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RESEARCH ARTICLE

The Gender Diversity–Firm Performance Relationship by Industry Type and Inclusiveness: An Empirical Study of Japanese Firms

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Abstract

This research is unique because it presents empirical evidence testing whether increasing gender diversity is associated with improved firm performance for Japanese listed companies, which have different cultural backgrounds from Western companies, after controlling for size and firm age. As Worthley et [1] point out that the growing importance of the Japanese female workforce under global competition requires a better understanding of gender-related issues in organizational management which is undergoing a transformation from their rooted traditional managerial habits, such as seniority-based promotion, lifetime employment, paternalism, or prioritizing corporate harmony, which favor men. We find statistically significant positive relationships between managerial gender diversity and one measure of firm performance, Tobin's q, without a long time lag required for it to be realized. We find, similarly to Siegel and Kodama [2], that manufacturing firms benefit significantly and sensitively to a greater extent from increasing managerial gender diversity as compared to those in the service industries, and moreover the curvature of this relationship is significantly greater for manufacturers. Having established a committee for diversity promotion by 2006 did not show any impact on firm performance per se, even by 2012, but it did magnify the effect of gender diversity on Tobin's q, providing support for Pless and Maak's [3] conjecture that a culture of inclusiveness is required for the benefits accruing to gender diversity to truly be realized

Key words: *Gender diversity, Inclusiveness, Organizational performance, Manufacturing industry, Services industry, Inclusiveness.*

Introduction

In the World Economic Forum's Gender Gap Index of 2013 in Japan ranked 105 out of 136 countries. The index continues to track the strong correlation between a country's gender gap and its national competitiveness, income, and development. A country's competitiveness depends on its human talent—the skills, education and productivity of its workforce [4]. The gender gap is significantly greater in Japan than in any other advanced OECD countries. The weakest indicator for Japan was its low ratio of women managers in firms.[1]

While there are several arguments that suggest firms could improve their performance by more actively employing women in managerial roles, empirical studies have yielded mixed results. While in principle increases in the female manager ratio do not necessarily imply increasing gender diversity, in practice in Japan, they are synonymous, owing to the very low numbers of women managers. There's also a body of research that suggests that although interactions with those diverse others may initially seem more difficult and effortful than interactions with similar others, they are associated with several benefits [5].

The purpose of this analysis is to explore whether, and to what extent, firms' competitiveness, as Pfeffer (1994) asserts, in the long term depends significantly on their developing equal opportunities regardless of gender. In particular, we study the effect that an increase in the gender diversity of a workforce has on organization-level performance and whether or not such equal opportunity working environments can help to improve Japanese firm performance.

This study has been conducted in Japan, where there is a scarcity of studies on the impact on firm performance of managerial gender diversity. In contrast, most western studies have focused on diversity in board membership or employees and have been conducted in countries with much

[1] See Hausmann, Tyson, and Zahidi (2012).

higher rates of female managerial participation than Japan.

This research is unique because it presents empirical evidence testing whether increasing gender diversity is associated with improved firm performance for Japanese listed companies, which have different cultural backgrounds from Western companies, after controlling for size and firm age. Moreover, we examine the curvature of these relationships to estimate the moderating effect of industry type on the gender diversity–performance relationship, in the manner of Richard, Murthi, and Ismai [6] and Ali, Kulik, and Metz [7].In addition we explore the way in which these relationships are facilitated by an inclusive diversity culture, which some scholars have emphasized is necessary for firms to benefit from diversity [3,8].

The Female Workforce and Culture in Japan

In recent years the IMF has focused on how the aging population and shrinking labor force caused by low birth rates are depressing Japan's potential growth rate [9]. In a report titled "Can Women Save Japan?" the IMF argued that increasing the female workforce, especially in career-track jobs, could boost economic growth. However, it is not so easy to overcome the current situation in Japan. First, only 12 percent of new hires are for career-track positions. Second, almost 68% of women drop out of the workforce upon having their first child due to several reasons, such as inadequate childcare support, their husband's long working hours, and inflexible employment policies. Japanese companies' decision makers perceive female employees to be a significant handicap. Many senior executives expect that women will leave the company to raise their children. Thus women are seldom promoted, discouraging them and sapping their career motivation, despite the fact that the female workforce in Japan is the most educated in the world (OECD 2006). Strikingly, 74 percent of college-educated women quit their jobs voluntarily, more than double the rate in the United States (31%) and Germany (35%).

