.38
Combined CEO-Chairman of the Bd.	2,563	.71	.45	0	1
Number of Independent Directors	2,563	7.77	2.80	0	29
Meeting Attendance of Directors	2,563	.26	.57	0	4.3
Panel B: Minority Directors Sample					
Tobin's Q	1,040	1.25	1.18	.14	4.54
Return on Assets (%)	1,040	4.34	5.33	−7.88	14.97
Number of Minority Directors	1,040	1.09	.89	0	6
Number of Min. Dir. on Nom. Com.	1,040	.39	.58	0	3
Number of Min. Dir. on Audit Com.	1,040	.58	.67	0	3
Number of Min. Dir. on Comp. Com.	1,040	.35	.56	0	3
Natural Log of Firm Total Assets	1,040	8.82	2.04	2.08	13.87
Number of Directors on the Board	1,040	11.83	3.02	5	27
Percentage Ownership of the Board	1,040	3.83	10.75	0	91.50
Average Additional Directorships	1,040	1.56	.74	.05	4.62
Average Age of the Directors	1,040	59.96	2.59	48.6	70.38
Combined CEO-Chairman of the Bd.	1,040	.76	.42	0	1
Number of Independent Directors	1,040	8.45	2.63	1	26
Meeting Attendance of Directors	1,040	.27	.60	0	4.3
Number of Female Directors	1,040	1.58	.95	0	6

Note: Panel A is the sample of firms with all of the directors identified as male or female. Panel B is the sample of firms with all of the directors identified as Black, Hispanic, or Caucasian.

TABLE 3
Fixed Effects Regression Estimates of the Relationship Between Firm Performance and the Number of Ethnic Minority and Women Directors on the Board

Independent Variables	Model 1 Tobin's Q Dependent Variable		Model 2 Tobin's Q Dependent Variable		Model 3 Tobin's Q Dependent Variable		Model 4 ROA Dependent Variable		Model 5 ROA Dependent Variable		Model 6 ROA Dependent Variable	
Number of minority directors	.02	(.66)					.33†	(1.78)				
Number of female directors	.03	(1.10)	.01	(.98)			.41*	(2.07)	.57**	(4.68)		
Number of directors	.01	(.58)	−.00	(−.55)	−.00	(−.37)	.11	(1.24)	.06	(1.11)	.11*	(1.97)
CEO-Chair duality	.04	(.82)	−.02	(−.58)	−.02	(−.55)	−.29	(−.52)	−.35	(−1.58)	−.32	(−1.46)
Additional directorships	.00	(.16)	.00	(.09)	.00	(.22)	.18	(.04)	.09	(.48)	.17	(.96)
Meeting attendance	.03	(1.3)	.02	(1.44)	.02	(1.42)	−.05	(−.20)	.04	(.22)	.01	(.06)
Board ownership	.00	(1.25)	.00	(1.14)	.00	(1.12)	.02	(1.30)	.01	(1.21)	.01	(1.08)
Independent directors	−.01	(−1.48)	−.01	(−.89)	−.00	(−.74)	−.11	(−1.31)	−.03	(−.54)	.00	(.07)
Average age of directors	−.01	(−1.12)	−.00	(−.97)	−.00	(−1.05)	−.06	(−.79)	−.03	(−.82)	−.05	(−1.12)
Log total assets	−.01	(−.88)	.00	(0.24)	.02	(.41)	−.06	(−.86)	−.04	(−.92)	−.01	(−.34)
Tobin's Q	.78**	(38.43)	.79**	(61.85)	.79**	(62.18)						
ROA							.59**	(14.74)	.58**	(19.87)	.59**	(20.26)
Intercept	.74	(1.55)	.49*	(2.02)	.49*	(2..0)	4.84	(.99)	3.38	(1.42)	3.65	(1.50)
Firm Fixed Effects	Yes		Yes		Yes		Yes		Yes		Yes	
Year Fixed Effects	Yes		Yes		Yes		Yes		Yes		Yes	
Firm-Year Observations	958		2,347		2,347		908		2,224		2,224	
Firms in Sample	339		577		577		315		533		500	
Adj. R-square	.81		.79		.79		.37		.37		.36	
F-Statistic	173.98		387.07		409.05		31.21		60.19		62.45	

