Appointments, pay and performance in UK boardrooms by gender

Appointments, Pay and Performance in UK boardrooms by Gender

Ian Gregory-Smith, Brian G. M. Main and Charles A. O'Reilly III.*

For the attention of the typesetter: Appointments, Pay, Performance and Gender

This paper uses UK data to examine issues regarding the scarcity of women in boardroom positions. The paper examines appointments, pay and any associated productivity effects deriving from increased diversity. Evidence of gender-bias in the appointment of women as non-executive directors is found together with mixed evidence of discrimination in wages or fees paid. However, the paper finds no support for the argument that gender diverse boards enhance corporate performance. Proposals in favour of greater board diversity may be best structured around the moral value of diversity, rather than with reference to an expectation of improved company performance.

JEL codes: J31; J62; J63

There are longstanding concerns over the equality of treatment of women in the labour market. Findings that women are underpaid or unduly overlooked for promotion offend a sense of moral justice and many countries regard such practice as unlawful. In addition, discrimination in the labour market constrains economic efficiency (Becker, 1957). An area that remains a high profile concern is diversity in the boardroom. Historically, very low numbers of female directors have suggested shortcomings in the market for board level appointments. Yet it is board directors who potentially have the greatest marginal impact on firm value and, in aggregate, GDP. Moreover, a lack of diversity at the top could result in narrow decision making and frustrate equality elsewhere in the company hierarchy. Whilst the trend amongst FTSE350 companies in Table 1 is towards greater gender diversity, some have predicted it might take another 70 years to achieve gender parity in the boardroom (E&HRC, 2007). In the UK, claiming that the

*Corresponding author: i.gregory-smith@sheffield.ac.uk; Department of Economics, The University of Sheffield, 9 Mappin Street, Sheffield, S1 4DT, UK. Tel: +44(0)114 222 3317. The authors thank members of the Work, Pensions and Labour Economics (WPEG) study group, participants at the European Association for Research in Industrial Economics' (EARIE) annual conference (2013) and the referees for helpful comments. The authors also thank Manifest Information Services Ltd and Guy Callaghan for the provision of data support. Brain Main acknowledges research support under ESRC Grant: RES-062-23-0904.

business case for increased female representation on boards is clear, the Department for Business Innovation and Skills (BIS) has set an aspirational target of 25% to be attained in FTSE100 companies by 2015 (Davies, 2011). More recently the EU has proposed a 40% target for female representation on the boards of all listed companies by 2020 (European Union, 2012). In 2003, Norway set a similar, initially voluntary, target of 40% to be attained by 2005. Only by later making compliance mandatory (Storvik and Teigen, 2010; Nielsen and Huse, 2010) was this figure finally attained (in 2008). Some countries such as France, Finland, Iceland, Italy, and Spain have embarked upon similar policy journeys (Davies, 2011), with others, such as Australia, Austria, and The Netherlands, adopting a less directive approach.

Current arguments in favour of mandatory quotas for female directors (Terjesen *et al.*, 2009), as adopted by Norwegian regulators, are generally based on considerations of equity but are often also located around an expectation of improved corporate performance (Adams *et al.*, 2007). This improvement can occur through two channels. First, high quality female directors, previously excluded from the executive labour market could replace less able male directors. Second, a more diverse team may improve board decision making. This raises two questions. First, just how inequitable is the experience of women board members? Second, what performance link can be observed between female representation at boardroom level and company performance?

The majority of work in this area has been conducted using data from the USA. There is a very different institutional context in the UK, with a comply-or-explain system of corporate governance (Cadbury, 1992; Greenbury, 1995; Hampel, 1998; FRC, 2012), director elections that avoid staggered boards (Bebchuk *et al.*, 2002), and a general aversion to dual class shareholding (Mayer, 2013). This produces a more robust market for corporate control (Mayer, 2013) than found in the USA and elsewhere. As explained above, the representation and treatment of women on boards is a highly salient policy issue both in the UK (Davies, 2011) and in the rest of Europe (European Union, 2012).

Using data on the board composition and the company performance of UK listed companies between 1996 and 2011, this paper searches for evidence that sheds light on these two issues, equity and productivity. In terms of equity, the board appointment process is examined for evidence of gender bias and the remuneration of directors is tested for a significant male-female wage gap. In terms of the productivity effects of diversity, key measures of company performance are tested for a link with board gender diversity.

Evidence is found of gender bias in the appointment of women as non-executive directors, although no effect is found in the case of executive directors. The data also reveal an unexplained underpayment of female non-executives relative to their male counterparts. Again, no such disparity in treatment is found for executive directors. Finally, the extent of gender diversity of boards could not be associated with any significant difference in company performance - even when examined over a wide range of performance measures. The article is structured as follows. Section 1. reviews the literature relating to the presence of women on company boards. Section 2. introduces the data sources utilised and discusses the estimation methods deployed. Section 3. presents the results, and the paper concludes with a policy discussion in section 4..

1. Women on company boards

1.1. The appointment of women to company boards

The fact that the representation of women on company boards is far lower than their presence in the labour market would suggest is not necessarily proof of discrimination. The outcome may be due to supply-side effects arising from considerations such as family formation (Mincer and Polachek, 1974; Bygren and Ghler, 2012). According to this view, the decisions of women in terms of their choice of labour market activity, human capital investment and consequent career path result in a relatively limited pool of qualified female candidates when board positions are filled. This contrasts with the notion of the 'glass ceiling' (Powell and Butterfield, 1994) which argues that there are discriminatory barriers that inhibit the progression of women up the corporate ladder. Both perspectives suggest that, when board appointments are made, qualified applicants are predominantly male.

Empirical testing for discriminatory effects in hiring at this level of the corporate ladder lacks comprehensive measures of the availability of suitably qualified candidates for any given position. That all job applications are not publicly observed, only accepted offers, makes testing the hiring process for discriminatory effects difficult. Even studies that deploy exceptionally rich data sets have their conclusions regarding the operation of a 'glass ceiling' undermined by lingering concerns regarding unobserved heterogeneity (Smith *et al.*, 2010). The work of Farrell and Hersch (2005) points to a test of discrimination in the appointment process that can be implemented by comparing the gender of a new appointment to a board with that of any immediate predecessor incumbent

who has just stood down.

In a gender neutral world, the next appointment to the board should simply be the best candidate for that position. If 10% of the qualified candidates in the labour market are women then there should be a 10% chance that any appointment is female. If the proportion is 20% then the probability should be 20%. That probability may be low owing to supply-side or 'pipeline' effects (Doldor *et al.*, 2012), but it should be the same whether a male or female director is leaving the board. What should not occur, however, is that the gender of the appointee should somehow depend on the gender of the departing director, as that is then not a gender neutral process but points to discrimination. The Farrell and Hersch (2005) test examines whether the probability that a newly appointed director is female is independent of the gender of any director who is stepping down from the board.

Farrell and Hersch (2005) establish that the chances of appointing a female are significantly higher if a woman has recently demitted the board. They study a sample of some 300 Fortune 500 level firms over the 10-year period that comprised the 1990s, and estimate that the probability of making a female appointment in any year is around 0.39 if a female has recently departed but only 0.13 if a male has departed. The observed effect may be due to 'tokenism' (Kanter, 1997; Elstad and Ladegard, 2012) but it certainly qualifies as discriminatory, and in terms of the attainment an aspirational target such as a 25% female representation on FTSE100 by 2015 (Davies, 2011), it would suggest that there is more to overcome than simple demographic inertia (Marschke *et al.*, 2007). It is this test of discrimination that we utilise here.