Yamaguchi [10,11] has proposed precisely this form of statistical discrimination (in contradistinction to earlier Japanese researchers, such as Koike [12] and Yashiro [13], who tended to favor Phelps-type theories[2]) as the main cause of the low rates of women managerial participation in Japan, where there is much societal pressure on women to exit the labor force after childbirth, leading to higher turnover and costs associated with women employees. However, the mechanism that he posits translates increased participation into higher productivity is that of the role model/motivational effect to be discussed below [14].

As Staley [15] notes, in traditional Japanese social culture women are expected to care for the family and assume domestic responsibilities, and some researchers identify this as the reason why companies do not recruit women for managerial positions. While Japanese culture is undergoing a transformation, it is still difficult to replace outdated but deeply rooted traditional managerial habits, such as seniority-based promotion, lifetime employment, paternalism, or prioritizing corporate harmony, which favor men [16].

However, more female participation in the workforce represents one feasible solution to the challenges confronting the Japanese economy. Facing pressure from foreign competition and a looming domestic labor shortage, Japanese companies in attempting to grapple with these new realities are undergoing organizational transformation. The growing importance of the female workforce under global competition requires a better understanding of gender-related issues in organizational management [1].

Theoretical Framework

Positive Effects of Gender Diversity on Organizational Performance

A number of researchers have proposed various mechanisms that would imply a positive relation between workforce diversity and firm performance. Moreover gender diversity has attracted the attention of researchers, politicians, and corporate executives around the world, especially on the question of how female representation in firms affects organizational and firm performance.

Laboratory studies of cultural diversity, including gender diversity, have generally yielded that the effectiveness of workgroups is enhanced by group-member diversity [17]. More heterogeneous groups tend to have broader knowledge and experience, analyze issues from a wider range of perspectives, and thus consider and debate a larger set of proposals, producing higher-quality and more innovative solutions [18,19].

Gender diversity in particular has been found to

[2] A form of so-called statistical discrimination, first described by Phelps (1972), which can lead to inequitable but on average efficient personnel decisions.

enhance employees' overall creativity and innovation because of the combination of different skills, perspectives and backgrounds that men and women tend to possess[20,21]. Moreover, women may provide more insight into the needs of female customers [22,23].These benefits of improved problem-solving, creativity, innovation, and market insight are valuable, rare, inimitable, and non-substitutable resources [24] and thus, according to the resource-based view of the firm [25],can produce a sustained corporate competitive advantage. Conversely, at the individual level, tokenism may impede the performance of members of a minority group when they are relatively few in number [26]. Empirical studies conducted by Frink, et.al. [27] have supported these positive views of diversity, even going so far as to suggest that an organization's optimal performance is achieved at maximum gender diversity (50% women).

Herring [28] points out that diversity pays by providing a competitive advantage through social complexity at the firm level, although such differences may lead to communication barriers and group conflict, and links diversity to profitability because businesses that draw on more inclusive talent pools are more successful.

We propose the following hypothesis:

Hypothesis 1a: Organizational gender diversity will be positively related to organizational performance.

Nonlinear Effects of Increasing Gender Diversity

In addition to these positive effects there are possible negative effects as well. Moreover, the above positive associations are not necessarily linear – most effects may have diminishing returns where the additional profit from higher managerial gender diversity is smaller with increasing diversity. Thus the net combined relation between managerial gender diversity and firm performance should be curvilinear, specifically, concave (i.e., an inverted U-shape), with positive slope at low levels of managerial gender diversity and smaller positive or even negative slope as managerial gender diversity approaches its maximum.

Social identity, self-categorization, and similarity-attraction theories imply that diversity can be disadvantageous for organizations.

According to these theories, individuals tend to be attracted to others whom they perceive to fall within the same social categories [29,30,31,32], with gender being a prominent component of self-categorization. Moreover, they usually perceive their group to be superior to others. Thus diverse groups may fragment into smaller gender-homogeneous groups, with concomitant inter-group communication and cooperation difficulties, tensions, and even outright conflicts [33, 34, 35]. Empirical studies [36, 37] have demonstrated these drawbacks as well. Not surprisingly, these negative effects have a deleterious impact on group and individual performance [38].

This impairment is considerably stronger at higher levels of gender diversity, as the two groups approach each other in size, leading to potential power struggles [39].Meanwhile, the advantages of diversity, being primarily generated by the introduction of new perspectives and backgrounds, would tend to increase more slowly as the number of members in the minority group increase, the additional contribution to the group from minority-specific novelty having been already largely captured by the earliest minority members.

