International Journal of Organizational Analysis

Top management team (TMT) tenure diversity and firm performance: Examining the moderating effect of TMT average age

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Abstract

Purpose – The purpose of this paper is twofold: first, to investigate the effect of top management team (TMT) tenure diversity and firm financial performance (return on equity [ROE], return on assets [ROA]), and, second, to examine the moderating effect of TMT average age between TMT tenure diversity and firm performance.

Design/methodology/approach – The paper presented results from a quantitative study of 744 TMTs in Japanese manufacturing firms. The multiple hierarchical regression analysis was used to test the hypotheses.

Findings – The results show that TMT tenure diversity had a negative and significant main effect on ROE but not ROA. Furthermore, the results also indicated that the negative relationship between TMT tenure diversity and firm performance was attenuated by having older TMTs.

Originality/value – First, this paper expands scope of research on TMT diversity, which has hitherto primarily on non-individualistic variables (such as industry setting) by examining the moderating role of an individualistic variable (TMT average age). Second, this paper extended the attempts to apply the age-related theory by considering the role from the viewpoint of group level, namely, TMT average age.

Keywords Diversity, Firm performance, Top management team, Average age, Life-span theory, Organizational tenure

Paper type Research paper

Introduction

As the complexity and uncertainty of the business environment increases, top management teams (TMT) have become a focus of both practical and academic concern (Cannella *et al.*, 2008). Academic consideration of TMTs can now be found across various research fields, one of which focuses on the personal attributes of TMT members. This has been recognized as a key issue because Hambrick and Mason (1984) identified the impact of personal factors on firms' decision-making and performance. A growing number of studies have examined the effect of TMT diversity on firm performance (Carpenter, 2002; Nielsen and Nielsen, 2013). Diversity in the context of work groups refers to "the distribution of personal attributes among interdependent

International Journal of Organizational Analysis
Vol. 24 No. 3, 2016
pp. 454-470

1934-8835
DOI 10.1108/IJOA-02-2014-0739

members of a work unit" (Jackson *et al.*, 2003, p. 802). Applying this to TMTs Cannella *et al.* (2008, p. 768) define TMT diversity as "the degree that TMT members differ with respect to background characteristics such as functional experience, age, and tenure".

Research exploring the effects of the different background characteristics of TMT members on firm performance has proliferated over the past 30 years (Nielsen, 2010; Finkelstein *et al.*, 2009). For example, tenure diversity is frequently examined as a predictor of firm performance (Simons *et al.*, 1999) because average job tenure has declined because professional executive search firms facilitate greater mobility (Beckman and Burton, 2011). TMT average age has also been considered as an antecedent of firm performance (Mayr, 2011) because age represents the collective accumulation of experience and knowledge (Bantel and Jackson, 1989; Hambrick and Mason, 1984).

Such studies generally show that TMT tenure diversity is negatively related to firm performance (Haleblian and Finkelstein, 1993), whereas the TMT average age is positively linked to it (Mayr, 2011). These findings are in line with Ng and Feldman's (2010, p. 687) point that "although we certainly expect age and organizational tenure will be positively correlated, they are not identical constructs". Thus, we may discover new phenomena by exploring the combined effects of the tenure diversity and TMT average age on firm performance. However, no study has yet explored the combined effects of the tenure diversity and TMT average age on firm performance.

Based on life-span theory (Kanfer and Ackerman, 2004), we hypothesize that TMT average age may attenuate the negative effect of TMT tenure diversity on firm performance. Kanfer and Ackerman (2004) point out that research on life-span theory suggests that age-related changes in personality, emotion and affect play a key role in successful work outcomes for managers. To be more specific, as people age, emotion regulation increases (Helson and Soto, 2005). Thus, when TMTs' average age is high, members may be more likely to maintain social relationships, which attenuate the negative effect of TMT tenure diversity because it reflects the differences in their experiences. Hence, we examine here the relationship between TMT tenure diversity and firm financial performance (as measured by return on equity [ROE] and return on assets [ROA]), while considering the potential moderating effect of TMT average age.

We expect this study to contribute to the literature in several ways. Specifically, we seek to improve understanding of the moderating role of an individualistic variable (TMT average age). Although previous researches have emphasized the context in which diversity is embedded, most studies of diversity in TMTs have focused solely on non-individualistic variables, such as industry setting (Hambrick *et al.*, 1996), rather than individualistic variables. However, given that TMTs are a type of team which are composed of individuals, their individual characteristics can be thought of as critical moderating variables (Pelled *et al.*, 1999). In this study, we examine the moderating effect of an individualistic variable (TMT average age) on the relationship between TMT tenure diversity and firm performance. Although many studies of TMT diversity do control for age, none set out arguments for why or how members' age might affect the relationship between the TMT dynamics arising from diversity and the outcome measures (Carpenter and Fredrickson, 2001). Therefore, our results will expand the base of evidence highlighting the role of age in the process through which the TMT tenure diversity influences performance.

Furthermore, this study might also contribute to the management literature by using age-related theory. Prior research had suggested that it is important to apply the perspectives of age-related theory because the average age of the workforce and age diversity in work teams have been increasing around the world. For instance, in their two meta-analyses, Ng and Feldman (2008, 2010) showed that age is related to job performance and multi-dimensional work attitudes (2010) and they applied age-related theories, such as socioemotional selectivity theory (Carstensen, 1991). Previous attempts to apply age-related theory in the management literature have tended to focus on the individual level of analysis (Ng and Feldman, 2008, 2010), whereas little work has been done to consider the issue of age at the group and team level.

On the basis of life-span theory (Kanfer and Ackerman, 2004), we attempt to explain the moderating role of the average age of TMTs. Therefore, this study extends the attempts to apply age-related theory by considering the role of age at the group level.

Theories and hypotheses

Diversity of the TMT

Finkelstein *et al.* (2009) point out that studying TMTs – rather than chief executive officers (CEOs) alone – enables better predictions of organizational outcomes. For example, several studies have demonstrated that significant amounts of the variance in organization-level outcomes can be explained by examining the attributes of senior executives rather than the CEO (Zhang and Rajagopalan, 2004).