1.2. The payment of women on company boards

A second area of potential discrimination is in the payment made to female directors - either as executive directors or as non-executive directors. For the latter, remuneration comprises fees paid for being in office and for attending various board meetings and board sub-committee meetings. For executive directors, remuneration is generally of a much higher level and comprises both cash-based and equity-linked pay, as will be detailed below. Using a very large sample of all employees in Sweden in 1998, Albrecht *et al.* (2003) establish a significant glass ceiling effect at the top of the wage distribution and demonstrate that a similar effect exists for the USA, albeit empirically more modest. They also argue that while three-quarters of the observed male-female wage gap at the top of the wage distribution can be explained by personal and occupational

characteristics, these, and particularly the observed occupation, are simply manifestations of the same glass-ceiling effect. One reason to doubt whether such findings can be replicated in boardroom appointments is the extensive use of remuneration consultants in setting directors' pay and the high degree of transparency that attends the award of directors' pay (Main *et al.*, 2008).

Research on the male-female director wage gap has focussed on the executive group. Using data for the USA on the five highest paid executives in each of a sample of companies from 1992 through 1997, Hallock and Bertrand (2001) find a raw gender pay gap of some 45% (where pay includes the value of executive share options issued in the year). They find that all but five percentage points of this gap can be explained by company characteristics (size and performance) and by individual characteristics (age, job-tenure, and CEO status). Adams *et al.* (2007) extend the period of analysis through 2004 and fail to find any significant gender difference in the pay of CEOs (measured as base pay plus annual bonus), although for other boardroom executives a statistically significant gap of some 17% remains. Pau and Sahni (2009) study the period 1994 through 2002 and ascribe much of the observed gender difference in remuneration (defined to include equity related awards) as being due to the riskiness of the industry entered. But they continue to find a statistically significant five percentage point gender gap in pay.

In fact, the evidence here is mixed. Smith *et al.* (2010) find that, in a sample of Danish companies, while controlling for personal and occupational characteristics reduces the male-female gap, it remains both empirically and statistically significant. Adams and Ferreira (2009), on the other hand, find that for companies in the USA between 1996 and 2003 there was no statistically significant gender difference in executive director pay. The lack of significance remains even when the focus is on individual CEO pay. The existence of a statistically significant gender wage gap among directors of UK companies will be tested below, with separate analyses for executive directors and non-executive directors. The latter are paid primarily by fee and, as has been indicated above, at what is generally a much lower level of reward.

1.3. Women on company boards and company performance

As indicated above, there is an equity-based case for appointing a greater proportion of women to serve on company boards. There are also, however, two further arguments that are based on considerations of productivity. The first concerns the direct costs

of discrimination and the second relates to the improvement to decision making, and hence productivity, that arises from working in diverse teams.

In terms of the first argument, any companies indulging in discrimination in this area (Becker, 1957) will fail to realise the full productive potential of women and hence place themselves at a competitive disadvantage. Appealing to self interest, 'not the best but the strongest motive in humanity' (Marshall, 1927), locates the argument for reducing discrimination in terms of productivity, rather than its moral quality. Yet self interest alone has been questioned in light of persistent discrimination in the labour market. For example, Arrow (1972) compares the profit motive's apparent impotence in eliminating discrimination to Sherlock Holmes' 'dog that did not bark in the night' (Doyle, 1892).

The Arrow-Marshall critique has been partly answered by models of human capital acquisition (Mincer and Polachek, 1974), statistical discrimination in job allocation (Lazear and Rosen, 1990), dynamic monopsony (Manning, 2003; Ransom and Oaxaca, 2010) whereby employers exploit the different supply elasticities of males and females, and by more psychological and sociological models (Booth, 2009) where employers' and employees' perspectives impact on labour market outcomes. In this last context, where individual negotiation is expected to be relatively important, the observed difference in negotiating styles between men and women, as captured in the Babcock and Laschever (2003) phrase 'women don't ask' could contribute to any observed pay disparity, as Blackaby *et al.* (2005) find among UK academics.

The second productivity-based argument in favour of appointing women to boards centres on the observation that diverse teams achieve better results than more homogeneous ones (Milliken and Martins, 1996; Eisenhardt *et al.*, 1997; Goodstein *et al.*, 1994). Translated to board composition, this leads to the 'business case for diversity' (Robinson and Dechant, 1997; van der Walt and Ingley, 2003), which argues that the addition of women to boards brings with it an uplift in productivity. Empirically, there is evidence to suggest that in general the precise composition of the board has little empirical impact on company performance (Larcker *et al.*, 2007) but, compared to men, women do seem to make different contributions in terms of board activity (Adams and Ferreira, 2009; Huang and Kisgen, 2012; Levi *et al.*, 2011; Nielsen and Huse, 2010; Zelechowski and Bilimoria, 2004). The evidence on whether this translates to a significant impact on company performance is less clear (O'Reilly and Main, 2012).

There are studies that point to consistent productivity effects (Joy *et al.*, 2007; McKinsey & Co., 2007, 2008, 2010; Rohner and Dougan, 2012; Wilson and Altanlar, 2009),

but others fail to find any significant effect (Adams and Ferreira, 2009). Using as a natural experiment the imposition of a quota of 40% boardroom representation imposed on publicly quoted Norwegian companies, Ahern and Dittmar (2012) actually find a negative impact on firm valuations, suggesting negative expected performance implications of the change. There are short run costs of being forced to hire in order to meet a quota. With an exclusive pool of female candidates to draw from, the Norwegian firms may be have been forced to pay over the odds for talent or hire underqualified directors. Only over a longer period of time, with an increase in the supply of suitably qualified candidates, would the benefits from diverse decision making be fully realised. Moreover, Gregory *et al.* (2012) provide evidence against using market reaction as a test of expected performance, as the market itself may be biased against female directors over a short performance window, only correcting itself after more information on actual performance is revealed. Other studies find a positive effect by focusing on indirect measures of performance such as innovation (Torchia *et al.*, 2011), with some going on to link such innovation to higher company performance (Miller and del Carmen Triana, 2009; Dezso and Gaddis Ross, 2012). The measures of performance used are invariably accounting based such as return of assets (ROA), return on equity (ROE), or Tobin's Q (Erhardt *et al.*, 2003). And finding a positive connection between women on the board and firm performance often depends on the specific metric chosen for performance (Erhardt *et al.*, 2003; Smith *et al.*, 2006). In the analysis below, both a market based measure of performance (shareholder return) and a range of accounting based measures are used to test the hypothesis that there is a link in the UK between the prevalence of women on a board and that company's performance.

2. Data and Methods

The data used here are obtained from a proprietary source created by Manifest Information Services for the purpose of providing proxy voting advice.[2] The data span 1996 through 2011 and cover all companies that have been listed on the FTSE350 during that period. Even when a company falls out of the index, it continues to be followed. The data provide a particularly rich picture of the comings and goings in the boardroom. The start and end date of each director's period of office is recorded, as is a variety of

[2]Stata files enabling the replication of results are available at *http://www.homepages.ed.ac.uk/mainbg/working_papers.htm*. To access the data used in the analysis, please contact the authors. Note, data access requires possession of the appropriate licence from Manifest.

information describing the personal characteristics and the financial reward received in each year by all directors - whether executive or non-executive. Additional information concerning company performance in each year is obtained from DataStream.