The combination of these two conclusions yields a relationship between changes in gender diversity and organizational performance that is initially positive but then decreases and turns negative at high levels of diversity, which has been borne out in practice [7,8,40,]. Nakagawa and Schreiber [41] find, in the case of managers, that these relationships exhibit negative curvature, with diminishing returns to higher gender diversity.
We propose the following additional hypothesis:

Hypothesis 1b: Organizational gender diversity will have an inverted U-shaped relationship with organizational performance.

Moderating effects of industry type

Recent research has emphasized the practical value of effective diversity management. Customer satisfaction is an important effectiveness metric for service organizations and is a key differentiator between firms in competitive industries such as retail [42]. In addition, a significant relationship exists between customer satisfaction and company profitability [43]. The simultaneous production and consumption of services means that services operations have considerably more customer involvement than manufacturing operations [44]. Richard [6] finds that, compared to manufacturing

firms, services firms require more marketing insight, such as a cultural knowledge of market segments. Furthermore, Richard et al. [38] assert that the services industries are best positioned to capitalize on the benefits of gender diversity due to the greater value of market insight to, and greater interaction among employees in, firms of those industries.

By contrast, Siegel and Kodama [2] used a dichotomous classification of companies as manufacturing or services and showed that in Japan manufacturing firms in particular have benefited from hiring female executives and female managers, and that a significant part of the benefit may derive from cost savings.

Ali et al. [7] find that, for Australian firms, the U-shaped gender diversity–performance relationship was stronger in services organizations than for manufacturing organizations, which they posited was due to the increased importance of customer involvement for service operations coupled with the ability of a gender-diverse workforce to facilitate effective interactions with both male and female customers.

Moderating effects of inclusiveness

Social and cultural homogeneity and exclusiveness among the Japanese workforce have been discussed by many authors. Even Western researchers agree that people are more attracted to those who share similar attitudes [45] and surface-level demographic characteristics [46] as themselves.

Holien summarizes studies that show that interacting with diverse others can be difficult and unpleasant and in particular that interactions with someone of different gender and race are associated with increases in negative emotions.

Most Western authors agree that the relation between diversity, HRM and performance is complex and remains unclear [47]. However, Benschop [48] finds that "an organization's strategy for managing diversity influences both the process of meaning-formation regarding diversity and perception of performance effects."

Pless and Maak [3] discuss a *culture of inclusiveness* in an organizational environment that allows people with multiple backgrounds, mindsets and ways of thinking to work effectively together and to perform to their highest potential

in order to achieve organizational objectives based on sound principles. They focus on the challenge of building an inclusive diversity culture, showing that a "culture of inclusion" has to be built on solid moral grounds. They find the fact that, as diversity is essentially about cultural norms and values, appropriate "reflection work" is required to create a truly inclusive work environment where people from diverse backgrounds feel respected and recognized.

Shore et al. [49] reviewed previous research and constructed a model of how inclusive work groups and their antecedent conditions create greater equality and opportunities in the workplace for diverse people by affirming the unique contributions they offer and encouraging full participation in work group activities.

Richard et al. [38] offered implications that inclusiveness in diverse groups can help an organization to avoid potential diversity pitfalls and obtain a superior diversity advantage. This study investigates how *culture of inclusiveness* may interact with gender diversity to influence organizational performance. This insights presents the potential for Japanese companies to shed light on the potential benefits by understanding what important segment of the workforce.

Thus we have

Hypothesis 2a: Industry type moderates the gender diversity–performance relationship such that positive effects of gender diversity are stronger for firms in service industries.

Hypothesis 2b: Inclusiveness moderates the gender diversity–performance relationship in such a way as to increase the positive effects of gender diversity.
present a possible framework in Figure 1.

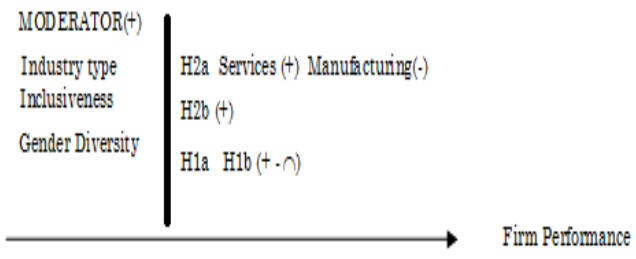

Figure 1: Proposed model of Industry type, inclusiveness, gender diversity, and performance.

Research Design

Sample and Data

Our sample includes 745 Japanese listed companies contained in the CSR data of Toyo Keizai for both the period 2005–6 (out of 1082 firms) and the period 2011–12 (out of 1127 firms). This source provided data on the numbers of regular employees, regular female employees, and female and male managers, and intra-company diversity promotion organizations. Data on sales revenue per employee and Tobin's q,[3] in 2005, 2011, and 2012, which are our measure of firm performance, are from Bloomberg, published in 2013.

