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Introduction to Tournament Theory

A key theme in *Fair Shake: Women and The Fight to Build a Just Economy* is that workplace competition, with increasingly outsized rewards for winners, generates gender inequality by creating a "triple bind," preventing women from achieving equal success in high-powered careers and reaching the top ranks of corporate hierarchies.[1] In this essay, we offer an economic perspective on the phenomenon of workplace competition, starting with a discussion of the potential benefits to employers from implementing competitive reward schemes as well as some of the potential downsides most often discussed in the economics literature. We then survey recent experimental research in economics examining how competitive schemes that reward workers based on their success relative to co-workers can contribute to gender inequality. We conclude by relating these experimental findings to the triple bind concept in *Fair Shake* and discussing potential policy implications.

It is perhaps natural that, as economists, we start by presenting the case in favor of competitive incentives at work. As background, it is useful to observe that a key feature of long-term employment relationships is that they shield participants from labor market competition. Workers with secure employment don't have to wake up every morning not knowing what job they will find or how much pay they will receive for it. Similarly, firms with employees are not left uncertain each day about who is going to operate their machines or serve their customers, and at what cost. Employment relationships increase stability for workers and firms and reduce search and training costs associated with job switches.

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1. NAOMI CAHN, JUNE CARBONE & NANCY LEVIT, FAIR SHAKE: WOMEN AND THE FIGHT TO BUILD A JUST ECONOMY (2024).

Alongside these beneficial features, however, is the concern that workers with safe jobs will devote too little effort to their work. This is the economic motivation for devising incentives at work.

Within-firm competition is presented as a solution to the fundamental challenge at the heart of the field of personnel economics:[2] How can firms motivate workers to invest costly effort into their jobs and increase output from production? The concern is not that workers are lazy or irresponsible, but that working hard strains workers physically, emotionally, or mentally, and takes time and energy away from other pursuits. It may be possible to get some people to work hard because they derive meaning or enjoyment from their work, so that these effort costs are compensated internally and offset by a greater benefit, but jobs also include many tasks that people don't enjoy and aren't intrinsically motivated to undertake. While recent work in behavioral economics has highlighted the potential for social relationships, social pressure, and gift exchange impulses to increase worker effort,[3] financial incentives are still believed to play a primary role, because the impact of nonpecuniary strategies appears limited to only certain people and situations.

After hiring workers, firms retain significant financial power over workers, because they can still fire or dismiss them, and among retained workers, they can decide on job assignments, working conditions, formal rank and authority, and, of course, compensation. The literature in personnel economics has extensively considered how control over these various aspects of job structure and rewards can be used to create financial incentives to motivate workers to provide effort. Individualized incentives based on a worker's own effort are viewed as the theoretical ideal, because such incentives are targeted at the outcome that the worker can control and that the employer values. However, in reality these incentives are often infeasible because of the high costs to employers of monitoring and measuring effort. Instead, employers commonly base incentives on proxies for effort or its outputs.[4]

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2. Personnel economics is defined as "the application of economic and mathematical approaches to traditional topics in the study of human resource management." Edward P. Lazear & Paul Oyer, *Personnel Economics* (Nat'l Bureau of Econ. Rsch., Working Paper No. 13480, 2007).

3. *See* Uri Gneezy, Stephen Meier & Pedro Rey-Biel, *When and Why Incentives (Don't) Work to Modify Behavior*, 25 J. ECON. PERSP. 191 (2011); David J. Cooper & John H. Kagel, *Other-Regarding Preferences: A Selective Survey of Experimental Results*, *in* 2 THE HANDBOOK OF EXPERIMENTAL ECONOMICS 217 (John H. Kagel & Alvin E. Roth eds., 2015).

