

# Golf Buddies and Board Diversity

Sumit Agarwal, Wenlan Qian, David M Reeb, and Tien Foo Sing  
National University of Singapore

December 12, 2015

---

## **Abstract**

We study the participation of women in golf, a predominately male social activity, and its influence on their likelihood of serving on a board of directors. Exploiting a novel dataset of all golf games in Singapore, we find that woman golfers enjoy a 54% higher likelihood of serving on a board relative to male golfers. A woman's probability of serving on the board in a large firm or in a predominately male industry increases by 117% to 125% when she plays golf. In summary, our results suggest that "playing the boys game" facilitates women's directorships in publicly-traded firms.

---

*Keywords: Board of Directors, Golf, Gender, Board Diversity*  
*JEL Classification:*

## **I. Introduction**

Women's share of board seats in developed economies averaged 16.7% in 2014, varying from 3% in Japan to 19% in the US, and 30% in France (Catalyst, 2015). Although a stream of studies demonstrates performance benefits from boards comprised of both men and women (Adams and Ferreira, 2009), alleviating gender disparity proves difficult to achieve. Norway sought to increase female participation in the executive labor market by regulating the minimum levels of female representation, leading other European countries to also implement gender quotas (Ahern and Dittmar, 2012; Bertrand et al., 2014). Female director nominations often arise from shareholder resolutions introduced by institutional investors or social activists (Anderson et al., 2011). Despite these external calls for greater female representation on the board, we have limited information on the impediments to their participation or the mechanisms women use to overcome these frictions in the executive labor market.

Research in economics indicates that social capital influences placement and earnings in the labor market (Simon and Warner, 1992). Unsurprisingly, gender influences the assembly and duration of social networks (Lewis et al., 2012; McPherson et al., 2001). Psychology research shows that children recognize, at early ages, suitable gender-related activities and behaviors (Martin and Ruble, 2004). Others emphasize that gender norms and social identity affect the involvement of women in social networks. For instance, in sports - a common social activity, gender stereotype influences the involvement of women by type and participation rates within the sports (Eccles and Harold, 1991). Reinforcing the gender disparity issues, women comprise less than 9.7% of sports editors in the Associated Press and less than 2% of sports radio hosts (Women's Media Center, 2014). Yet, sport groups constitute one of the most prevalent types of social networks among adults (Putnam, 1995).

We explore the role of social capital and the gender ceiling in the executive labor market using data on golf games. Specifically, we study whether women who play golf - a largely male-dominated sport – are also more likely to serve on the board of directors of publicly-listed companies. Anecdotally, golf is an important social network tool in corporate America. One perspective is that golf outings reinforce male social networks and bonding, limiting their usefulness for female golf players. Mayer and Puller (2008) report that social networks often operate along gender lines and serve to emphasize gender identity. Heilman et al. (2004) find that women involved in male-dominated activities are often penalized in their career outcomes. Because golf is a social activity with substantial male participation, involvement in this male-led activity could limit a woman’s opportunities in the executive labor market.<sup>1</sup>

Alternatively, female participation in golf may allow women to enter prominent social networks and increase their involvement in the labor market. Female executives reap career benefits from sports participation in general (Ernest and Young, 2014), suggesting that golf may provide a similar social capital for both men and women. Alternatively, women engaging in a predominately male activity might gain additional social capital relative to their male counterparts. This perspective suggests that women "*playing the boys game*" could increase their acceptance by predominantly male corporate boards. Moreover, women’s participation in male-dominated social activities could provide information on their efforts in overcoming gender disparities. Overall, cogent arguments exist that women’s participation in golf could either hinder or increase the likelihood of them serving on a board of directors.

---

<sup>1</sup> More broadly, our work relates to the vast literature on gender differences across various economic outcomes and possible determinants, including discrimination (Akerlof and Kranton, 2000, Bertrand, 2011), socio-economic status (Bartling, Fehr and Schunk, 2012), culture (Gneezy, Leonard and List, 2009; Guiso et al, 2008) biological attributes such as testosterone levels (Maestripieri, Sapienza and Zingales, 2009) and economic power (Bertrand, Kamenica and Pan, 2015; Agarwal, et. al. 2015).