Notes: All independent variables are lagged one period. Robust standard errors are used to calculate t-statistics. Probability values are based on a t-statistic for a two-tailed test of significance. The first number in each cell is the regression coefficient and the value in parentheses is the associated t-value.
**indicates $p < .01$, *indicates $p < .05$, and †indicates $p < .10$.

is greater than the book value of the assets. However, the variation in the sample is significant with the minimum Tobin's Q 0.14 and the maximum 4.54. The ROA reveals similar high variation. The mean ROA is 3.90 per cent, but the minimum is −7.88 per cent and the maximum is 14.97 per cent. The financial performance of the gender diversity sample and the ethnic diversity sample suggest that the firms in both samples have similar levels of performance. This should not be surprising because the ethnic minority sample is a sub-sample of the gender sample. Mean Tobin's Q for the gender sample is 1.19 compared to 1.25 for the ethnic minority sample and mean ROA is 3.90 per cent for the gender sample and 4.34 per cent for the ethnic minority sample. The firms in the two samples are very similar in size with the mean natural log of total assets 8.35 for the gender sample and 8.82 for the ethnic minority sample.

The average number of women directors on a board is 1.30 and the average number of ethnic minority directors on a board is 1.09 over the five-year period of the sample. However, the average number of women on a board was 1.58 in the ethnic minority sample, which indicates that the two samples are similar but not identical. The average number of directors on a board was very similar for the two samples with the gender sample mean of 11.21 directors compared to the ethnic minority director sample mean of 11.83. The mean number of women on the important board committees indicates that women have slightly higher rates of participation than ethnic minorities on board committees, but this is partially explained by the slightly lower number of ethnic minority directors compared to women.

In 71 per cent of the firm years, the positions of CEO and chairperson of the board were combined. The average board has approximately 11 directors, of which about eight are independent. The average director held 1.5 directorships in addition to the one in the sample firm. The average age of a director was about 59 years and about 25 per cent of the directors in the sample did not attend 75 per cent of the board meetings. These statistics are quite similar to those reported in other analyses of major U. S. corporations, for example Carter et al. (2003).

Fixed Effect Single Equation Analysis

Table 3 reports the fixed effect regression tests of Hypotheses 1 and 2.

TABLE 4
Fixed Effects Regression Estimates of the Relationship Between Firm Performance and the Number of Ethnic Minority and Women Directors on Board Committees: Dependent Variable is Tobin's Q

Independent Variables	Model 1 Audit Minority		Model 2 Nomin. Minority		Model 3 Comp. Minority		Model 4 Audit Women		Model 5 Nomin. Women		Model 6 Comp. Women	
Number of diverse (minority or women) directors on committee	.02	(.75)	.01	(.62)	.01	(.19)	.01	(.58)	.01	(.61)	.02	(.84)
Number of female directors	.03	(1.14)	.03	(1.19)	.03	(1.22)						
Number of directors	.01	(.71)	.01	(.71)	.01	(.74)	−.00	(−.40)	−.00	(−.35)	−.00	(−.39)
CEO-Chair duality	.04	(.84)	.04	(.85)	.04	(.85)	−.02	(−.57)	−.01	(−.55)	−.01	(−.52)
Additional directorships	.00	(.18)	.01	(.21)	.01	(.27)	.00	(.16)	.00	(.17)	.00	(.14)
Meeting attendance	.03	(1.27)	.03	(1.27)	.03	(1.29)	.02	(1.44)	.02	(1.45)	.02	(1.39)
Board ownership	.00	(1.24)	.00	(1.21)	.00	(1.20)	.00	(1.17)	.00	(1.10)	.00	(1.16)
Independent directors	−.01	(−1.54)	−.01	(−1.48)	−.01	(−1.54)	−.00	(−.78)	−.00	(−.84)	−.00	(−.75)
Average age of directors	−.01	(−1.12)	−.01	(−1.19)	−.01	(−1.21)	−.00	(−1.04)	−.00	(−1.04)	−.00	(−1.06)
Log total assets	−.01	(−.85)	−.01	(−.87)	−.01	(−.79)	.00	(.35)	.00	(.32)	.01	(.35)
Tobin's Q	.79**	(38.35)	.79**	(38.35)	.79**	(38.36)	.79**	(62.17)	.79**	(62.20)	.79**	(62.73)
Intercept	.73	(1.52)	.75	(1.53)	.77	(1.60)	.49*	(2.04)	.49*	(2.05)	.50*	(2.05)
Firm Fixed Effects	Yes		Yes		Yes		Yes		Yes		Yes	
Year Fixed Effects	Yes		Yes		Yes		Yes		Yes		Yes	
Firm-Year Observations	958		958		958		2,347		2,347		2,347	
Firms in Sample	339		339		339		577		577		577	
Adj. R-square	.81		.81		.81		.79		.79		.79	
F-Statistic	177.67		175.31		174.36		384.72		383.33		385.10	