4. Examples of individual incentives based on output, rather than effort, include a piece rate payment per unit produced, a commission that is a fixed percent of worker's own sales, or a fixed financial bonus for a teacher based on the amount

Moreover, performance incentives, both positive and negative, are commonly based on relative comparisons among coworkers, rather than individual effort or achievement alone. A prominent example highlighted in *Fair Shake* is the rank-and-yank (or stacked ranking) performance evaluation scheme implemented at GE under Jack Welch.[5]

The idea that relative comparisons and workplace competition could be harnessed by employers as an effective way to motivate worker effort was developed formally in foundational work by Lazear and Rosen.[6] That paper establishes key results of tournament theory, by showing how winner-take-all contests for a financial reward (such as a bonus or promotion) could be developed to induce desired effort levels in workers, even when effort is impossible to observe and there is only a noisy relationship between effort and output. Because workers are risk averse, and tournaments increase variability in pay, the employer may need to increase base pay to attract workers to enter the contest. Despite the costs of getting risk-averse workers to take on additional risk, tournaments can still be profitable if they are sufficiently effective at raising effort.[7] This is suggested by the widespread prevalence of tournament schemes across a range of organizations and outcomes, noted in *Compensation and Incentives in the Workplace*,[8] and the fact that promotions "almost always require relative rankings."[9]

While these theoretical predictions regarding the potential value of tournaments as a way to increase worker effort have been

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of their students' test score improvements.

5. Under stacked ranking, a fixed threshold is set for the share of top performing employees who are rewarded and of bottom ranking employees who are terminated. A related scheme used in major technology companies is "forced ranking" in which evaluators must conform to a predetermined structure for the overall score distribution, with fixed shares of employees placed in the highest and lowest categories.

6. Edward P. Lazear & Sherwin Rosen, *Rank-Order Tournaments as Optimum Labor Contracts*, 89 J. POL. ECON. 841 (1981).

7. *See id*. Lazear and Rosen demonstrate how tournaments can even match the benchmark of the individual piece rate under certain conditions. Furthermore, the literature shown that competitive incentives, using relative comparisons, can improve upon individual-based incentives for cases in which external shocks to output are common across workers and unrelated to their effort. In that case, benchmarking performance relative to a peer group can reduce the volatility of the outcomes and make it more closely related to the factor the worker can control, raising the signal to-noise ratio of the measure, and reducing the variability in payouts for risk averse agents.

8. Edward P. Lazear, *Compensation and Incentives in the Workplace*, 32 J. ECON. PERSP. 195 (2018).

9. *Id*. at 202.

supported in experimental and empirical studies of competitive incentives,[10] the literature has also examined potentially harmful effects of competition in some settings. Incentives for relative performance have the effect of pitting coworkers against one another, which can be harmful to production processes that depend on collaboration or information exchange among co-workers. This can even be a problem for training and mentoring of people who could potentially become competitors in the future. Team-based incentives may help, by removing individual-level competition, but these can weaken incentives and are not always feasible. Even for individual production, high-stakes tournaments can create incentives for deception and sabotage of colleagues.[11]

I. Economics of Gender and Competition

While the economics literature on tournaments was initially developed without regard to gender, focusing on workers who are either male or non-gendered, more recent studies have considered how competition might interact with gender. Drawing on substantial work on gender differences in competitiveness and voluntary participation in competitions from psychology,[12] experimental economists designed studies to test for gendered effects of competition. There are two main approaches. The first is focused on measuring gender differences in the effects of competition on work effort and performance, while the second is focused on gender differences in decisions to enter into competitions. Studies using both approaches have revealed significant gender differences. Male participants show significantly larger performance improvements under competition[13] and are more likely to choose a tournament scheme for pay, even when their relatively low prior performance suggests they would do better with a piece rate.[14] Later scholarly work has replicated and confirmed

10. *See, e.g.,* Jeffrey P. Carpenter & Peter Hans Matthews, *Tournaments and Competition*, *in* HANDBOOK OF LABOR, HUMAN RESOURCES AND POPULATION ECONOMICS (Klaus F. Zimmerman ed., 2023); Lazear, *supra* note 8.

11. *See* Carpenter & Matthews, *supra* note 10, at 22–30 (discussing potential negative effects of tournaments, including sabotage); *see also* Subhasish M. Chowdhury & Oliver Gürtler, *Sabotage in Contests: A Survey*, 164 PUB. CHOICE 135 (2015) (focused specifically on sabotage).

12. *See* ANNE CAMPBELL, A MIND OF HER OWN: THE EVOLUTIONARY PSYCHOLOGY OF WOMEN (2002).

