Rank Volatility of Executive Compensation and Firm Performance: Evidence from Chinese Listed Companies in Manufacturing Industry

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Abstract. The paper investigates the effect of the rank volatility of executive compensation on firm performance by selecting the panel data consisting of 1545 firm-years in Chinese listed manufacturing companies during 2008-2012 as the sample. Empirical analysis based on multiple regression analysis based on OLS by applying SPSS19.0 makes a new finding, i.e, there is a negative relationship between the rank volatility of executive compensation and firm performance, which would still hold with the change of measure methods of the research variables. The better practical choice for the boards to set executive compensation is to keep the stable rank order of the executives’ compensation level within the top management teams, and simultaneously to enlarge executive compensation to a moderate degree.

Introduction

Recent years, the persistent decline in performance improvement of the Chinese listed manufacturing companies has always been focused and criticized by the practitioners, the public, and the press. In order to meet such a practical need for understanding the determination mechanisms of firm performance, the scholars all across the world have paid much attention to the topic of the antecedents of firm performance in manufacturing companies by adopting various research methods, both theoretical and empirical. According to existing literature on firm performance, at least four kinds of antecedents which can determine firm performance to a certain degree: environmental factors (Christensen, & Montgomery, 1981)[1], strategic factors (M. Lam, 2004) [2], organizational factors (Geletkanycz, 2011) [3] and governance factors (Bozec et al., 2010) [4], among which governance factors are receiving the greatest attention. The reason may be that governance factors basically can not only directly determine firm performance by motivating top executives to a large degree, but can influence firm performance indirectly by affecting the strategic and organizational factors.

Executive compensation is the most critical governance factors that can affect firm performance, which is also the hottest issue in investigating how to improve firm performance. As a comprehensive concept in governance mechanisms, each dimension of executive compensation has been studied deeply from various perspectives. For example, executive compensation level can affect firm performance negatively or positively (Zhongyi Xiao et al., 2013) [5], executive pay-performance sensitivity can improve firm performance (Z. Dai et al., 2011) [6], moderate executive pay gap within the top management teams (TMTs) can do good to firm performance (Shuo Wang, & Chang-zheng Zhang, 2015) [7], and executive-employee
pay gap can improve firm performance (Faleye et al., 2013) [8], etc. Though rich research contributions have been made on the relationship between executive compensation and firm performance, the effect of rank volatility of executive compensation (RVEC), a special dimension of executive compensation, on firm performance has been ignored. In fact, RVEC can determine the executives’ satisfaction on their compensation to a good degree and further affect firm performance logically, according to the common sense of psychological science and organizational behavior science. Therefore, in order to fill this gap, the paper tries to investigate the relationship between RVEC and firm performance by taking the Chinese listed manufacturing companies as the sample.

The remainder is arranged as follows. Section 2 is the theoretical analysis and hypothesis. Section 3 is the sample and data. Section 4 is the empirical results. Section 5 provides the discussion and conclusions.

**Literature and Hypothesis**

According to tournament theory, executive compensation gap can improve firm performance by stimulating the top executives to work harder and harder in order to win the competition within the TMTs (Hambrick, & Siegel, 1997) [9]; while according to the behavioral theory, executive compensation gap can hinder firm performance by damaging the fairness feelings of the top executives when they compare their compensation with their peers with much higher compensation within the TMTs (Henderson, & Fredrickson, 2001) [10]. Consequently, executive compensation gap has unclear effects on firm performance in existing literature. Therefore, there is a need for scholars to search a new dimension of executive compensation which can affect firm performance in a clearer manner. Then it comes to RVEC in this research. We argue that RVEC can negatively affect firm performance for several reasons.

First, high RVEC means the unstable power allocation within the TMTs, which will do harm to firm performance. CEO is the core of the TMTs, he or she should keep the highest power than the other executives. At the same time each executive should have their own status, higher or lower than certain peers, within the TMTs. Executives with higher status or power can direct their peers with lower status. Such a stable power allocation can prompt the decision-making and decision-execution effectiveness. Otherwise, an unstable power allocation would simulate the struggle among executives, especially it is true in China. The compensation level in a TMT would represent power level of the top executives under the background of Chinese traditional culture, where compensation has great symbolic significance in signaling people’s status level in each aspects. Therefore, too high RVEC would lead to a negative psychological reaction among the executives who ever take the higher status. Such reactions would damage cooperation among top executives and lead to poor firm performance.

Second, high RVEC would lead to the strategy instability of the firms, which would naturally hinder firm performance. High RVEC usually means the core group of the top managers changes too frequently. Since the core group determines the firm strategy, the change of the components of the core group would lead to different firm strategies. High instability of firm strategy would waste the resources which have been invested for the previous strategy, and damage the enthusiasm of the front-line employees, and finally firm performance would be affected negatively.