Based on this evidence, many management researchers address firm performance through the lens of the TMT. One of the key themes in this field is the personal attributes of the TMT members. Although concern for the TMT itself stems from the behavioral theory of the firm (Cyert and March, 1963), the focus on members' personal attributes and the diversity of the TMT overall stems from seminal work in the 1980s (Nielsen, 2010). Specifically, Hambrick and Mason (1984) proposed the upper echelons theory, pointing out that executives' individual characteristics strongly influence their interpretations of strategic decision-making situations and, in turn, the choices they make (Nielsen and Nielsen, 2011). It has been suggested that:

> […] top managers' demographic characteristics are reasonable proxies for underlying differences in cognitions, values, and perceptions, and thus, differences in demographic backgrounds can significantly affect the process of strategic choices and resultant performance outcomes (Joshi *et al.*, 2011, p. 530).

Similarly, Pfeffer (1983) focused on the personal attributes of TMT members, pointing out that demography is an important causal variable in performance outcomes (Nielsen, 2010). Following these watershed articles in the 1980s, a substantial body of research has emerged on the relationship between TMT diversity and firm performance.

Effect of diversity on firm performance

While research into the diversity of TMTs may include any number of personal attributes (Jackson *et al.*, 2003), in this study, we focus on an organizational tenure. TMT tenure diversity is one of the most frequently examined attributes in this area of research (Certo *et al.*, 2006). Organizational tenure is the length of time an individual employee has worked for the firm, and it represents the accumulation of specialized and organizationally relevant knowledge (Gilson *et al.*, 2013). Given the overall decline in executive tenure and the growth of professional executive search firms (which facilitate

mobility), understanding the effect of the tenure diversity of TMTs is crucial (Beckman and Burton, 2011).

According to Joshi *et al.* (2011), some research has explained this relationship with theoretical frameworks of work group diversity such as social categorization theory (Tajfel, 1981) and the similarity-attraction paradigm (Byrne, 1971) as proposed by Williams and O'Reilly (1998). Social categorization theory proposes that similarities and differences between work group members form the basis for categorizing oneself and others into subgroups, thus distinguishing between similar (in-group) and dissimilar (out-group) members. According to this theory, people tend to differentiate between these subgroups by approving of in-group members more than out-group members and being more willing to cooperate with them (van Knippenberg and Schippers, 2007).

The similarity-attraction paradigm proposes that similarity in attributes will increase interpersonal attraction and connection. People with similar backgrounds may share common life experiences and values and, so, may find the experience of interacting with each other easier, positively reinforcing and more desirable. Similarity provides positive reinforcement for one's own attitudes and beliefs, whereas dissimilarity is seen as a punishment. Therefore, diversity may lead to decreased communication, message distortion and more errors in communication (Williams and O'Reilly, 1998).

Taking these two theories together leads to the same prediction; that is, when TMTs are homogeneous, they will have higher cooperative interaction (Simsek *et al.*, 2005). Drawing all these theories together, it may be proposed that more tenure-diverse TMTs will have more formation of subgroups, which may in turn lead to decreased communication between them and thus be negatively related to firm performance (Boerner *et al.*, 2011). Indeed, Haleblian and Finkelstein (1993) found the negative relationship between TMT tenure diversity and firm performance in their empirical study.

Based on theoretical arguments such as social categorization theory and similarity attraction paradigm and empirical evidence collected in previous TMT studies, we predict that TMT tenure diversity will be negatively related to firm performance. Hence, we hypothesize the following main effect:

H1. TMT tenure diversity will be negatively related to firm performance as measured by ROA (*H1a*) and ROE (*H1b*).

The moderating effects of top management team average age

In recent years, many researchers have attempted to understand the relationship between TMT diversity and performance by including moderating variables (Joshi and Roh, 2009). This underscores the importance of the conditions or situations in which diversity is embedded (Joshi *et al.*, 2011). This accumulation of research suggests that grasping the consequences of TMT diversity for performance must be predicated on a better understanding of when (that is, under what conditions) the benefits of diversity outweigh the costs (Nielsen and Nielsen, 2013; Carpenter, 2002). Most researchers now acknowledge that the relationship between diversity and performance is moderated by other variables (Nielsen, 2010).

Most studies focus on non-individualistic variables, such as industry setting (Hambrick *et al.*, 1996) and environmental complexity (Finkelstein and Hambrick, 1996). Few studies consider individualistic variables, such as TMT characteristics (Boerner *et al.*, 2011). However, given that TMTs are a type of team which are composed of

individuals, it is crucial to also examine the moderating role of attributive conditions and characteristics (Pelled *et al.*, 1999).

To fill this research gap, we examine the relationship between TMT tenure diversity and firm performance using an individualistic variable: TMT average age. The age of TMT members is recognized as an indicator of their attitudes, values and perspectives (Bantel and Jackson, 1989), and many researchers now also acknowledge it as an important antecedent of firm performance. In the field of upper echelons research, empirical findings confirm that TMTs' average age influences firms' strategic choice and performance.

For instance, Tihanyi *et al.* (2000) investigated the impact of TMT average age on firms' international diversification. Sampling from 126 firms in the electronics industry show that the two variables are negatively related. In addition, Mayr (2011) examined the relationship between TMT average age and firm performance using a dataset from five countries and more than 360 large companies. She found a U-shaped relationship between the two variables. However, TMT average age has tended to be used only as an indicator of the general characteristics of TMT or as a control variable in TMT diversity research.

One shortcoming of previous studies is that they have not set out a clear argument for why or how the age of TMT members might affect intra-team dynamics arising because of tenure diversity. The main reason why previous attempts have not addressed the moderating role of these two variables is because these two variables are highly correlated. However, in the context of TMT, these two constructs may not be identical. As mentioned before, executive tenure has declined, and professional executive search firms have facilitated executive mobility in recent years (Beckman and Burton, 2011). This recent tendency attenuates the high correlation between tenure and age in TMT. Based on recent trends, it is crucial to consider the moderating effect between the two variables without assuming that they are identical.

The moderating role of TMT average age might be explained by the literature on life-span theory (Kanfer and Ackerman, 2004). Although, generally speaking, aging has been recognized as leading to an overall decline in people's capabilities, some researchers have proposed that this discourse is simplistic and misleading (Kanfer and Ackerman, 2004; Inceoglu *et al.*, 2011). Indeed, Kanfer and Ackerman (2004) developed theory to explain that age-related changes in adult development affect work motivation and behavior. They insist that adult development is not simply a matter of decline but can be better thought of in terms of four distinct patterns of development: loss, gain, reorganization and exchange.

