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Research on Enterprise Salary Compensation Mechanism in the Context of Internet Era
Which Factor Influences Director Compensation-Taking Internet Enterprises as an Example

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ABSTRACT
This paper is based on incentive theory to analyze which factors will influence director compensation. We search data from 2017-2020 American internet firms, through correlation analysis we find a weak relationship between director compensation and these factors. Then we find director compensation is in a normal distribution, and calculate the mean of the normal distribution. The outcome implies the mean has a significant linear relationship with the NASDAQ index. This paper put forward a new hypothesis, director compensation fulfills normal distribution and companies to fine-tune their pay policies based on market averages level.

Keywords*: director compensation; CEO compensation; firm performance; cronyism*

1. INTRODUCTION

Numerous studies have examined board equity incentive plans, but have reached contradictory conclusions or found evidence of a disconnect between incentive payments and performance, and have even called into question board cronyism in CEO appointments, prompting calls for changes in board control and managerial incentives. After the Enron, WorldCom, and other large company scandals, more and more researchers become caring about ethical danger of conspiracy between directors and CEOs.

In 2006 Ivan Brick et al. brought forward cronyism, they find that CEO compensation is highly correlated with board member compensation, and that boards that are well compensated do not have sufficient incentives to monitor CEO behavior to the detriment of shareholders, and that the higher the proportion of inside directors, the more pronounced this complicity will be. And in 2004 Bernard Black et al. further show that board members receive much higher compensation than their fair share. Based on these theories, we try to build a regression model of director compensation and other factors which probably will influence., e.g. firm net interest, firm assets, wage index, CPI. We try to verify the above theory, but the outcome is beyond our expectations. The outcome implies that director compensation has limited relationships with all factors.

Following our debate and deliberation, we consider that the following factors contributed to this outcome: (1) Due to the many business strategies of Internet enterprises, Ivan Brick's thesis is not fully applicable. Today's Internet firms operate in substantially different ways than when the thesis was published in 2006. Internet firms' net profit no longer accurately reflects the company's operational realities. Using Amazon as an example, its book profit has remained low, but its cash flow has consistently increased, so even though its net profit is low, it can still keep the firm functioning and expanding well. Scott Linn also mentioned in the article that firms with more investment prospects will pay more; that is, a startup company with lower net profit but greater vitality will pay more than an established company with high net profit. Salary of the Board of Directors [1]. However, quantifying how many investment possibilities a firm has is always a challenge for researchers. (2) Changes in CEO and Director compensation policies. The compensation composition of managers has gotten

increasingly diversified and intricate as time and society have progressed. Previously, executive compensation was made up of a basic salary and spot stock awards. With the advent of complex financial derivatives such as RSUs (Restricted Stock Units), calculating the precise value of salary has grown increasingly challenging, affecting the accuracy of data to a certain extent. Many CEOs nowadays, for example, are paid a basic salary of merely one dollar. (3) The smaller sample size also had an impact on the statistics. Because our sample data was limited and focused on the same field, the final results suffered as a result.

Despite the above arguments, it also explains to some extent why previous theories were unable to properly capture the current situation. Today's director compensation scheme appears to be more complicated and disorganized. Then we find director compensation is in a normal distribution, and we calculate the mean of the normal distribution. And the mean has a strong relationship with the NASDAQ index, CPI, and American average net compensation. At last, we build a linear regression model of the mean between the NASDAQ index, improving our hypothesis.

There are four parts in this paper. Part 1 briefly introduces research purposes and background. Part 2 introduces our methodology and sample data. In part 3 we analyze these data. And in the last part we draw our conclusion.

2. DATA AND METHOD

We draw case samples from the period 2017 to 2020, collecting their data about director compensation, CEO compensation, net income, total asset. The samples consist of Twitter, Apple, Meta, Akamai, Splunk, Microsoft, Alphabet, Amazon eight firms. They are all famous internet firms and have variance compensation policies.