To examine the relationship between a women's participation in golf and their likelihood of serving on a board of directors, we collect data on the directors of the 431 firms listed on the Singapore Stock Exchange (SGX). Merging this information with data on golfers' handicap books in Singapore from 2000 to 2014, we obtain a comprehensive database sample of 10,584 golfers and 1,646 directors. Over 87% of golfers in this sample are male, confirming that golf is predominately a male sport in Singapore. In our analysis, golfers exhibit a higher probability of holding a directorship. The odds ratio, which captures the likelihood of an outcome after treatment, indicates that female golfers exhibit a 54% greater chance than their male counterparts of serving on a board of directors. In the multivariate tests that incorporate ethnicity, individual age, and a housing-sector fixed effect, we again find that female golfers display a relatively higher likelihood than male golfers of serving on a board.

To further explore if female-golf effects are associated with either general wealth effects or social capital, we split the analyses by small and large firms. If wealth effects explain these golf-related probabilities for women, the impact should be greater in small firms. In contrast, if social capital explains these findings, the effect should be more pronounced in large firms. Our analysis indicates that in smaller or less hierarchical firms, a woman's participation in golf has no differential impact on the likelihood of holding a board seat relative to male counterparts. In contrast, in large firms with presumably more hierarchy, female golfers exhibit a 125% higher likelihood of serving on a board relative to male golfers. These results provide a picture of how social capital potentially helps overcome the gender ceiling in the executive labor market.

An alternative explanation for the differential effects of women's golf participation on their likelihood of serving on a board could result from the consumption of leisure by successful women. To investigate this explanation, we split the analysis by the concentration of females employed in different industries in Singapore. A leisure or quiet life explanation suggests that the women's golf

participation effects should dominate in high female concentrated industries. However, arguments regarding the use of golf to overcome the corporate glass ceiling suggest that the effect should occur in industries with limited female participation. The results indicate that in industries with high female representation, a woman's participation in golf has no differential effect on the likelihood of holding a board seat relative to her male counterparts. In contrast, in industries with low female representation, female golfers exhibit a 117% higher likelihood of serving on a board than male golfers.

Another potential concern is that athletic skills, rather than social capital in a predominately male activity, drive the results on female golf participation. Consequently, we compare initial golf skills between female directors and non-directors. We find no significant difference between female directors and non-directors in terms of their general golf skills.

## **2. Sample Data.**

We download corporate data for a list of firms traded on the Singapore Exchange (SGX) from 2000 to 2014 from Datastream. We manually check and exclude firms that were active for less than 2 years. We also exclude firms that are classified as REIT, Trust, Venture Capital and Mutual Fund. After filtering, there are 765 firms in the sample. For these firms, we collect information on boards of directors (name and gender) from annual reports of the firms within the sample period. Annual reports are obtained from the SGX website, Morningstar, and the respective company websites. We could not find any reports for 17 firms, and these firms are excluded from our sample. We further narrow down the sample firms to those that are based in Singapore, i.e., those with Singapore as one of their main revenue-generating countries. Using the most recent sales distributions of companies, we identify 431 listed firms with their main revenue-generating activities in Singapore. Our analyses are based on the data of boards of directors from these 431 firms.

Table 1 tabulates the characteristics of the 431 firms during the sample period. We obtain year-end market capitalization, market to book and asset size for the 431 Singapore-based firms in each year from 2000 to 2014, and calculate the annual means across the firms over the 15-year period. A typical firm has, on average, a market capitalization of S\$726.54 million, an asset size of S\$3,735.08 million, and a market-to-book ratio of 1.56. Among the firms, on average, there are 7 members on the board of directors, of which 8.07% are women and 11.21% are from minority ethnic groups (i.e., non-Chinese).

