Empower Women by Index Membership: Evidence from a Unique Experiment from Japan

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Abstract

In 2017, Government Pension Investment Fund of Japan (GPIF), the world's biggest sovereign fund, adopted the MSCI Empowering Women Index (WIN), created by Morgan Stanley. To qualify for the prestigious index membership, firms must meet certain criteria for the advancement of women in their workforce, particularly in the management cadres. Inclusion in the WIN index is structured loosely as a tournament—only the top 50% in each industry category of the MSCI IMI Top 700 firms (roughly corresponding to the S&P 500 in the U.S.) are included. Focusing on firms around the inclusion threshold allows us to employ a difference-in-differences methodology to test for real social effects of the WIN index creation. Firms around the threshold competing for index inclusion show significant improvements in not only women's participation in the workforce but also in in the C-suite compared to firms farther away from the inclusion threshold. Interestingly, WIN Index firms also display an increase in paternity leaves suggesting a shift into a more women friendly corporate culture. WIN index firms also gain institutional ownership. Overall, the change in corporate social behaviour is not at the expense of lower operating profitability or valuation.

Keywords: Women in the workforce, diversity, gender, social performance, index, WIN
JEL Classification: G30, G23, M14

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"Creating an environment in which women find it comfortable to work […] is no longer a matter of choice for Japan. It is instead a matter of the greatest urgency."

--Abe Shinzō, speaking to the United Nations in September 2013

1. Introduction

Investing with a social good has gained tremendously over the last couple of decades. Matos (2020) cites changing societal preference as a strong driving force behind such a shift. In this paper, we ask a simple question: can specially crafted equity indices bring about real changes in corporate social behavior? Specifically, we focus on the MSCI Empowering Women Index (WIN) in Japan that uses "*women's participation and advancement in the workforce*" as its primary membership criterion (MSCI, 2019). The WIN index was launched in 2017 with the support of the Government Pension Investment Fund of Japan (GPIF) to encourage Japanese companies to improve women's participation in the workforce.[1] The index features a quasi-tournament-like structure in that it is hived off the top half of the MSCI Japan IMI Top 700 (IMI 700) Index, roughly corresponding to the S&P 500 in the US. Each firm in the IMI 700 is ranked on its MSCI Gender Diversity Score relative to its industry, and the top 50% are included in the WIN index. To shed light on whether indexation can bring about *real* changes to corporate social behavior, we examine whether the creation of the WIN index has resulted in significant improvements in women's participation in the workforce. In our empirical tests we compare gender diversity performance for the marginal firm that either gains inclusion in the index or just misses it vis-à-vis firms that rank sufficiently low that the inclusion in the index is a *fait accompli*.

[1] In 2016, among developed nations, Japan had one of the highest workforce gender gaps of 20.3%. In comparison, this was almost double the workforce gender gap in the United States (12.6%) and triple the average gap in Scandinavian countries (7.2%).

Thus, this difference-in-differences methodology affords us a weak identification strategy in establishing causality.

Why would belonging to the WIN index lead to changes in firm behavior and practices, or even be desirable? We posit two main channels through which this can happen.

First, changing shareholder preferences regarding ESG commitments may compel firms to improve the share of women in the workforce. To wit, if the marginal shareholder cares more about gender diversity than they did before, they will place a higher value on firms with a greater gender diversity score. In response, firms might oblige, as in the catering models of Baker, Greenwood, and Wurgler (2009).[2] But this raises the question of why firms would wait for the creation of the WIN index before they invest in improvements in women's participation in the workforce. Couldn't a firm have done this independent of the WIN Index? We posit that status quo habits are difficult to change, and often an external *nudge* may prove more effective in expediting change than slower moving secular trends might achieve on their own. The crux of the nudge argument is familiar to readers of the literature[3]—for instance, Bhargava and Loewenstein (2015) point to psychological biases such as "*motivated disbelief, the ostrich effect, confirmation bias, present-bias, adaptation, and intangibility*" (pp. 399) as roadblocks to quick adaptations towards optimal choices. Our results are consistent with such a conclusion.

[2] Dyck, Lins, Roth, and Wagner (2019) show that institutional investors drive corporate sustainability performance of firms, and especially, foreign investors domiciled in countries with high social norms towards sustainability. This channel is likely not the main driving force of real sustainability change in Japan as institutional investor ownership in Japan is low with total and foreign institutional ownership of 13.5% and 8.4%, respectively (see Table 1 in Dyck et al., 2019).

[3] See Thaler and Sunstein (2003), Camerer, Issacharoff, Loewenstein, O'Donoghue, and Rabin (2003), and especially the eponymous book by Thaler and Sunstein (2008), for an insight into the literature on nudge and directed choices. The essence of this literature is that seemingly innocuous but purposefully designed nudges may induce far reaching and consequential choice switching among a vast class of agents. Put simply, nudges lead agents towards welfare enhancing choices without restricting their options. Nudges are the ultimate positive NPV investments.

Second, belonging to the WIN index may increase the firm's visibility to investors, especially to those who share the goals of the index—for example, large investors such as the GPIF in Japan, the world's largest pension fund, with ¥191 trillion (~$1.75 trillion) in assets under management in 2021,[4] or large foreign institutional investors pledging to consider firms' sustainability performance in their investment decisions. The GPIF is on record in 2017 to allocate ¥1 trillion towards investing in indices based on three ESG factors, one of which is the WIN index. The increased investor attention for firms with greater social performance is expected to lead to greater institutional ownership and a lower cost of capital (see, e.g., Pastor, Stambaugh, and Taylor, 2021).[5]

There is also the possibility that managers experience personal disutility from being excluded from the WIN Index. If the index is structured as a tournament, and exclusion from the index is associated with 'shame', firms will compete to be included. For instance, Chattopadhyay, Shaffer and Wang (2020) show that firms competed to be included in the JPX-Nikkei400 Index because the inclusion bestowed the status of Japan's *Best Run* companies.

Our analysis focuses on the real effects of the creation of the WIN Index—that is, whether the WIN Index brought about real changes in Japanese firms' social behaviour, specifically in their gender performance in the workplace. Because there may be secular trends regarding the advancement and empowerment of women across all firms in Japan, we employ a regression discontinuity specification to provide directional evidence. To that end, we compare firms around the inclusion threshold to firms farther away from the threshold with little chance to be included

[4] The GPIF introduced a new code in 2020 that specifically includes a focus on diversity and inclusion and requires firms to disclose gender statistics in line with the 2015 Act on Promotion of Women's Participation and Advancement in the Workplace.

[5] In addition, incremental buying pressure by investors might elevate prices for index members under the assumption of downward sloping demand curves. See, among others, Shleifer (1987) and Kaul, Mehrotra, and Morck (2000) for evidence supporting downward sloping demand curves for stocks.

in the WIN index. Given the tournament-like structure of the WIN Index, the identification assumption is that firms around the threshold (those that barely made it or missed it) have an incentive to improve their gender diversity performance to be included in the WIN Index at the next rebalancing date (whereas the firms farther away from the threshold have little chance of being included).

Because MSCI only discloses inclusion in the WIN index as a binary variable, we obtain the workforce gender diversity data from MSCI and re-create the gender diversity scores used by MSCI for each of the IMI 700 firms and assign ordinal ranks based on these scores for each firm in a given industry (MSCI GICS sector) and year.[6] We confirm that this synthetic ranking approach accurately predicts the actual WIN index members with a correlation of 94%. Using these synthetic ranks, we identify 'treated' firms as those that rank in the vicinity of the inclusion threshold (ranked between the 40th to 60th percentile; the threshold is the median), and 'control' firms as those with a much lower probability of gaining inclusion (ranked between the 40th to 10th percentile). The difference-in-differences analysis compares the differences of various workforce diversity measures in these two groups between the years before the WIN's inauguration in July 2017 and the years after 2017 (we exclude the inauguration year). The sample period is 2013 to 2020.