The choice of 2005 as the initial data point for gender diversity allows a maximum time lag of 6 years between diversity and performance using longitudinal data. The 2012 final data point for gender diversity is chosen because it provided a minimum time lag of 9 months between diversity and performance (cf. below). The two time lags enable us to investigate whether gender diversity takes 1 or 6 years to impact firm performance.

Measures

Outcome (Dependent Variable)

In keeping with common practice in corporate governance research, Tobin's q is utilized as a measure of firm performance. In addition, productivity, here defined as sales revenue divided by the total number of employees, is also used as a dependent variable.

Predictor

As a measure of diversity generally, various metrics have been used in the literature, but the most common is the Blau index [50].

$$1 - \sum_{i=1}^{n} p_i,$$

where n is the number of groups into which the sample is divided and p_i is the proportion of the total sample in group i.[4] We use the Blau index of manager gender, calculated for 2012 and 2006. The ratio from 2006 is also tested because of the

possibility that there might be a time lag, of several years, in the effect of changes in the structure of management on firm performance.

Moderator

The firms are categorized into manufacturing or services industry type based on the Global Industry Classification Standard. The contextual dummy variable Manufacturing is defined to be 1 for the following industrial sectors, when the entire sector is classified as manufacturing, and constituent industries, when it is not: the basic materials sector (including mining, chemicals, and forest products), the industrial sector (including construction, engineering, machinery, aerospace and defense), the technology sector with the exception of software, the energy sector (distinct from utilities, which are counted among services), most consumer non-cyclicals (excluding only health care services and commercial services, while including agriculture and food and beverages), and the textile, apparel, auto manufacturing and parts, home building, furniture, house wares industries within the consumer cyclicals sector. The remaining sectors and industries were classed as services, including the communications, finance, and utilities sectors in their entireties. This division corresponds to that in Ali, Kulik, and Metz [7].

Inclusiveness is represented by dummy variables for the existence of an intra-company diversity promotion committee or organization. This information is derived from Toyo Keizai's surveys from 2006 and 2012.

Controls

Firm size, defined as the natural logarithm of the total number of employees, is used as a control variable. Organization age is also included as it may have an impact on performance: Compared to old firms, new firms with less formalized structures may be better positioned to capitalize on the benefits of gender diversity such as creativity and innovation.

Tobin's q is based on year-ending (31 Dec) data, while sales revenue covers the full Japanese business year (which ends 31 Mar), whereas data on employees is as of 31 Mar. Thus, for example, Tobin's q for 2012 is as of 31 Dec 2012, the number of employees or female managers for 2012 is as of 31 Mar 2012, and the sales revenue for 2012 covers the period from 1 Apr 2012 to 31 Mar 2012.

Methodology and Models

Hierarchical Multiple Regression Analysis

[3] Tobin's q, the ratio of the market value of the firm to the replacement value of the firm's assets, is "widely viewed as the best measure of a firm's market value" (Dobbin and Jung 2011).

[4] If the whole population is contained within a single group then there is no heterogeneity and the index is equal to zero. For the case of gender diversity, the Blau index can be expressed as $2x(1 - x)$, where x is the proportion of women. In this case the Blau index has a maximum value of 1/2 when the proportions of men and women are each 50%.

These models are used in this study to explain how and to what extent firm financial performance is affected by gender diversity of the managers, along with the control variables. The fundamental models tested via hierarchical regression analysis are of the following form:

$$Performance = \beta_0 + \sum \beta_i x_i + \varepsilon \quad (A),$$

$$Performance = \beta_0 + \beta_1 Diversity + \beta_2 Previous\ period + \sum \beta_i x_i + \varepsilon \quad (B),$$

$$Performance = \beta_0 + \beta_1 Diversity + \beta_2 (Diversity)^2 + \beta_3 Previous\ period + \sum \beta_i x_i + \varepsilon \quad (C),$$

$$Performance = \beta_0 + \beta_1 Diversity + \beta_2 (Diversity)^2 + \beta_3 Previous\ period + \beta_4 Diversity * Moderator + \beta_5 (Diversity)^2 * Moderator + \beta_6 Moderator + \sum \beta_i x_i + \varepsilon \quad (D),$$

where x_i are the control variables listed above, which are the same for every model and submodel, and *Performance* is Tobin's q or sales revenue per employee.

Each equation is tested for 2 different choices of explanatory variable *Diversity*: manager gender Blau index in 2012 and in 2006.