We also obtain data from two other sources, which contain information on golf players, their Handicap book details in Singapore, and demographic details of Singapore's residents. In the golf database, we observe the player's name, gender, registration date and statistics on golf skills based on a handicap index. The Handicap Index measures the potential ability of a golf player, taking into account the difficulty of a course and their "handicap" score in games reported by a golfer. It is expressed up to one decimal place, e.g., 12.8, and a lower index corresponds to a higher ability. The maximum Handicap Index is 36.4 for men and 40.4 for women. The demographic data for Singapore residents is a comprehensive dataset that captures information such as birthdate, gender, home address (including housing type and zipcode) and ethnicity group.

Next, we match the databases on the board of directors and the golf participants, along with the demographic details for the sample directors/golf players. We further restrict individuals with an age between 30 and 75 in order to capture valid counterfactuals as the board of directors' age primarily falls between 30 and 75 years. Although this matching is primarily based on name and gender; we also use age to verify the accuracy of the match in instances where there are multiple matches by name and gender. We drop all multiple matches that cannot be precisely identified based on the available information.

The final sample consists of a total of 1,472,462 Singaporean residents, of which 10,584 (0.7%) are registered golf players and 1,646 (0.1%) serve on the boards of directors of the listed Singaporean firms. Among the matched golf players, 1,191 (11.3%) are female and 9,393 (88.7%) are male. For the matched board of directors, 155 (9.4%) are female and 1,491 (90.6%) are male. Using these numbers, we compute the odds ratio by gender and board membership at 0.094, suggesting that on average, females are 90% less likely to serve on the boards of directors in our sample.

### **3. Empirical Analyses and Results**

We start by computing the unconditional odds ratio to study the association between playing golf and serving on the corporate boards, according to gender (Table 2). In the full sample, we find the odds ratio to be 59.9, indicating that playing golf is strongly associated with serving on the corporate board. We also observe a stronger association between playing golf and corporate board membership for men (odds ratio = 38.9), but the magnitude is smaller for women. When comparing the odds ratios by gender, it suggests that playing golf is associated with a stronger propensity to serving on corporate boards for women than for men (by 54%).

We further classify firms into small and large firms by market capitalization, and into firms of high and low female concentration by industry workforce share. Based on the average market capitalization from the years 2000 to 2014 or during their listing period, whichever is shorter, firms with less than the median market capitalization of the 431 sample firms are classified into the small firm group. The odds ratio by firm size exhibits strong associations between golf and board membership for women in both the small and the large firms. More interestingly, the association is stronger for large firms as reflected by 1.84 in the female to male ratio, compared to 1.20 for small firms.

Using the published statistics on female employment shares across industries (source: Ministry of Manpower, Singapore), we sort the industries by the median female employment share. Firms in services, commerce, finance, hotels and restaurants, food and beverage, and real estate industries are found to have a high female representation. Firms in agriculture, construction, utilities, manufacturing and multi-industry, as well as in transportation, storage and communication industries, have relatively lower levels of female representation. Whilst the strong association between golf and board membership for women persists in the two groups, the effect is stronger for firms in industries with a low female representation.

To control for observable differences in demographics, we run multivariate logistic regressions with a binary dependent variable that is equal to one, if an individual serves on a corporate board of listed firms in Singapore, and zero otherwise. The key explanatory variables include a female dummy, a golf-player dummy, and an interaction of the two dummy variables. We include the year of birth and a non-Chinese binary variable to control for heterogeneity in age and ethnicity. Location and type (public versus private) of houses are strongly correlated with wealth (Agarwal and Qian, 2015). We control for variations in house price by including the postal code fixed effects in the model.