13. *See* Uri Gneezy, Muriel Niederle & Aldo Rustichini, *Performance in Competitive Environments: Gender Differences*, 118 Q.J. ECON. 1049 (2003).

14. *See* Muriel Niederle & Lise Vesterlund, *Do Women Shy Away from Competition? Do Men Compete Too Much?*, 122 Q.J. ECON. 1067 (2007).

these initial findings,[15] while also yielding new insight into the variation of the effects across features of the setting and competition.

This important work shows that, regardless of their effects on overall efficiency, competitive incentives are unfavorable to women as a group. The literature argues that the prevalence of competition in elite fields and promotion tournaments to attain top leadership job is a key factor contributing to gender inequality at the top of the earnings distribution and women's low rates of representation in top corporate jobs. This hypothesis is typically considered as an alternative in contrast to explanations based on women's caretaking obligations preventing them from investing the long hours at work needed for success in elite jobs.

II. Effects of Competition on Work Time

Rather than treating workplace competition and long work hours as two separate phenomena that each act independently to produce gender inequality, our recent work with Ragan Petrie instead examines the possibility that the two are related.[16] Although not highlighted explicitly in the prior literature, an implication of tournament theory is that contests provide greater incentives for workers to invest effort by both working harder while they are engaged in work and also by working for longer hours. This suggests a causal relationship between these two features of high-status and high-paying male-dominated jobs: the reliance on high-stakes competition among coworkers may itself be producing the requirement for long work hours. If this happens in practice, it offers another answer to the question of why some workers are willing and expected to devote such long hours to their jobs. This explanation corresponds to the popular notion of a "rat race" (because a race is competitive), but it has not been examined in the economics literature. Prominent theories for long work hours have either focused on the possibility that certain production functions are convex, meaning that workers doing those kinds of work have an hourly productivity rate that increases as they work more hours,[17] or on long hours serving as a signaling mechanism through

15. *See* Muriel Niederle, Gender, *in* 2 The HANDBOOK OF EXPERIMENTAL ECONOMICS 481 (John H. Kagel & Alvin E. Roth eds., 2015).

16. Amalia R. Miller, Ragan Petrie & Carmit Segal, *Effects of Workplace Competition on Work Time and Gender Inequality*, 77 INDUS. & LAB. RELS. REV. 251 (2024).

17. Claudia Goldin, *A Grand Gender Convergence: Its Last Chapter*, 104 AM.

which workers convey their dedication and work ethic to employers before promotions.[18]

Miller, Petrie, and Segal tested this theory in *Effects of Workplace Competition*, using a controlled field experiment[19] in which workers were randomly assigned to different incentive schemes, to eliminate the host of potential confounding factors that could drive the correlation observed between competitive workplace incentives and long work hours. In the experiment, workers operating under different payment schemes are compared to one another in their performance of the same job, using the same technology to accomplish the same work task, and working under otherwise identical conditions. This design draws on the prior experimental literature on competition but departs from the usual focus on work intensity. Instead, to consider work hours as an outcome, the study examines a tournament that allows workers to improve their performance through both the amount and intensity of their effort. To do this, it develops an experimental setup that uses an open-ended task, where the amount of work to be done is not limited (as in a race) and where work time is not limited to an equal and brief amount of time.

In the primary experiment, workers were offered a fixed payment for an advertised hour-long work session in which they would be testing and benchmarking a tablet-computer program. Upon arrival at their designated sessions, workers were assigned to gender-balanced rooms of four workers and provided with brief training explaining the work task. The task entailed watching the screen and clicking on boxes that appeared in random locations at set intervals, with an enforced wait period of ten seconds between appearances of boxes. The job was designed to require constant attention but offered limited stimulation, which combine to create costly effort. Indeed, workers found it to be very tedious and unpleasant.

ECON. REV. 1091, 1103–06 (2014).