The loss and growth themes are characterized by a decline in fluid intelligence (e.g. working memory and processing of new information) with older age and an increase in crystallized intelligence (e.g. educational or experiential knowledge). Meanwhile, there are reorganization and exchange concern changes in personality, emotion and affect (Inceoglu *et al.*, 2011). From the viewpoint of reorganization and exchange, an individual's motives can change over the life-cycle (Inceoglu *et al.*, 2011). In particular, emotion regulation improves with age. For instance, there are several pieces of evidence that state that older adults have higher agreeableness (Fleeson and Heckhausen, 1997). Furthermore, according to socioemotional selectivity theory (Carstensen, 1991), older adults are motivated to maintain social interactions and emphasize obtaining affective rewards (emotional satisfaction) and supporting one's identity rather than instrumental

value (Inceoglu *et al.*, 2011). Given the literature review of age-related theory, we predict a consistent pattern in which age development affects individual behavior – that is, older workers may be more motivated to maintain social relationships.

Some empirical findings support this theory-driven prediction that older workers are motivated to maintain social relationships. For instance, Ng and Feldman (2008) examined the relationship between age and ten dimensions of job performance. Although they did not find a positive relationship between age and core task performance, they found significant positive links between age and extra-role performance and a negative link with counterproductive work behavior. Based on these empirical findings, Ng and Feldman (2008, p. 403) concluded that "older employee are good citizens, are more likely to control their emotions at work and less likely to engage in counterproductive behaviors." Similarly, Inceoglu *et al.* (2011) examined age-related differences in work motivation in a large sample and found that older employees were less motivated by extrinsic factors (e.g. material rewards, career progression, and status) and more by intrinsically rewarding job features (i.e. personal principles).

This review of the literature on age and age development gives rise to some further propositions. Older members of TMTs may be more motivated to maintain social relationships than younger TMT members. Therefore, when average TMT age is high, the TMT may effectively attenuate negative intragroup dynamics, such as intergroup conflict or lack of "teamness". On the basis of this discussion, we propose the following hypothesis:

H2. TMT average age will moderate (that is, weaken) the negative relationship between TMT tenure diversity and firm performance as measured by ROA (*H2a*) and ROE (*H2b*).

Methods

Sampling and data collection

The sample was drawn from Japanese manufacturing companies as identified by the Section 1 of the Tokyo Stock Exchange. Data on their TMTs were collected for the fiscal year 2010 and on the firms for fiscal years 2010 to 2012 using annual securities reports. Companies were excluded from the sample if they had missing values for TMT tenure diversity, TMT average age, firm performance and control variables. In the end, the sample included 744 firms and their TMTs.

Although TMTs have been defined conceptually as "the top executives who have a direct influence on the formulation of a firm's strategy" (Nielsen, 2010, p. 305), several empirical studies offer a more practical definition, such as "the executive team listed in the company annual reports" (Nielsen and Nielsen, 2013, p. 377). On this basis, we collected the TMT data (tenure diversity and average age) for full-time executives from the *Yakuin Shikiho* (a quarterly journal profiling executives).

Variables

TMT tenure diversity. Tenure diversity was calculated using the coefficient of variation (the standard deviation divided by the mean). Some researchers have discussed how to operationalize the concept of tenure diversity (Harrison and Klein, 2007) and have concluded that the coefficient of variation is a statistically valid approach. Allison (1978) has laid out the rationale for this measurement. For instance, Carpenter and Fredrickson

(2001) explained the rationale in their measurement by quoting Allison (1978, p. 538): "among inequity measures, the coefficient of variation is preferable when interval-level data such as age or time are used". Based on this argument, we calculated organizational tenure by reference to the year of commencing work with a company as listed in the Toyo Keizai (2010) and measured TMT tenure diversity by computing the overall coefficient of variation.

Firm performance. Following previous work, the dependent variable of firm performance was operationalized as ROE and ROA at the end of each fiscal year with TMT composition measured at the beginning of the same year (Cannella *et al.*, 2008; Nielsen and Nielsen, 2013). We also calculated subsequent firm performance as ROE and ROA averaged over t + 1 and t + 2 to reduce the bias of single-year outliers (Cannella *et al.*, 2008; Nielsen and Nielsen, 2013). ROE and ROA were captured by the averaged values for the three fiscal years 2010 to 2012 from annual securities reports.

TMT average age. Average age was captured by averaging the age of each executive in the TMT. Data came from the Toyo Keizai (2010).

Control variables. Following previous research, we also included in our analyses several other variables that might affect firm performance (Cannella *et al.*, 2008; Carpenter, 2002; Boerner *et al.*, 2011). First, we might expect firm size (the logarithm of the total number of employees) to have a crucial impact on performance, as shown in previous studies (Barrick *et al.*, 2007). Second, TMT size (number of TMT members) may be a possible source of influence. In fact, Haleblian and Finkelstein (1993) identify this as an important determinant of firm performance (Certo *et al.*, 2006). Third, we included firm age (subtracting year of incorporation from the current year) as a further control variable because it is associated with the institutional routines and norms that affect performance (Ling and Kellermanns, 2010). Fourth, we included TMT average tenure because this is a standard approach in calculating tenure diversity (Boerner *et al.*, 2011). Fifth, following the existing studies that use tenure diversity (Gilson *et al.*, 2013), we include TMT age diversity (coefficient of variation) in our analysis. Finally, we used dummy variables to represent industries. We categorized the manufacturing industry into ten categories (i.e. food, raw materials and chemicals, pharmaceutical, energy resources, automobiles, steel and nonferrous metals, materials, machinery, electric appliances and others) with nine dummy variables.

Results

Table I presents the means, standard deviations and correlations for all variables. As expected, TMT tenure diversity was negatively correlated with ROE ($r = -0.10$; $p < 0.01$) and ROA ($r = -0.10$; $p < 0.01$).

We tested *H1* and *H2* by carrying out hierarchical regression analyses. In the first step, all control variables were included simultaneously in the regression. In the second step, to address *H1*, we added TMT tenure diversity. In the third step, we inserted the cross product of TMT tenure diversity and TMT average age to test the moderation hypothesis. Following the advice of Aiken and West (1991), the two variables of interest were grand-mean centered to reduce the risk of bias because of multicollinearity. Finally, the interaction effects were displayed graphically to help interpret them. The results are shown in Table II.