Then we collect CPI and American Average net compensation data from the United States Census Bureau. Then we try to use the Person correlation analysis method, which is used to test the relationship between two data, its variance from +1 to -1. +1 means a completely positive relationship, -1 means a completely negative relationship, 0 means having no relationship at all. In a common situation, we think two data have a significant relationship if their Person correlation coefficient is higher than 0.75. According to the theory of Ivan Brick, director compensation would have a strong positive relationship with executive compensation, but have a high negative relationship with net income because of the Cronyism effect [2]. So, we use director compensation to make Pearson correlation analysis with some factors that would be influenced, try to improve this theory. And the outcome implies in the following table.

Table 1. Relationship between director compensation and other factors

	Pearson correlation coefficient
Director Compensation	1.000
Net income	-0.090
Executive compensation (TOP5 Average)	0.461
Stock price(highest)	0.376
Total assets	0.211
NASDAQ (highest)	0.483
American Average net compensation	0.434
CPI	0.432

3. RESULT AND DISCUSSION

These findings exceeded our expectations, and neither director compensation nor these variables were shown to be substantially associated. This is not just contradictory to Ivan Brick's hypothesis, but also contradictory to certain other hypotheses. According to incentive theory, director compensation will have a strong positive correlation with a company's total asset, because managing a larger organization should be rewarded more. However, as seen by the table data, this idea is not entirely consistent.

However, over the course of our data collection, we discovered that most directors' incomes fluctuated between $150,000 and $600,000, with the majority of directors' salaries clustered around $300,000, which fulfills the features of a normal distribution. As a result, we fitted the yearly director remuneration data from 2017 to 2020 to a normal distribution. The result is shown below:

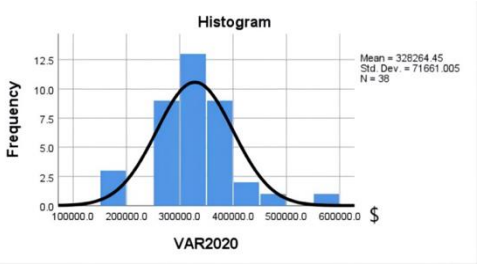

Figure 1 Normal distribution of 2020 director compensation

As figure1 is shown, data fulfill the features of a normal distribution. Then we draw the P-P Plot for it, and make a significance test. The significance test is used to judge whether our hypothesis has a significant difference from the real situation. In common, when the asymptotic significance>0.01, imply these data can be fitted, when

the asymptotic significance>0.05 means the fitting level is high.

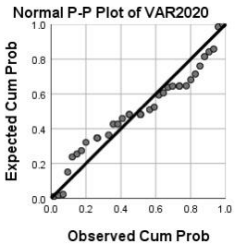

Figure 2 P-P Plot

P-P Plot is a kind of measure to judge whether sample data fit a well normal distribution. The P-P plot compares data distribution with several theoretical models, using the empirical cumulative distribution function and cumulative distribution functions of normal. A model which fits the data well should plot approximately as the y = x line. And as figure 2 is shown, sample data is basically located in the diagonal line of the P-P Plot. That implies these data match on a normal distribution.

One-Sample Kolmogorov-Smirnov Test

		VAR2020
N		38
Normal Parameters[a,b]	Mean	328264.447
	Std. Deviation	71661.0046
Most Extreme Differences	Absolute	.143
	Positive	.143
	Negative	-.137
Test Statistic		.143
Asymp. Sig. (2-tailed)		.049[c]

a. Test distribution is Normal.

b. Calculated from data.

c. Lilliefors Significance Correction.