We measure workforce performance with data obtained from the Toyo Keizai CSR Workforce database. Toyo Keizai Shimposha, founded in 1895, is among the top two prominent publishers in Japan along with Nikkei that has published economic and business news for more than a century. Each year, Toyo Keizai launches a survey inviting companies listed on Japanese stock exchanges to participate. Based on the survey data as well as publicly available disclosures, Toyo Keizai compiles a panel of Japanese firms' workforce characteristics. The database contains

[6] See MSCI (2019a) for a description of the detailed index methodology and MSCI (2019b) for the workforce gender diversity data.

rich workforce data with more than 200 line items in aggregate and many line items broken down by gender—for example, the number of employees, turnover of employees, number of employees by position in the workforce, and maternity/paternity leaves, to name a few. These data allow us to construct various workforce diversity outcome measures. We augment the workforce data with financial and accounting data from Worldscope and Datastream and institutional ownership from Bloomberg.

We begin our analysis by examining whether the WIN index brought about real changes to firms' workforce diversity. Using our difference-in-differences design, controlling for firm characteristics and firm and time fixed effects, we find that treated firms (compared to control firms) significantly improved the fraction of women in the workforce following the launch of the WIN index. In terms of economic significance, treated firms improved their fraction of women in the workforce by about 5% per year. A visual parallel trends analysis and regressions in event time confirm that the change happened in the years after the WIN index was created. Thus, the increase is not due to long-run secular trends either across all firms, or within the treated firm itself, lending credit to a directional interpretation of our results—that is—the WIN index incentivised firms to significantly improve their overall gender diversity in the workforce. These effects are novel to the literature, documenting the social power of index creations.

A greater fraction of women in the workforce can be obtained by hiring more women or by terminating more male employees (while keeping the number of women employees constant). If the latter was true, observing a greater fraction of women in the workforce would indicate some 'greenwashing' behaviour of firms and would not be an indication of an improvement of women's participation in the workforce. To explore this further, we repeat our baseline tests focusing on the changes in the number of women and men in the workforce. Our results show that treated firms

significantly increased the number of women in the workforce in the post period (compared to control firms). In contrast, the change in male employees as well as the turnover in male employees are insignificantly different from zero. Thus, the increase in women in the workforce is particularly explained by firms hiring more women in the post period.

In additional tests we find that the increase in women in the workforce is particularly concentrated in supervisory positions (entry positions obtained by employees with a fresh undergraduate degree) as well at senior levels, including general managers, executive officers, and directors. Thus, firms do not just hire more women at the lowest levels, which is promising for firms' future improvements in the workforce as Matsa and Miller (2001) document a trickle-down effect where firms with female directors are more likely to recruit female executives. We also document some positive social externalities and a possible shift in the workplace culture. For instance, we find that male employees in treated firms are more likely to take paternity leaves in the post period. This allows women to stay in the workforce. It is also a sign of a shift in culture in that male employees are not afraid of losing their jobs because they take paternity leaves (it is now more socially accepted) and also participate in a more 'equal' and shared family responsibility.

So far, our results show the social power of index creation—firms significantly improved their workplace gender diversity performance after the launch of the WIN index. Next, we examine changes in investor interest in firms included in the WIN index. In particular, we shed light on whether WIN index firms' institutional ownership and performance changed. To that end, we compare differences between WIN and non-WIN firms before and after WIN inclusion. Our main result is that institutional ownership growth is stronger for the included group vis-à-vis the excluded group of firms. However, despite the increase in institutional ownership, we are unable

to detect an increase in valuation (measured with Tobin's *q* and annual stock returns) associated with the increase in institutional ownership for the included firms relative to excluded firms. While we find no positive valuation effects, our results also do not document that being included in the WIN investing in greater workforce gender diversity hurts shareholders, an often-debated fact when it comes to greater investments in firms' social performance. Finally, we find no evidence that shame of being excluded from the WIN index played a significant role in the treated firm's gender score improvement.

Our paper makes several contributions. Our findings inform investors, regulators, and academics interested in mechanisms capable of bringing about real change in corporate social behavior. We identify one specific channel, the creation of a tournament-style equity index linked to a firm's gender diversity performance, through which firms significantly improved their workforce diversity contributing to a more gender equal corporate culture.

We add to the literature on gender diversity in corporations. Many studies focus on the effects of women in leadership positions on corporate cultures with greater gender equality (Tate and Yang, 2015; Kunze and Miller, 2017), more conservative investment and financing policies (Huang and Kisgen, 2013; Faccio, Marchica, and Mura, 2016), fewer incidents of lawsuits (Adhikari, Agrawal, and Malm, 2019), and having a less sexist corporate culture, which is associated with higher firm valuations (Lins, Roth, Servaes, and Tamayo, 2022). These studies focus mostly on females in leadership positions and on the *outcomes* of having more women in such positions, whereas we highlight a potential *channel* through which firms *improve* gender diversity in the workforce, including management and executive positions, potentially leading to the above documented outcomes.

We also contribute to the literature on board gender diversity and board gender quotas as a *regulatory* force to improve gender equality in the board room (Adams and Ferreira, 2009; Adams and Funk, 2012; Ahern and Dittmar, 2012; Kim and Starks, 2016; Bertrand, Black, Jensen, and Lleras-Muney, 2019). Our results highlight a capital markets channel through which firms are motivated (e.g., by lowering the cost of capital or by increasing institutional ownership) to improve gender diversity in the workforce above and beyond the board of directors.

Our findings also advance the literature on the drivers behind the improvement of firms' sustainability. The literature has documented the roles of institutional investors (Dyck et al., 2019; Krueger, Sautner, and Starks, 2020), private engagements by investors (Dimson, Karakaş, and Li, 2015), governance mechanisms to renew the thinking of the board (Dyck, Lins, Roth, Towner, and Wagner, 2022), directors with foreign sustainability experiences (Iliev and Roth, 2022), legal environment (Liang and Renneboog, 2017; Ioannou and Serafeim. 2012), litigation (Freund, Nguyen, and Pham, 2021), propagation through the supply chain (Dai, Liang, and Ng, 2021; Schiller, 2018), and the influence of management (Cronqvist and Yu, 2017). Most of these studies focus on *aggregate* sustainability performance, and it is unclear whether specific material sustainability improvements are obtained. We focus on a narrow, well-defined outcome—greater female participation in the workforce—and show that through a purposefully crafted equity index that ties inclusion to the desired outcome, firms change their corporate social behaviour and improve their gender diversity.

Lastly, we also extend the literature on index inclusion, which finds that inclusion in large equity indices, such as the S&P 500 or Russell 1000, increases institutional ownership, improves monitoring, and lowers the cost of capital through capital inflows by large index funds who need to purchase newly added securities. We specifically add to the debate in Bebchuk and Hirst (2019),

who argue that index funds are insufficient drivers of stewardship to improve governance. Our findings show that indices, specifically created to focus on one narrowly defined goal, can have a positive impact on firms' social behaviour and performance—in our context, improving women's advancement in the workforce.

2. Institutional Details, the WIN Index, and Empirical Strategy

2.1. Institutional Details in Japan

Since the mid-2010s, the Government Pension Investment Fund of Japan (GPIF), the world's largest pension fund with ¥191 trillion (~$1.75 trillion) in assets under management in 2021, has increased its focus on investor stewardship and ESG substantially. First, the GPIF signed the UN Principles for Responsible Investment (PRI) in September 2015.[7] Given the GPIF's large presence in the domestic market, Kawaguchi (2015) discusses a possible spillover effect that promotes ESG investment by other Japanese institutional investors. Second, the GPIF revised its Investment Principles in October 2017, with the new principle explicitly stating that its stewardship responsibilities include "the consideration of ESG (Environmental, Social, and Governance) factors" (GPIF, 2017).

To further enhance the GPIF's stewardship role, the pension fund was at the forefront of creating various ESG indices. In September 2016, the GPIF requested proposals for ESG indices of Japanese public equities with the promise of significant investments in chosen indices. Fourteen investment companies responded and proposed 27 indices, thereof the GPIF selected three indices to launch in July 2017. They are the FTSE Blossom Japan Index, MSCI Japan ESG Select Leaders

[7] https://www.gpif.go.jp/en/investment/pdf/signatory_UN_PRI_en.pdf.