18. *See* Renée M. Landers, James B. Rebitzer & Lowell J. Taylor, *Rat Race Redux: Adverse Selection in the Determination of Work Hours in Law Firms*, 86 AM. ECON. REV. 329 (1996); Renee M. Landers, James B. Rebitzer & Lowell J. Taylor, *Work Norms and Professional Labor Markets*, *in* GENDER AND FAMILY ISSUES IN THE WORKPLACE 166 (Francine D. Blau & Ronald G. Ehrenberg eds., 1997).

19. Miller et al., *supra* note 16. As described by John List: "Similar to laboratory experiments, field experiments use randomization to achieve identification. Different from laboratory experiments, however, field experiments occur in the *natural environment* of the agent being observed and cannot be reasonably distinguished from the tasks the agent has entered the marketplace to complete." John A. List, *Field Experiments: A Bridge Between Lab and Naturally Occurring Data* (Nat'l Bureau of Econ. Rsch., Working Paper No. 12992, 2007).

As part of the initial training, workers were informed that they only needed to stay and work for ten minutes and then complete a survey about the program to be paid the promised wage. The reasons for the shortened mandatory work time were described as being motivated by the employer's concern for their wellbeing, and workers were asked kindly to stay and work for as long as possible, for a maximum of forty minutes, to benefit the employer. At the end of the training, workers in randomly selected treatment rooms were also told they could potentially earn a bonus payment for their performance. Workers in the main treatment were offered a tournament-based bonus of $30, paid to highest-output worker in the room. Workers in the control room were not offered any financial incentives for performance.[20]

Several features of the experiment help enhance its reliability. First, the fact that workers were not alerted to the possibility of a bonus payment before they arrived and started training means that individuals are not self-selecting into tournaments. Second, the decision to recruit workers for a full-hour and limit them to all staying for less than that was made in order to prevent variation in outside obligations from affecting how long workers decided to stay at the job. Third, the simplicity of the task, and the fact that it was a one-time only job, had the combined effects of making effort the most important determinant of performance and of preventing signaling motivations from affecting effort. The simplicity of the task and the fact that ability and prior knowledge may not help improve performance emulates the real-world feature of competitions that workers (who are typically grouped with others who have similar skills and qualifications) are not able to win by relying on their greater skill alone, but must also invest substantial effort. The one-shot nature of the task, which differs from high-status jobs that demand high effort levels over months and years, is necessary to reliably measure the effects of competition in a controlled setting. Finally, the experiment draws on the behavioral economics insights about the potential impact of non-financial factors on work effort by trying to stimulate social impulses for reciprocity and directing them to work effort. This was done by hiring workers for a job that produced an output described as

20. The paper also tested two alternative bonus schemes: a low-stakes tournament with a $15 prize and a piece rate of 3 and 1/3 cents per point (set to match the average bonus rate paid in the $30 tournament) paid to all workers based on their individual performance alone.

meaningful to the employer, who displayed thoughtfulness and consideration for the workers.

The first key result of this experiment is that workers offered a chance to win a tournament prize spend significantly more time on the job than workers not offered that chance. The average work time in the $30 tournament is 83% longer than in the non-bonus group and the share of workers staying for the maximal time is eight-times larger. Work intensity also increased, raising total output by close to 90%. This near doubling of output was more than enough to offset the greater cost of the tournament scheme, which increased costs by 30%. As a result, the cost of extracting effort from workers is reduced by more than 30% with the introduction of a tournament prize. This was true despite the fact that workers in the flat payment control group responded to social incentives, and 58% stayed for significantly more than the minimum time. The finding supports the theoretical prediction from economic models that tournaments can be attractive to employers because of their cost-effectiveness at inducing workers to invest effort and provide labor.

While the first result is based on an analysis of all workers, and does not directly address gender, it has implications for the gendered effects of workplace competition. This is because, outside of our controlled setting, the gendered distribution of unpaid work in which women bear the bulk of caretaking and homemaking obligations, means that women are, on average, less able to work the long hours needed for success and promotion in competitive workplaces. Even female workers who are equally talented and productive per unit of work time, will struggle to produce the same total volume of output as their less encumbered male colleagues, and as a result, will be less likely to succeed. Knowing this in advance can even produce gender differences in entry into certain occupations and job types. Women who expect to reduce their work time while engaged in greater home production, such as childcare or eldercare, can anticipate that these obligations will interfere with progress in competitive fields, and therefore lower their expected returns from those fields. In this way, the finding that tournaments lead to longer work times for all workers reveals the fundamental connection between the two features of elite jobs. This shows that workplace competition contributes to gender inequality through the indirect mechanism of extended work time.