Notes: All independent variables are lagged one period. Robust standard errors are used to calculate t-statistics. Probability values are based on a t-statistic for a two-tailed test of significance. The first number in each cell is the regression coefficient and the value in parentheses is the associated t-value.
**indicates $p < .01$, *indicates $p < .05$, and † indicates $p < .10$.

Models 1 and 2 reveal that the coefficients for the number of ethnic minority directors and the number of female directors are not different from zero which means there is no evidence of a significant link between Tobin's Q and the number of women directors or Tobin's Q and the number of ethnic minority directors. Model 3 contains only the control variables and the adjusted R^2 exhibits almost no change for the larger gender sample when the number of women directors is omitted. The only explanatory variable that is significant in Models 1, 2, and 3 is lagged Tobin's Q. The correlation between Tobin's Q and lagged Tobin's Q is high with a Pearson correlation coefficient of 0.9.[15] The regression estimates in Table 3 for Model 4 reveal a significant (0.10 level) positive link between ROA and the number of ethnic minority directors on the board. Model 5 in Table 3 exhibits a positive significant (0.01 level) coefficient for the number of women directors on the board. When the diversity variables are omitted in Model 6 of Table 3, the R^2 exhibits almost no change. The lagged ROA variable is highly significant in Models 4, 5, and 6 but t-statistics are lower than the t-statistics for lagged Tobin's Q in Models 1, 2, and 3. The Pearson correlation coefficient between ROA and lagged ROA is 0.5. We estimate Models 1, 2, 4, and 5 in Table 3 with an added interaction term between the number of women on boards

and the number of ethnic minority directors on boards. The interaction term was not significant in any of the equations and the other coefficients were very similar to the results reported in Table 3. So we did not report the full results which are available from the authors.

Table 4 contains the fixed effect regression estimates for the board committee equations with Tobin's Q as the dependent variable. None of the regression models indicate a significant relationship between Tobin's Q and the number of women directors on a board committee or the number of ethnic minority directors on a board committee. The only significant variable in any of the equations is lagged Tobin's Q and the coefficients for lagged Tobin's Q are very similar to the equations in Table 3.

Table 5 contains the fixed effect regression estimates for the board committee equations with ROA as the dependent variable. Models 1, 2, and 3 indicate that the number of ethnic minority directors on any of the major board committees is not associated with ROA. However, Models 4, 5, and 6 indicate that the coefficients for the number of women on all of the major board committees are positively related to ROA. The regression coefficients for the number of women on the audit committee and nomination committee reported in Models 4 and 5 of Table 5 are positive and significant at

TABLE 5
Fixed Effects Regression Estimates of the Relationship Between Firm Performance and the Number of Ethnic Minority and Women Directors on Board Committees: Dependent Variable is Return on Assets

