



Does society underestimate women? Evidence from the performance of female jockeys in horse racing



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ABSTRACT

Women are under-represented in many top jobs. We investigate whether biased beliefs about female ability – a form of ‘mistake-based discrimination’ – are partially responsible for this under-representation. We use more than 10 years of data on the performance of female jockeys in U.K. and Irish horse racing – a sport where, uniquely, men and women compete side-by-side – to evaluate the presence of such discrimination. The odds produced by the betting market provide a window onto society’s beliefs about the abilities of women in a male-dominated occupation. We find that women are slightly underestimated, winning 0.3% more races than the market predicts. Female jockeys are underestimated to a greater extent in jump racing, where their participation is low. We discuss possible reasons for this association.

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1. Introduction

Women are under-represented in top-ranking positions across a range of professions: within business, within politics, and within academia. This under-representation has been dubbed the ‘glass ceiling’, and has attracted interest from academics (e.g. [Bertrand and Hallock, 2001](#)), policymakers,¹ and the popular press.² Furthermore, the absence of women in high-ranking positions coincides with a gender wage gap right across the wage distribution ([Arulampalam et al., 2007](#)).

Explanations for unequal outcomes for men and women in the labour market are manifold. One explanation is that women are reluctant to engage in competition. [Niederle and Vesterlund \(2007\)](#) show that women prefer piece-rate compensation, rather than compensation determined by a competitive tournament. If the achievement of high office – whether in business, politics, or elsewhere – involves performing in competitive environments, the relative absence of women at this level could be partially explained by female distaste for such competition.

Other prominent explanations can be categorised as discrimination. One example is taste-based discrimination ([Becker, 1957](#)), where discriminatory managers are willing to forgo some profitability in return for a workplace predominantly

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¹ For example, see the British government report on increasing female representation on corporate boards (www.gov.uk/government/policies/making-companies-more-accountable-to-shareholders-and-the-public).

² For example, see *The Economist* on the male-dominated world of central banking (www.economist.com/news/finance-and-economics/21584386-unsteady-march-diversity).

composed of men. Alternatively, such discrimination may be statistical (Phelps, 1972), in that the decision to choose a male employee over an equally qualified female employee is due to unobserved factors in individual productivity, combined with differences in the average productivity of men and women.

In this paper we investigate an alternative form of discrimination. We investigate whether society – for want of a better word, and intended to include both men and women – systematically underestimates the skills and abilities of women. Perhaps many employers mistakenly believe that women are not capable of carrying out high-powered jobs? Furthermore, perhaps the absence of women in these roles accentuates this perception, as employers do not get the opportunity to learn about the abilities of women? Wolfers (2006) labelled this type of discrimination ‘mistake-based’.

To examine mistake-based discrimination, we investigate the performance of female jockeys within U.K. and Irish horse racing. This is the only major sport where men and women compete side-by-side in competition. Moreover, a betting market trades bets on the winner of each race. The betting market – and the odds it produces – therefore provides a unique window onto society’s beliefs about the skills and abilities of women in a male-dominated occupation. If female jockeys are systematically underestimated, we can expect them to win more often than their odds imply, and finish races before their more heavily-favoured male competitors.

Importantly, our empirical strategy does not rely on the assumption that male and female jockeys are of equal ability, or indeed that they receive equal opportunities to ride the best horses. The analysis we present answers the simple question: given the hand that male and female jockeys have been dealt – both in terms of their individual ability, and that of their horse – does the market systematically underestimate the skills and abilities of women?

Across more than 10 years of racing in the U.K. and Ireland, involving 123,704 races and more than 1.32 m competitors, we find that female jockeys are slightly underestimated; female jockeys are 0.3% more likely to win races than betting market prices predict.

This small effect, however, masks subtle differences across the sample. We find that female jockeys particularly outperform expectations in the two forms of jump racing: over hurdles, and over the more arduous obstacles in steeplechases. To be specific, female jockeys win 0.7% more hurdle races and 0.9% more steeplechases than the market predicts. Captured another way, female jockeys finish, on average, 0.3 places better than the market predicts in steeplechases and 0.54 places better in hurdles. Interestingly, female jockeys secure only 2.89% of the rides in steeplechases and 2.18% of rides in hurdle races, compared to 8.19% in all-weather flat races, for example. In Section 5 we will discuss possible reasons why female jockeys are underestimated in precisely the types of races where their participation is lowest.

Our paper is closest in spirit to those of Wolfers (2006) and Kolev (2012). Wolfers compared the stock returns of firms with a female CEO to those with a male CEO. If female CEOs are underestimated by financial markets, we would expect to accrue abnormal returns by holding the stock of firms with a female head. Wolfers actually found negative abnormal returns of firms headed by a woman when compared to the returns of firms headed by a man, but the difference was not statistically significant. This insignificance was predominantly ascribed to a lack of statistical power. In his sample there were only 64 female CEOs, compared to 4175 male CEOs, and females only worked 1.3% of the CEO-years. Kolev (2012), however, showed that an alternative construction of the data, and alternative econometric techniques, yielded statistically significant negative abnormal returns for female-led firms. In the absence of an omitted risk-factor, or mispricing lasting beyond the length of Kolev’s study, there is therefore evidence to suggest that females are, in fact, overestimated by stock market participants. If that is the case, erroneous beliefs regarding female ability are unlikely to be a driver behind the large discrepancy between male and female labour market outcomes.³

Our setting, however, offers advantages over the aforementioned stock market studies. Firstly, there is greater statistical power. We have 1385 female jockeys in our sample out of a population of 6134. Although female jockeys secure fewer rides than their male counterparts, they still obtain 4.75% of the approximately 1.32 m rides in our sample. A second advantage is that each jockey is not tied to any one horse in the way that a CEO is, at least temporarily, tied to one firm. Jockeys will ride different horses in the same day, and horses will also be ridden by different jockeys. We can therefore more cleanly isolate the ‘value-added’ by each jockey. Thirdly, while caution must be exerted in extrapolating observations from betting – an activity with negative expected returns – betting market prices may reflect the beliefs of a wider section of society. Stock returns are largely in the hands of institutional investors and money managers, while individuals ‘manage their own money’ in betting markets. In 2011, the British Horse Racing Authority estimated that 6.1 m people attended a U.K. horse race, with a substantial proportion placing bets.⁴ We hope to garner a reflection of their beliefs about female ability by examining the prices that result from these bets.

Fourth, we can measure beliefs about male and female ability at different levels of an industry. While stock market prices may reflect beliefs about the abilities of the heads of large publicly-listed firms, betting markets can tell us about the public’s perceptions of a wide range of competitors, from the elite practitioners in class 1 races, all the way down to the part-timers

³ There is a parallel literature that examines stock market reactions to the appointment of a female CEO. Lee and James (2007) find a negative market response, on average, to female appointments compared to male appointments. However, others have not found such a response when randomly selecting comparator male CEOs appointment from the same industry (Gondhalekar and Dalmia, 2007), or when using matching on observables techniques (Martin et al., 2009). A review of this literature can be found in Mohan (2014). Our interest is in whether market beliefs are unbiased, rather than establishing the nature of these beliefs (i.e. whether the market believes the appointment of a female is bad news or not). For this reason, our paper is more closely related to the work of Wolfers (2006) and Kolev (2012).

⁴ British Horse Racing Authority FactBook 2011/12.

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