Results

Hierarchical Multiple Regression Analysis

Table 1 displays the means, the standard deviations, and the number of firms.
Table 2 presents the results of the correlation analyses for the 15 variables.

We used hierarchical multiple regression to test all hypotheses, similarly to the methodology. To test hypothesis 1A, firm performance (sales revenue/number of employees and Tobin's q) in 2012 is regressed separately on each predictor (manager gender diversity in 2006 and 2012) after the relevant control variables for firm size and age are included (Model B). The results support the hypothesis for Tobin's q for the shorter time lag (9 months), but not for productivity or the longer 6-year time lag. Firm age and size were largely irrelevant after controlling for previous-period performance, except for regressions involving productivity with a long time lag.

Hypothesis 1B, on the curvature of the relationship between gender diversity and performance, is not supported by any of the analyses (Model C).

The test of hypothesis 2A on the moderating effect of industry type yielded strong results for Tobin's q, more so with a shorter lag, but nothing for productivity. Manufacturing firms were found to significantly benefit to a greater extent from increasing gender diversity in management as compared to those in the service industries, and moreover the curvature of the relationship was also significantly higher for manufacturers. This is the opposite result to that found by Ali et al. for Australian firms, but accords with Siegel and Kodama's [2] conclusion that manufacturing companies in Japan systematically profit from increasing their numbers of female executives and upper-middle managers generally, but even more so from the addition of their first such female manager, as compared to services companies, which have been utilizing female managers for a longer time and thus do not experience a significant impact on competitive advantage through an increase in their employment. Thus manufacturers show a greater sensitivity to gender diversity, benefitting more from beginning to employ female managers, but also with more rapid deceleration of the effect as their numbers increase.

Similarly, the results of the analysis of Model D provide support for hypothesis 2B on the moderating effect of having an organization for promoting diversity, but only for Tobin q and a longer time lag. Firms with such a diversity committee in place for 5 years or more show a greater sensitivity to gender diversity, benefitting more from increasing the employment of female managers, but also with more rapid deceleration of the effect as their numbers increase.

Table 1: Descriptive statistics

Variable	Mean	Standard deviation	Number of firms
Manager gender diversity	0.0622	0.0767	607
Manager gender diversity, 2006	0.0543	0.0826	669
Firm age	61.4242	24.4948	712
Natural logarithm of number of employees	7.1074	1.3887	751
Industry type (1=Manufacturing; 0=Services)	0.6352	0.4817	751
Tobin Q	0.9632	0.2618	692
Tobin Q, 2011	0.9685	0.2772	696
Tobin Q, 2005	1.2829	1.2233	661
Sales revenue per employee	220.2393	869.3492	700
Sales revenue per employee, 2011	211.9586	795.2904	705
Sales revenue per employee, 2005	214.506	924.5246	693
Has employee satisfaction survey (dummy)	0.6273	0.4839	593
Has feedback for performance appraisal (dummy)	0.8727	0.3336	605
Has diversity committee (dummy)	0.2677	0.443	736
Has diversity committee 2006 (dummy)	0.1991	0.3996	698

Notes: All data are from 2012 unless otherwise indicated. Means for dummy variables are the proportion of firms with the given characteristic.

Table 2 . Correlation matrix of all variables

Variable	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*	*11*	*12*	*13*	*14*
1 Manager gender diversity														
2 Manager gender diversity, 2006	0.841***													
3 Firm age	-0.226***	-0.221***												
4 Natural logarithm of number of employees	-0.069*	-0.113***	0.282***											
5 Industry type (1=Manufacturing; 0=Services)	-0.344***	-0.374***	0.261***	0.116***										
6 Tobin Q	0.146***	0.098**	-0.029	0.251***	-0.022									
7 Tobin Q, 2011	0.124***	0.047	0.006	0.281***	0.020	0.915***								
8 Tobin Q, 2005	0.159***	0.150***	-0.168***	0.008	-0.082**	0.484***	0.568***							
9 Sales revenue per employee	0.098***	0.040	-0.085**	-0.101***	-0.070*	0.021	0.016	-0.016						
10 Sales revenue per employee, 2011	0.099***	0.041	-0.080**	-0.098***	-0.075**	0.018	0.018	-0.018	0.996***					
11 Sales revenue per employee, 2005	0.106**	0.046	-0.122***	-0.028	-0.094**	0.008	0.008	-0.018	0.846***	0.850***				
12 Has employee satisfaction survey (dummy)	0.060	-0.019	0.129***	0.370***	0.019	0.164***	0.133***	-0.036	0.083**	0.088**	0.082*			
13 Has feedback for performance appraisal (dummy)	0.087**	0.043	0.000	0.093**	-0.091**	0.098**	0.089**	0.050	0.050	0.055	0.052	0.093**		
14 Has diversity committee (dummy)	0.100***	-0.002	0.144***	0.512***	0.000	0.149***	0.166***	-0.014	0.102***	0.109***	0.132***	0.361***	0.131***	
15 Has diversity committee 2006 (dummy)	0.101**	0.042	0.117***	0.428***	-0.057	0.099**	0.102***	-0.017	0.010	0.016	0.048	0.263***	0.123***	0.641***