2.1. Measures

A comprehensive measure of pay is obtained by adding not only cash payments such as base pay, board fees and annual bonus payments but also the value of long-term incentive arrangements such as executive share options and performance share plans (Pepper, 2006). The single source of reward that is not captured arises from pensions. This is because data on pensions are simply not available in a consistent or continuous form. That said, the pay measures used are as comprehensive as possible. Three pay measures are calculated. The narrowest is the cash-based short term measure of salary plus annual cash bonus paid out (plus any other cash payments or cash equivalents paid in the year, such as re-location allowances and the cash value of perquisites). This is labelled total cash compensation (TCC). A wider measure that adds to 'TCC' an approximation of the value of awarded share options, performance share plans and other long-term incentives is total direct compensation awarded ($TDCa$). In this, we approximate the actuarial value of executive share options by one-third of awarded face value and of performance share plans by 70% of awarded share value.[3] Owing to the growing complexity of such arrangements due to the increasing conditionality of these equity-linked rewards that are often dependent on the attainment of complex and idiosyncratic relative performance conditions (Main, 2006), no measure of the value awarded is going to be anything but an approximate estimate. For this reason, the third measure has much to commend it. This is total direct compensation as realised ($TDCr$) which adds to 'TCC' the observed realised value of long term incentives such as executive share options and performance share plans. This obviates the need to estimate the expected value of awarded incentives, and simply records their actual value at vesting when they can be cashed in (Gregory-Smith and Main, 2013).

Owing to the richness of the data, it is possible to characterise a company's board at the end of each financial year by the percentage of directors who are female (p_female), the percentage who are non-executive (p_neds), the percentage who are adjudged by the

[3]The use of 30% of face value as an estimate of the actuarial value of share options follows the practice of the remuneration consultancy industry (MM & K Ltd, 2007). Checks performed in Gregory-Smith (2012) demonstrate that the approach is robust. Conyon and Murphy (2000) valued performance share plans at 80% of face value.

proxy advisory firm to be truly independent (p_ind), and the total board size ($Board$). The size of the company is measured by the logarithm of that year's turnover ($LnSize$) as recorded in DataStream. Company performance is also gauged on an annual basis using: total shareholder return (TSR); return on assets (ROA); return on equity (ROE); and the logarithm of the price-to-book ratio ($LnPTOB$), used here to approximate Tobin's Q. Share price volatility ($Volatility$) is measured over the prior 12-month period. Director pay and company descriptors are all winsorised at the 1% and 99% tails. All financial data are expressed in £2010.

Apart from gender ($Female$), additional personal detail on individual directors is available in the form of age in years (Age), age-squared (Age^2), and the number of years to date on the board ($Tenure$). It is also possible to categorise the position held on the board into Chief Executive Officer (CEO), Chair ($Chair$), or Financial Director (FD). For non-executive directors, particular attention is paid to service on the remuneration committee, whether simply as a member ($RemCo\ Member$) or as Chair ($RemCo\ Chair$). In the analysis of the new board member appointment decision, use is also made of the descriptor as to whether in the prior period any male director had exited the board ($MExit$) or whether any female director had exited the board ($FExit$). These measures are also available separately for executive directors and for non-executive directors.

Table 1 provides a summary of the data in terms of the representation of women on company boards between 1996 and 2010. As explained above, companies continue to be followed in the sample even when they fall out of the FTSE350 but, for the sake of clarity, Table 1 restricts companies to those contemporaneously in the FTSE350 at the end of their financial year. The improvement in female representation over the period is evident - more so for non-executives than for executives. Even at the end of the sample period, however, only 3.25% of executives are female and only 9.81% of non-executive directors are female. Descriptive statistics on the entire sample are available in Table 2.

2.2. Estimation

The process of adding new board members is modelled as a probit focusing on each new appointment (this is not the periodic re-election of existing directors but the actual appointment of a new person to the board). The dependent variable is the gender of the newly selected person (1 = female). The independent variables comprise the range

of company descriptors described above, including the measure of whether any male or female has stepped down from the board in the prior 12-month period.[4] It is possible to have four things occur: no-one has stepped down; a male director has stepped down; a female director has stepped down; both a male and a female director have stepped down. All the independent variables are lagged one period. In what we label the Farrell and Hersch (2005) test, the hypothesis tested is that with a gender neutral selection process at work then the probability that a new appointment is female should bear no significant relationship to the gender of those stepping down.

In the wage regressions, all three of our measures of pay are examined: the narrow 'salary plus annual bonus' type measure ('TCC'); the wider measure of total direct compensation that includes an estimate of the expected value of the share options and performance shares granted in the period ('TDCa'); and, finally, the total direct compensation measure that records realised pay and avoids any ambiguity of valuation ('TDCr'). These three measures are only distinct in the case of the executive director regressions. For non-executive directors, regression analysis is restricted to TCC owing to the fact that their remuneration is essentially in the form of fees, as the use of share options and other long term incentives is positively discouraged (being perceived to threaten the independence of the director's status). The dependent variable is in logs. Independent variables include lagged values of company characteristics and the personal attributes of the director concerned. Year dummies are included and estimation is in fixed effects. The hypothesis being tested here is that, once in a job in the boardroom, males and females are treated equally in terms of remuneration. Due to the paucity of detail regarding the board appointment process, the issue of sample selection (Heckman, 1979) is not explicitly treated. The interpretation of results below takes this into account.

The performance of companies in relationship to the prevalence of women in boardroom positions is examined in a series of regressions using as dependent variable: total shareholder return ('TSR'); return of assets ('ROA'); return of equity ('ROE'); and the logarithm of price to book ratio ('LnPTOB'). The null hypothesis under test is that there is a no significant link between a company's performance and the prevalence of women on the board of that company. In addition to the lagged percentage of directors who are women, board size, proportion of directors who are non-executive, proportion

[4]Note that care relating to the timing of the departing director is required when coding this variable. Here we use the actual date of appointment and look back 12 months for any exits by directors in that company. This is more precise than simply structuring the data as a annual panel and using lagged exit.

who are judged independent, the size of the company and it's volatility are all entered with a lag as control variables. To reflect the dynamic nature of performance, the lagged value of the dependent variable is also included. This variable is treated as endogenous, being correlated with the error term. In addition, the lagged value 'p_female' is also potentially endogenous. High performing companies may attract a greater pool of female applicants and/or better performing companies may have more flexibility to appoint female directors. Likewise, each of the control variables ('LnSize', 'Board', p_neds', 'p_ind' and 'Volatility') could be regarded as endogenous as a result of choices made by the board, in view of expected performance. Because of this, estimation is by generalised methods of moments (Arellano and Bond, 1991; Arellano and Bover, 1995; Blundell and Bond, 1998). This exploits lagged values as instruments for the potentially endogenous variables. The two step version of the estimator is used, with Windmeijer (2005) corrected standard errors.

3. Results

Table 3 reports the probit estimates of the probability that a board appointment goes to a woman. The first two columns treat all directorships alike. Even in column (2), which controls for company characteristics, it can be seen that the fact that a woman has stepped down in the previous period significantly enhances the probability that the appointment in question will go to a woman. The reverse is true had a male recently stepped down. Estimated at the median of the sample characteristics and reported in Table 4, the probability of a female appointment changes from 0.075 if a man has stepped down to 0.136 if a woman has stepped down. While these are empirically modest probabilities (reflecting the dominant prevalence of male directors), the odds against a female appointment fall by some 52% between the two scenarios.