Table I.
Descriptive statistics and correlations

Variable	Mean	SD	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
1 Firm size (log)	5.01	0.62																		
2 TMT size	8.63	4.45	0.43**																	
3 Firm age	68.53	21.54	0.15**	0.15**																
4 TMT average tenure	30.45	8.93	0.13**	0.17**	0.48**															
5 Age diversity	0.08	0.04	−0.17**	−0.10**	−0.14**	−0.07†														
6 Food industry[b]	0.08	0.27	0.08*	0.02	−0.05	−0.02	0.13**													
7 Raw materials and chemicals industry[b]	0.21	0.41	−0.05	−0.02	0.13**	0.12**	−0.04	−0.15**												
8 Pharmaceutical industry[b]	0.04	0.20	−0.01	−0.02	0.03	−0.06†	−0.01	−0.06†	−0.11**											
9 Energy resources industry[b]	0.01	0.12	0.13**	−0.02	−0.09*	−0.11**	−0.04	−0.04	−0.06	−0.03										
10 Automobiles industry[b]	0.09	0.29	0.24**	0.10**	0.05	−0.05	−0.10**	−0.09*	−0.16**	−0.07†	−0.04									
11 Steel and non-ferrous metals industry[b]	0.06	0.24	0.01	−0.02	0.03	−0.04	−0.08*	−0.08*	−0.13**	−0.05	−0.03	−0.08*								
12 Materials industry[b]	0.07	0.26	−0.07†	−0.05	0.08*	0.00	−0.03	−0.08*	−0.14**	−0.06	−0.03	−0.09*	−0.07†							
13 Machinery industry[b]	0.15	0.36	−0.14**	−0.04	−0.04	0.06†	0.03	−0.13**	−0.22**	−0.09*	−0.05	−0.13**	−0.11**	−0.12**						
14 Electric appliances industry[b]	0.22	0.42	−0.03	0.02	−0.12**	−0.02	0.05	−0.16**	−0.28**	−0.11**	−0.06†	−0.17**	−0.14**	−0.15**	−0.23**					
15 TMT avrage age	61.98	3.05	0.14**	0.04	0.17**	0.33**	−0.15**	−0.02	0.06	−0.01	−0.00	0.01	0.04	0.02	−0.00	−0.07†				
16 TMT tenure diversity	0.40	0.25	−0.19**	−0.14**	−0.00	−0.59**	0.13**	0.00	−0.09*	0.05	−0.00	0.09*	0.06	−0.00	−0.05	0.02	−0.09*			
17 ROE	3.62	9.83	0.07†	0.07*	−0.00	0.05	−0.03	0.03	0.06	0.08*	0.06†	0.11**	−0.07†	−0.05	−0.00	−0.08*	0.05	−0.10**		
18 ROA	2.18	3.26	0.07†	0.07†	−0.06†	0.03	0.06	0.03	0.07†	0.17**	0.03	0.09*	−0.07†	−0.07†	−0.02	−0.11**	−0.02	−0.10**	0.72**	

Notes: $N = 744$; †$p < 0.10$; *$p < 0.05$; **$p < 0.01$; [b] coded as a dummy variable

Table II.
Results of hierarchical multiple regression analyses for testing the relationship between TMT tenure diversity and firm performance

	ROE			ROA		
	Model 1a β (S. E.)p	Model 1b β (S. E.)p	Model 1c β (S. E.)p	Model 2a β (S. E.)p	Model 2b β (S. E.)p	Model 2c β (S. E.)p
Step 1: Control variables						
Firm size	−0.05 (0.68)	−0.03 (0.69)	−0.02 (0.68)	0.04 (0.22)	0.02 (0.23)	0.03 (0.22)
TMT size	0.07 (0.09)	0.07 (0.09)†	0.06 (0.09)	0.06 (0.03)	0.06 (0.03)	0.05 (0.03)
Firm age	−0.06 (0.02)	−0.01 (0.02)	−0.01 (0.02)	−0.14 (0.01)***	−0.11 (0.01)**	−0.11 (0.01)**
TMT average tenure	0.05 (0.05)	−0.05 (0.07)	−0.02 (0.07)	0.10 (0.02)*	0.04 (0.02)	0.07 (0.02)
Age diversity	−0.01 (8.61)	0.01 (8.71)	−0.00 (8.64)	0.07 (2.81)†	0.08 (2.86)*	0.07 (2.82)†
Food industry[b]	0.15 (1.96)**	0.16 (1.96)**	0.16 (1.94)**	0.08 (0.64)	0.08 (0.64)	0.08 (0.63)
Raw materials and chemicals industry[b]	0.23 (1.70)***	0.23 (1.70)***	0.22 (1.68)***	0.16 (0.56)*	0.16 (0.56)*	0.15 (0.55)*
Pharmaceutical industry[b]	0.18 (2.28)***	0.18 (2.28)***	0.17 (2.25)***	0.22 (0.75)***	0.22 (0.75)***	0.22 (0.74)***
Energy resources industry[b]	0.12 (3.46)**	0.12 (3.45)**	0.12 (3.42)**	0.06 (1.13)	0.06 (1.13)	0.07 (1.12)
Automobiles industry[b]	0.23 (1.95)***	0.24 (1.95)***	0.23 (1.94)***	0.16 (0.64)**	0.17 (0.64)**	0.16 (0.63)**
Steel and non-ferrous metals industry[b]	0.05 (2.08)	0.05 (2.08)	0.05 (2.06)	0.01 (0.68)	0.01 (0.68)	0.01 (0.67)
Materials industry[b]	0.08 (2.02)	0.08 (2.01)	0.08 (1.99)	0.02 (0.66)	0.02 (0.66)	0.02 (0.65)
Machinery industry[b]	0.16 (1.77)*	0.17 (1.76)**	0.16 (1.74)*	0.06 (0.58)	0.07 (0.58)	0.06 (0.57)
Electric appliances industry[b]	0.12 (1.68)†	0.14 (1.68)†	0.13 (1.67)†	0.00 (0.55)	0.01 (0.55)	0.00 (0.55)
TMT average age	0.04 (0.13)	0.06 (0.13)	−0.04 (0.15)	−0.03 (0.04)	−0.02 (0.04)	−0.13 (0.05)
R^2_1	0.06***			0.09***		
Step 2: Independent variable						
TMT tenure diversity		−0.13 (2.06)*	−0.10 (2.07)†		−0.08 (0.68)	−0.05 (0.68)
R^2_2		0.07***			0.09***	
$\Delta R^2_{(1\text{-}2)}$		0.01***			0.00***	
Step 3: Interactions effects						
TMT tenure diversity* TMT average age			0.18 (0.39)***			0.19 (0.13)***
R^2_3			0.09***			0.11***
$\Delta R^2_{(2\text{-}3)}$			0.02***			0.02***