Figure 3 Significant Test of 2020 director compensation

As figure 2 and figure 3 shown, the data which have been fitted deviated slightly at P-P Plot, and match on a normal distribution. After calculating, we come up that Asymp. Sig.=0.049 means the fitting level is high. After that, we handle the data from2017 to2019 in the same way, then come up with their mean, std. deviation, and asymptotic significance. The result is shown below:

Table 2 Normal distribution data of director compensation from 2017 to2020

	2020	2019	2018	2017
Mean	328264.45	322236.78	318495.57	319232.27
Std. Deviation	71661.00	83973.59	69684.39	68035.07
N	38	37	38	36
Asymp. Sig.	0.049	0.051	0.043	0.055

Then we make a correlation analysis between the mean of every year data and other factors. The outcome implies the meaning has significantly strong positive relationships with these three factors. Especially with the NASDAQ index, the correlation coefficient equals 0.966 which is quite high.

Table 3 Relationship between director compensation and other factors

	Pearson correlation coefficient
NASDAQ (highest)	0.966
American Average net compensation	0.881
CPI	0.880

Then we use the NASDAQ index as the independent variable, the mean of direction compensation as the dependent variable. Trying to build a linear regression model. The result is shown below:

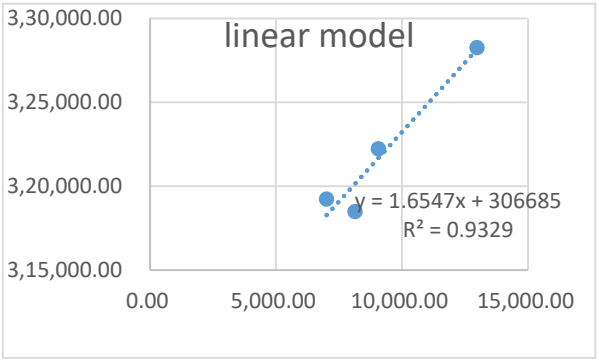

Figure 4 linear regression equation

The regression equation is modeled: y=1.6547x+306685. (y: director compensation; x: NASDAQ index);

The model fit is tested using R^2(Nash – Sutcliffe model efficiency coefficient), with a variance higher than 0.8 suggesting a good fit.

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.966[a]	.933	.899	1409.61457

a. Predictors: (Constant), VAR00002

Figure 5 efficiency coefficient test

The outcome is R^2=0.933, very close to 1, which implies our model has a high significance. There is an obvious linear relationship between the NASDAQ index and the mean of director compensation.

4 CONCLUSION

In this paper, to some extent, we find that director compensation of internet companies and net income in other companies and asset are only limited correlated, which is determined by the industry characteristics of internet companies with low book profits and more intangible assets to some extent. Therefore, previous theories can no longer describe the situation accurately and completely.

As the research continues, we found that director compensation in the same year is in line with normal distribution. After fitting the data to the normal distribution curve, we found that this is indeed the case. Moreover, if the mean and NASDAQ indexes of different years are analyzed, it can be found that there is a strong positive correlation between them. Therefore, by trying to establish a linear regression equation with NASDAQ index as the independent variable and mean of director compensation as the dependent variable, we found the following results: y=1.6547x+306685(y is mean of director compensation, x is NASDAQ index）. We test its validity, and then come to the conclusion of R^2=0.933, whose validity is high.

The above results may indicate a possibility, so we put forward a new hypothesis. The design of director compensation policy is not like CEO compensation, and the company will not spend a lot of energy to design the most idealized and motivating policy. Instead, it makes some modifications according to the existing average salary in the market as an anchor point, which depends on the performance of the stock in the market in turn, as mentioned in Farrell K A's article [3]. It is not difficult for us to infer the reason for doing so, because the salary of independent directors accounts for a relatively small proportion of the operating cost of the company, and its direct impact on the operation of the company is far less than that of the managerial level [4]. Therefore, rather than expending effort on devising a more rational pay policy, it may be more rational for companies to fine-tune their pay policies based on market averages.

In this paper, we only put forward a new hypothesis, but we hope to provide a new idea for future researchers. At the same time, more efforts are needed to further explore this problem.

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