Third, high RVEC would mislead employees’ attention and prevent employees from paying great attention to their own job. For one thing, high RVEC would usually lead to the change of
the status of each executive. Such a fact would lead to that the subordinates under a certain executive usually experience the changes between good emotion and poor emotion, which would naturally affect the work emotions of the employees. They are always under a fear of facing the emotion change of their leaders and try their most effort to deal with the anger or irritability of their leads, while little attention is left for working harder. For another thing, since high RVEC would lead to the too frequent change of firm strategy, the effort of employees usually gets valueless under new strategies. So the reasonable choice of the employees is to only taste their work, or do their job at a speed far from the satisfying one. Such scamping behavior would inevitably accompany higher RVEC. Therefore, there should be a negative relationship between firm performance and RVEC.

According to the above discussion, we can propose the following hypothesis:

H1: RVEC has negative effect on firm performance.

Methods

Measures

RVEC. Based on the views of *Haksoon Kim (2014)* [11], the paper measures RVEC as follows: If the executive with the first highest compensation in the last year does not hold the first place any more for the sample year, then RVEC1 is coded as 1, otherwise is 0; If the executive with the second highest compensation in the last year does not hold the second place any more for the sample year, then RVEC2 is coded as 1, otherwise is 0; Following this rule, RVEC3, RVEC4 and RVEC5 are defined in the same way. RVEC is the sum of RVEC1, RVEC2, RVEC3, RVEC4 and RVEC5.

Firm performance. Drawing on the view of *Ibrahim and Lloyd (2011)* [12], firm performance is measured by EPS, ROA and ROE respectively. EPS is taken as main measure of firm performance for hypothesis test, while ROA and ROE are taken as the substitutes for robustness test.

Control variables include marketization index (MI), ration of independent directors (RID), ratio of state-owned ownership (RSO), logarithm of executive compensation gap (LNECG), logarithm of executive compensation (LNECL), financial expense ratio (FER), management expense ratio (MER), logarithm of firm size (LNFS).

Table 1. Descriptive statistics and correlation coefficients.

<table>
<thead>
<tr>
<th></th>
<th>Mean</th>
<th>S.D.</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. MI</td>
<td>9.347</td>
<td>1.946</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. RID</td>
<td>34.604</td>
<td>9.204</td>
<td>-.085**</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. RSO</td>
<td>4.161</td>
<td>12.547</td>
<td>.013</td>
<td>.005</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. LNEPG</td>
<td>11.522</td>
<td>1.2189</td>
<td>.128**</td>
<td>.000</td>
<td>-.034</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. LNEPL</td>
<td>13.136</td>
<td>.802</td>
<td>.224**</td>
<td>-.039</td>
<td>.027</td>
<td>.683**</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. FER</td>
<td>.023</td>
<td>.077</td>
<td>-.040</td>
<td>.007</td>
<td>-.064*</td>
<td>-.017</td>
<td>-.032</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. MER</td>
<td>.125</td>
<td>.577</td>
<td>-.024</td>
<td>.008</td>
<td>-.022</td>
<td>-.002</td>
<td>-.043</td>
<td>-.161**</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8. LNFS</td>
<td>22.233</td>
<td>1.258</td>
<td>.122**</td>
<td>-.018</td>
<td>.053</td>
<td>.317**</td>
<td>.587**</td>
<td>.121**</td>
<td>-.119**</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>9. RVEC</td>
<td>2.264</td>
<td>1.854</td>
<td>-.064*</td>
<td>.056</td>
<td>-.069**</td>
<td>-.066**</td>
<td>.027</td>
<td>.089**</td>
<td>-.001</td>
<td>.077**</td>
<td>1</td>
</tr>
</tbody>
</table>

** represents significance level of 0.05
*** represents significance level of 0.01
Sample
Taking the listed manufacturing companies which exist during 2008-2012 in Shanghai and Shenzhen stock exchange as the sample framework, we select the research sample according to the following rules: (1) The firms which went public before 2007 should be removed; (2) The firms which were punished publicly by the government authorities for any reasons should be removed; (3) The firms should have a normal status for stock trading which should not be marked with ST, PT, SST, or *ST, etc.; (4) The firms should disclose all the data that we need in this study according to our measure design; (5) The firms should run relatively normally and smoothly, i.e., the firms whose financial data contain the singular data, too high financial loss, or too high net profit should not be allowed. According to such rules, 309 firms are chosen, and a sample consisting of 1545 firm-years are designed. The descriptive statistics analysis and correlation analysis results are shown in Table 1.

Empirical Test
Main Results
In order to test H1, we design Model 1 based on OLS which takes ROA as the dependent variable, RVEC as the predictor, and MI, RID, RSO, LNEPG, LNEPL, FER, MER and LNFS as the control variables.

\[
ROA = \alpha + \beta_1 RVEC + \beta_2 MI + \beta_3 RID + \beta_4 RSO + \beta_5 LNEPG + \beta_6 LNEPL + \beta_7 FER + \beta_8 MER + \beta_9 LNFS + \varepsilon
\]

(1)

The paper makes the regression analysis on Model 1 by adopting the panel data with 1545 firm-years. Results are shown in Table 2.