Index, and MSCI Japan Empowering Women Index (WIN).[8] The WIN index is the only 'thematic' index, the other two are 'integrated' indices based on broad ESG metrics.[9]

The GPIF's identity as a long-term, large, and diversified owner of domestic companies in Japan means that it needs to be attentive to curbing economy-wide negative externalities. The pension fund states that by creating ESG indices it aims to promote Japanese firms' ESG performance: "We are expecting that the use of those selected ESG indices will provide an incentive for Japanese companies to enhance responses to ESG issues to lead to the improvement of their corporate value in the long term" (GPIF, 2017, p. 40). To this end, the index managers are required to "publicly disclose how they conduct ESG evaluation and how they develop indices, and to proactively engage with companies" (GPIF, 2017, p. 41). In addition to the GPIF's efforts to enhance their stewardship role in Japanese companies, the Japanese government under President Abe pushed for empowering women to revitalize the Japanese economy.[10]

2.2. Gender Gap in Labor Contracts in Japan

Despite ranking close to the top decile for human development, Japan ranks in the bottom quartile of all nations in gender equality.[11] The reasons behind Japan's low scores on gender equality are complex. For instance, the post-war emphasis by corporate Japan on employment protection and seniority-based compensation meant that employees who would decide to leave the workforce, even temporarily, were *de facto* penalized in their careers (Crawford, 2021).

[8] The assets under management as of March 31, 2018 in the FTSE Blossom Japan Index, MSCI Japan ESG Select Leaders Index, and MSCI Japan Empowering Women Index (WIN)were ¥527 billion, ¥623 billion, and ¥388 billion, respectively (GPIF, 2017).

[9] In September 2018, the GPIF launched two additional indices focusing on carbon emissions, one for domestic equities and the other for foreign equities.

[10] "Shinzo Abe: Unleashing the Power of '*Womenomics'*," Wall Street Journal, September 25, 2013.

[11] In 2020, Japan ranked 121st among 153 countries on the Global Gender Gap Index compiled by the World Economic Forum. This was worse than its ranking in 2017 when it ranked 114 out 144 countries included in the survey. Japan's rank in the Human Development Index compiled by UNDP was 20th of the 183 countries in the survey in 2020.

Employees who chose to leave the regular work track faced the risk of losing their position in the lifetime employment track and often returned to non-regular work with lower pay and less protection from job termination. While this inefficiency could be overlooked in the post-war economic boom, the shifting demographics in the 1990s meant that the social cost of Japan's gender inequality started to rise. Crawford (2021) notes that the term *Womenomics* made its debut in 1999,[12] with a clear mandate of closing the economic gender gap and boosting productivity. Politicians were quick to note the economic benefit of workplace gender equality, with ex-Prime Minister Shinzo Abe making Womenomics a key part of his pro-growth agenda. *Womenomics* was introduced in 1999; since then, the resulting gains in workplace gender equality have been unimpressive (Crawford, 2021). Part of the problem is that there is little teeth in the recommendations to improve workplace equality. Even when the government announced the availability of small grants to encourage hiring and promotion of women, there were few takers.

We believe that the WIN index offers a unique opportunity to realize the recommendations by offering the chance of a reward for the included firms, and equally importantly, an opportunity loss for the firms that fail to make the index. The quasi-tournament like structure of the index where only half of the firms in specific industry groups can gain membership in the WIN index precludes a box-checking response where everyone can claim victory by suitably defining their firm's gender equality scores. The emphasis on relative performance means that firms near the median find it incentive compatible to expend effort to improve their gender scores, assuming of course that WIN index membership provides tangible benefits to the firm and its key stakeholders such as top executives and shareholders.

[12] Kathy Matsui at Goldman Sachs Japan is credited with coining the term.

To the extent taking time off from work for child raising presented a determinant to women's career choices, we want to examine the impact of the WIN index on slow moving cultural shifts. In particular, we want to examine if the uptake of maternity and parental leaves change in the wake of the WIN index creation. Both represent hurdles in the path of women's career advancement as noted above, and a higher uptake of either policy would support the role of WIN index in nudging corporate culture in the direction of gender equality.

Finally, our interest is in determining if the creation of the WIN index led to a shift in the nature of work for women. While women's participation in the labor force in Japan has indeed advanced remarkably over the last two decades to the extent that today it surpasses that in the U.S., critics have noted that women represent a majority of irregular work (Crawford, 2021). Regular jobs that provide employment stability and salary bonuses are disproportionately held by men. What is troubling is that regular employment represent a lower fraction of jobs held by women today than it did two decades ago (Crawford, 2021). In many ways, women have provided a cushion to corporate Japan's ability to withstand economic shocks over this period.

The government of Japan's own report on Abenomics[13] admits that less than 10% of managerial positions are filled by women—this fraction is considerably lower when the managerial positions are restricted to the C-suite.[14] Since the WIN index explicitly takes into account the representation of women in managerial positions, we are in a position to provide a report card on progress made in this dimension by treatment and control firms. We also extend the analysis to board representation.

[13] See *Abenomics*, Section 2, published by the government of Japan: https://www.japan.go.jp/abenomics/index.html.
[14] According to the 2017 *Annual Report of the Ministry of Health, Labour and Welfare*, women hold just 6.6% of senior management positions (department director or higher); 9.3% of middle management (section heads); and 18.6% of lower management (e.g., task unit supervisor) positions. Crawford (2021) writes that the issue of job status and pay gap for women in Japan is "… *is deeply structural and highly resistant to ordinary incremental inducements and exhortations (pp. 7)*."

Table 1 shows that in 2017, women held less than one out of 15 senior management positions in corporate Japan. The numbers improve at the middle and lower management cadres, but still remain at less than one out 10 and one out of five positions, respectively. Part of the problem is structural and goes back to post-war economic boom in Japan where lifetime employment for regular workers was encouraged by firms. A downside of this practice was that employees who chose to leave the regular work track often lost their position in the lifetime employment track and often returned to non-regular work with lower pay and less protection from job termination.

We believe that the creation of a purposefully designed index with gender empowerment scores as the basis for qualification has the potential to bring out faster change than government edicts and exhortations that in practice lack the bite of enforcement penalties, relying instead on the softer principle of comply or explain. The quasi-tournament like structure of the WIN index by design rules out an expansion of membership to all and sundry and supports the old adage that efforts to make everyone special ensures no one is.

2.3. The WIN Index and Empirical Strategy

To examine whether indexation leads to improvements in firms' social performance, we take advantage of the MSCI Empowering Women Index (WIN). As discussed above, the WIN index was among the three indices launched in July 2017 with the support of the GPIF. Each May and November, all firms included in the MSCI Japan Investable Market Index (IMI) Top 700 Index are ranked within their industry sector (there are 11 MSCI GICS sector groups) based on their MSCI Gender Diversity Score. Companies with scores of zero or missing scores (unrated companies), REITs, and companies with ESG controversies are excluded from the universe of

eligible companies. Using the eligible universe, companies with a gender diversity score equal or greater than the median score of all companies in the same industry sector are included in the WIN index.

The MSCI Gender Diversity Score was first introduced by MSCI in July 2017 (MSCI, 2019b). The score aims to assess a company's overall practices to improve gender diversity and performance and ranges between zero and ten. It is calculated as the weighted average of the gender diversity performance score (with a weight of 75%) and the gender diversity practices score (weight of 25%). The performance score comprises performance metrics of a firm's attraction (% women employees among new hires and % women employees in total workforce), retention (% difference in average employment years for female and male employees), and promotion (% women in senior management and % women directors on the board) of women in the workforce. The performance score is the average of the five measures (each ranging from zero to ten). To account for firms' selective data disclosure, MSCI applies a disclosure discount—for example, if a firm only discloses three out of the five performance metrics, a 10% discount is applied. The gender diversity performance Score ranges from zero to ten, with a greater score indicating better performance. To measure a firm's effort and intent to improve employment practices, MSCI calculates the MSCI Gender Diversity Practices Score that assesses the existence of workforce diversity policies, management oversight responsibility for diversity, and targets for improvement in women's representation and programs that make it easier for women work (e.g., flexible working arrangements, subsidized childcare, and parental leave). The score is calculated as the average of two policy variables (each ranging from zero to ten)—workforce diversity policy and management oversight and programs to increase workforce diversity. The gender diversity practices score ranges from zero to ten with higher values indicating better diversity practices.

In our main empirical tests to examine whether indexation based on gender diversity can bring about real changes to corporate social behaviour for the marginal firm, we compare changes in firms' gender diversity for firms that gain inclusion in the index or just misses it vis-à-vis firms that rank sufficiently low that the inclusion in the index is a *fait accompli*.

