How Many Female Seats on a Board? Board Gender-Diversification, Power, Risk-Taking, and Financial Performance

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Introduction

The question about the firm value impact of board gender diversity has been persistent (and, sometimes, even controversial). The reason is that the extant empirical evidence in the academic literature has been mixed. My paper sheds new light on this important subject by highlighting how the within-board power and influence asymmetry modulates the impact of board gender diversity on firm risk-taking, financial performance, and value.

Methodology

I do three (3) fundamental things. First, I identify four (4) main empirical challenges that lead to the mixed evidence in the academic literature and their potential solutions as well as revisit the crucial research questions. Second, I formulate an intuitive set of hypotheses on the firm value impact of board gender diversity. And, third, I develop a novel empirical strategy to mitigate the empirical challenges by internalizing the potential solutions and dealing with endogeneity.

The four (4) main empirical challenges and potential solutions:

Figures 1A and 1B, below, highlight the empirical challenges that lead to the mixed evidence in the academic literature, the principal issues, and their potential solutions.

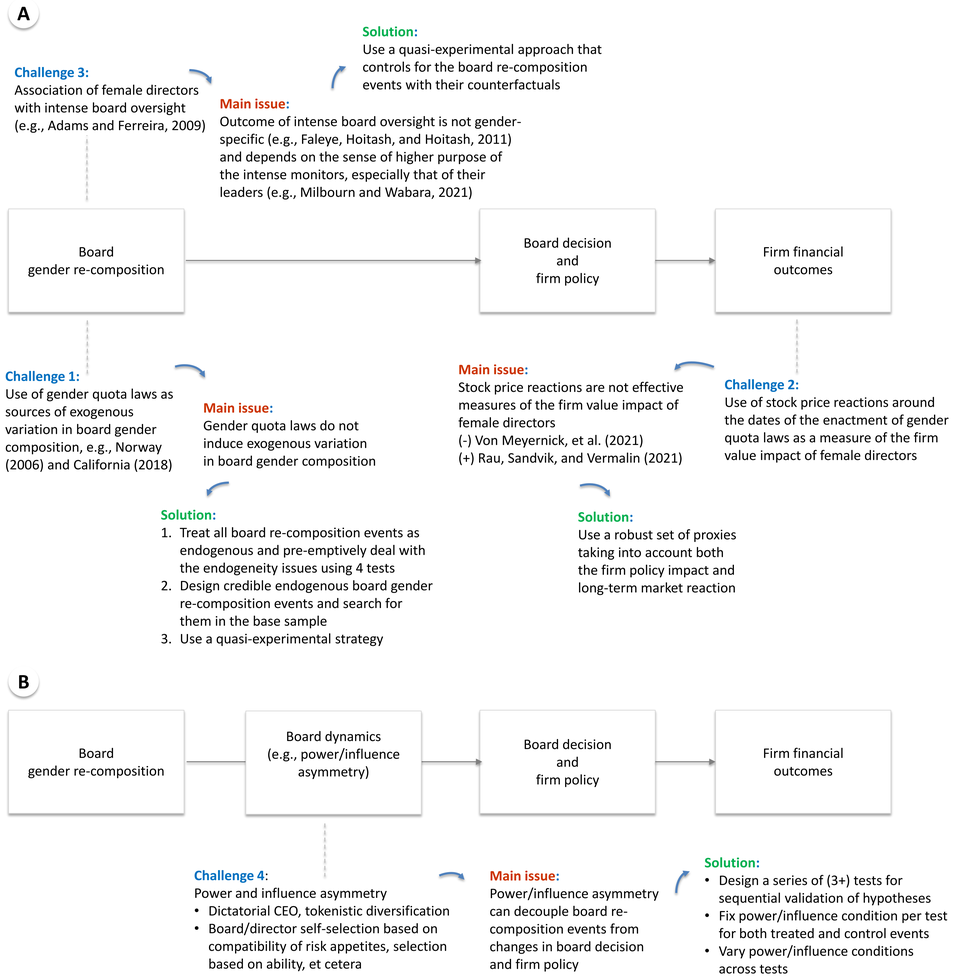

Figure 1. Four (4) main empirical challenges that lead to the negative or mixed evidence, issues, and solutions.