Notes: $N = 744$; †$p < 0.10$, *$p < 0.05$; **$p < 0.01$; ***$p < 0.001$; R^2_1, R^2_2 and R^2_3 denote the ajusted R^2 generated by the first, second and third step regressions, respectively; $\Delta R^2_{(1-2)} = R^2_2 - R^2_1$, $\Delta R^2_{(2-3)} = R^2_3 - R^2_2$; [b]coded as a dummy variable

The main effect of TMT tenure diversity on firm performance

As shown in Models 1b and 2b in Table II, the results support *H1a* but not *H1b*. TMT tenure diversity had a negative main effect on ROE ($\beta = -0.13$; $p < 0.05$) but not ROA ($\beta = -0.08$; n.s.). These results give partial support to *H1*.

The moderating effect of TMT average age on the relationship between TMT tenure diversity and firm performance

Next, as shown in Models 1c and 2c of Table II, the interaction term was significant for both ROE ($\beta = 0.18$; $p < 0.001$) and ROA ($\beta = 0.19$; $p < 0.001$). This indicates interaction effects in the relationship between the tenure diversity and average age of TMTs, as depicted in Figures 1 and 2. Consistent with *H2a* and *H2b*, a simple slope analysis shows that the negative relationship between tenure diversity and firm performance is attenuated in older TMTs. Specifically, for both ROE and ROA, the results showed a significant negative effect in younger TMTs ($t = -3.93$; $p < 0.001$; $t = -2.97$; $p < 0.01$,

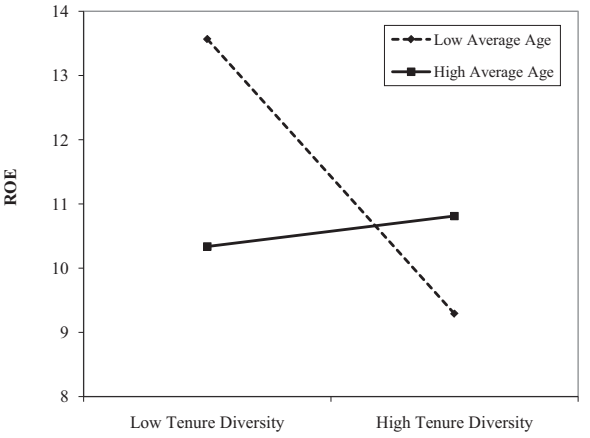

Figure 1.
A moderating effect of TMT average age on the relationship between TMT tenure diversity and ROE

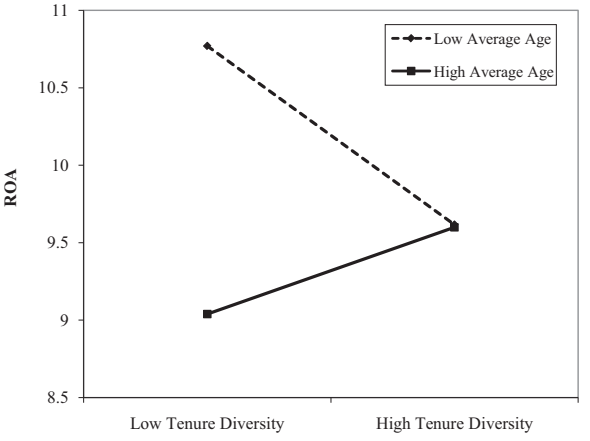

Figure 2.
A moderating effect of TMT average age on the relationship between TMT tenure diversity and ROA

respectively) and no significant effect in older TMTs ($t = 0.37$; *n.s.*; $t = 1.72$; *n.s.*, respectively).

Discussion and conclusions

Academic interest in TMTs – the source of firms' high-level decision making – has increased in recent years. A key topic in this field is TMT diversity, and many researchers have examined its relationship with firm performance (e.g. Cannella *et al.*, 2008; Nielsen and Nielsen, 2013). Researchers have accumulated a wealth of evidence about this link over the past 30 years and more complex models, including models of moderating variables. Such models underscore the importance of the context in which TMT diversity is embedded (Joshi *et al.*, 2011). Most researchers now agree that the hypothesized links between TMT diversity and firm performance are moderated by other factors (Nielsen, 2010). Following this research trend, the purpose of this study was to examine the relationship between TMT tenure diversity and firm performance, while considering the moderating effect of TMT average age.

Theoretical and practical implications

First, as expected, we found a negative relationship between TMT tenure diversity and performance as measured by ROE. This finding supports diversity-related theories, such as social categorization and similarity-attraction, and it corroborates previous empirical findings. Therefore, this study provides additional empirical evidence of a negative relationship between TMT tenure diversity and firm performance in the context of Japan, augmenting previous diversity studies (Haleblian and Finkelstein, 1993).

Second, this study tested the moderating effect of an individualistic variable (TMT average age) on the negative relationship between tenure diversity and firm performance and found the link between tenure diversity and firm performance was attenuated when average age was higher. Although existing researches have emphasized the context in which TMT diversity embedded, previous studies have tended to mainly focus on the moderating role of non-individualistic variables, such as industry setting or environmental complexities. Thus, little work has been done to examine the moderating role of individualistic variables. In particular, because given that TMTs are a type of team which are composed of individuals, their individual characteristics can be critical moderating variables. Therefore, this study partially filled the gap by using TMT average age as a variable to indicate the characteristics of TMTs and as a moderating variable.

In addition, the interaction effects of TMT tenure diversity and TMT average age have rarely been examined because there is a common belief that TMT tenure and TMT age are highly correlated. However, given that professional executive search firms are facilitating executive mobility (Beckman and Burton, 2011), it is valid to recognize these as two different constructs in the context of TMT. Indeed, according to our results, the correlation between TMT average age and TMT average tenure was not high ($r = 0.33$; $p < 0.01$). Therefore, the results confirm that the interaction term plays a significant role and add new evidence to TMT diversity research.