III. Gender Differences in Worker and Job Applicant Responses to Competition

The next set of results in *Effects of Workplace Competition* test for gender differences in the primary experiment. No differences in work time or production are detected between male and female workers in the control group with no bonus, which means that the experimental setting was effective at removing the role of gender differences in outside obligations. Male and female workers also both increased their effort and output under the tournament treatment. Despite these similarities, however, a significant gender difference emerges in the degree of responsiveness to the tournament incentive. Male workers increase their effort by significantly more than female workers, leading to statistically significant gender gaps in time stayed and total output. As a result, although each tournament group started with an even mix of male and female competitors, the winners of the tournament are 73% male.

This finding of a gender gap in work effort that emerges only in the high-stakes tournaments points to a direct mechanism through which workplace competition puts women at a disadvantage. This confirms prior findings of gender gaps favoring men in response to competition[21] in a new setting in which workers decide on both amount and intensity of effort. The finding also aligns with work that finds, when given an option, men are more likely to choose to enter a tournament over an alternative payment scheme. Workers in the *Effects of Workplace Competition* main experiment were not given a choice between a tournament and an alternative bonus scheme but the decision of how long to work is equivalent to a continuous stream of choices between staying in the competition and leaving for another activity. However, there is an important difference that emerges in the continuous setting where workers perform their tasks in the same room at the same time and are therefore able to observe and respond to choices made by other workers. This introduces the possibility that female workers leaving earlier causes male workers to stay even longer, and vice versa.

The paper therefore presents results from a secondary experiment that measures ex ante gender differences in tournament entry choices. This experiment uses the same work task and setup as the primary experiment, but it differs in first informing job applicants in advance about these details (including

21. *See* Gneezy et al., *supra* note 13.

the fact that only ten minutes of work will be required) and about a bonus payment. This enables the study to offer job applicants the possibility of selecting whether they would prefer to compete for a tournament prize based on performance relative to others in their work room, or if they would rather be paid a flat wage rate (of 20¢ per minute) for any overtime after the mandatory period. Applicants were asked to select between tournaments for a variety of prize levels ($12, $18, $24, $30, $36) and told that, if hired, they would be assigned at random into one of the prize levels, and their choice for that level would determine whether they entered into a tournament for a bonus or paid a fixed wage rate.

The main result of the second experiment is that the choices of job applicants (N = 739; 57% female) to enter into tournaments also differ by gender, but only for higher stakes tournaments. At low prize levels, men and women choose the tournament at statistically indistinguishable rates. However, as the prize level increases, men respond more strongly to the increased competitive incentive and are significantly more likely to select a tournament. This is a more direct confirmation to the prior literature on gender differences in tournament entry, extended to a setting with variable hours.[22] The finding that the extent of the gender gap varies with details of the setup is also consistent with prior work in that literature.[23] The fact that the largest differences are found for the highest prize levels may be particularly concerning for the gendered impact of competition on elite careers.

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22. *See* Niederle & Vesterlund, *supra* note 14.

23. *See* Uri Gneezy, Kenneth L. Leonard & John A. List, *Gender Differences in Competition: Evidence from a Matrilineal and a Patriarchal Society,* 77 ECONOMETRICA 1637 (2009) (showing the existence of gender gaps in patriarchal but not in matrilineal societies); Muriel Niederle, Carmit Segal & Lise Vesterlund, *How Costly is Diversity? Affirmative Action in Light of Gender Differences in Competitiveness*, 59 MGMT. SCI. 1 (2013) (showing that when rules are changed to favor women, gender gaps are reversed); Thomas Buser, Muriel Niederle & Hessel Oosterbeek, *Gender, Competitiveness, and Career Choices*, 129 Q. J. ECON. 1409 (2014) (showing that the choice to enter a tournament predicts subsequent high school academic track selection); Jeffrey A. Flory, Andreas Leibbrandt & John A. List, *Do Competitive Workplaces Deter Female Workers? A Large-Scale Natural Field Experiment on Job Entry Decisions*, 82 REV. ECON. STUDIES 122 (2014) (showing that the gender gaps depend on the specific work task and whether the job is performed in teams); Nagore Iriberri & Pedro Rey-Biel, *Stereotypes are Only a Threat when Beliefs are Reinforced: On the Sensitivity of Gender Differences in Performance Under Competition to Information Provision*, 135 J. ECON. BEHAV. & ORG. 99 (2017) (finding that gender gaps in performance vary across tasks and informational conditions).