Table 3: Hierarchical multiple regression analysis estimate of manager gender diversity in 2012 predicting 2012 firm performance (Tobin's q), as moderated by industry type.

	Model			
Variable	**1A**	**1B**	**2C**	**2D**
Female manager ratio		0.044**	0.024	-0.173**
Fem mgr ratio squared			0.022	0.179**
Manufacturing dummy				-0.103***
Fem mgr ratio x manufacturing dummy				0.244***
Fem mgr ratio squared x manufacturing dummy				-0.178***
Tobin Q, 2011	0.896***	0.889***	0.889***	0.889***
Firm age	-0.028*	-0.019	-0.019	-0.021
Log number employees	0.013	0.017	0.018	0.018
N	732	732	732	732
Adjusted R^2	0.809	0.811	0.81	0.815
F-Statistic	1030***	783***	626***	402***
□R^2		0.002	0.000	0.005
Incremental F-Statistic		6.935***	0.259	6.282***

Notes: Regression coefficients are standardized (betas). The change in R^2 and incremental F-test reported for Models B, C, and D correspond to the differences between Models A and B, B and C, and C and D, respectively. Probability values are based on a t-statistic for a two-tailed test of significance, using White heteroscedasticity-consistent errors. *indicates p<0.10; **indicates p<0.05; ***indicates p<0.01.

Table 4: Hierarchical multiple regression analysis estimate of manager gender diversity in 2012

predicting 2012 firm performance (Tobin's q), as moderated by inclusiveness.

	Model			
Variable	**1A**	**1B**	**1C**	**1D**
Female manager ratio		0.044**	0.059*	0.029
Fem mgr ratio squared			-0.018	0.004
Diversity comm dummy				0.025
Fem mgr ratio x diversity comm dummy				0.012
Fem mgr ratio squared x diversity comm dummy				0.018
Tobin Q, 2011	0.895***	0.890***	0.889***	0.887***
Firm age	-0.029*	-0.021	-0.020	-0.022
Log number employees	0.012	0.015	0.016	-0.001
N	728	728	728	728
Adjusted R^2	0.808	0.809	0.809	0.81
F-Statistic	1020***	773***	618***	389***
□R^2		0.002	0.000	0.002
Incremental F-Statistic		6.876***	0.383	2.046

Notes: Regression coefficients are standardized (betas). The change in R^2 and incremental F-test reported for Models B, C, and D correspond to the differences between Models A and B, B and C, and C and D, respectively. Probability values are based on a t-statistic for a two-tailed test of significance, using White heteroscedasticity-consistent errors. *indicates p<0.10; **indicates p<0.05; ***indicates p<0.01.

Table 5: Hierarchical multiple regression analysis estimate of manager gender diversity in 2012 predicting 2012 firm performance (sales revenue per employee), as moderated by industry type.

	Model			
Variable	1A	1B	1C	1D
Female manager ratio		-0.003	-0.008	0.007
Fem mgr ratio squared			0.005	-0.004
Manufacturing dummy				0.005
Fem mgr ratio x manufacturing dummy				-0.009
Fem mgr ratio squared x manufacturing dummy				-0.006
Sales/employee, 2011	0.990***	0.990***	0.990***	0.991***
Firm age	0.001	0.000	0.000	0.000
Log number employees	-0.006	-0.006	-0.006	-0.006
N	731	731	731	731
Adjusted R^2	0.981	0.981	0.981	0.981
F-Statistic	12800***	9570***	7650***	4800***
□R^2		0.000	0.000	0.000
Incremental F-Statistic		0.398	0.319	1.693

Notes: Regression coefficients are standardized (betas). The change in R^2 and incremental F-test reported for Models B, C, and D correspond to the differences between Models A and B, B and C, and C and D, respectively. Probability values are based on a t-statistic for a two-tailed test of significance, using White heteroscedasticity-consistent errors. *indicates p<0.10; **indicates p<0.05; ***indicates p<0.01.