Given the tournament-like structure of the WIN index, the identification assumption is that firms around the inclusion threshold have an incentive to improve their gender diversity performance to remain or to move into the WIN index at the next rebalancing date, whereas the firms farther away from the threshold have little chance of being included. Because MSCI only discloses inclusion in the WIN index as a binary variable, we obtain the workforce gender diversity data from MSCI and re-create the gender diversity scores used by MSCI for each of the IMI 700 firms and assign ordinal ranks based on these scores for each firm in a given industry (MSCI GICS sector) and year.[15] Since the outcome variables we use are annual measures, we rank firms annually at the end of May. We then identify 'treated' firms as those that rank in the vicinity of the WIN index inclusion threshold (ranked between the 40th to 60th percentile; the threshold is the median), and 'control' firms as those with a much lower likelihood of gaining inclusion (ranked between the 40th to 10th percentile). Our empirical approach relies on a difference-in-differences specification that compares the differences of various workforce diversity measures in these two groups between the years before the inauguration of the WIN index in July 2017 and the years after 2017.

3. Sample and Summary Statistics

3.1. Toyo Keizai CSR Workforce Database

[15] See MSCI (2019a) for a description of the detailed index methodology and MSCI (2019b) for the workforce gender diversity data.

We obtain detailed workforce data for Japanese companies from the Toyo Keizai CSR Workforce database for the years 2013 to 2020 surrounding the launch of the WIN index. The database covers a wide range of workforce-related line items. Toyo Keizai compiles these data based on annual CSR surveys of listed companies and some large private Japanese companies since 2005.[16] Each June/July, Toyo Keizai sends out a questionnaire to the surveyed companies requiring their response by August. To facilitate the survey process, Toyo Keizai has created a specific website that explains how to answer the survey questions.[17] In addition, prior to sending out the questionnaire, usually in May, Toyo Keizai offers a workshop for all companies to provide guidelines in how to fill out the questionnaire. The response rate of all companies is quite high—for example, in 2020, 1,349 out of 3,819 companies filled out the questionnaire for an overall response rate of 35% and increases with firm size. For non-responding firms that have responded in the prior two years and/or are included in the GPIF's ESG indices, Toyo Keizai fills the data from in-house data collections and public sources. Overall, the Toyo Keizai CSR data are widely used in Japan and highly regarded, mostly because of the high survey response rate and Toyo Keizai's century old reputation as a prominent publisher.

We use these data to create annual measures of women's participation in the workforce along the same line as MSCI Workforce Gender scores. The overall employment is measured by two variables: (1) the *Fraction of Women in the Workforce* which is calculated as the number of women employees divided by the number of male employees and (2) the *Ratio of Women to Men*, which is defined as the number of women employees divided by the number of male employees. We measure turnover of women and male employees with two variables: (1) *Change in Women*

[16] See Toyo Keizai's survey manual at http://www.toyokeizai.net/csr/pdf/ht_u/CSR_howtouse2018_1koyo.pdf, accessed on July 31, 2022.
[17] http://www.toyokeizai.net/csr/research/No17-2021.html, accessed on 31 July 2022 (in Japanese).

(Male) Employees, which is measured by the difference in the number of female (male) employees between year *t* and *t*-1 divided by the number of female (male) employees in year *t*-1), and (2) *Turnover in Women (Male) Employees*, which is defined as the number of female (male) employees leaving the company for reasons other than mandatory retirement over the year *t*-1 to year *t* period divided by the number of female (male) employees in year *t*-1.

We calculate four variables indicating various roles of female employees in the workforce ranking from being general workers (*ippan shoku*) such as doing secretarial and administrative supporting tasks, holding a general management position (*kanri shoku*), and serving in the top management teams, namely the executive operation officer team (*shikko yakuin*) and the board (*torishima yaku*). [18] These variables are: (1) *Secretary*, which is defined as the number of female workers in non-management positions divided by the number of all workers; (2) *General Management*, which is defined as the number of females with a general management position divided by the number of all management positions (*kanri shoku*); (3) *Executive Officers*, which is defined as the number of female executive officers divided by the number of all executives (*shikko yakuin*); and (4) *Board,* which is defined as the number of female board of directors divided by the number of all directors (*torishimari yaku*).

Finally, we use the Toyo Keizai data to measure firms' maternity and paternity leaves. *Women Taking Maternity Leaves* (number of female employees who take maternity leaves in year *t* divided by the number of all employees in year *t*-1) and *Men Taking Paternity Leaves* (number of men employees taking paternity leaves in year *t* divided by the number of all employees in year *t*-1). We create two additional versions for each of the two variables dividing women (men) taking

[18]It is not uncommon that some members in the executive officer team at the same time also served as a meber of the board of director. For example, Akio Toyota, the CEO of Toyota Motors, served both in the officer team and the board as of 2022.

maternity (paternity) leaves by employees that are less than 30 years old and alternatively, less than 40 years old to account for the fact that older employees are less likely to take maternity/paternity leaves.

Panel A of Table 1 shows summary statistics for the employment characteristics of all sample firms. Women account for 18% (14%) of the average (median) firm's total workforce over the sample period of 2013-2020. Women are relatively more represented at non-management positions, where they account for 23.2% of the workforce. This fraction drops to 4.4% for management positions, and to 0.9% for executive positions. Four percent of board members are women. The median firm in our sample has no women in executive or board positions.

The number of female and male employees show a small increase of 0.6% and 0.5% over this period. Average employee turnover for women is lower (1.0%) compared to men (2.7%). Women taking maternity leave represent 1.3% of the workforce—this fraction is higher (5.1%) for women under 30. Men on parental leave represent 0.1% of the workforce. Men under 30 are six times more likely to avail of parental leave.

3.2. Firm Characteristics

In our analyses, we control for time-variant firm characteristics that may affect firms' workforce performance directly. We obtain financial, accounting, and stock market data from the Thomson Reuters Worldscope. In all our tests, we control for firm size (measured as the log of total assets in ¥ billion), cash holdings (cash and cash equivalents divided by total assets), tangibility (PP&E divided by total assets), financial leverage (total debt divided by total assets), ROA (net income divided by total assets), and Tobin's *q* (measured as the market value of equity plus the book value of debt divided by total assets).

Table 1, Panel B reports summary statistics for the full sample. We study large Japanese firms included in the IMI 700 index (the parent index from which the WIN index draws its constituents) with an average (median) total assets of ¥2,871 billion (¥625 billion), corresponding to about $26 ($5.7) billion using the 2021 end-of-year exchange rate. The firms we study have average cash holdings of 16.3%, tangibility of 28.4%, and a financial leverage of 20.2%. The mean ROA is 4.2%. Average (median) institutional ownership is 48% (47.5%), which is lower than the average institutional ownership of more than 80% in S&P 500 firms.

4. Results

4.1. Did the WIN Index Increase Women's Participation in the Workforce?

We discuss our baseline results in Table 3. The main dependent variable in these regressions is the fraction of women in the firm's workforce. We also re-estimate the regressions with the ratio of women to men employees as a dependent variable. The first four columns represent coefficient estimates from a panel regression. We also provide event year regressions in columns 5 and 6 where year dummies are measured relative to the year in which the treatment firm is added to the WIN Index. In all regressions, we include firm and time (year) fixed effects and the standard errors are double clustered by firm and time.

All firms are ranked based on their MSCI Gender Diversity Score within their respective industry codes (see Table 2). Recall that only 50% of firms from each industry grouping are included in the WIN index. We define treated firms as those that rank between the 40th and 60th GDS percentiles. Control firms are defined as those ranked in the 10th to the 40th gender diversity score percentiles. Control firms have little chance of being included in the WIN index—treated

firms, by contrast, have a higher likelihood of being included in the WIN index, depending on improvements in their gender diversity score.

We begin with plotting the fraction of women in the workplace from 2015 to 2019 for treatment and control group firms in Panel A of Figure 1. Prior to 2017, both groups show a similar value—a mean fraction of women employees of 0.18 for both groups. In 2015 too, the fraction of women employees is similar, albeit lower, for both groups indicating a rising trend for women participation in the workplace. Following the inception of the WIN index, we see a remarkable divergent trend for the treatment and control groups. While the fraction of women employees remains at the pre-WIN level for the control group, it increases secularly over the two years following the WIN index creation, and exceeds 0.20 for the treatment group by 2019. The difference between the treatment and control groups, while statistically indistinguishable in the pre-WIN period, shows a remarkable divergence in the post-WIN period. A similar pattern is observed when we plot the ratio of women to men employees from 2015 to 2018 in Panel B. Overall, Figure 1 provides a strong basis for the parallel trends condition for the difference-in-difference tests that follow in the subsequent tables regarding the effect of the WIN index creation on the treatment vs. control sample of firms.