Table 3 reports the odds ratio estimates for the logistic regressions. Column 1 shows the results for the full sample. Consistent with the univariate analysis, we observe that females, on average, are 89% less likely to serve on corporate boards of listed firms in Singapore, and the effect is statistically significant at the 1% level. We also find that playing golf is statistically and economically significant in predicting the likelihood of serving on corporate boards for both genders. More interestingly, the interaction between the terms of ‘female’ and ‘golfer’ is also large and statistically significant. To interpret the results, this suggests that relative to the effect of male



golfers, women who play golf are 74% more likely to serve on corporate boards. The effect is statistically significant at the 10% level.<sup>2</sup>

To further explore whether the women-golfer effect stems from the general wealth effects or from social capital, we split the sample between small and large firms. If wealth differences explain these golf effects for women, the impact should be greater in small firms relative to large firms. In contrast, if social capital explains these findings, then the effect should be most pronounced in large, plausibly more hierarchical firms. To examine the firm size effect, we also include the non-director population as well as the board of directors in both the small and large firm groups in our analysis. The results as reported in columns 2-3 of Table 3 show that the women-golfer effect is concentrated in large firms. For small firms, woman's participation in golf has no differential effect, both statistically and economically, on board membership relative to her male counterparts. However, female golfers are 125% more likely to serve on a board relative to male golfers in large firms with presumably a more hierarchical structure. This effect is economically large and statistically significant at the 1% level.

We next split the samples by the level of female employment representation in different industries. The effect of using golf as an avenue to gain social capital is expected to be stronger in industries with a low female representation, where the barriers to such networks are more prohibitive. For tests in column 4(5) of Table 3, we include both the non-director population and the board of directors for firms in high (low) female representation industries. We find that women are more likely to serve on the board of directors in low female representation industries (by 117%) if they play golf, relative to their male counterparts. The effect is statistically significant at the 1% level. However, we do not observe significant differential effects of the golfers on board

---

<sup>2</sup> We also perform a similar analysis for minority ethnicities. In unreported results, we find a similar pattern that playing golf is associated with a stronger likelihood of board membership for ethnic minorities compared to the effect of golf for ethnically Chinese golfers.

membership between women and men. In summary, the results suggest a strong influence of social capital in helping to overcome the gender ceiling in the executive labor market.

Lastly, we investigate an alternative explanation that links the “athletic” golf skills of women playing golf and their likelihood of serving on corporate boards. We compare, in the full golfer sample, the Handicap Index between golfers who are on their board of directors and those who are non-directors for both genders. As shown in Figure 1, there are no discernible differences in golf skills between female directors and non-directors, or between male directors and non-directors. Consequently, we compare initial golf skills between female directors and non-directors, and confirm (in unreported regression results) that no statistically significant difference exists in the Handicap Index for female golfer-directors and non-directors, relative to the difference between men golfer-directors and non-directors.

#### **4. Conclusion**

Our analyses suggest that the participation of women in golf - a predominately male social activity, significantly increases their likelihood of serving on a board of directors. Using a dataset of over 1 million golf games played in Singapore over a 15-year period, we find that female golfers exhibit a 54% higher likelihood of serving on a board relative to male golfers. A woman’s probability of serving on the board in large firms increases by 116% if she plays golf, whilst golf has no such effect in small firms. Perhaps even more surprising is the finding that the gender-golf effect increases to 158% for women in a predominantly male industry. In summary, the results suggest that "*playing the boys game*" significantly increases the likelihood of a woman serving on the board of directors in publicly-traded firms.

This study highlights three important issues. Firstly, the analysis validates the notion of a gender glass ceiling, demonstrating a mechanism that women use to overcome gender disparity.

Secondly, the data supports the notion that social capital and networking help foster career outcomes in the executive labor market. Whilst this effect occurs in both men and women, women's involvement in a male-dominated social activity appears to increase their probability of serving on a board in a large firm. Finally, the analysis implies that engaging in social activities that run counter the social norms or behaviors is an important mechanism used by women to partially mitigate the glass ceiling in corporate boards.