Third, in the process of explaining the moderating role of TMT average age, we used Kanfer and Ackerman's (2004) life-span theory. Many researchers and practitioners have become interested in employee age and its influence on their work

attitudes and behaviors because the average age of the work teams has been increasing around the world (Ng and Feldman, 2008, 2010). Although age-related theories have been used to explain the relationship between individuals' age and work outcomes (Ng and Feldman, 2008, 2010), relatively little work has been done to consider the issue of age at the group and team levels. Therefore, this study extends the previous attempts to age-related theory by considering the role from the group level using TMT average age.

From the managerial viewpoint, these results seem to provide an opportunity to rethink the decision-making involved in the appointment of new TMT or board members. As mentioned before, there is a stereotype that aging leads to an overall decline in people's capabilities in both practical and academic fields (Kanfer and Ackerman, 2004; Inceoglu *et al.*, 2011). Because this discourse dominates the practical field, firms and organizations with high-level TMT diversity may tend to avoid appointing older candidates as new TMT or board members. However, our findings indicate that older TMTs can effectively manage diversity. Therefore, our study seems to disprove the stereotype about aging and provides an opportunity to rethink the decision-making involved in the appointment of new TMT or board members.

Cultural considerations

With the aim to generalize our conceptual model and findings, we developed our hypothesized model based on general theories, including life-span theory (Kanfer and Ackerman, 2004) and socioemotional selectivity theory (Carstensen, 1991). Further, we collected a massive amount of TMT data and financial performance data over time from the manufacturing industry, which is one of the major industries in Japan. Although our hypothesized model, based on Western-driven research theories, was supported, caution is needed when generalizing our findings, which were obtained from an East Asian country (i.e. Japan). For example, most large Japanese companies have maintained unique human resource (HR) practices, such as periodic recruiting of new graduates, long-term employment, long-term investment in HRs and seniority payment, despite the prolonged economic stagnation in Japan (Ahmadijan and Okumura, 2011; Pettigrew *et al.*, 2000). As to such HR practices in Japan, individuals working for large companies tend to stay with their employers over the long term, progressing in their career vertically within an organization (Ariga, 2006; Dirks *et al.*, 2000). Therefore, it can be expected that Japanese TMT members will tend to be long-tenured and mature people. Indeed, the TMT average age (mean = 61.98, SD = 3.05) in our study was comparatively higher than that in previous studies conducted in other countries (Boerner *et al.*, 2011; Wiersema and Bantel, 1992). As mentioned above, although the findings of this study imply a certain level of generalizability, a relatively older TMT sample may inflate the finding that TMT average age weakens the negative relationship between TMT tenure diversity and firm performance. To check whether our sample's attributes (i.e. comparatively higher average age) in the generalizability issue, future research needs to test our hypothesized model by using a sample of TMTs comprising young members from different industries, from firms of different sizes, from firms that use different HR practices and from different countries, which may potentially influence TMT members' age.

Limitations and future researches

Future research should address some of the limitations of this study. The first issue is the power hierarchy within TMTs. This study conceptualizes TMT diversity as a group property (Tsui and Gutek, 1999; Harrison and Klein, 2007) and emphasizes its compositional aspects. This implicitly assumes that all TMT members have equal influence over decision-making (Tsui and Gutek, 1999). However, given the nature of corporate governance in Japanese firms, such an assumption can be applied to only a few companies (Sato, 2008). This is because most practitioners acknowledge the existence of a power hierarchy within TMTs (Sato, 2008). Like most other work in the field, this study has not addressed such hierarchical arrangements in the operationalization of TMT diversity. For instance, Nielsen (2010) points out the need for further research into TMT processes, as well as the role of the CEO as the most powerful individual. In addition, she suggests using multilevel theory and methodology to investigate CEOs in the context of TMT diversity research. Therefore, future research might also consider the role of internal TMT power structures and the function of TMT diversity.

Second, this study may have fallen into what Lawrence (1997, p. 2) calls a "congruence assumption". She criticizes scholars for assuming that demographic predictors are congruent with the intervening process through which, it is theorized, they influence firm performance, without testing the intermediate steps in the theorized causal chains (Priem *et al.*, 1999). For example, this study has not measured intragroup dynamics directly. Therefore, future research might include intermediate processes to test our model more rigorously.

Some previous work has indicated that the effects of TMT diversity are not directly related to firm performance but affect intermediate aspects, such as team processes (e.g. Nielsen, 2010) and hence mediate the relationship between TMT diversity and firm performance (Hambrick and Mason, 1984; Hambrick, 2007). Although previous studies have examined some team processes, such as emotional conflict and debate as mediating variables (Pelled *et al.*, 1999; Simons *et al.*, 1999), their mediating effects are equivocal. Therefore, it is important for future TMT diversity research to include mediating variables that closely relate to firm performance. Based on this perspective, one of the important concepts is "teamness" in TMT (Hambrick, 1994). In TMT research, it is crucial to cultivate the sense of TMTs as a unified team to improve firm performance (Hambrick, 1994; Carmeli and Halevi, 2009). Hambrick (1994) proposed behavioral integration as a construct representing "teamness" in TMT. Although the construct refers to "the degree to which the group engages in mutual and collaborative interaction" (Hambrick, 1994, p. 188), previous studies have found a positive relationship between TMT behavioral integration and firm performance (Carmeli and Halevi, 2009). For example, Hambrick (1998) reported that behavioral integration enables teams to react well to increasing market needs and develop global strategy (Carmeli and Halevi, 2009). Furthermore, Carmeli (2008) found a positive relationship between TMT behavioral integration and multiple performance measures of service firms. Thus, although TMT behavioral integration is an important intermediate variable predicting firm performance, previous TMT diversity research has rarely used behavioral integration as a mediator (Buyl *et al.*, 2011; Simsek *et al.*, 2005). Therefore, following the recommendation of Lawrence (1997), future research might include

intermediate processes, especially behavioral integration, to examine our hypotheses more rigorously.