Independent Variables	Model 1 Audit Minority		Model 2 Nomin. Minority		Model 3 Comp. Minority		Model 4 Audit Women		Model 5 Nomin. Women		Model 6 Comp. Women	
Number of diverse (minority or women) directors on committee	.37	(1.46)	−.04	(−.16)	.16	(.59)	.53**	(3.17)	.53**	(3.20)	.46*	(2.19)
Number of female directors	.43*	(2.24)	.47*	(2.41)	.46*	(2.35)						
Number of directors	.14	(1.55)	.14	(1.63)	.14	(1.60)	.10†	(1.80)	.11*	(1.99)	.10†	(1.87)
CEO-Chair duality	.04	(.11)	.07	(.19)	.05	(.13)	−.35	(−1.58)	−.32	(−1.43)	−.29	(−1.33)
Additional directorships	.21	(.83)	.27	(1.08)	.25	(.98)	.11	(.65)	.13	(.74)	.14	(.77)
Meeting attendance	−.07	(−.28)	−.06	(−.25)	−.06	(−.23)	.03	(.18)	.04	(.27)	.00	(.03)
Board ownership	.02	(1.31)	.02	(1.26)	.02	(1.22)	.01	(1.36)	.01	(1.02)	.01	(1.18)
Independent directors	−.12	(−1.47)	−.12	(−1.50)	−.12	(−1.46)	−.01	(−.24)	−.02	(−.40)	.00	(.06)
Average age of directors	−.06	(−.81)	−.07	(−.95)	−.07	(−.96)	−.04	(−1.07)	−.04	(−1.06)	−.05	(−.81)
Log total assets	−.05	(−.78)	−.04	(−.65)	−.05	(−.71)	−.03	(−.64)	−.03	(−.74)	−.02	(−.52)
Return on Assets	.59**	(14.52)	.59**	(14.81)	.60**	(14.91)	.58**	(20.03)	.58**	(20.25)	.58**	(20.16)
Intercept	4.70	(.96)	5.28	(1.07)	5.33	(1.09)	3.64	(1.50)	3.61	(1.50)	3.66	(1.52)
Firm Fixed Effects	Yes		Yes		Yes		Yes		Yes		Yes	
Year Fixed Effects	Yes		Yes		Yes		Yes		Yes		Yes	
Firm-Year Observations	908		908		908		2,224		2,224		2,224	
Firms in Sample	315		315		315		533		533		533	
Adj. R-square	.37		.37		.37		.36		.36		.36	
F-Statistic	31.23		31.23		31.29		59.22		59.43		59.29	

Notes: All independent variables are lagged one period. Robust standard errors are used to calculate t-statistics. Probability values are based on a t-statistic for a two-tailed test of significance. The first number in each cell is the regression coefficient and the value in parentheses is the associated t-value.
**indicates p < .01, *indicates p < .05, and †indicates p < .10.

the .01 level. The regression coefficient for the number of women on the compensation committee is positive and significant at the .05 level. The only other coefficients in Models 4, 5, and 6 of Table 5 that are significant are for the number of directors on a board committee and lagged ROA. The coefficients for the number of directors are significant at the .10 and .05 levels and positive.

The fixed effect single equation analysis rejects null hypothesis 1 at the .10 probability level when ROA is used to measure firm financial performance. Null Hypothesis 1 cannot be rejected when Tobin's Q is used to measure financial performance. The hypothesis tests support the idea that a positive relationship exists between the number of ethnic minority directors on the board and ROA but there is no support for a relationship between the number of ethnic minority directors on the board and Tobin's Q. Null Hypothesis 2 can be rejected at the .01 level when ROA is used to measure financial performance but cannot be rejected when Tobin's Q is used to measure financial performance. Tests of Hypothesis 2 indicate that a positive relationship exists between the number of women on the board and ROA but do not support a relationship between the number of women on the board and Tobin's Q. Null Hypothesis 3

cannot be rejected for any of the board committees with either Tobin's Q or ROA used as a measure of financial performance. The tests of Hypothesis 3 provide no evidence of a significant relationship between the numbers of ethnic minority directors on any of the board committees investigated and financial performance as measured by either ROA or Tobin's Q. Tests of Hypothesis 4 support a positive, significant relationship between the number of women directors on all of the board committees investigated and financial performance as measured by ROA. However, there was no relationship between the number of women on board committees and Tobin's Q.