Separating the analysis into executive directors (rows (3) and (4)) and non-executive directors (rows (5) and (6)) reveals a markedly lower probability of women achieving executive appointments as opposed to non-executive appointments. This was already evident in Table 1 discussed above. The gender bias is statistically significant only in the case of non-executive directors, where the probabilities of a female appointment discussed above become 0.095 and 0.190 respectively. This represents a shift in the odds against a female appointment from just under ten-to-one against to slightly over four-to-one against. While representing an empirically significant impact on the odds of appointment, these estimated probabilities are lower than the 0.13 and 0.39 respectively

by Farrell and Hersch (2005) for the USA. However, the conclusion remains the same. The non-executive appointment process is not gender neutral and there is evidence of a degree of tokenism whereby boards have an eye to maintaining a representation of women but do not allow an equal opportunity of appointment to all non-executive positions.

The results on executive pay are presented in Table 5. The raw male-female wage gap (the simple regressions reported in columns (1) through (3)) reveals that women are paid at least 20% less than men in each of the three wage measures. Once company characteristics, director personal characteristics and company-specific fixed effects are controlled for, this wage gap becomes statistically insignificant (columns (4) through (6)). A fixed effects estimator is used which conceptualises the unobserved firm-level heterogeneity as time invariant and specific to each firm in our sample. It is easy to imagine this fixed effect as the result of stable firm characteristics, at least over the duration of our sample, such as geographical territory or culture. It is harder to believe that this firm specific effect is randomly drawn from the population of firms and unrelated to other company descriptors. Indeed, the random effects approach is rejected by a Hausman test on our data. Of course, as Albrecht *et al.* (2003) are careful to point out, the absence of a statistically significant gender gap with fixed effects does not imply that there is no glass ceiling or that the executive labour market is free of sex discrimination. For instance, omitting the CEO dummy from columns (4) to (6), results in a weakly significant 9% pay gap,[5] across the three measures of pay. This implies at least some of the raw pay gap is the result of females finding themselves in less senior positions. So there may be significant discrimination that impacts on women on their career path to these positions but, once in post, the pay arrangements enjoyed by female executive directors do not seem to be materially different from those enjoyed by their male colleagues.

When the fees received by non-executive directors are considered in Table 6, a rather different picture emerges. There is a clear gender difference in the raw levels of remuneration received of just over 4% and this is statistically significant at the 10% confidence level. But in a company-specific fixed effects regression that controls for company and personal characteristics, a significant gap of over 8% is revealed, and this at a 1% level of significance. After controlling for the day job of the non-executive director with dummy variables indicating their executive role at any of the companies within sample,

[5]Output omitted here but available at
http://www.homepages.ed.ac.uk/mainbg/working_papers.htm

this decreases to 7% but remains significant. It seems that the care being expended by remuneration consultants on bench-marking and other pay design considerations for executive director positions is not being effected as successfully for non-executives.

Finally, in Table 7, the association between gender diversity at board level and company performance is examined. The focal variable is the fraction of the board that is female ('p_female') which is entered with a lag, as are the other variables that capture company characteristics.[6] It can be seen that for each of shareholder return ('TSR'), return on assets ('ROA'), return on equity ('ROE'), and the price to book ratio ('LnPTOB') there is no significant link between that performance measure and the extent of boardroom gender diversity ('p_female'). The evidence in Table 7, therefore, fails to support the hypothesis that there is a productivity enhancing effect brought about by gender diversity in the boardroom. Other than in the case of TSR, the estimates pass the diagnostic tests for over-identifying restrictions and no serial correlation. Some caution is necessary, therefore, in interpreting the TSR results.

Robustness checks on these estimates are performed,[7] both by utilising the matching approach of Abadie and Imbens (2011) and by a two stage least squares approach that instruments the presence of women on a company's board by utilising a measure of the female connectedness of the board (Adams and Ferreira, 2009). [8] These techniques allow more explicit treatment of endogeneity concerns at the price of a less direct measure of female representation on the board. In neither case do the results of these checks undermine our findings. The overall conclusion is, therefore, that there is no evidence here of any boardroom gender diversity effect showing through to overall company per-

[6]As explained above, accounting-based performance measures are serially correlated and for this reason the lag of the dependent variable is included in these GMM estimates.

[7]Not reported here but available for inspection, see
http://www.homepages.ed.ac.uk/mainbg/working_papers.htm

[8]The robustness equations are estimated with two-stage least squares (ivreg 2sls). The percentage of female directors on the board is instrumented with 'female connectedness' on the board. We compute 'female connectedness' by calculating for each director-year, the number of female directors serving at *other* companies where the director also served (typically as a non-executive director) in that year. We sum 'female connectedness' for each firm-year and divide by the number of directors on the board (so to eliminate an association with board size). Our instrument is valid under the assumption that working relationships with female directors at other companies *only* impacts performance through the association with the increased likelihood that females will be appointed to the company. This is a similar identification strategy to that in Adams & Ferreira (2009). In the first stage, a one standard deviation increase in the average number of female connections is associated with approximately a 2% point increase in females on the board ($p<0.000$). At the mean percentage of females of just under 5%, this represents a 40% increase in relative terms. The instrument passes the standard diagnostic tests that it is not a weak instrument ($F=203.4$ p<¡0.000; Min eigenvalue statistic=1210; Shea's partial r-squared = 0.08).

formance.

4. Policy Discussion and Conclusions

Drawing on 15 years of data between 1996 and 2010 describing the boardroom composition, pay and performance of FTSE350 companies, this paper has addressed several issues that emerge in the ongoing debate regarding the scarcity of women in the boardroom. This field is riven with contradictory findings (as we have attempted to review above) and there is no settled view or agreement on the extent of the glass ceiling effect (lack of gender neutral appointment process), the existence of pay discrimination towards female directors, or the impact of gender diversity on corporate performance. In this context, two questions are addressed above. The first asks whether boardroom procedures are gender neutral by examining the process of making boardroom appointments and by testing for a significant male-female pay gap. The second asks whether a significant performance link can be observed between female representation at boardroom level and company performance.

In terms of equity, the board appointment process is found to display a gender bias in the case of non-executive directors. This is a gender bias in the sense that the probability of a boardroom appointment going to a woman is dependent on whether a woman has stepped down from the board in the recent period. The odds on making a female appointment at the non-executive level (never high) are significantly enhanced when a non-executive woman has stepped down in the prior period. The preponderance of males on UK boards, of course, means that many more men stepping down than women. The appointment process for non-executives is not gender neutral. In this respect, our results are consistent with (Farrell and Hersch, 2005). No such significant effect is found for executive positions, albeit the lower frequency of executive female appointments may contribute to larger standard errors relative to the non-executive appointments. Thus the absence of any evidence of gender bias in the executive process is unlikely to provide much relief to policymakers striving to increase gender diversity, given that the probability of a female executive appointment is already so much lower.

The result that the appointment process for non-executive directors tends to favour replicating the gender of the departing director may be evidence of discrimination but alternative interpretations exist. It may be that the proportion of female directors is already optimal to start with. This would be consistent with the findings of Ahern and Dittmar (2012) who show a significant negative effect on firm valuation subsequent

to the mandatory appointment of female directors in Sweden - which in the light of their finding could be interpreted as forcing firms to deviate from some sort of optimal gender mix equilibrium. Equally, however, the result may owe more to a behavioural effect known as the 'status quo bias' (Kahneman *et al.*, 1991; Lau and Murnighan, 1998). One explanation of this effect uses the framing model of Kahneman and Tversky (1979) to argue that in the face of uncertainty individuals weigh potential losses from a switch more heavily than potential gains, and so end up preferring the status quo. Given the policy importance of women on boards (Davies, 2011), it is clear that this is an area ripe for further research.