(A) Challenges # 1, 2, and 3 stem from the standard assumptions used in studies of board gender diversity. Specifically, the hope is that exogenous variations to board gender composition can lead to changes in board decisions and firm policies, impacting firms' financial outcomes.

(B) Challenge # 4 stems from the hitherto lack of accounting for the role of board dynamics, particularly the modulating effect of the within-board power/influence asymmetry.

Revisiting the key research questions:

Indeed, a new perspective hinged on surmounting the above empirical challenges calls for a revisiting of the critical question: Does gender diversity really hurt firm value? Specifically, what really happens to the risk-taking culture and financial performance / value of publicly listed US firms when: (i) an "ordinary" female director (i.e., a director in a non-leading role) is added to a homogenous male board? (ii) the power / influence of the female subgroup of directors ↑ via greater numerical strength or more significant aggregate non-token position on the board?

Hypotheses development:

Berliant and Fujita (2012) model diversity as endogenous and conclude that diverse groups working together can lead to an increase in productivity. Wabara (2021a) studies gender and risk-taking behavior in a pseudo-laboratory setting and concludes that sufficient self- or subgroup power/influence within-group guarantees voice and inclusion (and, therefore, impact within-group). The power/influence distribution by gender in corporate boards, especially those of publicly listed US firms, is such that male directors are numerically dominant and occupy much more significant leadership positions (e.g., Chair, CEO, Lead Director, etc.) and CEOs – be they male or female – tend to possess a very large share of the within-board power/influence.

Putting it all together, I hypothesize as follows:

- *If a female director is unlikely to have any personal power or influence on the board, her addition to the board will have no significant impact on firm risk-taking and performance. However, with increasing power/influence on the board (via greater numerical strength or non-token aggregate position), female directors will tend to reduce the excessive risk-taking behavior of the firm and, to the extent that the gender-diversification process is non-disruptive, this effect can feature significant increases in profitability and firm value*.

Note:

My hypotheses are generally intuitive and consistent. For example, the power/influence component is compatible with Wabara (2021a), the primary assumption in Adams, Almeida, and Ferreira (2005), and the central theme of the minority relations literature (e.g., Gittler, 1956; Noel, 1968; Yetman, 1985). The profitability and firm value components are indeed consistent with Berliant and Fijita (2012).

Basic identification strategy:

Conceptually, I seek to measure the counterfactual impact of the female gender in fixed subgroup power/influence conditions on the board. For example, given a board re-composition event structure (with credible impact attributability), what will be the average counterfactual impact of the female gender if new director(s) is/are introduced to the board? Figure 2 schematizes the concept.

Figure 2. Measuring the counterfactual impact of gender in fixed power/influence conditions

A blue circle represents a male director. The letters "C" and "L" represent CEO and Lead Independent Director (or non-CEO leader), respectively. Hence, pre-event, the board is a homogenous male board with male CEO and male Lead Independent Director such that the male subgroup of directors are homogenously dominant both numerically and in terms of board positions occupied. A (some) new director (s) is (are) to be introduced. Conceptually, I wish to identify the counterfactual impact of the gender of the new director (s).

Proxy variables and interpretation:

Risk indicators (within-firm)					*Firm value*	*Market's reaction*
Leverage	Tangibility	Operating Profitability	Cash/Asset	Volatility of Cash/Asset	Tobin's q	Volatility of Market-Adjusted Return
(1)	*(2)*	*(3)*	*(4)*	*(5)*	*(6)*	*(7)*