The results of the fixed effect single regression analysis suggest a different relationship between the number of women directors on the board and financial performance and the relationship between the number of ethnic minority directors on the board and financial performance. The evidence suggests a positive link in both cases between the number of diverse directors on the board and ROA. However, the evidence is stronger for female directors. Furthermore, the evidence for board committees supports a positive link between the number of female directors and ROA but does not support a link between ROA and ethnic

TABLE 6
3 SLS Regression Estimates of the Relationship Between Firm Performance and the Number of Ethnic Minority and Women Directors on the Board

Independent Variables	Model 1 Tobin's Q Dependent Endogenous Variable		Model 2 Tobin's Q Dependent Endogenous Variable		Model 3 ROA Dependent Endogenous Variable		Model 4 ROA Dependent Endogenous Variable	
Number of minority directors	.15	(.64)			1.72	(.81)		
Number of female directors	.01	(.19)	−.16	(−.74)	.19	(.46)	1.21	(.76)
Number of directors	.00	(.20)	.01	(.44)	−.02	(−.15)	.01	(.09)
CEO-Chair duality	.01	(.31)	−.01	(−.18)	.00	(.01)	−.22	(−.95)
Additional directorships	.01	(.08)	.05	(1.63)	−.36	(−.61)	−.07	(−.30)
Meeting attendance	.01	(.28)	.00	(.04)	.08	(.28)	.01	(.07)
Board ownership	.00†	(1.67)	.00	(.79)	.01	(.80)	−.06	(−.61)
Independent directors	−.01	(−1.22)	−.00	(−.73)	−.04	(−.03)	−.20	(−1.11)
Average age of directors	−.01	(−.62)	−.00	(−.86)	−.03	(−.42)	.15	(.98)
Log total assets	−.01	(−1.17)	.01	(1.21)	−.14	(−1.50)	−.04	(−.49)
Tobin's Q	.81**	(60.39)	.80**	(42.93)				
ROA					.56**	(14.54)	.53**	(12.83)
Intercept	.17	(1.13)	.00	(.02)	3.07*	(2.16)	1.69†	(1.69)
Firm Fixed Effects	Yes		Yes		Yes		Yes	
Year Fixed Effects	Yes		Yes		Yes		Yes	
Chi Square Statistic	4,738.96		7,332.11		408.91		863.77	

Notes: In Models 1 and 3 the number of minority directors is an independent endogenous variable that is not lagged and all of the other independent variables are lagged one time period. In Models 1 and 3 the number of female directors is not endogenous and is lagged one time period. In Models 2 and 4 the number of female directors is an independent endogenous variable that is not lagged and all of the other independent variables are lagged one time period. Only the results of the 3SLS procedure equations with Tobin's Q and ROA as the dependent variable are reported. Probability values are based on a z-statistic for a two-tailed test of significance. The first number in each cell is the regression coefficient and the value in parentheses is the associated z-value.
**indicates $p < .01$, *indicates $p < .05$, and †indicates $p < .10$.

minority directors. The difference in the sample for ethnic minority directors compared to women directors might be a contributing factor to this difference. However, in Model 4 in Table 3, the number of female directors variable is included with the number of ethnic minority directors in the smaller ethnic minority director sample and the gender variable is significant and slightly stronger based on the t-statistic.

Hausman Tests of Endogeneity

Hermalin and Weisbach (1998, 2003) argue that board composition and firm performance are endogenous. If this is the case, ordinary least squares estimators for the hypothesized relationships are not efficient or consistent (Gujarati & Porter, 2009). Gujarati and Porter (2009) recommend that investigators check for an endogeneity problem in the data. If the hypothesized equation is determined to actually be simultaneous, then 2SLS or instrumental variables methods should be used instead of ordinary least squares (Gujarati & Porter, 2009). We perform a Hausman test of endogeneity (simultaneity) for each of the models in Tables 3, 4, and 5. The results indicate that the board diversity variables and

financial performance variables are endogenous in many of the models. The full results of these tests include the regression results for two regression equations for each model in each table so we do not report them to conserve space. The results are available from the authors.

3 SLS Regression Analysis

Table 6 contains partial results of the 3SLS regression analysis of Hypotheses 1 and 2. Neither null Hypothesis 1 or 2 can be rejected based on the analysis. Neither the number of ethnic minority directors variable nor the number of women directors variable are different from zero in Models 1, 2, 3, or 4. The only significant variables in any of the equations are the lagged values of Tobin's Q and ROA. Simply, the 3SLS analysis provides no support for a link between the number of women on boards or the number of ethnic minority directors on boards and financial performance.