Once appointed, however, executive directors are treated equally in terms of pay, both in the narrower cash-based measure of 'salary plus bonus' and in the wider measures that allow for equity-linked rewards such as executive share options and performance shares. Given the extensive industry of remuneration consultants (Conyon, 2011) who strive to devise appropriate pay arrangements, and given the transparency that characterises disclosure in this area (Conyon *et al.*, 2010), this result is perhaps less than surprising. But, in the case of non-executive directors (where the median remuneration is a relatively modest £42,420 as opposed to £411,165 for executives in the same TCC cash pay terms), there is a significant male-female pay gap that is revealed once account is taken of the personal and company characteristics. The estimated discriminatory gap is around 7% to 8%. This is surprising and may relate to the tokenism of female non-executive appointments which is suggested by the earlier result concerning the increased likelihood of a woman being appointed if another woman has just stepped down from the board. It may also reflect lighter monitoring of non-executive fees by institutional shareholders relative to executive pay which attracts considerable scrutiny. Indeed, hitherto, formal evidence on gender gaps in non-executive fees has been absent. It is necessary to bear in mind the possibility of uncorrected sample selection bias (women directors being of different quality than allowed for in our control variables) and further research in this area is clearly desirable. But, given the increased emphasis assigned to the role played by non-executive directors as a control mechanism for effective governance, institutional groups and policy makers may wish to reassess what actions can be taken to ensure equality of treatment in the market for non-executive directors.

In terms of the second research question, there seems to be no significant link between the gender diversity of boards and any of our measures of company performance. Of course, a lack of clear connection with company performance is not to say that boards with a more diverse make-up do not behave differently, as there is substantial evidence

to suggest they do. But it does mean that there is no clear translation of this into performance as measured on the bottom line, neither in terms of shareholder return ('TSR'), nor in terms of the accounting measures of 'ROA' and 'ROE', nor as measured by our approximation to 'Tobin's-Q'. This is reminiscent of the (Demsetz and Lehn, 1985) argument regarding ownership structure having no observed linkage with performance. Boards may already be optimising their gender composition to take full advantage of resource dependency considerations (Hillman *et al.*, 2000; Luckerath-Rovers, 2009) or concerns regarding advice and counsel (Westphal, 1999).

To be clear, the absence of a clear connection between gender diversity and company performance does not undermine the case for greater levels of gender diversity in the boardroom. The moral case that gender diversity is inherently valuable in and of itself does not require justification by citing performance effects. Furthermore, the results presented in Table 3 suggest the appointment process is not currently gender neutral and that without external intervention substantially increased gender diversity in the boardroom may be some time coming. Nevertheless, if proposals continue to be put forwarded referring to clear performance benefits for UK companies then the case for gender diversity may be undermined. Such proposals would be better structured around the moral value of equal opportunity, rather than with reference to an expectation of improved corporate performance.

Ian Gregory-Smith, *University of Sheffield*
Brian G. M. Main, *University of Edinburgh*
Charles A. O'Reilly III, *Stanford University*

Manuscript accepted September 2013

5. Tables

Table 1: Percentage of women on the board by year in the FTSE350

			Percentage of Female Directors		
Year	N	Board Size	All	Executives	Non-execs
1996	350	9.72	2.22	0.65	3.36
1997	350	9.75	2.64	1.18	3.35
1998	350	9.88	3.28	1.39	4.52
1999	350	9.67	3.42	1.48	4.26
2000	350	9.71	4.05	2.01	4.99
2001	350	9.76	4.32	2.08	5.54
2002	350	9.70	5.06	2.76	6.25
2003	350	9.85	5.74	2.80	7.24
2004	350	9.93	6.45	2.69	8.33
2005	350	9.74	6.90	3.20	8.54
2006	350	9.70	7.18	3.49	8.70
2007	350	9.25	7.48	3.08	9.50
2008	350	8.99	7.33	3.19	8.93
2009	350	8.82	7.30	3.18	8.67
2010	350	8.62	8.19	3.24	9.82

* The FTSE350 is compiled by identifying the 350 companies listed on the London Stock Exchange (LSE) with the highest market capitalisation as at their financial year end. Consequently, the composition of FTSE350 varies from year to year.

† Data was not available for every company with years ending 2011, hence this year is omitted from the table above.

Table 2: Sample Statistics

Variable	N	Mean	Median	St. Dev.	Min	Max
Executive.Years						
Age	48,226	50.37	50.24	7.46	35.75	73.97
CEO	48,226	0.27	0	0.45	0	1
Chair	48,226	0.10	0	0.3	0	1
FD	48,226	0.24	0	0.43	0	1
LnTCC	48,226	12.58	12.61	0.89	8.35	14.31
LnTDCa	48,226	12.78	12.76	1.01	8.37	14.91
LnTDCr	48,226	12.69	12.67	0.99	8.35	14.83‘
RemCo Chair	48,226	0.01	0	0.08	0	1
RemCo Member	48,226	0.06	0	0.23	0	1
Tenure	48,226	5.64	3.81	5.63	0.08	27.23
Non-Executive.Years						
Age	67,068	59.13	59.95	7.54	35.75	73.97
LnTCC	67,068	10.41	10.38	0.84	8.35	14.31
RemCo Chair	67,068	0.22	0	0.41	0	1
RemCo Member	67,068	0.73	1	0.44	0	1
Tenure	67,068	4.93	3.61	4.72	0.08	27.23
Company-Years Descriptives						
Board	13,870	8.02	7	2.98	3	17
LnPTOB	13,870	0.51	0.44	0.94	-2.41	3.67
LnSize	13,870	11.5	11.62	2.46	4.66	16.83
p_female	13,870	0.05	0	0.08	0	0.67
p_ind	13,870	0.16	0.13	0.18	0	0.8
p_neds	13,870	0.61	0.57	0.22	0	1
ROA	13,870	0.03	0.05	0.14	-0.79	0.32
ROE	13,870	0.05	0.09	0.4	-2.79	1.2
TSR	13,870	-0.01	0.07	0.54	-2.34	1.29
Volatility	13,870	0.14	0.12	0.09	0	0.56

* The sample comprises all executive and non-executive directors serving in companies listed on the London Stock Exchange (with financial years ending between January 1995 and December 2011.
† All variables are winsorised at the 1% level.

Table 3: The impact of gender on director appointments

	All Appointments		Executive Appointments		Non-Executive Appointments	
	(1)	(2)	(3)	(4)	(5)	(6)
Recent Exit						
$FExit$	0.39***	0.34***	0.23	0.22	0.56***	0.46***
	(9.30)	(7.79)	(1.60)	(1.48)	(9.03)	(6.97)
$MExit$	-0.024**	-0.045***	-0.022	-0.019	-0.022	-0.063***
	(-2.22)	(-3.52)	(-0.72)	(-0.56)	(-1.23)	(-3.07)
Controls						
ROA_{t-1}		0.020		0.033		0.061
		(0.12)		(0.12)		(0.29)
TSR_{t-1}		0.063		0.14*		0.017
		(1.56)		(1.93)		(0.35)
$LnPTOB_{t-1}$		0.014		-0.054		0.045
		(0.64)		(-1.30)		(1.61)
$LnSize_{t-1}$		0.018		-0.060***		0.038***
		(1.60)		(-2.79)		(2.86)
$Board_{t-1}$		0.030***		0.048***		0.020**
		(3.58)		(3.22)		(2.08)
p_neds_{t-1}		0.79***		0.72***		0.79***
		(6.90)		(2.73)		(5.74)
p_ind_{t-1}		-0.22*		-0.47*		-0.21
		(-1.77)		(-1.83)		(-1.46)
$Volatility_{t-1}$		0.28		-0.23		0.45*
		(1.33)		(-0.57)		(1.77)
Observations	9,023	8,968	3,563	3,531	5,469	5,437

z-statistics in parentheses

*** p<0.01, ** p<0.05, * p<0.1

* The table above reports probit estimates of the impact of recent female exit and recent male exit, on the probability that the gender of a given appointment is female. The dependent variable is the population of director appointments, with female appointments taking the value 1 and male appointments taking the value zero. Of the 9,023 director appointments, 787 were female and 8,245 were male.