In columns 1 through 4, the main variable of interest is the treated firm interacted with the post-WIN index inclusion period (years 2018 and 2019). In column 1, we find that the interacted coefficient is positive and significant at the 5% level. We interpret this result as showing that treated firms are significantly more likely to increase the fraction of women workers relative to control firms in the two years following the inception of the WIN index in 2017. We exclude 2017 from the analysis. In the next column, we re-estimate the regression with a slew of additional control variables such as firm size (total assets), liquidity position (cash), asset tangibility (property

plant and equipment scaled by assets), leverage, ROA, and Tobin's *q*. The main variable of interest, Treated × Post, remains positive and significant. In columns 3 and 4, we repeat the regressions using the ratio of women to men in the workforce as the dependent variable. Treated × Post remains positive and significant in both models.

In columns 5 and 6, we show regressions in event time to examine the time dynamics of the effects. Specifically, we include five additional time indicator variables denoting calendar years before and after the creation of the WIN index in 2017 and interact these time indicators with the treated variable. We find that the time indicators interactions are significant only in the post-WIN inception years, and not before, confirming the findings in the first four columns.

4.2. Decomposing the Increase in Women's Participation in the Workforce

We next turn to examining whether the increase in the fraction of women in the workforce is associated with fewer male employees, or due to hiring more women, or due to higher turnover among men, or some combination of all three. In Table 4, we replace the dependent variable in Table 3 with four separate dependent variables. These are the change in the number of female employees, the change in the number of male employees, the turnover in female employees, and the turnover in male employees. The variable of interest is again Treated × Post in each regression. In other words, we are interested in examining whether treated firms experience a change in any of the four dependent variables noted above.

Our results show that only the change in female employees has a significantly positive coefficient, confirming that treated firms experienced an increase in the number of female employees at the firm. The remaining three dependent variables are also positive, but not statistically significant, indicating that there is no significant change in the number of male

employees or in the turnover of male or female employees. These results confirm that the increase in women employees does not come at the expense of laying off male employees.

4.3. Did Women Gain Job Status Following the Creation of the WIN Index?

We next turn to examining the breakdown of the increase in female employees documented above. We break down the workforce into various positions: line workers, supervisory roles, senior management (executives), and board of directors. Again, the question we ask is whether treated firms experience an increase in the fraction of women in these specific positions. Table 5 presents the results.

Each of the four dependent variables corresponds to a specific workplace position. We begin with workers without supervisory or senior management ranks in column 1. Treated firms do not appear to experience a significant change in the number of non-management female workers. When we look at managerial positions and top executives in columns 2 and 3, respectively, we get a different picture. The estimated coefficient on Treated × Post is positive and significant in both regressions, indicating that treated firms increase the number of women in these positions more than the control firms do. When we examine board positions, the result is marginally significant at the 10% level.

Overall, Table 5 shows that the increase in the number of women in the workforce is driven by supervisory and higher ranked workers. Overall, the results in this table show that the WIN index effects are not driven by augmenting women participation in non-regular workforce; rather, the treatment firms appear to make meaningful changes to the representation of women in regular, permanent jobs at senior levels. Treatment firms are not seen to make temporary adjustments to game WIN index membership.

4.4. Did the WIN Index Influence Attitudes Towards Parental Leave?

We next turn to the question of workplace disruptions due to childbirth and examine whether treated firms experience a change in the take-up rate for maternity or paternity leaves. Our priors are that treated firms are morel likely to encourage such parental leaves. We find mixed results and present them in Table 6. The first three columns use maternity leave as the dependent variable. The variable of interest, Treated × Post, is not significant in any of the three regressions. In contrast, in columns 4 through 6, we find that male employees are significantly more likely to go on parental leave in treated firms in the post-WIN period compared to control firms. We submit that the higher uptake of parental leaves among male employees in treated firms marks a shift in corporate culture that is an outcome of the desire by treated firms to be included in the WIN index.

4.5. Change in Institutional Ownership, Profitability and Firm Value

Table 7 shows that institutional ownership of treated firms increased in the post period, confirming one of our discussed channels why firms may care. However, there is no significant change in the treated firms' market value (based on Tobin's *q*), and there is no significant impact on annual returns. Table 7 also shows that adding more women to the workforce did not come at the expense of profitability—EBITDA is unchanged for treated firms. Overall the increase in women's participation and status in the firm is not coming at the expense of shareholder value. Indeed, investors appear to increase their ownership in treated firms.

5. Conclusions

We use a unique experiment in Japan to examine whether equity market indexation can bring about real change to corporate social performance. We examine the years surrounding the

launch of the MSCI Empowering Women Index (WIN) that includes Japanese firms based on their gender workforce diversity performance. Using a regression discontinuing framework, we find that firms ranked around the index inclusion threshold improve their fraction of women in the workforce after the launch of the WIN index compared to control firms. These results are not driven by firms' reducing the number of male employees.

We further document that the improvement of the fraction of women in the workforce happens in supervisory and executive positions, while lower-level worker positions do not show a significant change. We also show a potential shift in corporate culture in that male employees are more likely to take up parent leaves following the launch of the WIN index. Finally, firms included in the WIN index experience an increase in institutional ownership, but do not exhibit lower operating performance, which is often used as an argument against investments in firms' social performance.

Our results highlight an important capital markets channel through which changes in corporate social behaviour can be achieved. This finding is potentially important for regulators and sustainability-minded investors who are interested in improving the social performance of companies.

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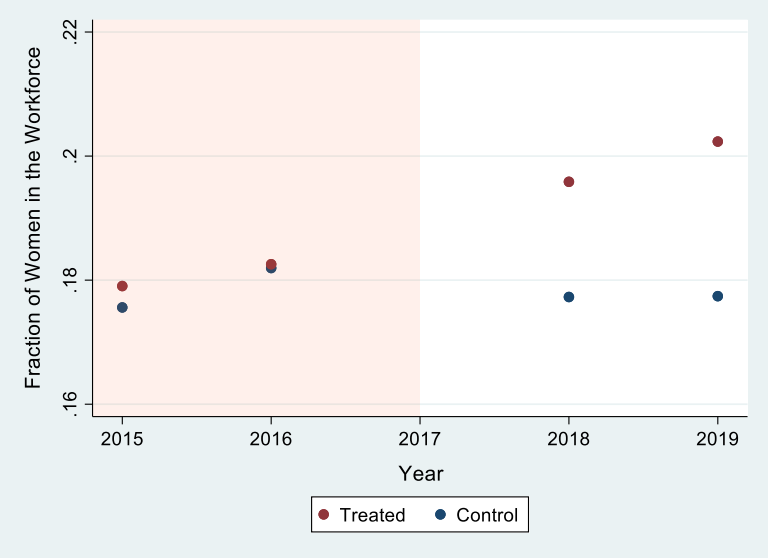
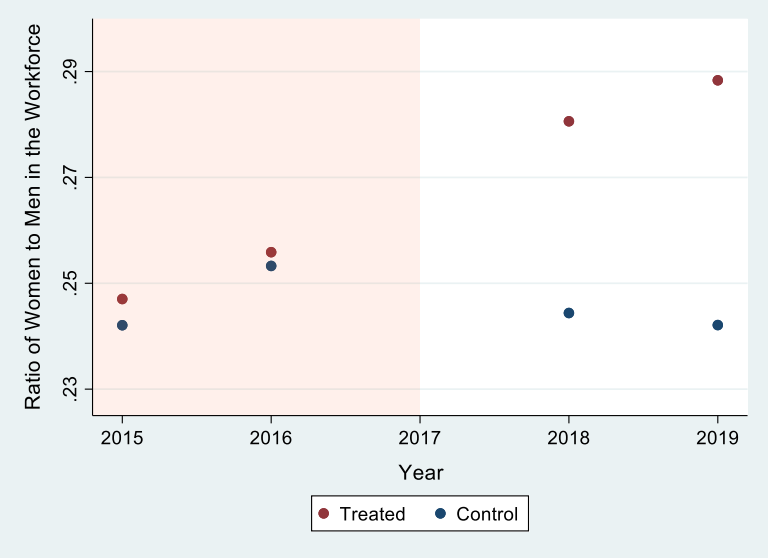
Figure 1
Women in the Workforce for Treated and Control Firms