Figure 3: Proxy variables and their interpretation

I draw from the extant literature to put together a robust set of proxies that capture both the firm-level policy impacts, value, and the long-term market reaction in the form of the volatility of market-adjusted return computed over 36 months. I use a pre-defined interpretation scheme consistent with Aggarwal, et al. (2010): ↓ leverage and ↓ volatility of cash/asset or ↑ cash/asset → ↓probability of bankruptcy. Also, ↔ / ↑ tangibility → ↓ expected costs of financial distress in the event of bankruptcy. Similarly, ↑ (↓) in profitability → ↓ (↑) underlying business risks. Following Adams and Ferreira (2009), I use Tobin's q to proxy for firm value but also check for qualitative consistency using Total q. I focus not on any given proxy alone but on the general consistency of the story that their respective changes tell in response to the board gender re-composition events.

Novel set of tactics for hypotheses testing:

First, I split the study hypotheses into three (3) directly testable sub-hypotheses (H1, H2a, and H2b) as schematized in Figure 4A. Next, I structure quasi-temporal event counterfactual samples for the sub-hypotheses. Figures 4B1, 4B2, and 4B3 respectively capture the structuring of the quasi-temporal event counterfactuals for H1, H2a, and H2b.

Computational approach

Practically, and since one cannot simultaneously observe an event and its counterfactual, my method effectively amounts to computing stacked difference-in-differences (DiDs) on carefully structured quasi-temporal event counterfactual samples to measure the average differential impact of the female gender in fixed power/influence conditions on the board. Specifically, to compute the stacked DiDs, I adapt the the Bertrand and Mullainathan (2003) stacked difference-in-differences model (i.e., further include both firm and industry-year fixed effects) as follows:

$$RI_{i,j,c,t} = \beta * Treated\_Post_{i,j,c,t} + p_t + m_c + \alpha_i + \vartheta_{j,t} + u_{i,j,c,t}$$

Where RI = Risk indicator, i = firm, j = industry, c = cohort, and t = year.

Results:

The ex-ante expectations are evident (and derive directly) from the statements of the study hypotheses. Overall, my results provide strong support for all of the sub-hypotheses:

- *If a female director is unlikely to have any personal power or influence on the board, her addition to the board will have no significant impact on firm risk-taking and performance. However, with increasing power/influence on the board (via greater numerical strength or non-token aggregate position), female directors will tend to reduce the excessive risk-taking behavior of the firm and, to the extent that the gender-diversification process is non-disruptive, this effect can feature significant increases in profitability and firm value*.

❖ **Please click on the link on the top right corner to view the regression tables and other details of the results in the full paper**

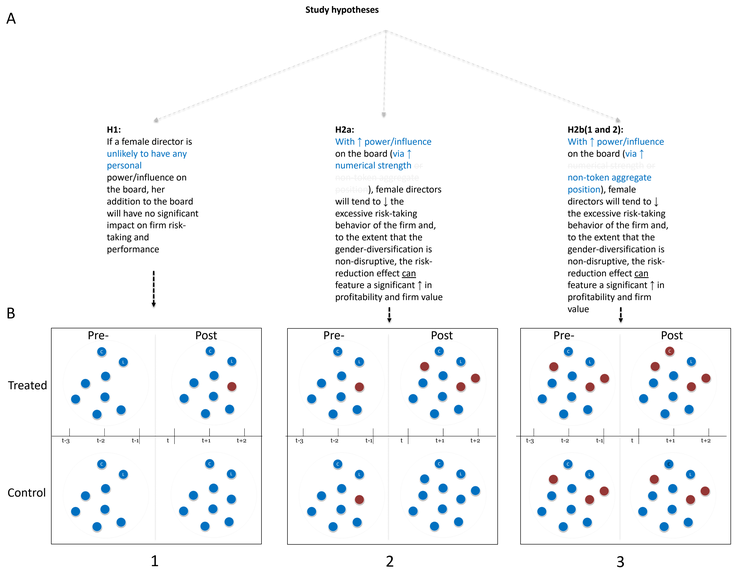

Figure 4. Novel set of tactics for hypotheses testing

A. I split the study hypotheses into three (3) directly testable sub-hypotheses (H1, H2a, and H2b). H1 captures the low power/influence condition. H2a captures the increasing power/influence condition via numerical strength. H2b captures the increasing power/influence condition via non-token aggregate position.