† Female (male) exit variables equal 1 if a female (male) director exited the company within the last 12 months from the appointment date. The marginal effects of these variables are described in table 4.

‡ In the case of executive appointments (columns 3 and 4), the female (male) exit variables describe the exit of an executive director in the last 12 months. In the case of non-executive appointments (columns 5 and 6) the exit variables describe the exit of a non-executive director in the last 12 months. The marginal effects of these variables are described in table 4.

Table 4: Probabilities of the appointment being female implied by Table 3

	Female Exit?	
	No	Yes
All Appointments		
No Male Exit	0.082	0.136***
Male Exit	0.075**	0.129***
Executive Appointments		
No Male Exit	0.048	0.070
Male Exit	0.046	0.068
Non-Executive Appointments		
No Male Exit	0.106	0.190***
Male Exit	0.095***	0.179***

*** p<0.01, ** p<0.05, * p<0.1

* The table describes the probability that a given appointment was female, by whether a female and/or male director left the company in the last 12 months.
† The probability that the appointment is female is derived from the average marginal effects after the probit estimates shown in Table 3. The average marginal effects were calculated for median values of each of the control variable.
‡ Stars indicate statistical significance relative to the case of no female exit and no male exit.

Table 5: The gender pay gap: Executive directors

	(1)	(2)	(3)	(4)	(5)	(6)
Female	-0.22***	-0.20***	-0.23***	-0.042	-0.019	-0.038
	(-4.12)	(-3.23)	(-3.89)	(-1.26)	(-0.56)	(-1.04)
Individual Level Controls						
CEO				0.54***	0.58***	0.54***
				(52.9)	(53.4)	(50.2)
$Chair$				0.041*	0.0093	-0.0068
				(1.94)	(0.41)	(-0.30)
FD				0.033***	0.063***	0.033***
				(3.36)	(6.22)	(3.15)
Age				0.099***	0.10***	0.10***
				(12.1)	(12.5)	(12.0)
Age^2				-0.0010***	-0.0010***	-0.0010***
				(-12.2)	(-12.9)	(-11.9)
$Tenure$				0.011***	0.0075***	0.015***
				(10.2)	(6.58)	(12.4)
Firm Level Controls						
ROA_{t-1}				-0.034	-0.11*	0.053
				(-0.68)	(-1.87)	(0.92)
TSR_{t-1}				0.042***	0.062***	0.072***
				(4.31)	(5.23)	(6.32)
$LnPTOB_{t-1}$				-0.0022	-0.0087	0.051***
				(-0.20)	(-0.62)	(3.80)
$LnSize_{t-1}$				0.15***	0.22***	0.20***
				(11.4)	(12.4)	(12.4)
$Board_{t-1}$				0.0032	-0.0023	-0.0030
				(0.91)	(-0.48)	(-0.71)
p_neds_{t-1}				0.46***	0.86***	0.68***
				(7.06)	(9.68)	(8.51)
p_ind_{t-1}				0.23***	0.19***	0.27***
				(4.41)	(2.81)	(4.12)
$Volatility_{t-1}$				0.11**	0.18***	0.18***
				(2.16)	(2.83)	(2.85)
Observations	48,226	48,226	48,226	45,822	45,822	45,822
R-squared	0.002	0.001	0.002	0.572	0.602	0.571

Robust t-statistics in parentheses

*** p<0.01, ** p<0.05, * p<0.1

* The table above estimates the gender pay gap across three different measures of pay. 'TCC' the cash components of remuneration received during the year, including salary, bonuses and perks. 'TDCa' adds to this measure the expected value of share options and other equity awards granted during the year. 'TDCr' adds to TCC, the ex-post realised value of share options and other equity awards exercised during the year. Each pay variable is defined in logs and therefore female captures the gender pay gap in percentage terms.

† Columns 1, 2 and 3 describe the raw difference in pay between female and male executive directors. Columns 4, 5 and 6 describe the raw difference in pay fees arising from gender within companies.

Table 6: The gender pay gap: Non-executive directors

	(1)	(2)	(3)
Female	-0.042*	-0.084***	-0.069***
	(-1.95)	(-5.77)	(-4.68)
Individual Level Controls			
Day Job CEO			0.077***
			(5.22)
Day Job FD			0.038***
			(2.71)
Day Job Chair			0.11***
			(5.42)
Day Job Exec			0.049***
			(3.82)
Chair		0.86***	0.84***
		(60.3)	(59.1)
Rem Co Chair		-0.0041	-0.0026
		(-0.50)	(-0.31)
Rem Co Member		-0.017	-0.014
		(-1.01)	(-0.81)
Age		0.064***	0.062***
		(10.8)	(10.5)
Age^2		-0.0005***	-0.0005***
		(-10.4)	(-10.0)
Tenure		0.0034***	0.0042***
		(3.23)	(3.94)
Firm Level Controls			
ROA_{t-1}		0.063	0.066
		(1.44)	(1.51)
TSR_{t-1}		0.014*	0.015*
		(1.81)	(1.87)
$LnPTOB_{t-1}$		0.019**	0.019**
		(2.43)	(2.36)
$LnSize_{t-1}$		0.054***	0.054***
		(7.05)	(7.01)
$Board_{t-1}$		0.0081***	0.0083***
		(3.22)	(3.31)
p_neds_{t-1}		0.20***	0.20***
		(4.32)	(4.18)
p_ind_{t-1}		-0.17***	-0.17***
		(-5.70)	(-5.78)
$Volatility_{t-1}$		0.035	0.034
		(0.79)	(0.76)
Observations	67,068	64,045	64,045
R-squared	0.000	0.539	0.541

Robust t-statistics in parentheses
*** p<0.01, ** p<0.05, * p<0.1

* Col (1) describes the raw difference in fees between female and male non-executive directors.
† Col (2) describes the difference in fees , within companies and controlling for the role of the non-executive.
‡ Col (3) additionally controls for the day job of the non-executive director at another FTSE company within sample. The base is no executive position.

Table 7: The impact of gender diversity in the boardroom on corporate performance

	TSR	ROA	ROE	LnPTOB
p_female_{t-1}	-0.079	0.024	0.13	0.059
	(-1.21)	(0.97)	(1.40)	(0.27)
Controls				
y_{t-1}	-0.13	0.35***	0.36***	0.72***
	(-1.46)	(4.37)	(4.14)	(16.8)
$LnSize_{t-1}$	0.016***	0.0090***	0.024***	0.019***
	(3.95)	(5.56)	(5.83)	(4.43)
$Board_{t-1}$	-0.0034	-0.0026***	-0.0046**	0.0070**
	(-1.34)	(-3.63)	(-2.27)	(2.44)
p_neds_{t-1}	0.14***	0.016**	0.072***	-0.089*
	(4.02)	(2.05)	(3.18)	(-1.93)
p_ind_{t-1}	0.050	-0.013	-0.050**	-0.026
	(1.58)	(-1.63)	(-2.23)	(-0.75)
$Volatility_{t-1}$	-0.11	-0.052***	-0.13**	0.023
	(-1.46)	(-3.08)	(-2.42)	(0.29)
Hansen J	94.62***	83.40	67.15	98.43
No AR(2)	p=0.028	p=0.731	p=0.259	p=0.324
Observations	11,515	11,515	11,515	11,515
Number of companyid	1,983	1,983	1,983	1,983

Robust t-statistics in parentheses
*** p<0.01, ** p<0.05, * p<0.1

* The table above estimates the impact of the percentage of female directors on the board, across four measures of corporate performance. Total Shareholder Return (TSR) captures the annual change in the log of the Datastream return index, capturing both capital growth in the company's stock price and dividends. Return of Assets (ROA) and Return on Equity (ROE) capture annual accounting performance. The natural log of the market to book ratio proxies Tobin's Q, a forward looking measure that indicates opportunities for future growth in the firm.