This figure shows the fraction of women in the workforce and the ratio of women to men in the workforce for the two years surrounding the inception of the MSCI Japan Empowering Women Index (WIN). The figure plots averages for treated and control firms. We follow MSCI's WIN index creation methodology, for each year after the inception of the WIN index, we rank all firms within their respective GICS sector by their MSCI Gender Diversity Score. Treated firms are those that rank around the WIN index inclusion cutoff (the median of the Gender Diversity Score in each GICS sector) and fall within the 40th and 60th percentile of the distribution of the Gender Diversity Score. Control firms are those that rank below the 40th and above (equal) the 10th percentile of the distribution of the Gender Diversity Score. In the years before the inception of the WIN index (2014-2016), a firm is treated if it was treated in any of the years after the inception of the WIN index, and a firm is a control firm if it was a control firm in any of the years after the inception of the WIN index. The WIN index inception year (2017) is excluded from the analysis. All variables are defined in Appendix A.



Panel A: Fraction of Women



Panel B: Ratio of Women to Men

Table 1
Summary Statistics

This table shows summary statistics. The variables are described in Appendix A. The sample period is 2013 to 2020.

Variable	Mean	Median	Min	Max	SD
A. Employment Characteristics					
Fraction of Women in the Workforce	0.180	0.140	0.055	0.686	0.112
Ratio of Women to Men	0.250	0.162	0.059	2.187	0.238
Change in Women Employees	0.006	0.003	-0.081	0.188	0.021
Change in Male Employees	0.005	0.003	-0.194	0.318	0.049
Turnover in Women Employees	0.010	0.004	0.000	0.292	0.029
Turnover in Men Employees	0.027	0.015	0.002	0.539	0.063
Fraction of Women in					
Non-Management Positions	0.232	0.179	0.066	0.823	0.160
Management Positions	0.044	0.026	0.000	0.331	0.052
Executives	0.009	0.000	0.000	0.222	0.027
Directors	0.040	0.000	0.000	0.333	0.063
Women Taking Maternity Leaves					
All	0.013	0.007	0.001	0.330	0.033
Women Under 30	0.051	0.036	0.005	0.348	0.047
Women Under 40	0.021	0.015	0.002	0.230	0.023
Men Taking Paternity Leaves					
All	0.001	0.000	0.000	0.020	0.003
Men Under 30	0.006	0.002	0.000	0.109	0.015
Men Under 40	0.002	0.001	0.000	0.040	0.005
B. Firm Characteristics					
Total Assets	2,871	625	6	204,000	13,337
Log (Total Assets)	6.594	6.438	1.792	12.226	1.336
Cash	0.163	0.137	0.014	0.706	0.122
Tangibility	0.284	0.273	0.003	0.851	0.175
Leverage	0.202	0.165	0.000	0.705	0.174
ROA	0.042	0.040	-0.096	0.201	0.033
Tobin's *q*	0.911	0.781	0.161	2.733	0.514
Institutional Ownership	0.480	0.475	0.001	0.996	0.169
Annual Stock Returns	0.144	0.110	-0.534	1.946	0.288
EBITDA	0.097	0.096	-0.051	0.285	0.048

Table 2
Predicting WIN Index Membership with MSCI Data

This table shows regression estimates of MSCI Japan Empowering Women (WIN) index membership, a dummy variable equal to one if a firm is a WIN index member, and zero otherwise, on our own measures of whether a firm is a member of the WIN index and control variables. We follow the MSCI's WIN index creation methodology, and for each year after the inception of the WIN index, we rank all firms within their respective GICS sector by their MSCI Gender Diversity Score. Ranked WIN index is an indicator variable that is equal to one if a firm has an above-median Gender Diversity Score compared to firms in the same GICS sector and year, and zero otherwise. Quartiles 2, 3, and 4, are indicator variables equal to one if a firm falls within the 2, 3, and 4, quartile, respectively, of the Gender Diversity Score in a given GICS sector and year. The WIN index inception year (2017) is excluded from the analysis. All other variables are defined in Appendix A. The sample period is 2018 to 2020. The WIN index inception year (2017) is excluded from the analysis. All variables are winsorized at the 1st and 99th percentiles. All right-hand side variables are lagged by one year. Standard errors are double clustered by firm and time and *t*-statistics are reported in parentheses. ***, **, * denote statistical significance at the 1%, 5%, and 10% level, respectively.

	MSCI Japan Empowering Women (WIN) Index Membership			
	(1)	(2)	(3)	(4)
Ranked WIN Index	0.925***	0.936***		
	(88.72)	(106.78)		
Quartile 2			0.016**	0.025***
			(2.87)	(4.12)
Quartile 3			0.933***	0.944***
			(76.19)	(72.19)
Quartile 4			0.933***	0.954***
			(70.58)	(101.90)
Log (Total Assets)		-0.023***		-0.025***
		(-3.53)		(-3.84)
Cash		-0.042		-0.038
		(-0.90)		(-0.81)
Tangibility		-0.002		-0.003
		(-0.03)		(-0.05)
Leverage		-0.004		-0.005
		(-0.09)		(-0.11)
ROA		0.154		0.164
		(1.76)		(1.75)
Tobin's *q*		0.002		0.001
		(0.20)		(0.07)
Industry FE	Yes	Yes	Yes	Yes
N	1,718	1,718	1,718	1,718
Adjusted R^2	0.865	0.868	0.865	0.868

Table 3
Treatment Effects on Women in the Workforce

This table shows regression estimates of the fraction of women in the workforce and the ratio of women to men in the workforce on an interaction term between Treated and Post and control variables. We follow MSCI's WIN index creation methodology, for each year after the inception of the WIN index, we rank all firms within their respective GICS sector by their MSCI Gender Diversity Score. Treated firms are those that rank around the WIN index inclusion cutoff (the median of the Gender Diversity Score in each GICS sector) and fall within the 40th and 60th percentile of the distribution of the Gender Diversity Score. Control firms are those that rank below the 40th and above (equal) the 10th percentile of the distribution of the Gender Diversity Score. In the years before the inception of the WIN index launch (2013-2016), a firm is treated if it was treated in any of the years after the inception of the WIN index, and a firm is a control firm if it was a control firm in any of the years after the inception of the WIN index. Post is a dummy variable equal to one for years 2018 and 2019, and zero otherwise. The WIN index inception year (2017) is excluded from the analysis. Columns 4 and 5 report regression results in event time. For each firm, a set of time indicators variables is created for the four years before 2017 (the inception year of the WIN index) and the two years after 2017. The indicator variable for the year 2013 (4 years before the inception of the WIN index) is omitted from the regressions because of collinearity. Once a firm is treated after the WIN index inception, all subsequent time indicators variables are set to one. All other variables are defined in Appendix A. The sample period is 2013 to 2020. All variables are winsorized at the 1st and 99th percentiles. All right-hand side variables are lagged by one year. Standard errors are double clustered by firm and time and *t*-statistics are reported in parentheses. ***, **, * denote statistical significance at the 1%, 5%, and 10% level, respectively.