IV. Discussion and Implications

Taken together, the results of the field experiments in *Effects of Workplace Competition* and the broader economics literature on gender and competition support the central theme of *Fair Shake*, that winner-take-all corporate tournaments put women at a disadvantage relative to men. The direct mechanism for the negative effect of workplace competition on gender equality is examined in *Effects of Workplace Competition* and in the prior literature on economics on gender and competition. It derives from the fact that men and women respond differently to competitive incentives.[24] Competition is more attractive to male workers and has a more positive impact on their job performance. This means that competitive workplace cultures will tend to draw in fewer women than men from the outset, they will retain fewer women over time, and they will tend to bestow fewer rewards on women. This gender difference in direct response to competition and men's greater apparent desire to participate and dominate in tournaments may contribute to the third aspect of the triple bind discussed in *Fair Shake*: that women are less likely to enter and persist in winner-take-all workplace cultures.

Despite this common conclusion, however, the focus of *Fair Shake* differs from the prior economics literature on gender and competition. Instead of considering cases where competition improves performance in a way that increases the production of useful goods and services, the book is most interested in situations where winning at work is not simply a matter of effort (working harder and longer) but also requires engaging in activities that are socially harmful, and possibly also unethical or illegal. This focus on the "dark side" of high-powered incentives is also found in the economics literature on competitive incentives, but that work has not typically focused on gender differences. The personnel economics literature has also focused on agency problems, where competitive incentives are a problem for firms because they distort effort away from non-incentivized activities[25] or towards efforts to

24. These differential responses themselves likely derive from the combined effects of gender differences in risk aversion (where men are more willing to accept gambles and women more willing to pay to avoid them), overconfidence (where men tend to overestimate their own relative ability ranking and future performance), as well as preferences, positive or negative, for engaging in competitions (and from winning or losing in them).

25. *See* Bengt Holmstrom & Paul Milgrom, *Multitask Principal-Agent Analyses: Incentive Contracts, Asset Ownership, and Job Design*, 7 J.L. ECON. & ORG. 24 (1991).

falsify performance metrics,[26] or sabotaging the productivity of colleagues at the same company.[27] While some of the examples in *Fair Shake* illustrate agency problems between firms and employees, the bulk of the examples depart from that framework. Instead, they describe scenarios in which the socially harmful behavior benefits top managers at the company (improving short-term profits or stock prices) and possibly even its shareholders at the expense of its customers, employees, or other stakeholders.

In that sense, the book broadens the argument, relative to *Effects of Workplace Competition*, by showing that workplace competition can have gendered effects if men and women differ in their willingness to engage in socially harmful behaviors to win at workplace tournaments. The first and second parts of the triple bind in the book suggest reasons for why that must happen, even if men and women have the same underlying preferences for conforming to ethical norms (because of differences in access to information about the expectations for unethical behavior or differences in expected punishments that men and women are likely to suffer if they decide to do it). The third part of the bind is based on the idea that preferences might also differ, with the same information and reward structure. While this is ultimately an empirical question, making it an interesting topic for future research, the research findings of gender differences in tastes for competition can offer further support for this dimension as well. If men value winning at work more than women do, they will be more willing to risk the same punishment or incur the same amount of internal psychic costs from violating their own ethical priorities because the rewards to do so will lead to more utility (for the same financial payout).[28]

Although, as noted above, the triple bind proposed in *Fair Shake* includes differential entry and persistence by gender into tournaments, which resembles the direct mechanism in *Effects of Workplace Competition*, it may be more similar in spirit to the second mechanism in that paper because of its indirect nature. The

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26. *See* Jeffrey P. Carpenter, Peter Hans Matthews & John Schirm, *Tournaments and Office Politics: Evidence from a Real Effort Experiment*, 100 AM. ECON. REV. 504 (2010); Richard B. Freeman & Alexander M. Gelber, *Prize Structure and Information in Tournaments: Experimental Evidence*, 2 AM. ECON. J.: APPL. ECON. 149 (2010).