Table 7 contains partial results of the 3SLS analysis of Hypotheses 3 and 4. Neither null Hypothesis 3 or 4 can be rejected by the 3SLS regression tests for any of the board committees investigated. None of the parameter estimates of interest are different from zero in Models 1, 2, 3, 4, 5, or 6 in

TABLE 7
3SLS Regression Estimates of the Relationship Between Firm Performance and the Number of Ethnic Minority and Women Directors on Board Committees

Independent Variables	Model 1 Audit Minority	Model 2 Nom. Minority	Model 3 Comp. Minority	Model 4 Audit Women	Model 5 Nom. Women	Model 6 Comp. Women
Panel A: Endogenous Dependent Variable is Tobin's Q						
Number of minority directors on committee	.14	.14	−.42			
Number of women directors on committee				−.64	−.56	−1.89
Tobin's Q	.81**	.81**	.82**	.79**	.80**	.87**
Log total assets	−.01	−.01	−.00	.02	.03	.03
Intercept	.10	.12	.07	.07	−.05	.30
Firm Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Time Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Governance Variables	Yes	Yes	Yes	Yes	Yes	Yes
Chi-Square Statistic	4,821.68	4,952.56	3,931.59	4,685.40	5219.38	1,365.75
Panel B: Endogenous Dependent Variable is ROA						
Number of minority directors on committee	1.55	1.70	−5.46			
Number of women directors on committee				5.90	3.39	7.08
ROA	.56**	.58**	.57**	.51**	.53**	.50**
Log total assets	−.11	−.12	−.03	−.11	−.13	−.07
Intercept	2.23*	2.40*	2.02	1.36	1.89	.08
Firm Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Time Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Governance Variables	Yes	Yes	Yes	Yes	Yes	Yes
Chi-Square Statistic	430.86	423.13	292.55	484.45	729.71	472.69

Notes: The number of minority directors on a specified board committee is an endogenous independent variable and is not lagged in models 1, 2, and 3. The number of women directors on a specified committee is an endogenous independent variable and is not lagged in models 4, 5, and 6. All other independent variables in the model are lagged one period. The governance variables are included in all of the models as independent variables but regression statistics are not shown to conserve space. Only the results of the 3SLS equations when Tobin's Q and ROA are the dependent variable are reported. Probability values are based on a z-statistic for a two-tailed test of significance. The number in each cell is the regression coefficient and the associated z-value is not reported.
**indicates $p < .01$, *indicates $p < .05$, and † indicates $p < .10$.

Table 7. These results provide no evidence of a link between the number of women directors on any of the board committees investigated and/or the number of ethnic minority directors on any of the board committees investigated and either Tobin's Q or ROA.

Change Model

As a robustness check, we estimate first difference forms of Models 1, 2, 4, and 5 Table 3 and Models 1, 2, 3, 4, 5, and 6 in Table 4 (Gujarati & Porter, 2009). However, we do not include Tobin's Q or ROA as independent variables in any of the regressions. None of the change equations are significant as indicated by the equation *F*-test. (The results of these tests are available from the authors.) Therefore, none of the four null hypotheses could be rejected based on these tests.

CONCLUSION

The purpose of this paper is to provide empirical evidence on one of the more significant propositions in the theory of corporate governance. Corporate governance theory proposes that board structure is a strong influence on the actions of the board and top management that ultimately affect firm performance (Kim et al., 2009). A secondary, but important, proposition of this larger construct is that the demographic diversity of the board is one dimension of board structure that matters. However, there are reasonable theoretical arguments and empirical evidence that suggest either no effect of board diversity on firm performance or a detrimental effect. Understanding the influence of the gender and ethnic minority diversity of the board of directors on the financial performance of the firm has important implications for top managers, shareholders, corporate boards, and policy makers.

The results of our estimation of fixed effect regression equations indicate a positive and significant relationship between both the number of women on the board and the number of ethnic minorities on the board and the ROA. When Tobin's Q is used as the measure of financial performance, we find no relationship to gender diversity or ethnic minority diversity, neither positive nor negative. The results

from the fixed effect regression equations indicate a positive and significant link between the numbers of women on each of the major board committees investigated and ROA. We find no such link when Tobin's Q is used to measure performance. Furthermore, we find no link between ethnic minority membership on important board committees and either ROA or Tobin's Q. Our results suggest that the interaction of gender diversity and ethnic minority diversity do not impact financial performance.