Finally, future research should examine the moderating role of TMT average age on various independent and dependent variables. The use of similar firms' financial indexes as outcomes (i.e. ROE and ROA) is one reason why this study confirmed a similar moderating role ($r = 0.72$; $p < 0.01$). Therefore, this point is a limitation and future research should examine the moderating effect on other outcome variables. One possible pathway is to examine the moderating effect on strategic choices. Previous TMT literature has often used strategic factors, such as internationalization (Nielsen and Nielsen, 2011; Tihanyi *et al.*, 2000), as dependent variables. According to existing empirical evidence, some of these strategic choices did not confirm a significant positive correlation between strategic choice and firm financial performance (Nielsen and Nielsen, 2011). Accordingly, we may find different moderating roles of TMT average age using strategic choices as dependent variables. Hence, future research should examine whether our results are reproduced with other outcome variables, such as strategic choices. In addition, regarding the independent variable, this study only used TMT tenure diversity to test our model. However, prior research has indicated "mixed results for different diversity attributes within the same study" (Nielsen and Nielsen, 2013, p. 373). Accordingly, different moderating effects may be found by using other aspects of diversity. Hence, future research should include other aspects of diversity to examine the moderating role of TMT average age.

References

Ahmadijan, C.L. and Okumura, A. (2011), "Corporate governance in Japan", in Mallin, C.A. (Ed.), *Handbook on International Corporate Governance: Country Analyses*, Edward Elgar Publishing Limited, Cheltenham, pp. 247-268.

Aiken, L.S. and West, S.C. (1991), *Multiple Regression Testing and Interpreting Interactions*, Sage, Newbury Park, CA.

Allison, P.D. (1978), "Measures of inequality", *American Sociological Review*, Vol. 43 No. 6, pp. 865-880.

Ariga, K. (2006), "Horizontal transfer, vertical promotion, and evolution of firm organization", *Journal of the Japanese and International Economies*, Vol. 20 No. 1, pp. 20-49.

Bantel, K.A. and Jackson, S.E. (1989), "Top management and innovations in banking: does the composition of the top team make a difference?", *Strategic Management Journal*, Vol. 10 No. S1, pp. 107-124.

Barrick, M.R., Bradley, B.H., Kristof-Brown, A.L. and Colbert, A.E. (2007), "The moderating role of top management team interdependence: implications for real teams and working groups", *Academy of Management Journal*, Vol. 50 No. 3, pp. 544-557.

Beckman, C.M. and Burton, M.D. (2011), "Bringing organizational demography back in: time, change, and structure in top management team research", in Carpenter, M.A. and Weikel, M.K. (Eds), *The Handbook of Research on Top Management Teams*, Edward Elgar Publishing, Cheltenham, pp. 49-70.

Boerner, S., Linkohr, M. and Kiefer, S. (2011), "Top management team diversity: positive in the short run, but negative in the long run?", *Team Performance Management*, Vol. 17 Nos 7/8, pp. 328-353.

Buyl, T., Boone, C., Hendriks, W. and Matthyssens, P. (2011), "Top management team functional diversity and firm performance: the moderating role of CEO characteristics", *Journal of Management Studies*, Vol. 48 No. 1, pp. 151-177.

Byrne, D. (1971), *The Attraction Paradigm*, Academic, New York, NY.

Cannella, A.A., Park, J.H. and Lee, H.U. (2008), "Top management team functional background diversity and firm performance: examining the roles of team member colocation and environmental uncertainty", *Academy of Management Journal*, Vol. 51 No. 4, pp. 768-784.

Carmeli, A. (2008), "Top management team behavioral integration and the performance of service organizations", *Group & Organization Management*, Vol. 33, pp. 712-735.

Carmeli, A. and Halevi, M.Y. (2009), "How top management team behavioral integration and behavioral complexity enable organizational ambidexterity: the moderating role of contextual ambidexterity", *The Leadership Quarterly*, Vol. 20 No. 2, pp. 207-218.

Carpenter, M.A. (2002), "The implications of strategy and social context for the relationship between top management team heterogeneity and firm performance", *Strategic Management Journal*, Vol. 23 No. 3, pp. 275-284.

Carpenter, M.A. and Fredrickson, J.W. (2001), "Top management team, global strategic posture, and the moderating role of uncertainty", *Academy of Management Journal*, Vol. 44 No. 3, pp. 533-545.

Carstensen, L.L. (1991), "Selectivity theory: social activity in life-span context", *Annual Review of Gerontology and Geriatrics*, Vol. 11, pp. 195-217.

Certo, S.T., Lester, R.H., Dalton, C.M. and Dalton, D.R. (2006), "Top management teams, strategy and financial performance: a meta-analytic examination", *Journal of Management Studies*, Vol. 43 No. 4, pp. 813-839.

Cyert, R.M. and March, J.G. (1963), *A Behavioral Theory of the Firm*, Prentice-Hall, Englewood Cliffs, NJ.

Dirks, D., Hemmert, M., Legewie, J., Meyer-Ohle, H. and Waldenberger, F. (2000), "The Japanese employment system in transition", *International Business Review*, Vol. 9 No. 5, pp. 525-553.

Finkelstein, S. and Hambrick, D.C. (1996), *Strategic Leadership: Top Executives and Their Effects on Organizations*, West Educational Publishing, Minneapolis, MN.

Finkelstein, S., Hambrick, D.C. and Cannella, A.A. (2009), *Strategic Leadership: Theory and Research on Executives, Top Management Teams, and Boards*, Oxford University Press, New York, NY.

Fleeson, W. and Heckhausen, J. (1997), "More or less 'me' in past, present, and future: perceived lifetime personality during adulthood", *Psychology and Aging*, Vol. 12 No. 1, pp. 125-136.

Gilson, L.L., Lim, H.S., Luciano, M.M. and Choi, J.N. (2013), "Unpacking the cross-level effects of tenure diversity, explicit knowledge, and knowledge sharing on individual creativity", *Journal of Occupational and Organizational Psychology*, Vol. 86 No. 2, pp. 203-222.

Haleblian, J. and Finkelstein, S. (1993), "Top management team size, CEO dominance, and firm performance: the moderating roles of environmental turbulence and discretion", *Academy of Management Journal*, Vol. 36 No. 4, pp. 844-863.

Hambrick, D.C. (1994), "Top management groups: a conceptual integration and reconsideration of the 'team' label", in Staw, B.M. and Cummings, L.L. (Eds), *Research in Organizational Behavior*, JAI Press, Greenwich, CT, Vol. 16, pp. 171-213.

Hambrick, D.C. (1998), "Corporate coherence and the top management team", in Hambrick, D.C., Nadler, D.A. and Tushman, M.L. (Eds), *Navigating Change: How CEOs, Top Teams, and Boards Steer Transformation*, Harvard Business School Press, Boston, MA, pp. 123-140.

Hambrick, D.C. (2007), "Upper echelons theory: an update", *Academy of Management Review*, Vol. 32 No. 2, pp. 332-343.