Table 6: Hierarchical multiple regression analysis estimate of manager gender diversity in 2012 predicting 2012 firm performance (sales revenue per employee), as moderated by inclusiveness.

	Model			
Variable	1A	1B	1C	1D
Female manager ratio		-0.003	-0.008	-0.003
Fem mgr ratio squared			0.005	0.003
Diversity comm dummy				0.002
Fem mgr ratio x diversity comm dummy				0.002
Fem mgr ratio squared x diversity comm dummy				-0.008
Sales/employee, 2011	0.990***	0.990***	0.990***	0.991***
Firm age	0.001	0.000	0.000	0.000
Log number employees	-0.006	-0.006	-0.006	-0.006
N	727	727	727	727
Adjusted R^2	0.981	0.981	0.981	0.981
F-Statistic	12700***	9520***	7610***	4740***
□R^2		0.000	0.000	0.000
Incremental F-Statistic		0.395	0.318	0.522

Notes: Regression coefficients are standardized (betas). The change in R^2 and incremental F-test reported for Models B, C, and D correspond to the differences between Models A and B, B and C, and C and D, respectively. Probability values are based on a t-statistic for a two-tailed test of significance, using White heteroscedasticity-consistent errors. *indicates p<0.10; **indicates p<0.05; ***indicates p<0.01.

Table 7: Hierarchical multiple regression analysis estimate of manager gender diversity in 2006 predicting 2012 firm performance (Tobin's q), as moderated by industry type.

	Model			
Variable	**1A**	**1B**	**1C**	**1D**
Female manager ratio 2006		0.040	0.097	0.060
Fem mgr ratio 2006 squared			-0.064	-0.027
Manufacturing dummy				-0.031
Fem mgr ratio 2006 x manufacturing dummy				0.193**
Fem mgr ratio 2006 squared x manufacturing dummy				-0.193**
Tobin Q, 2005	0.483***	0.479***	0.475***	0.474***
Firm age	-0.001	0.005	0.007	0.001
Log number employees	0.242***	0.246***	0.248***	0.238***
N	562	562	562	562
Adjusted R^2	0.289	0.289	0.289	0.293
F-Statistic	77.00***	58.00***	46.60***	30.10***
□R^2		0.002	0.001	0.008
Incremental F-Statistic		1.184	0.758	2.138*

Notes: Regression coefficients are standardized (betas). The change in R^2 and incremental F-test reported for Models B, C, and D correspond to the differences between Models A and B, B and C, and C and D, respectively. Probability values are based on a t-statistic for a two-tailed test of significance, using White heteroscedasticity-consistent errors. *indicates p<0.10; **indicates p<0.05; ***indicates p<0.01.

Table 8: Hierarchical multiple regression analysis estimate of manager gender diversity in 2006 predicting 2012 firm performance (Tobin's q), as moderated by inclusiveness.

	Model			
Variable	*1A*	*1B*	*1C*	*1D*
Female manager ratio 2006		0.045	0.104	0.102
Fem mgr ratio 2006 squared			-0.068	-0.061
Diversity comm 2006 dummy				-0.039
Fem mgr ratio 06 x diversity comm 06 dummy				0.180**
Fem mgr ratio 06 squared x diversity comm 06 dummy				-0.181***
Tobin Q, 2005	0.485***	0.481***	0.478***	0.476***
Firm age	-0.001	0.004	0.006	0.007
Log number employees	0.238***	0.242***	0.244***	0.240***
N	551	551	551	551
Adjusted R^2	0.291	0.292	0.292	0.292
F-Statistic	76.40***	57.70***	46.30***	29.40***
□R^2		0.002	0.001	0.004
Incremental F-Statistic		1.481	0.869	1.147

Notes: Regression coefficients are standardized (betas). The change in R^2 and incremental F-test reported for Models B, C, and D correspond to the differences between Models A and B, B and C, and C and D, respectively. Probability values are based on a t-statistic for a two-tailed test of significance, using White heteroscedasticity-consistent errors. *indicates p<0.10; **indicates p<0.05; ***indicates p<0.01.

Table 9: Hierarchical multiple regression analysis estimate of manager gender diversity in 2006 predicting 2012 firm performance (sales revenue per employee), as moderated by industry type.