B. Figures B1, B2, and B3 schematize the structured quasi-temporal event counterfactual samples for H1, H2a, and H2b respectively:

1. Pre-event, both the treated and the control boards are homogenous male with a male CEO and a male non-CEO leader and have stayed that way for at least the past three (3) years. Post-event, every other thing stays basically the same, except that while the treated boards add a female director in a non-leading role, the control boards add a male director also in a non-leading role. The multi-cohort stacked DiD captures the average differential impact of gender when the female director is unlikely to have significant power/influence on the board.
2. Pre-event, both the treated and the control boards are similar to the treated boards in B1 (i.e., majority male with a male CEO, a male non-CEO leader, and only one female director) and have stayed that way for at least the past three (3) years. Post-event, every other thing stays basically the same, except that while the treated boards add more female directors in non-leading roles, the control boards add more male directors also in non-leading roles. The multi-cohort stacked DiD captures the average differential impact of gender when the power/influence of the female subgroup of directors is increased via an increase in numerical strength.
3. Pre-event, both the treated and the control boards are similar to the treated boards in B2 (i.e., majority male with a male CEO, a male non-CEO leader, and at least two female directors) and have stayed that way for at least the past three (3) years. Post-event, every other thing stays basically the same, except that while the treated boards switch from a male to female CEO, the control boards switch from male to another male CEO. The multi-cohort stacked DiD captures the average differential impact of gender when the power/influence of the female subgroup of directors is increased via more significant aggregate non-token position.

Robustness:

- ✓ **Computational integrity**: My DiD results (computed one variable at a time) are consistent with the stylized facts on the determinants of leverage as in Rajan and Zingales (1995).
- ✓ **Interpretational integrity**: My results are inconsistent with Baker and Wurgler (2002), thus ruling out the possibility that the market timing theory might be at play.

Main endogeneity concerns:

The endogeneity concerns are director selections issues, namely: selection based on the compatibility of risk preferences and the motive (alone) in selecting based on ability. I rule out both (see below).

Real ex-post causality analyses:

- Suppose one argues that the "reduction of excessive risk results" in H2a and H2b are explained not by my power/influence hypotheses but by endogenous selection based on the compatibility in risk preferences, then it must be that, on average: By H2a and H2b, female directors have a lower appetite for taking excessive risk and a board that picks a female director also has similarly low appetite for taking excessive risk. The converse follows as well for male directors and the boards that select them. However, by H1, the argument fails, leading to a contradiction. Consequently, I rule out endogenous selection based on the compatibility of risk preferences.
- Suppose one then shifts to the argument that the "reduction of excessive risk results" in H2a and H2b are explained not by my power/influence hypotheses but by the underlying motive for some endogenous selection based on ability (e.g., financial expertise, etc.), then it must be that, on average: By H2a and H2b, female directors have an intrinsic ability to influence firm policy toward preventing excessive risk-taking and male directors have an intrinsic ability to influence firm policy toward inducing excessive risk-taking. However, by H1, the intrinsic ability of female directors to influence firm policy toward preventing excessive risk-taking does not manifest when female directors do not have significant power/influence on the board, validating my power/influence hypotheses. Consequently, I rule out endogenous selection based on underlying motive (alone) for some endogenous selection based on ability and affirm the power/influence hypotheses

Conclusion

- ✓ **Technical implication**: ↑ power and influence for the female directors (via ↑ numerical strength or non-token aggregate position) might help firms operate at optimum capital structure since female directors do not simplistically reduce risk; they tend to reduce excessive risk and enhance firm value.
- ✓ **Public discourse and policy implications**: It may be more sustainable to begin shifting the academic and public discourse from whether diversity (board gender diversity, in particular) hurts firm value to: How best might diversification processes be implemented to profitably unlock the value inherent in diversity?