Hambrick, D.C., Cho, T.S. and Chen, M. (1996), "The influence of top management team heterogeneity on firms' competitive moves", *Administrative Science Quarterly*, Vol. 41 No. 4, pp. 659-684.

Hambrick, D.C. and Mason, P.A. (1984), "Upper echelons: the organization as a reflection of its top managers", *Academy of Management Review*, Vol. 9 No. 2, pp. 193-206.

Harrison, D.A. and Klein, K.J. (2007), "What's the difference? Diversity constructs as separation, variety, or disparity in organizations", *Academy of Management Review*, Vol. 32 No. 4, pp. 1199-1228.

Helson, R. and Soto, C.J. (2005), "Up and down in middle age: monotonic and nonmonotonic changes in roles, status, and personality", *Journal of Personality and Social Psychology*, Vol. 89 No. 2, pp. 194-204.

Inceoglu, I., Segers, J. and Bartram, D. (2011), "Age-related differences in work motivation", *Journal of Occupational and Organizational Psychology*, Vol. 85 No. 2, pp. 300-329.

Jackson, S.E., Joshi, A. and Erhardt, N.L. (2003), "Recent research on team and organizational diversity: SWOT analysis and implications", *Journal of Management*, Vol. 29 No. 6, pp. 801-830.

Joshi, A., Liao, H. and Roh, H. (2011), "Bridging domains in workplace demography research: a review and reconceptualization", *Journal of Management*, Vol. 37 No. 2, pp. 521-552.

Joshi, A. and Roh, H. (2009), "The role of context in work team diversity research: a meta-analytic review", *Academy of Management Journal*, Vol. 52 No. 3, pp. 599-627.

Kanfer, R. and Ackerman, P.L. (2004), "Aging, adult development, and work motivation", *Academy of Management Review*, Vol. 29 No. 3, pp. 440-458.

Lawrence, B.S. (1997), "The black box of organizational demography", *Organization Science*, Vol. 8, pp. 1-22.

Ling, Y. and Kellermanns, F.W. (2010), "The effects of family firm specific sources of TMT diversity: the moderating role of information exchange frequency", *Journal of Management Studies*, Vol. 47 No. 2, pp. 322-344.

Mayr, R. (2011), "Top Management team age structure and firm performance", Unpublished doctoral dissertation, University of St. Gallen, St. Gallen.

Ng, T.W.H. and Feldman, D.C. (2008), "The relationship of age to ten dimensions of job performance", *Journal of Applied Psychology*, Vol. 93 No. 2, pp. 392-423.

Ng, T.W.H. and Feldman, D.C. (2010), "The relationship of age with job attitudes: a meta-analysis", *Personnel Psychology*, Vol. 63 No. 3, pp. 677-718.

Nielsen, B. and Nielsen, S. (2011), "The role of top management team international orientation in international strategic decision-making: the choice of foreign entry mode", *Journal of World Business*, Vol. 46 No. 2, pp. 185-193.

Nielsen, B.B. and Nielsen, S. (2013), "Top management team nationality diversity and firm performance: a multilevel study", *Strategic Management Journal*, Vol. 34 No. 3, pp. 373-382.

Nielsen, S. (2010), "Top management team diversity: a review of theories and methodologies", *International Journal of Management Reviews*, Vol. 12 No. 3, pp. 301-316.

Pelled, L.H., Eisenhardt, K.M. and Xin, K.R. (1999), "Exploring the black box: an analysis of work group diversity, conflict, and performance", *Administrative Science Quarterly*, Vol. 44 No. 1, pp. 1-28.

Pettigrew, A., Massini, S. and Numagami, T. (2000), "Innovative forms of organising in Europe and Japan", *European Management Journal*, Vol. 18 No. 3, pp. 259-273.

Pfeffer, J. (1983), "Organizational demography", in Cummings, L.L. and Staw, B.M. (Eds), *Research in Organizational Behavior*, JAL Press, Greenwich, CT, Vol. 5, pp. 299-357.

Priem, R.L., Lyon, D.W. and Dess, G.G. (1999), "Inherent limitations of demographic proxies in top management team heterogeneity research", *Journal of Management*, Vol. 25 No. 6, pp. 935-953.

Sato, D. (2008), "Toppu manejimento kenkyu no bunseki sikaku (Methods and perspectives in top management research)", *Kaihatsu Ronsyu*, Vol. 82, pp. 121-152.

Simons, T., Pelled, L.H. and Smith, K.A. (1999), "Making use of difference: diversity, debate, and decision comprehensiveness in top management teams", *Academy of Management Journal*, Vol. 42 No. 6, pp. 662-673.

Simsek, Z., Veiga, J.F., Lubatkin, M.H. and Dino, R.N. (2005), "Modeling the multilevel determinants of top management team behavioral integration", *Academy of Management Journal*, Vol. 48 No. 1, pp. 69-84.

Tajfel, H. (1981), *Human Groups and Social Categories*, Cambridge University Press, New York, NY.

Tihanyi, L., Ellstrand, A.E., Daily, C.M. and Dalton, D.R. (2000), "Composition of the top management team and firm international diversification", *Journal of Management*, Vol. 26 No. 6, pp. 1157-1177.

Toyo Keizai (2010), *Yakuin Shikiho (Quarterly Journal Profiling Executives*), Toyo Keizai Shinposha, Tokyo.

Tsui, A.S. and Gutek, B.A. (1999), *Demographic Differences in Organization*, Lexington Books, Lanham, MD.

van Knippenberg, D. and Schippers, M.C. (2007), "Work group diversity", *Annual Review of Psychology*, Vol. 58, pp. 515-541.

Wiersema, M.F. and Bantel, K.A. (1992), "Top management team demography and corporate strategic change", *Academy of Management Journal*, Vol. 35 No. 1, pp. 91-121.

Williams, K.Y. and O'Reilly, C.A. (1998), "Demography and diversity in organizations: a review of 40 years of research", in Staw, B.M. and Cummings, L.L. (Eds), *Research in Organizational Behavior*, JAI Press, Greenwich, CT, Vol. 20, pp. 77-140.

Zhang, Y. and Rajagopalan, N. (2004), "When the known devil is better than an unknown god: an empirical study of the antecedents and consequences of relay CEO successions", *Academy of Management Journal*, Vol. 47 No. 4, pp. 483-500.

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