	Fraction of Women in the Workforce		Ratio of Women to Men in the Workforce		Effects in Event Time: Fraction of Women in the Workforce	Effects in Event Time: Ratio of Women to Men in the Workforce
	(1)	(2)	(3)	(4)	(5)	(6)
Treated × Post	0.007**	0.006**	0.020**	0.020**		
	(2.69)	(2.50)	(2.52)	(2.25)		
Treated	0.001	0.001	-0.002	-0.001		
	(0.37)	(0.49)	(-0.25)	(-0.11)		
Log (Total Assets)		0.001		-0.003	0.001	-0.004
		(0.10)		(-0.18)	(0.12)	(-0.19)
Cash		0.034		0.180	0.034	0.181
		(0.68)		(1.39)	(0.69)	(1.40)
Tangibility		0.027		0.135	0.027	0.140
		(0.77)		(1.59)	(0.77)	(1.59)
Leverage		0.015		0.057*	0.017	0.066**
		(1.33)		(2.03)	(1.47)	(2.33)
ROA		0.029		0.097	0.025	0.089
		(0.95)		(0.79)	(0.78)	(0.71)
Tobin's *q*		-0.009		-0.047	-0.008	-0.046
		(-0.93)		(-0.99)	(-0.90)	(-0.98)
Event Time Dummy Interactions						
Treated × D_{2014}					-0.000	-0.003
					(-0.06)	(-0.47)
Treated × D_{2015}					0.004	0.017
					(1.57)	(1.14)
Treated × D_{2016}					0.003	0.016
					(1.45)	(1.46)
Treated × D_{2018}					0.007**	0.023**
					(2.84)	(2.47)
Treated × D_{2019}					0.008**	0.022**
					(2.47)	(2.32)
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes	Yes	Yes
N	1,335	1,324	1,335	1,324	1,335	1,324
Adjusted R^2	0.973	0.973	0.932	0.934	0.973	0.934

Table 4
Changes and Turnover

This table shows regression estimates of measures of changes of women and men in the workforce and turnover of women and men employees on an interaction term between Treated and Post and control variables. We follow MSCI's WIN index creation methodology, for each year after the inception of the WIN index, we rank all firms within their respective GICS sector by their MSCI Gender Diversity Score. Treated firms are those that rank around the WIN index inclusion cutoff (the median of the Gender Diversity Score in each GICS sector) and fall within the 40th and 60th percentile of the distribution of the Gender Diversity Score. Control firms are those that rank below the 40th and above (equal) the 10th percentile of the distribution of the Gender Diversity Score. In the years before the inception of the WIN index launch (2013-2016), a firm is treated if it was treated in any of the years after the inception of the WIN index, and a firm is a control firm if it was a control firm in any of the years after the inception of the WIN index. Post is a dummy variable equal to one for years 2018 and 2019, and zero otherwise. The WIN index inception year (2017) is excluded from the analysis. All other variables are defined in Appendix A. The sample period is 2013 to 2020. The WIN index inception year (2017) is excluded from the analysis. All variables are winsorized at the 1st and 99th percentiles. All right-hand side variables are lagged by one year. Standard errors are double clustered by firm and time and *t*-statistics are reported in parentheses. ***, **, * denote statistical significance at the 1%, 5%, and 10% level, respectively.

	Change in Women Employees	Change in Male Employees	Turnover in Women Employees	Turnover in Men Employees
	(1)	(2)	(3)	(4)
Treated × Post	0.007**	0.010	0.002	0.001
	(2.13)	(1.17)	(0.94)	(0.32)
Treated	-0.004	-0.010	-0.001	-0.003
	(-1.49)	(-1.31)	(-0.61)	(-0.73)
Log (Total Assets)	-0.020*	-0.043	0.003	0.010
	(-1.77)	(-1.25)	(0.66)	(1.14)
Cash	0.057**	0.081	-0.005	0.037
	(2.16)	(1.65)	(-0.44)	(1.01)
Tangibility	0.020	0.004	0.004	0.064*
	(0.96)	(0.06)	(0.23)	(1.77)
Leverage	0.007	-0.040	0.005	0.012
	(0.58)	(-1.25)	(0.46)	(0.55)
ROA	0.098*	0.159	-0.006	-0.117***
	(1.92)	(1.39)	(-0.58)	(-3.38)
Tobin's *q*	-0.002	-0.004	-0.003*	-0.003
	(-0.31)	(-0.53)	(-1.94)	(-1.01)
Firm FE	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes
N	1,227	1,227	1,175	1,175
Adjusted R^2	0.110	0.144	0.809	0.803

Table 5
Women in the Workforce by Position

This table shows regression estimates of the fraction of women by position in the workforce on an interaction term between Treated and Post and control variables. We follow MSCI's WIN index creation methodology, for each year after the inception of the WIN index, we rank all firms within their respective GICS sector by their MSCI Gender Diversity Score. Treated firms are those that rank around the WIN index inclusion cutoff (the median of the Gender Diversity Score in each GICS sector) and fall within the 40th and 60th percentile of the distribution of the Gender Diversity Score. Control firms are those that rank below the 40th and above (equal) the 10th percentile of the distribution of the Gender Diversity Score. In the years before the inception of the WIN index launch (2013-2016), a firm is treated if it was treated in any of the years after the inception of the WIN index, and a firm is a control firm if it was a control firm in any of the years after the inception of the WIN index. Post is a dummy variable equal to one for years 2018 and 2019, and zero otherwise. The WIN index inception year (2017) is excluded from the analysis. All other variables are defined in Appendix A. The sample period is 2013 to 2020. All variables are winsorized at the 1st and 99th percentiles. All right-hand side variables are lagged by one year. Standard errors are double clustered by firm and time and *t*-statistics are reported in parentheses. ***, **, * denote statistical significance at the 1%, 5%, and 10% level, respectively.

	Fraction of Women by Position in the Workforce			
	Workers	General Management	Executives	Board
	(1)	(2)	(3)	(4)
Treated × Post	-0.000	0.008**	0.013***	0.015*
	(-0.02)	(2.11)	(4.27)	(2.06)
Treated	0.005*	-0.003	-0.003	-0.004
	(1.96)	(-1.06)	(-0.81)	(-0.49)
Log (Total Assets)	0.013	0.001	-0.004	0.005
	(1.08)	(0.40)	(-0.45)	(0.30)
Cash	-0.017	0.057**	-0.018	-0.064
	(-0.47)	(2.69)	(-0.79)	(-1.66)
Tangibility	0.015	0.035	0.003	0.080
	(0.42)	(1.32)	(0.11)	(1.67)
Leverage	-0.046*	0.032**	0.015	-0.071**
	(-1.95)	(2.14)	(0.74)	(-2.15)
ROA	0.008	0.003	-0.020	-0.156**
	(0.14)	(0.11)	(-0.59)	(-2.26)
Tobin's *q*	-0.011	-0.006	0.001	-0.004
	(-1.07)	(-0.89)	(0.41)	(-0.51)
Firm FE	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes
N	1,224	1,302	1,164	1,202
Adjusted R^2	0.956	0.912	0.567	0.567

Table 6
Real Effects: Maternity and Parental Leaves

This table shows regression estimates of the fraction of women who take maternity leaves and the fraction of men who take paternity leaves on an interaction term between Treated and Post and control variables. We follow MSCI's WIN index creation methodology, for each year after the inception of the WIN index, we rank all firms within their respective GICS sector by their MSCI Gender Diversity Score. Treated firms are those that rank around the WIN index inclusion cutoff (the median of the Gender Diversity Score in each GICS sector) and fall within the 40th and 60th percentile of the distribution of the Gender Diversity Score. Control firms are those that rank below the 40th and above (equal) the 10th percentile of the distribution of the Gender Diversity Score. In the years before the inception of the WIN index launch (2013-2016), a firm is treated if it was treated in any of the years after the inception of the WIN index, and a firm is a control firm if it was a control firm in any of the years after the inception of the WIN index. Post is a dummy variable equal to one for years 2018 and 2019, and zero otherwise. The WIN index inception year (2017) is excluded from the analysis. All other variables are defined in Appendix A. The sample period is 2013 to 2020. All variables are winsorized at the 1st and 99th percentiles. All right-hand side variables are lagged by one year. Standard errors are double clustered by firm and time and *t*-statistics are reported in parentheses. ***, **, * denote statistical significance at the 1%, 5%, and 10% level, respectively.