27. *See* Chowdhury & Gürtler, *supra* note 11.

28. Men may also derive greater social benefits from higher earnings and economic status, and greater penalties for unemployment and low wages, for example, through rewards in marriage and dating markets, while ambitious career-oriented women may suffer penalties. *See* Leonardo Bursztyn, Thomas Fujiwara & Amanda Pallais, *'Acting Wife': Marriage Market Incentives and Labor Market Investments*, 107 AM. ECON. REV. 3288 (2017).

difference between the paper and the book is the nature of the intermediate mechanism. In *Fair Shake*, the gendered impacts run through an intermediate mechanism related to rule-breaking and misbehavior, while in *Effects of Workplace Competition*, it is from punishingly long work hours. The finding that tournaments increase the work time required of all workers is itself gender neutral, because it applies equally to male and female workers. Nevertheless, it has a highly gendered impact, because women bear that primary burden of unpaid caregiving and home production work, which limits the time they can devote to workplace competition.

A key implication of the presence of this second indirect mechanism is also shared by the triple bind mechanism proposed in the book: that addressing the harmful effects of workplace competition on women's careers is not going to be as simple as convincing more women to be competitive and risk-loving.[29] Although studies suggest this may be possible,[30] or that gender-based affirmative action can induce talented women to enter tournaments,[31] it is unlikely to be sufficient.

Furthermore, the presence of these indirect mechanisms also raises questions about the social desirability of changing women's preferences to compete like men. This is clearly concerning if competing like men means more cheating and deception, but it may also be concerning if it means sacrificing the possibility of devoting time to home production. This can drive talented women with family aspirations out of careers where they could contribute socially or suppress fertility intentions for others. Perhaps these effects could be mitigated if gender norms around caretaking and homemaking continue to evolve towards greater equality, with men sharing more evenly in the burdens and pleasures of home production, sometimes taking on the major role. Although recent

29. The risk component is important separately from tastes for competition because tournament schemes typically concentrate rewards among a small number of winners. This increases the variability in payouts and therefore income inequality across workers, while also raising the level of financial risk faced by individual participants in workplace tournaments. In the experiments in Miller et al., *supra* note 16, although the average payment to workers was slightly higher in the piece rate individual bonus ($32.56) than in the high-prize tournament ($32.50), the standard deviation in payments was much higher in the tournament (13.1) than in the piece rate (3.2).

30. *See* Sule Alan & Seda Ertac, *Mitigating the Gender Gap in the Willingness to Compete: Evidence from a Randomized Field Experiment*, 17 J. EUR. ECON. ASS'N 1147 (2019).

31. *See* Niederle et al., *How Costly is Diversity?*, *supra* note 23.

opinion polls suggest some progress on the social dimension,[32] we see little cause for optimism, as expressed by Goldin,[33] that technological change will itself eliminate the disproportionate rewards for long work hours in elite jobs. If workplace competition is a root cause of long hours, as implied by *Effects of Workplace Competition*, then long hours should be expected to persist as long as workplace competition does.

32. Recent opinion polls from the Pew Research Center suggest optimism on this dimension. The vast majority of fathers surveyed described being a parent as the among the most (61%) or as the most (25%) important aspect of their personal identity; and 77% of adults said that "children who are raised in a household with a mother and a father are better off when both parents focus equally on their job or career and on taking care of their children and home." Katherine Schaeffer, *Key Facts About Dads in the U.S.*, PEW RSCH. CTR. (June 15, 2023), https://www.pewresearch.org/short-reads/2023/06/15/key-facts-about-dads-in-the-us/ [https://perma.cc/8ELV-FN25].

33. *See* Goldin, supra *note* 17.