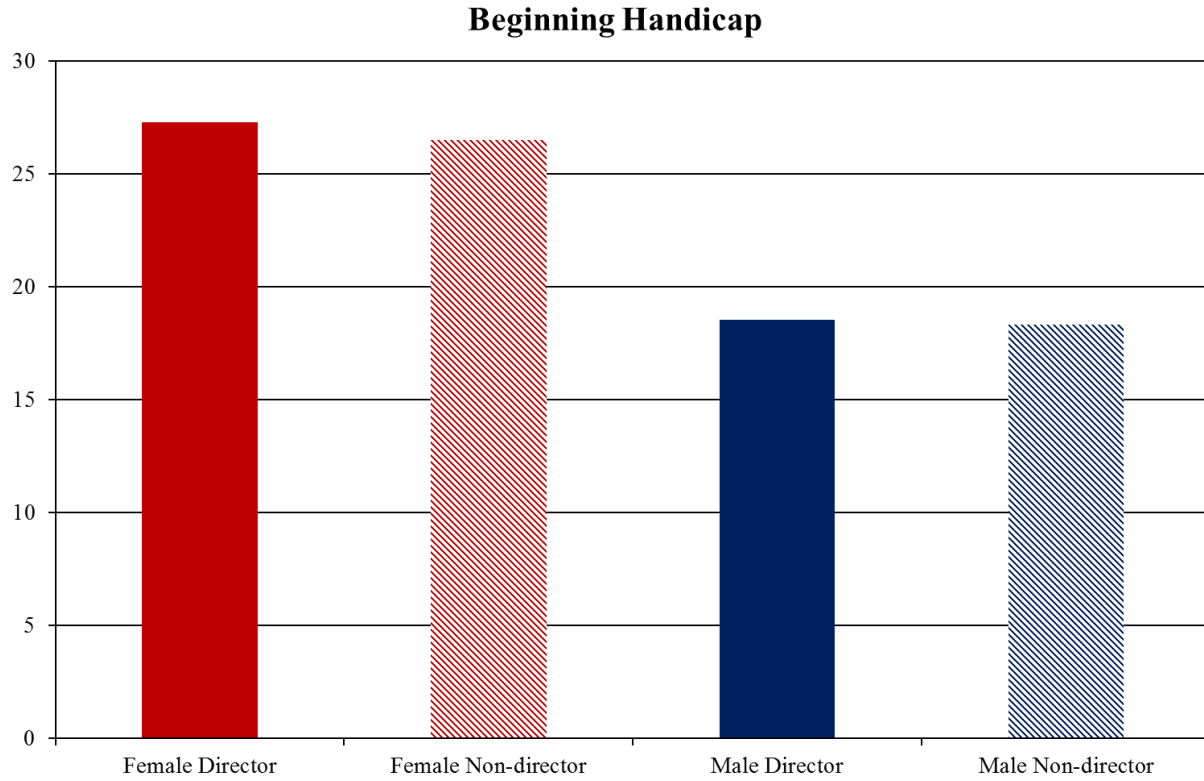
## References

- Agarwal, S. and W. Qian, 2015. Access to home equity and consumption: evidence from a policy experiment, Working paper, National University of Singapore.
- Agarwal, S., R. Green, E. Rosenblatt, V. Yao, and J. Zhang, 2015. Who bears the pen? Relative income and gender gap in mortgage signing order, Working paper.
- Akerlof, G. A., Kranton, R. E., 2000. Economics and identity. *Quarterly Journal of Economics* 115, 715–753.
- Ahern, K. and A. Dittmar, 2012. The changing of the boards: The impact on firm valuation of mandated female board representation, *Quarterly Journal of Economics* 127, 137-197.
- Anderson, R., D. Reeb, A. Upadhyay, and W. Zhao, 2011. The economics of director heterogeneity, *Financial Management* 40:5-38.
- Bartling, B., Fehr, E., Schunk, D., 2012. Health effects on children’s willingness to compete. *Experimental Economics* 15, 58-70.
- Bertrand, M., 2011. New perspectives on gender. *Handbook of Labor Economics* 4, 1543–1590.
- Bertrand, M., S. Black, S. Jensen, and A. Lleras-Muney, 2014. Breaking the glass ceiling: The effect of board quotas on female labor market outcomes in Norway, *NBER Working Paper No 20245*.
- Bertrand, M., Kamenica, E., Pan, J., 2015. Gender identity and relative income within households. *Quarterly Journal of Economics*, doi: 10.1093/qje/qjv001.
- Catalyst, 2015. *Catalyst 2014 Census: Women Board of Directors*. New York: Catalyst.
- Eccles, J. and R. Harold, 1991. Gender differences in sport involvement: Applying the Eccles’ expectancy-value model, *Journal of Applied Sport Psychology* 3, 7-35.
- Gneezy, U., Leonard, K. L., List, J. A., 2009. Gender differences in competition: Evidence from a matrilineal and a patriarchal society. *Econometrica* 77, 1637–1664.
- Guiso, L., Monte, F., Sapienza, P., Zingales, L., 2008. Culture, gender, and match. *Science* 320, 1164-1165.
- Heilman, M., A. Wallen, D. Fuchs, and M. Tamkins, 2004. Penalties for success: Reactions to women who succeed at male gender-typed tasks. *Journal of Applied Psychology* 89, 416-427.
- Kamonjoh, E., 2014. *Gender Diversity on Boards: A Review of Global Trends*, published by Institutional Shareholder Services, downloaded at: <http://www.issgovernance.com/file/publications/>

- Lewis, K., M. Gonzalez, and J. Kaufman, 2012. Social selection and peer influence in an online social network, *Proceedings of the National Academy of Sciences* 109, 68-72.