† The equations are estimated with GMM (xtabond2), treating the explanatory variables as endogenous covariates. The two step version of the estimator is used, with Windmeijer (2005) corrected standard errors. The diagnostic tests for valid overidentifying restrictions and no serial correlation in the AR(2) residuals pass other than in the case of TSR.

‡ Alternative specifications were explored, including estimation by OLS, firm fixed effects (xtreg, fe), matching techniques (psmatch2) and 2 stage least squares (ivregress 2sls). The absence of a positive impact of females on corporate performance was robust to these alternative specifications (available at *www.homepages.ed.ac.uk/mainbg/working_papers.htm*).

References

Abadie, A. and Imbens, G.W. (2011). 'Bias-corrected matching estimators for average treatment effects', *Journal of Business & Economic Statistics*, vol. 29(1), pp. 1–11.

Adams, R.B. and Ferreira, D. (2009). 'Women in the boardroom and their impact on governance and performance', *The Journal of Financial Economics*, vol. 94, pp. 291–309.

Adams, S.M., Gupta, A., Haughton, D.M. and Leeth, J.D. (2007). 'Gender differences in CEO compensation: evidence from the USA', *Women in Management Review*, vol. 22(3), pp. 208–224.

Ahern, K.R. and Dittmar, A.K. (2012). 'The changing of the boards: The impact on firm valuation of mandated female board representation', *Quarterly Journal of Economics*, vol. 127(1), pp. 137–197.

Albrecht, J., Bjorklund, A. and Vroman, S. (2003). 'Is there a glass ceiling in Sweden?', *The Journal of Labor Economics*, vol. 21, pp. 145–177.

Arellano, M. and Bond, S. (1991). 'Some tests of specification for panal data: Monte Carlo evidence and an application to employment equations', *Review of Economic Studies*, vol. 58, pp. 277–298.

Arellano, M. and Bover, O. (1995). 'Another look at the instrumental variable estimation of error-components models', *Journal of Econometrics*, vol. 68(1), pp. 29–51.

Arrow, K. (1972). *Models of Job Discrimination*, D. C. Heath.

Babcock, L. and Laschever, S. (2003). Princeton N.J.: Princeton University Press.

Bebchuk, L.A., Coates, J.C. and Subramanian, G. (2002). 'The powerful antitakeover force of staggered boards: Theory, evidence, and policy', *Stanford Law Review*, vol. 54, pp. 887–951.

Becker, G.S. (1957). *The Economics of Discrimination*, University of Chicago Press.

Blackaby, D., Booth, A.L. and Frank, J. (2005). 'Outside offers and the gender pay gap', *Economic Journal*, vol. 115, pp. 81–107.

Blundell, R. and Bond, S. (1998). 'Initial conditions and moment restrictions in dynamic panel data models', *Journal of Econometrics*, vol. 87(1), pp. 115–143.

Booth, A.L. (2009). 'Gender and competition', *Labour Economics*, vol. 16(6), pp. 599–606.

Bygren, M. and Ghler, M. (2012). 'Family formation and men's and women's attainment of workplace authority', *Social Forces*, vol. 90(3), pp. 795–816, doi:10.1093/sf/sor008.

Cadbury, A. (1992). 'The financial aspects of corporate governance, report on the committee on the financial aspects of corporate governance', GEE, London.

Conyon, M. and Murphy, K. (2000). 'The prince and the pauper? CEO pay in the United States and United Kingdom', *The Economic Journal*, vol. 110, pp. 640–671.

Conyon, M.J. (2011). *Handbook on International Corporate Governance: Country Analyses*, chap. Compensation Committees and CEO Pay, Edward Elgar, Massachusetts, pp. 297–316.

Conyon, M.J., Fernandez, N., Ferreira, M.A., Matos, P. and Murphy, K. (2010). 'The executive compensation controversy: A transatlantic analysis', Fondazione Rodolfo Benedetti, Italy.

Davies, E. (2011). 'Women on boards an independent review into women on boards', Department for Business Innovation and Skills BIS, London.

Demsetz, H. and Lehn, K. (1985). 'The structure of corporate ownership: Causes and consequences', *The Journal of Political Economy*, vol. 93(6), pp. 1155–1177.

Dezso, C.L. and Gaddis Ross, D. (2012). 'Does female representation in top management improve firm performance? A panel investigation.', *Strategic Management Journal*, vol. 33(12), p. forthcoming.

Doldor, E., Vinnicombe, S., Gaughan, M. and Sealy, R. (2012). 'Gender diversity on boards: The appointment process and the role of executive search firms', Equality and Human Rights Commission Research Report Series, Manchester.

Doyle, A.C. (1892). 'The adventure of silver blaze', *The Strand Magazine*.

E&HRC (2007). 'Sex and power', Equalty and Human Rights Commission, Manchester.

Eisenhardt, K.M., Kahwajy, J.L. and Bourgeouis, L.J. (1997). 'Conflict and strategic choice: How top management teams disagree', *California Management Review*, vol. 39, pp. 42–62.

Elstad, B. and Ladegard, G. (2012). 'Women and tokenism on corporate boards: The case of Norway', Oslo University College, Oslo, Norway.

Erhardt, N.L., Werbel, J.D. and Shrader, C.B. (2003). 'Board of director diversity and firm financial performance', *Corporate Governance*, vol. 11(2), pp. 102–111.

European Union (2012). 'Women in economic decision-making in the EU: Progress report. a Europe 2020 initiative', European Union, Commission Staff Working Document, Luxembourg: Publications Office of the European Union, 2012.

Farrell, K.A. and Hersch, P.L. (2005). 'Additions to corporate boards: the effect of gender', *Journal of Corporate Finance*, vol. 11, pp. 85–106.

FRC (2012). 'The UK corporate governance code', Financial Reporting Council, London.

Goodstein, J., Gautam, K. and Boeker, W. (1994). 'The effect of board size and diversity on strategic change', *Strategic Management Journal*, vol. 15, pp. 241–250.

Greenbury, R. (1995). 'Directors remuneration: Report of a study group chaired by Sir Richard Greenbury', Confederation of British Industry, London.

Gregory, A., Jeanes, E., Tharyan, R. and Tonks, I. (2012). 'Does the stock market gender stereotype corporate boards? Evidence from the markets reaction to directors trades', *The British Journal of Management, forthcoming*.

Gregory-Smith, I. (2012). 'Chief executive pay and remuneration committee independence', *Oxford Bulletin of Economics and Statistics*, vol. 74(4), pp. 510–531.

Gregory-Smith, I. and Main, B.G.M. (2013). 'Heads i win, tails you lose. A career analysis of executive pay and corporate performance', *Working Paper*.

