Empirical Study on the Relationship between Executive-employee Pay Gap and Firm Performance: the Moderating Role of Technology Intensity

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paper adopts sub-sample comparison analysis method, chooses Abstract: This 191 technology-intensive firms and 644 labor-intensive firms in manufacturing industry over 2008-2012 as the sample, examines the moderating effect of technology intensity on the relationship between Executive-employee pay gap (EEPG) and firm performance in Chinese manufacturing industry. The multiple linear regression results do confirm that the relationship between the two is sensitive to technology intensity. Results show EEPG does have a positive effect on firm performance for either technology-intensive or labor-intensive enterprises, but for the former the positive relationship is very weak and tends to focus more on organizational justice theory. Relatively, for the latter, the positive correlation is very significant, much stronger, and more in line with tournament theory. Our finding suggests that technology intensity negatively moderates the relationship between EEPG and firm performance, which can reconcile the extant disagreements on performance consequences of EEPG among scholars to a large degree and provide some guidance for firms of different industries in designing rational EEPG practically too.

Introduction

Incentives Pay, as a frequently used business incentives, has always been a hot issue in both business and theorists especially its real effect on firm performance. Executive-employee pay gap(EEPG), as one of the main incentives pay ways, is the key topic of corporate governance in China, and its wide executive-employee pay disparities is receiving more and more attention from scholars across the world (Patrick E. Downes, 2014) [1]. When it comes to the issue of EEPG, it usually means employers take the whole firm as a team and set compensation policy based on ordinal rank. And EEPG reflects the allocation of social resources within a firm, its effect on firm performance express the distribution efficiency. EEPG has key effects on employees' behavior and attitudes, which would make great significance to improve organizational performance (Flora F.T. Chiang, 2010) [2]. According to the opinion of Henderson and Fredrickson (2001) [3], there are two main competing theoretical views on the topic of performance consequences of EEPG, respectively organizational justice theory proposed by Adams (1963) [4] from the behavioral view and tournament theory proposed by Lazear & Rosen (1981) [5] from the economic view. And at present, scholars have not reached a consensus on the performance consequences of EEPG.

Based on the previous literature, obviously, EEPG is a double-edged sword which can improve or harm firm performance. That means the function mechanism of EEPG's performance consequences is complicated and it is difficult to grasp accurately. Logically inferring, EEPG does have both positive effect argued by tournament theory and negative effect argued by behavioral theory on firm performance simultaneously, and each effect has its prerequisites for reaching a dominant position compared with the other effect. That is to say, different contingent factors will moderate the relative strength of the two opposite effects. Under certain condition, positive effect due to interpersonal competition and material incentive derived by higher EEPG will overcome the negative effect; On the other hand, under other conditions, negative effect due to counterproductive behavior and dissatisfaction derived by higher EEPG will exceed the positive effect. Consequently, for scholars, it is critical to find out such contingent factors and further investigate its moderating effect on the relationship between EEPG and firm performance. This study takes technology intensity as the critical contingent variable and tries to discuss the moderating effect of technology intensity on the relationship between EEPG and firm performance.

Literature review and hypotheses

Tournament theory demonstrates that when the monitoring cost on agents and employees is rather high, the principal will try to motivate them adopting their ordinal rank instead of the absolute performance. Since the winner in the tournament will get most of the prizes, while the losers will even get nothing, the high EEPG will provide the competitors great motivation to try to win. Employees should try to do better than others to get promotion. Eventually, the competition results will improve firm performance. All in all, the tournament theory regards that higher EEPG can lead to higher firm performance. Since the appearance of tournament theory by Lazear and Rosen (1981), many scholars have empirically tested the positive performance consequences of EEPG. For example, Eriksson (1999) [6] takes Denmark firms as the sample, adopting coefficient of variation, and confirms that EEPG is positively with firm performance.

Behavioral view focuses on the influence of EEPG on employees. Different with the tournament theory which supports large EEPG, from the perspective of psychology, behavioral theory regards that EEPG is one of the important components of social psychological and social political environment, which have effects on individual's intentions choice between pursuing his own benefits and cooperating with others for shared goals. The theory holds that large EEPG will lead to the sense of unfairness. Once the dissatisfaction emerges, the work effort will decrease, and the counterproductive effort will occur, eventually the firm performance will be damaged. When employees find that their compensation is much lower than executives , they will feel a sense of been exploited, which will naturally lead to negative workplace behavior, such as uncooperative, free riding, sabotage, strike, and negative attitudes, including carelessness on organizational objectives and the decrease of cohesion and commitment to the firms (Paul D. Sweeney, 1990) [7]. Consequently, firm performance will be affected negatively.