- Making the Connection: Women, Sport and Leadership*, 2014. EY Women Athletes Business Network and espnW. Press release available at <http://www.ey.com/GL/en/Newsroom/News-releases/news-female-executives-say-participation-in-sport-helps-accelerate--leadership-and-career-potential>
- Maestripieri, Dario, S. P., Zingales, L., 2009. Gender differences in financial risk aversion and career choices are affected by testosterone. *Proceedings of the National Academy of Sciences* 106, 15268-15273.
- Martin, C. and D. Ruble, 2004. Children's search for gender cues: Cognitive perspectives on gender development, *Current Directions in Psychological Science* 13, 67-70
- McPherson, M., L. Smith-Lovin, and J. Cook, 2001, Birds of a feather: Homophily in social networks, *Annual Review of Sociology* 27, 415-444.
- Putnam, R., 1995. Bowling alone: America's declining social capital, *Journal of Democracy* 6, 65-78.
- The Glass-Ceiling Index, *The Economist*, March 5<sup>th</sup>, 2015. Downloaded at <http://www.economist.com/blogs/graphicdetail/2015/03/daily-chart-1>
- Women's Media Center, 2015. *The Status of Women in the US Media 2014*. Downloaded at [http://wmc.3cdn.net/2e85f9517dc2bf164e\\_htm62xgan.pdf](http://wmc.3cdn.net/2e85f9517dc2bf164e_htm62xgan.pdf)

### Figure 1. Golfer Skill by Gender and Board Membership

This figure plots measures of golfer skill (as measured by the Handicap index) for female directors, female non-directors, male directors, and male non-directors in the population of Singaporean (citizen and permanent residents) golfers. The Handicap index is a number that represents one's potential ability on a course of standard playing difficulty (a lower index corresponds to a higher ability). It is expressed up to one decimal place, e.g., 12.8. The maximum Handicap Index is 36.4 for men and 40.4 for women. (<http://www.sga.org.sg/usga-handicap-system/>)



### Table 1. Summary Statistics

This table presents the summary statistics of firm characteristics and directorships in our sample. We record the year-end firm characteristics for each of the 431 Singapore firms, and calculate the mean across all firms in each year from 2000 to 2014, and then compute the time series mean, standard deviation, as well as percentile statistics across the 15 years. Market cap and assets are denominated in Singapore dollars.