<table>
<thead>
<tr>
<th>Model 1</th>
<th>Unstandardized Coefficient</th>
<th>Standardized Coefficient</th>
<th>T</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>B</td>
<td>Standardized Error</td>
<td>( \beta )</td>
<td></td>
</tr>
<tr>
<td>Constant</td>
<td>-2.93</td>
<td>2.727</td>
<td>-1.07</td>
<td>.915</td>
</tr>
<tr>
<td>MI</td>
<td>-0.017</td>
<td>0.073</td>
<td>-0.006</td>
<td>.817</td>
</tr>
<tr>
<td>RID</td>
<td>-0.017</td>
<td>0.015</td>
<td>-0.028</td>
<td>.268</td>
</tr>
<tr>
<td>RSO</td>
<td>0.007</td>
<td>0.011</td>
<td>0.017</td>
<td>.501</td>
</tr>
<tr>
<td>LNEPG</td>
<td>0.379</td>
<td>0.157</td>
<td>0.008</td>
<td>.813</td>
</tr>
<tr>
<td>LNEPL</td>
<td>.855</td>
<td>.284</td>
<td>1.24</td>
<td>.003</td>
</tr>
<tr>
<td>FER</td>
<td>-12.604</td>
<td>1.824</td>
<td>-1.77</td>
<td>.000</td>
</tr>
<tr>
<td>MER</td>
<td>-1.147</td>
<td>.242</td>
<td>-1.20</td>
<td>.000</td>
</tr>
<tr>
<td>LNFS</td>
<td>-2.78</td>
<td>.139</td>
<td>-0.63</td>
<td>.045</td>
</tr>
<tr>
<td>RVEC</td>
<td>-2.04</td>
<td>.075</td>
<td>-0.068</td>
<td>.277</td>
</tr>
<tr>
<td>R</td>
<td>.250</td>
<td>R²</td>
<td>0.62</td>
<td>.057</td>
</tr>
<tr>
<td>F</td>
<td>11.354</td>
<td>Model Sig.</td>
<td>0.00</td>
<td>N</td>
</tr>
</tbody>
</table>

Note: Dependent variable is ROA.
In Table 2, the regression coefficient of RVEC is -0.068 (T=-2.711, P<0.01). That means H1 is confirmed. Our data supports that EVEC has significant and negative effects on firm performance. To a certain degree, the effect is higher than that of executive compensation gap on firm performance, which has always been investigated heavily since 2000 (K.W. Lee et al., 2008) [13].

Robustness Test
In order to test the robustness of the empirical results, two more things are done. First, the paper uses respectively ROE and EPS as the alternative measure of performance, and takes the refined Model 1 to match the data. Results show that, when ROE is the measure of firm performance, the coefficient of RVEC is -0.055(T=-2.301, P<0.05), while when EPS is the measure of firm performance, the coefficient of RVEC is -0.060(T=-2.502, P<0.05). H1 still holds. Second, the paper uses “RVEC1+RVEC2+RVEC3” as the alternative measure of RVEC, which only focuses on the top three core executives instead of the top five core executives. The data analysis results confirm to H1 again. That is to say, our empirical results are robust enough, which would not change with the change of the measure methods of the dependent variable or the independent variable.

Conclusions
Though the effect of executive compensation on firm performance has been investigated by large amounts of empirical studies, the role of rank volatility of executive compensation in determining firm performance has not been explored by the existing literature. By taking 1545 firm-years in the manufacturing listed firms during 2008-2012 as the research sample, applying multiple regression method based on OLS as the data analysis method, the paper empirically investigates the relationship between RVEC and firm performance.

Theoretical analysis and empirical results both confirm that RVEC has negative effects on firm performance, which is even higher than that of executive compensation gap on firm performance. It is a new finding in the fields of the determination mechanisms of firm performance which has never been made. According to this finding, the ranks of the top executives’ compensation level should not be changed too frequently. Instead, firms should keep such ranks at a relatively stable status, which is helpful to improve the cooperation effectiveness and collaboration willingness within the TMTs. It is better for a firm to keep lower RVEC than to enlarge executive compensation gap in order to improve firm performance.

There are limitations for this research. First, data are limited into manufacturing industry, which would weaken the validity of the results in the other industries; Second, the measure of firm performance has not consider the long-termed indexes, which would limit the reasonability of the conclusions in improving long-termed firm performance; Finally, only eight control variables are chosen in the regression model, which would inevitably face the risk of the confusion of the independent variable’s effect. In the future, the three points should be addressed seriously.

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