The past literature has investigated the performance consequences of EEPG very deeply, Most of the studies do confirm the existence of the effect of EEPG on firm performance, however the specialized functioning mechanisms, i.e., effect strength and effect nature, have not been reached a consensus. The reason of such complex debates on this issue is that past literature has rarely considered the functioning context of EEPG, which actually determines the final performance consequences of EEPG. Logically reasoning based on theoretical analysis and practical observation, technology intensity may be one of such a critical contingent context variables. The most important and obvious reason is that technology-intensive firm is technology and innovation intensive, and these activities need a higher level of team collaboration among employees, while labor-intensive firm does not need that. So a higher EEPG might lead to hostile competition which could potentially reduce collaboration and harm firm performance(Ying-Fen Lin, et al., 2013) [8]. Therefore, EEPG will have different effects on firm performance under different technology intensities, and we propose the following hypothesis.

H1: Technology intensity can negatively moderate the relationship between EEPG and firm performance.

Method

Sample

Taking Chinese manufacturing listed enterprises in Shenzhen and Shanghai Stock Exchange during 2008-2012 as the subjects to be investigated. According to certain criteria, the paper designs and chooses the suitable sub-sample to ensure the reliability and validity of research. Finally, 191 firms are titled as technology-intensive enterprises belonging to sub-sample TI SS, consisting of 955 firm-years; 664 firms are treated as labor-intensive enterprises belonging to sub-sample LI SS. consisting of 3320 firm-years. Most data are selected from the Financial Research Database of CSMAR and RESSET, and part of the data are selected from the annual reports of listed firms which can supplement the missing data and inaccurate data of the commercial research database.

Measurement

There are there groups of research variables in this study, respectively, explanatory variable, dependent variable and control variable.

Measure of explanatory variable: EEPG is the sole explanatory variable in this study. And one of the most popular measure methods of EEPG is adopted in this study, respectively the absolute pay gap between executives and employees (AEEPG). AEEPG is the difference between executives' average cash compensation and employees' average cash compensation.

Measure of dependent variable: Firm performance is the sole dependent variable in this study, and it is operationally defined as Earnings Per Share (EPS) to test the hypothesis. To be specific, EPS is calculated as the ratio of net profits to share numbers.

Measure of control variables: According to extant literature, firm size (V. Chaiporn, &T. Jittima, 2015) [9], debt to assets ratio (N. S. Sadeghian et al., 2012) [10], ownership concentration (John S. Earle et al., 2005) [11], independent director ratio (Hsiang-Lan Chens, 2014) [12], State-owned shares ratio, the number of Shareholders' Meeting, Shareholders Balance and the number of Directors General Meeting can significantly influence firm performance to different degree by different ways. Therefore, we choose the above constructs as the control variables in this study. Firm size, coded as FS, is measured by the total assets. Debt to assets ratio, coded as DAR. Ownership concentration, coded as OC, is defined as the share holding rate of the first large shareholder. Independent director ratio, coded as IDR: State-owned shares ratio, coded as SOR. Shareholders Balance, coded as SB, is defined as the difference between the share holding rate of the first large shareholder and the share holding rate of the second large shareholder. The number of Shareholders' Meeting and Directors General Meeting is separately codes as SMN and DGMN.

Data's Descriptive statistics and Correlation analysis

By applying SPSS17.0, the descriptive statistics of the research variables of the two samples is executed, and the results show that we have chosen the suitable data for linear regression analysis. According to the results, the mean of AEEPG is 531065.72 (of TI_SS) and 472252.10 (of LI_SS), which means on average executives will get an excess compensation of more than 450 thousands RMB Yuan compared to the employees. Obviously, EEPG of Chinese manufacturing industry has grown to a very high level. Then Pearson correlation analysis among all the research variables of the two samples with 2-tailed significance is executed. The result shows there is a significant correlation between the main variables and it's noteworthy that correlation between EEPG and firm performance is particularly significant, with .101** (of TI_SS) and .261** (of LI_SS), the direction and intensity of the correlation coefficient largely match the research expectation. **Empirical Model**