	(1)	(2)	(3)	(4)	(5)
	Mean	Std. Dev.	25%	50%	75%
Market cap (in mils)	726.54	133.04	598.41	719.41	852.07
Market to book	1.56	0.29	1.35	1.52	1.63
Assets (in mils)	3,735.08	1,701.29	1,976.16	4,206.88	4,911.01
# board of directors	7.06	0.25	6.87	6.95	7.30
Female board members (%)	8.07%	0.84%	7.60%	7.85%	8.67%
Non-Chinese board member (%)	11.21%	0.58%	10.98%	11.32%	11.58%
N	431				

**Table 2. Univariate Statistics on Golf and Female Board Representation**

This table shows the odds ratio of serving on the board of directors in the presence of golf participation by gender (an odds ratio of magnitude greater than 1 indicates that playing golf raises the likelihood of being a board of directors). In columns 1-3, we consider the effect on all Singapore firms. Columns 4-9 report the subsample analysis by size, whereby we use the median of the average market capitalization during the 15 years from 2000 to 2014 and divide the full sample firms into small and large firms. Columns 10-15 report the subsample analysis by the representation of female employment in a given industry, whereby we divide the full sample of firms into high female representation industries and low female representation industries using the median percentage of female employment in a given industry (Ministry of Manpower, Singapore). Firms in services, commerce, finance, hotel and restaurant, food and beverage, and properties industries are considered to have high levels of female representation. Firms in agriculture, construction, utilities, manufacturing, multi-industry, transportation or storage or communication industries are considered to have low levels of female representation.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
	All Firms			Small Firms			Large Firms			Firms in high female representation industries			Firms in low female representation industries		
	Female	Male	F/M	Female	Male	F/M	Female	Male	F/M	Female	Male	F/M	Female	Male	F/M
Odds Ratio	59.90	38.90	1.54	41.41	34.50	1.20	82.94	45.13	1.84	61.07	40.64	1.50	75.50	31.92	2.37



**Table 3: Golf and Female Board Representation**

This table presents results of logistic regressions of how playing golf relates to the probability of women serving on corporate boards. The sample includes all Singaporean citizens and permanent residents with age equal to or greater than 30. The dependent variable is a dummy variable equal to 1 if the person serves on the board of directors of a Singaporean-based company listed on the Singapore Stock Exchange, and 0 otherwise. Female is a dummy variable for women in the sample, and 0 otherwise. Golf is a dummy variable equal to 1 if the individual plays golf (i.e., is a registered player in a golf club in Singapore). Chinese is a dummy variable equal to 1 for Chinese ethnicity, and 0 otherwise. Postal Code-Housing Sector fixed effect is included. We report the odds ratio estimates and include t-statistics (based on robust standard errors) below in parentheses, and \*\*\*, \*\*, and \* denote statistical significance at the 1%, 5%, and 10% level, respectively.

VARIABLES	(1) All firms	(2) Small	(3) Large	(4) High female representation industries	(5) Low female representation industries
Female	0.110*** (-24.49)	0.111*** (-18.01)	0.0983*** (-18.24)	0.102*** (-18.53)	0.101*** (-19.02)
Golf	7.210*** (32.95)	6.657*** (22.98)	7.787*** (26.83)	7.144*** (25.42)	7.381*** (26.48)
Female x Golf	1.735* (1.840)	1.327 (0.602)	2.246** (2.212)	1.708 (1.319)	2.173** (2.138)
Chinese	1.871*** (5.713)	2.343*** (5.242)	1.570*** (3.229)	1.806*** (4.134)	1.870*** (4.392)
Birth year	0.997 (-1.107)	1.005 (1.334)	0.989*** (-3.348)	0.999 (-0.267)	0.993** (-2.352)
Postal Code-Housing Sector FE	YES	YES	YES	YES	YES
Pseudo R-square	0.13	0.11	0.14	0.13	0.13
N	1,423,142	1,370,369	1,293,599	1,304,690	1,344,332