Hallock, K.F. and Bertrand, M. (2001). 'The gender gap in top corporate jobs', *Industrial and Labor Relations Review*, vol. 55(1), pp. 3–21.

Hampel, S.R. (1998). 'Committee on corporate governance', GEE, London.

Heckman, J.J. (1979). 'Sample selection bias as a specification error', *Econometrica*, vol. 47(1), pp. 153–161.

Hillman, A.J., Cannella, A.A. and Paetzold, R.L. (2000). 'The resource dependence role of corporate directros: Strategic adaption of board composition in response to environmnetal change', *Journal of Management Studies*, vol. 37(2), pp. 235–255.

Huang, J. and Kisgen, D.J. (2012). 'Gender and corporate finance: Are male executives overconfident relative to female executives?', Boston College.

Joy, L., Carter, N.M., Wagener, H.M. and Narayanan, S. (2007). 'The bottom line: Corporate performance and women's representation on boards', Catalyst.

Kahneman, D., Knetsch, J.L. and Thaler, R.H. (1991). 'The endowment effect, loss aversion, and status quo bias', *The Journal of Economic Perspectives*, vol. 5, pp. 193–206.

Kahneman, D. and Tversky, A. (1979). 'Prospect theory: An analysis of decisions under risk', *Econometrica*, vol. 47, pp. 262–291.

Kanter, R.M. (1997). *Men and Women of the Corporation*, New York: Basic Books.

Larcker, D.F., Richardson, S.A. and Tuna, A.I. (2007). 'Corporate governance, accounting outcomes and organizational performance', *Accounting Review*, vol. 82, pp. 963–1008.

Lau, D.C. and Murnighan, K.T. (1998). 'Demographic diversity and faultlines: The compositional dynamics of organizational groups', *The Academy of Management Review*, vol. 23, pp. 325–340.

Lazear, E.P. and Rosen, S. (1990). 'Male-female wage differentials in job ladders', *Journal of Labor Economics*, vol. 8(1), pp. 106–123.

Levi, M., Li, K. and Zhang, F. (2011). 'Men are from mars, women are from venus: Gender and mergers and acquisitions', Sauder School of Business, University of British Columbia.

Luckerath-Rovers, M. (2009). 'Female directors on corporate boards provide legitimacy to a company: A resource dependency perspective', SSRN.

Main, B.G.M. (2006). 'The ABI guidelines for share-option based incentive schemes. Setting the hurdle too high?', *Accounting and Business Research*, vol. 36(3), pp. 191–205.

Main, B.G.M., Jackson, C., Pymn, J. and Wright, V. (2008). 'The remuneration committee and strategic human resource management', *Corporate Governance: An International Review*, vol. 16, pp. 225–238.

Manning, A. (2003). *Monopsony in motion*, Princeton, NJ: Princeton University Press.

Marschke, R., Laursen, S., Nielsen, J.M. and Rankin, P. (2007). 'Demographic intertia revisited: An immodest proposal to achieve equitable gender representation among faculty in higher education', *Journal of Higher Education*, vol. 78(1), pp. 1–26.

Marshall, A. (1927). *Industry and Trade*, London: Macmillan.

Mayer, C. (2013). *Firm Commitment. Why the corporation is failing us and how to restore trust in it*, London: Oxford University Press.

McKinsey & Co. (2007). 'Women matter. Gender diversity, a corporate performance driver', McKinsey & Company.

McKinsey & Co. (2008). 'Women matter. Female leadership, a competitive edge for the future', McKinsey & Company.

McKinsey & Co. (2010). 'Women matter. Women at the top of corporations, making it happen', McKinsey & Company.

Miller, T. and del Carmen Triana, M. (2009). 'Demographic diversity in the board room: Mediators of the board diversity-firm performance relationship', *Journal of Management Studies*, vol. 46(5), pp. 755–786.

Milliken, F.J. and Martins, L.L. (1996). 'Searching for common threads: understanding the multiple effects of diversity in organizational groups', *Academy of Management Review*, vol. 21, pp. 402–433.

Mincer, J. and Polachek, S. (1974). 'Family investment in human capital: Earnings of women', *Journal of Political Economy*, vol. 82(2), pp. S76–S108.

MM & K Ltd (2007). 'The executive director total remuneration survey', In Association with Manifest Information Services Ltd.

Nielsen, S. and Huse, M. (2010). 'The contribution of women on boards of directors: Going beyond the surface', *Corporate Governance: An International Review*, vol. 18, pp. 136–148.

O'Reilly, C.A. and Main, B.G.M. (2012). 'Women in the boardroom: Symbols or substance?', Stanford Graduate School of Business, Palo Alto, California, http://ssrn.com/abstract=2039524.

Pau, S.L. and Sahni, H. (2009). 'Women in top management and job self-selection', Paper delivered at Financial Management Association, Reno, Nevada.

Pepper, S. (2006). *Senior Executive Reward: Key Models and Practices*, Gower Publishing Ltd.

Powell, G.N. and Butterfield, D. (1994). 'Investigating the 'glass ceiling' phenomenon: An empirical study of actual promotions to top management', *Academy of Management Journal*, vol. 37, pp. 68–86.

Ransom, M.R. and Oaxaca, R.L. (2010). 'New market power models and sex differences in pay', *Journal of Labor Economics*, vol. 28(2), pp. 267–289.

Robinson, G. and Dechant, K. (1997). 'Building the business case for diversity', *Academy of Management Executive*, vol. 11, pp. 21–31.

Rohner, U. and Dougan, B. (2012). 'Gender diversity and corporate performance', Credit Suisse Research Institute, Zurich.

Smith, N., Smith, V. and Verner, M. (2006). 'Do women in top management affect firm performance? A panel study of 2,500 Danish firms', *International Journal of Productivity and Performance Management*, vol. 55(7), pp. 569–593.

Smith, N., Smith, V. and Verner, M. (2010). 'Breaking through the glass ceiling? Gender differences in promotion patterns into ceo and voce-director positions in danish companies', Department of Economics, Aarhus School of Business, Denmark.

Storvik, A. and Teigen, M. (2010). 'Women on board. The Norwegian experience', Friedrich-Ebert-Stiftung International Policy Analysis, Berlin, Germany, available at www.fes.de/ipa.

Terjesen, S., Sealy, R. and Singh, V. (2009). 'Women directors on corporate boards: A review and research agenda', *Corporate Governance: An International Review*, vol. 17(3), pp. 320–337, ISSN 1467-8683, doi:10.1111/j.1467-8683.2009.00742.x.

Torchia, M., Calabr, A. and Huse, M. (2011). 'Women directors on corporate boards: From tokenism to critical mass', *Journal of Business Ethics*, vol. 102, pp. 299–317.

van der Walt, N. and Ingley, C. (2003). 'Board dynamics and the influence of professional background, gender and ethnic diversity of directors', *Corporate Governance*, vol. 11, pp. 218–234.

Westphal, J.D. (1999). 'Collaboration in the boardroom: Behavioural and performance consequences of CEO-board social ties', *Academy of Management Journal*, vol. 42, pp. 7–24.

Wilson, N. and Altanlar, A.R. (2009). 'Director characteristics, gender balance and insolvency risk: An empirical study', Leeds University Business School.

Windmeijer, F. (2005). 'A finite sample correction for the variance of linear efficient two-step gmm estimators', *Journal of Econometrics*, vol. 126(1), pp. 25–51.

Zelechowski, D. and Bilimoria, D. (2004). 'Characteristics of women and men corporate inside directors in the US', *Corporate Governance: An International Review*, vol. 12, pp. 337–342.