Hausman tests reveal the existence of endogeneity in the single equation fixed effect models suggesting the need to estimate the hypothesized relationships with 3SLS regression. The results of our 3SLS regressions provide no support for a link between either the gender or ethnic minority diversity of the board and board committees and financial performance. All of our 3SLS estimates of the parameters of primary interest are not different from zero. The absence of significant parameter estimates in the first-difference form regression equations support the results of the 3SLS regression analysis.

It is important to notice what we do not find. First, there is no evidence of a negative link between board diversity and financial performance so that our evidence does not refute the business case for board diversity. Second, we do not find any empirical evidence of causation going from board diversity to financial performance, either positive or negative. We find some evidence of a positive relationship between board diversity and financial performance in the fixed effect regression analysis but this is not evidence of causation. The 3SLS regressions offer a means to address causation but the lack of any statistical significance in the parameter estimates rules out evidence of causation.

The hypotheses tested were developed from four theories: resource dependence theory, human capital theory, agency theory, and social psychological theory. Each of these theories is discussed earlier in the paper because they provide the conceptual framework for the hypothesis of a link between the gender and ethnic diversity of the board and the financial performance of the firm. Resource dependence theory and human capital theory offer the most support for a positive link between gender and ethnic diversity of the board and firm performance. However, other theories are not mutually exclusive so that valuable resources provided to the firm by women and ethnic minority directors may have been offset by the social-psychological dynamics of the board such as exclusion or conflict. Our results of no empirical relationship are consistent with social psychological theory because there could be offsetting effects of having women and ethnic minority directors. For example, innovation and creativity in decisions might be nullified by group conflict. Our results are also consistent with a contingency framework because women and ethnic minority directors may be a positive, negative, or neutral influence on financial performance according to the unique circumstances at the time. Over multiple firms and years, the effects may cancel out so that no effect is identified. The results of this analysis do not confirm or deny any particular theory because the investigation was not structured or intended to be a direct test of any single broad based theory, such as resource dependence theory or agency theory.

Our study only considered major US based corporations listed in the S&P 500 index. Other countries have different laws, cultural environments, historical backgrounds, geography, and other factors that might affect diversity, in general, and board diversity in particular. As mentioned previously, Norway has a law requiring 40 per cent of the board members of a firm to be women so that Norwegian boards are more diverse in terms of gender than US boards. (Rose, 2007). Due to potential differences in diversity across countries, multi-country studies of the relationship between board diversity and firm financial performance should greatly increase our understanding of board diversity.

The choice of gender and ethnicity as important dimensions of diversity is somewhat unique to the US. In other countries, language, or religion may be more important dimensions of diversity that should be explored. The level of integration of any group into the mainstream society appears to be a relevant factor in the definition of diversity. If a diverse group, whether defined by gender, ethnicity, language, religion, education, or some other dimension, is highly integrated, then any noticeable difference in the behavior of corporate directors from that diverse group might be minimal.

The results of our analysis, previous research by Farrell and Hersch (2005), and the meta-analysis by Dalton et al. (1998) indicate that board structure may not matter in the US. Several possibilities could explain the growing body of evidence suggesting no relationship between board composition and firm performance. If under some conditions board diversity has a positive effect on financial performance and under other conditions board diversity has a negative effect, over time and many firms, the results may cancel out leaving no measureable result. We suggest that future research explore both theoretically and empirically a contingency view of board diversity. Our results are also consistent with the idea that the corporate governance of a firm is an equilibrium solution and no measureable effect will be observed unless something disturbs the equilibrium (Adams et al., 2008). Analysis of this idea directs future research to case studies, clinical settings, and natural experiments that should greatly increase our understanding of the link between board composition and firm performance. Finally, the empirical connection between a single dimension of board structure and firm performance may be too nuanced to statistically tease out. Research that empirically links board structure to board or firm actions is a much better method to test if a relationship between board composition and performance exists than an analysis that attempts to go from board structure directly to firm performance and skips over board and firm actions. For example, Adams and Ferreira (2009) find that executive officer turnover is more sensitive to financial performance in firms with more women on the board. We believe that future research that explores actual board behavior will greatly increase our understanding of the link between board composition and firm performance. Eventually, this line of research should tie board and firm actions to firm performance. Ultimately, investigators may determine there is no true relationship between simple metrics of board composition and firm performance.