	Women Taking Maternity Leaves			Men Taking Paternity Leaves		
	All	Under 30	Under 40	All	Under 30	Under 40
	(1)	(2)	(3)	(4)	(5)	(6)
Treated × Post	0.002	-0.004	0.004	0.001**	0.007***	0.002***
	(0.91)	(-1.27)	(1.23)	(2.56)	(3.85)	(3.35)
Treated	-0.002	-0.003	-0.005	-0.001*	-0.004*	-0.001
	(-0.96)	(-0.86)	(-1.67)	(-1.79)	(-2.00)	(-1.37)
Log (Total Assets)	-0.003	-0.014	-0.010	-0.000	-0.005	-0.002
	(-0.98)	(-1.30)	(-1.52)	(-0.63)	(-1.37)	(-1.43)
Cash	-0.054	0.013	0.005	-0.000	0.004	0.000
	(-1.08)	(0.42)	(0.57)	(-0.20)	(0.27)	(0.01)
Tangibility	-0.025	-0.021	-0.002	0.002	-0.002	0.003
	(-1.12)	(-0.68)	(-0.12)	(0.52)	(-0.12)	(0.42)
Leverage	0.013*	0.049	0.023**	0.002	0.025*	0.007*
	(1.84)	(1.65)	(2.27)	(1.57)	(1.99)	(1.87)
ROA	0.009	0.131	0.046	0.004	0.046	0.010
	(0.79)	(1.12)	(1.09)	(0.95)	(1.39)	(1.15)
Tobin's *q*	0.000	0.009*	-0.001	0.001*	0.003	0.001
	(0.21)	(1.97)	(-0.26)	(1.85)	(1.40)	(1.59)
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes	Yes	Yes
N	1,202	1,081	1,098	1,130	1,023	1,031
Adjusted R^2	0.930	0.808	0.756	0.611	0.575	0.586

Table 7
Real Effects: Institutional Ownership and Performance

This table shows regression estimates of measures of institutional ownership and performance on an interaction term between WIN and Post and control variables. WIN is a dummy variable equal to one if the firm was included in the WIN index in any year, and zero otherwise. Post is a dummy variable equal to one for years 2018 and 2019, and zero otherwise. The WIN index inception year (2017) is excluded from the analysis. All other variables are defined in Appendix A. Columns 2 and 3 exclude lagged Tobin's q and column 4 excludes ROA as explanatory variables. The sample period is 2013 to 2020. All variables are winsorized at the 1st and 99th percentiles. All right-hand side variables are lagged by one year. Standard errors are double clustered by firm and time and *t*-statistics are reported in parentheses. ***, **, * denote statistical significance at the 1%, 5%, and 10% level, respectively.

	Institutional Ownership	Tobin's *q*	Annual Stock Returns	EBITDA
	(1)	(2)	(3)	(4)
WIN × Post	2.908**	-0.040	-0.013	-0.003
	(2.67)	(-0.76)	(-0.63)	(-1.82)
Log (Total Assets)	2.688*	-0.032	-0.080**	-0.013**
	(2.19)	(-0.27)	(-3.19)	(-3.06)
Cash	-0.167	-0.771	-0.157	-0.004
	(-0.05)	(-1.13)	(-1.56)	(-0.30)
Tangibility	-20.694**	0.195	-0.327**	-0.009
	(-3.38)	(0.41)	(-2.55)	(-0.82)
Leverage	-7.759	0.129	0.092	-0.031
	(-1.86)	(0.50)	(0.92)	(-1.61)
ROA	-11.449	2.086	-1.237*	
	(-0.88)	(0.99)	(-2.30)	
Tobin's *q*	1.866**			0.037***
	(2.95)			(10.87)
Firm FE	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes
N	4,106	4,172	4,157	4,009
Adjusted R^2	0.802	0.850	0.185	0.823

Appendix A
Variable Descriptions

This table shows variable descriptions and lists the data sources.

Variables	Description
A. Employment Characteristics	
Fraction of Women in the Workforce	The number of women employees divided by the number of male employees. *Source*: Toyo Keizai.
Ratio of Women to Men	The number of women employees divided by the number of male employees. *Source*: Toyo Keizai.
Change in Women Employees	Change in the number of female employees divided by the lagged number of female employees. *Source*: Toyo Keizai.
Change in Male Employees	Change in the number of male employees divided by the lagged number of male employees. *Source*: Toyo Keizai.
Turnover in Women Employees	The number of female employees leaving the company for reasons other than mandatory retirement divided by the lagged number of female employees. *Source*: Toyo Keizai.
Turnover in Men Employees	The number of male employees leaving the company for reasons other than mandatory retirement divided by the lagged number of male employees. *Source*: Toyo Keizai.
Fraction of Women in	
Workers	The number of female workers in non-supervisory and non-management positions divided by the number of all workers. *Source*: Toyo Keizai.
General management	The number of females with a general management position divided by the number of all general managers (*kanri-shoku*). *Source*: Toyo Keizai.
Executives	The number of female top executive officers divided by the number of all executives (*shikko-yakuin*). *Source*: Toyo Keizai.
Board	The number of female directors on the board of directors/ audit & supervisory board divided by the number of all members of the board of directors/ audit & supervisory board (*torishimari yaku* & *kansa yaku*) . *Source*: Toyo Keizai.
Women Taking Maternity Leaves	
All	Number of female employees taking maternity leaves divided by the lagged number of all employees. *Source*: Toyo Keizai.
Women Under 30	Number of female employees taking maternity leaves divided by the lagged number of all employees aged under 30. *Source*: Toyo Keizai.
Women Under 40	Number of female employees taking maternity leaves divided by the lagged number of all employees aged under 40. *Source*: Toyo Keizai.
Men Taking Paternity Leaves	
All	Number of men employees taking paternity leaves divided by the lagged number of all employees. *Source*: Toyo Keizai.
Men Under 30	Number of men employees taking paternity leaves divided by the lagged number of all employees aged under 30. *Source*: Toyo Keizai.
Men Under 40	Number of men employees taking mat paternity leaves divided by the lagged number of all employees aged under 40. *Source*: Toyo Keizai.

B. Firm Characteristics

Total Assets	Total assets. *Source*: Worldscope.
Log (Total Assets)	Natural logarithm of total assets. *Source*: Worldscope.
Cash	Cash and short-term investments divided by total assets. *Source*: Worldscope.
Tangibility	Net property, plant, and equipment divided by total assets. *Source*: Worldscope.
Leverage	Total debt divided by total assets. *Source*: Worldscope.
ROA	Return on assets. *Source*: Worldscope.
Tobin's *q*	Calculates as (market value of equity plus book value of debt) divided by total book assets. *Source*: Worldscope.
Institutional Ownership	Fraction of total shares held by institutional owners. *Source*: Bloomberg.
Annual Stock Returns	Fiscal year stock return measured as the total return index (RI) at the end of the fiscal year divided by the toral return index at the end of the previous fiscal year minus one. *Source*: Datastream.
EBITDA	Earnings before interest, taxes, and depreciation divided by total assets. *Source*: Worldscope.

Appendix B
Additional Tests

Table B1
Treatment Effects on Women in the Workforce: Alternative Treatment Definitions

This table replicates models 2 and 4 of Table 4 with different approach to define treated and control firms.

	Fraction of Women in the Workforce			Ratio of Women to Men in the Workforce		
	Dropping Switchers	Treatment in 2018	Treatment in 2019	Dropping Switchers	Treatment in 2018	Treatment in 2019
	(1)	(2)	(3)	(4)	(5)	(6)
Treated × Post	0.008**	0.004**	0.007*	0.024**	0.013*	0.016**
	(2.46)	(2.52)	(1.95)	(2.54)	(1.84)	(2.19)
Log (Total Assets)	0.002	-0.004	0.009	-0.004	-0.013	0.018
	(0.25)	(-0.58)	(1.32)	(-0.19)	(-0.51)	(1.30)
Cash	0.055	0.076*	-0.050	0.235	0.321*	-0.037
	(1.24)	(2.26)	(-1.15)	(1.71)	(2.00)	(-0.45)
Tangibility	0.046	0.090**	-0.026	0.174**	0.315**	0.002
	(1.63)	(2.85)	(-0.69)	(2.34)	(2.45)	(0.03)
Leverage	0.000	0.019	0.018	0.012	0.082**	0.064*
	(0.02)	(1.73)	(1.06)	(0.24)	(2.33)	(1.85)
ROA	0.025	0.064*	0.003	0.088	0.250	-0.043
	(0.57)	(1.86)	(0.10)	(0.62)	(1.41)	(-0.65)
Tobin's *q*	-0.011	-0.019	0.005	-0.068	-0.092	0.015*
	(-0.82)	(-1.36)	(1.30)	(-1.02)	(-1.21)	(1.79)
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes	Yes	Yes
N	1,000	790	866	1,000	790	866
Adjusted R^2	0.972	0.977	0.977	0.926	0.920	0.975