In this study, we use the method called sub-sample comparison analysis to test the moderating effect of TI. According to the technology intensity level of each firm, we split the whole sample into two sub-samples, respectively TI_SS and LI_SS. TI_SS consists of firms with higher technology intensity, and LI_SS consists of firms with lower technology intensity. We construct Model 1 to compare β' between TI_SS and LI_SS, which is the regression coefficient of EEPG. If β' in TI_SS is significantly smaller than that in LI_SS, then it can be concluded H1 holds.

$$EPS_{i} = \alpha + \beta_{1}^{'}SMN_{i} + \beta_{2}^{'}OC_{i} + \beta_{3}^{'}DGMN_{i} + \beta_{4}^{'}IDR_{i} + \beta_{5}^{'}SB_{i} + \beta_{6}^{'}SOR_{i}$$
$$\beta_{7}^{'}FS_{i} + \beta_{8}^{'}DAR_{i} + \beta_{9}^{'}EEPG_{i} + \varepsilon_{i}$$
(1)

Results and discussion

Empirical analysis results

In order to recognize the different effects of AEEPG on firm performance under different technology intensities and confirm the validity of H1, we use Model 1 to make regression analysis by respectively adopting TI_SS and LI_SS. The results are shown in Tab.1 and Tab.2.

	Unstand	Unstandardized Coefficients			
Model	В	Std. Error	Beta	t	Sig.
1 (Constant)	.328	.103		3.189	.001
SMN	.004	.010	.013	.345	.730
OC	.003	.002	.088	1.223	.222
DGMN	.000	.004	.003	.089	.929
IDR	005	.002	067	-2.069	.039
AEEPG	6.571E-08	.000	.084	2.490	.013
SB	001	.002	033	467	.641
SOR	001	.001	032	941	.347
DAR	002	.000	144	-4.332	.000
FS	2.464E-12	.000	.058	1.686	.092

Table 1. Regression results of Model 1 with TI_SS

a. Dependent Variable: EPS; N=955

Table 2. Regression results of Model 1 with LI_SS

		Unstandardized Coefficients		Standardized Coefficients		
Model		В	Std. Error	Beta	t	Sig.
1	(Constant)	.190	.061		3.110	.002
	SMN	.007	.005	.023	1.246	.213
	OC	.003	.001	.106	2.503	.012
	DGMN	7.968E-05	.002	.001	.034	.973
	IDR	003	.001	034	-2.015	.044
	AEEPG	1.970E-07	.000	.225	12.802	.000
	SB	002	.001	085	-2.080	.038
	SOR	.001	.000	.054	3.047	.002
	DAR	002	.000	114	-6.775	.000
	FS	3.219E-12	.000	.121	6.647	.000

a. Dependent Variable: EPS; N=3220

Discussion

From the Tab.1 and Tab.2, we can know AEEPG does exist a positive impact on firm performance for the two sub-samples. But the comparison between Tab.1 and Tab.2 shows that there is a significant difference between the effects of AEEPG on firm performance under different technology intensities. Specifically, under the condition of high technology intensity, Tab.1 shows that the positive effect of AEEPG on firm performance is small (Beta=0.084, P=0.013). It can be further concluded that if AEEPG was enlarged a little more, the net effect of AEEPG on firm

performance would be negative. However, under the condition of lower technology intensity, AEEPG plays a tournament role and shows a very significant positive effect on firm performance (Beta=0.225, P=0.000), it's much larger than technology-intensive firms. That means most of the firms with lower technology intensity can improve their performance by increasing their present AEEPG generally. So we argue that technology intensity can negatively moderate the relationship between EEPG and firm performance, H1 holds.

Conclusions

EEPG is of strategic meanings to firm performance. However, the effect of EEPG is not fixed and invariable, instead, it is contingent on some conditional variables. We argue that technology intensity is such a conditional variable. Reasonable EEPG design should balance the functions of playing incentive and keeping the sense of equity for employees according to different technology intensity level. This paper investigates the moderating role of technology intensity in the relationship between EEPG and firm performance.

Taking 191 technology-intensive firms and 644 labor-intensive firms in manufacturing industry over 2008-2012 as the sample, then sub-sample comparison analysis are carried on to test the moderating effect of technology intensity on the relationship between EEPG and firm performance. Theoretical analysis and empirical analysis results both confirm that technology intensity can negatively moderate the relationship between EEPG and firm performance. For firms with higher technology intensity, EEPG's positive effect on firm performance is much smaller than firms with lower technology intensity.

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