One of the important practical implications of our results is that the decision to appoint women and ethnic minorities

to corporate boards should be based on criteria other than the future financial performance of the firm. Our evidence does not support public policy initiatives for quotas of women and ethnic minorities on corporate boards based on the premise that gender and ethnic diversity will improve the financial performance of the firm. At the same time, gender and ethnic minority directors do not appear to have a negative effect on firm financial performance. Diversity in director behavior that contributes to effective board process may be more important to the financial performance of the firm than the demographic diversity of corporate boards, albeit behavioral diversity and demographic diversity may be partially correlated in some circumstances.

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NOTES

1. Hillman et al. (2002) present empirical evidence that female and African-American directors have different backgrounds from traditional directors. Robinson and Dechant (1997) and Stephenson (2004) provide nontechnical summaries of the business case for diversity.
2. Adams and Ferreira (2009) report evidence on the gender diversity of corporate boards that is consistent with a contingency theory view. They conclude, "Overall, our results suggest that gender-diverse boards are tougher monitors. Nevertheless, they reveal that mandating gender quotas in the boardroom may harm well-governed firms where additional monitoring is counterproductive."
3. Kiel and Nicholson (2003) test the basic link between board composition and financial performance with Australian data. Their set of board composition measures includes the number of directors on the board, CEO duality, the percentage of outsiders on the board, and the number of director interlocks.
4. Terjesen et al. (2009) review the theoretical and empirical research that exists on the issue of women directors in the boardroom. Most of these theories speak to board diversity as well as gender diversity.
5. Hillman et al. (2002) find that African-American directors and female Caucasian directors have significantly different educational backgrounds relative to white Caucasian directors but African-American and female Caucasian directors have similar educational backgrounds.

6. This point is closely related to the concept of human capital theory (Becker, 1964) that we address in a following section.
7. Hillman et al. (2002) suggest that status characteristics theory predicts that low status-groups, such as women and racial minorities, are held to a higher standard to demonstrate ability than high-status groups. Kanter (1977) indicates that educational credentials can help level the playing field for low-status groups and offers opportunities for greater achievement (Hillman et al., 2002). Thus, we expect to see women and ethnic minority directors have higher educational levels and different configurations of human capital.
8. Westphal and Milton (2000) go on to investigate under what conditions demographic minorities may avoid out-group biases and exert some influence on board decisions.
9. While the audit committee is often credited with various value creating functions, the case of Enron, where a distinguished audit committee was ineffective in preventing fraud, is not easily forgotten (Monks & Minow, 2004). Thus the possibility exists that in many cases a committee may not add value in a particular situation.
10. This information is based on a telephone conversation with a representative of *RiskMetrics* that is familiar with the IRRC data.
11. Our statistical analysis draws from Jackling and Johl (2009), Garay and Gonzalez (2008), Bhagat and Bolton (2008), Jiraporn et al. (2009), and Adams and Ferreira (2009).
12. We are indebted to an anonymous reviewer for this idea. Most investigations use the percentage of diverse directors on a board. We did some robustness tests with percentages and did not find significant differences.
13. Some investigators use operating income instead of net income in ROA (Bhagat & Bolton, 2008). Bhagat and Bolton (2008) provide an explanation of the calculation of financial performance and several of the other empirical issues related to this analysis.
14. We are indebted to an anonymous reviewer for suggesting the use of the lagged value of financial performance in our estimates. See Keele and Kelly (2006), Achen (2000), and Gujarati and Porter (2009) for a discussion of lagged dependent variables.
15. Achen (2000) discusses the methodology of lagged dependent variables and some of the trade-offs in their use. We estimate Models 1 and 2 without the lagged dependent variable and the adjusted R^2 dropped from approximately .80 to .15. The coefficient for the ethnicity variable in Model 1 is not significant but the coefficient for the gender variable in Model 2 is significant at the .015 probability and positive. The full results of these estimated equations are available from the authors.

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