	Model			
Variable	**1A**	**1B**	**1C**	**1D**
Female manager ratio 2006		0.000	0.004	-0.039
Fem mgr ratio 2006 squared			-0.004	0.027
Manufacturing dummy				-0.030*
Fem mgr ratio 2006 x manufacturing dummy				0.056*
Fem mgr ratio 2006 squared x manufacturing dummy				-0.031
Sales/employee, 2005	0.975***	0.975***	0.975***	0.974***
Firm age	0.022**	0.022*	0.022*	0.023**
Log number employees	-0.028*	-0.028*	-0.028**	-0.030**
N	585	585	585	585
Adjusted R^2	0.952	0.952	0.952	0.952
F-Statistic	3840***	2870***	2290***	1450***
□R^2		0.000	0.000	0.001
Incremental F-Statistic		0.003	0.043	2.525*

Notes: Regression coefficients are standardized (betas). The change in R^2 and incremental F-test reported for Models B, C, and D correspond to the

differences between Models A and B, B and C, and C and D, respectively. Probability values are based on a t-statistic for a two-tailed test of significance, using White heteroscedasticity-consistent errors. *indicates $p<0.10$; **indicates $p<0.05$; ***indicates $p<0.01$.

Table 10: Hierarchical multiple regression analysis estimate of manager gender diversity in 2006 predicting 2012 firm performance (sales revenue per employee), as moderated by inclusiveness.

	Model			
Variable	**1A**	**1B**	**1C**	**1D**
Female manager ratio 2006		0.000	0.005	0.012
Fem mgr ratio 2006 squared			-0.005	-0.010
Diversity comm 2006 dummy				0.028*
Fem mgr ratio 06 x diversity comm 06 dummy				-0.039
Fem mgr ratio 06 squared x diversity comm 06 dummy				0.022
Sales/employee, 2005	0.975***	0.975***	0.975***	0.974***
Firm age	0.022*	0.022*	0.022*	0.022*
Log number employees	-0.029*	-0.029*	-0.029**	-0.034**
N	574	574	574	574
Adjusted R^2	0.952	0.952	0.952	0.952
F-Statistic	3770***	2820***	2250***	1410***
□R^2		0.000	0.000	0.000
Incremental F-Statistic		0.003	0.068	1.255

Notes: Regression coefficients are standardized (betas). The change in R^2 and incremental F-test reported for Models B, C, and D correspond to the differences between Models A and B, B and C, and C and D, respectively. Probability values are based on a t-statistic for a two-tailed test of significance, using White heteroscedasticity-consistent errors. *indicates $p<0.10$; **indicates $p<0.05$; ***indicates $p<0.01$.

Conclusion

This study has been conducted in Japan, where there is a scarcity of studies on the impact on firm performance of managerial gender diversity. In contrast, most western studies have focused on diversity of board members or employees and have been conducted in countries with much higher rates of female managerial participation than Japan.

After controlling for firm size and age, we find statistically significant positive relationships between managerial gender diversity and one measure of firm performance, Tobin's q, without a long time lag required for it to be realized, but not the other performance metric, sales per employee. Furthermore, we do not find that either of these relationships exhibits significant curvature, with or without a time lag. Thus our results in this regard do not resemble those of Richard et al. [6] in the United States or Ali et al. [7] in Australia.

We also find, similarly to Siegel and Kodama [2], that manufacturing firms benefit to a greater extent from increasing managerial gender diversity as compared to those in the service industries, and moreover the curvature of this relationship is significantly greater for manufacturers. That is, our results show a stronger and more sensitive U-shaped relationship between managerial gender diversity and Tobin's q for manufactures.

Having established a committee for diversity promotion by 2006 did not show any impact on firm performance per se, even by 2012, but it did magnify the effect of gender diversity on Tobin's q, providing support for Pless and Maak's [3] conjecture that a *culture of inclusiveness* is required for the benefits accruing to gender diversity to truly be realized. Thus establishing such a corporate cultural would appear to be a necessary first step for a Japanese firm to reap the potential rewards of a more diverse management.

Among the limitations of this study is that for most companies the proportion of women managers was so low, averaging under 4%, that extrapolating to very high levels of diversity, where the negative quadratic effects may become significant, is difficult. Also the data used in this paper include only firms listed for both the periods 2005-2006 and 2011-2013. Future studies should consider both intermediate and long-term performance to better understand the effects of diversity.

This research is unique because it presents empirical evidence testing whether increasing gender diversity is associated with improved firm performance for Japanese listed companies, which have different cultural backgrounds from Western companies, after controlling for size and firm age.

We examined the curvature of these relationships to estimate the moderating effect of industry type and inclusiveness workforce on the gender diversity–performance relationship.

We offer new, robust evidence for a linkage between Japanese firm performance and women's managerial participation. Gender diversity could revitalize Japanese firms by providing an immediately accessible but underutilized source of competitive advantage [51-69].

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