Research about the Influence of Incentive Method towards Executive and Corporation Performance Based on Multiple Regression Model

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Abstract. With the advent of economic globalization, the corporation plays a vital role in the development of economy. Contemporary society is confronted with a common difficulty that how to manage corporations effectively, and how to maximize corporation revenue. According to the Principal Agent Theory, the division of ownership and management right makes it limited to develop corporations. This paper intends to explore how to improve the corporation performance by providing executives with proper incentive system, based on the Incentive Theory. Furthermore, we use statistical software SPSS to validate the relationship between incentive method toward executive and corporation performance based on multiple regression model, and hope that the result of this paper could bring realistic meanings to contemporary enterprises.

Keywords: Multiple Regression, Principal Agent Theory, Incentive Theory, SPSS

1 Introduction

Stockholding system is a common structure among large company nowadays. Stockholders are owners of company, while senior executives are decision makers and administrators, whose operation directly affect company performance and prospect, as well as benefit of stockholders. However, increase of senior executive's income sometime contradict to long-term profit of company, as well as that of stockholders. So an appropriate incentive method towards them seem to be considerably important to healthy development of company.

Selecting and implementing effective incentive method is always a difficult task in human resource field. Because human's demand can be classified in several levels, which is raised by Maslow, while senior executives usually desire something other thansalary after their basic need is satisfied. So a valid incentive method should put that into consideration. In this paper, we will propose a theory of multivariate regression analysis to think about the effect of various incentive methods on senior executive and company performance.

Currently, most state-of-the-art incentive theories are based on general staff, and those research working on senior executive merely concerned their salary, which lack diversity and comprehensiveness of analyze on incentive method. We address basic salary, shareholding ratio of senior executives, and company recognition from society in our proposed method, and it is apparently more convictive.

As increasing private enterprises show up and develop in China, we hope to take reference on successful companies overseas, bring appropriate manage patterns back to native enterprises, and motivate the most of their potential.

2 Background

2.1 Data selection

In this paper, we mainly consider CEO (Chief Executive Officer), CFO (Chief Financial Officer), and those whose salary and shareholding ratio is mentioned in annual reports as our research targets. There are two reasons of this choice: (1) These people are decision makers but not the owners of company; (2) The data of their salary and shareholding ratio can be obtained directly from Proxy Statement on the website of SEC (Securities and Exchange Commission).

Usually, the salaries of senior executives are made up of base salary, bonus, stock award and particular award differ from each company. For the unity of data in comparison, we use base salary as their specific emolument.We also use company reputation score published by Reputation Institute as index of each company's reputation, because Reputation Institute conducts global survey and evaluates each large company in seven aspects, including product/services, innovation, workplace, governance, citizenship, leadership and financial performance, which ensure the authority of its results.Moreover, we consider earnings per share as the indicator to company performance, for it can represent the operating result of one company during a particular period objectively.

2.2 relevant theory

Principal agent theory mainly concerns about the agency relationship between stockholders and senior executives who are hired by board of directors according to the ideas of those stockholders. Jensen and Meckling[1] believed that the separation of ownership and control power result in the behavior that senior executives give up the benefit of stockholders and chase their own profit, which generates agency cost. Because those senior executives are usually not the possessors of companies, they may acquire only a small proportion of earnings after they undertake all responsibility and do their best to operate the companies, especially when they take companies' long-term interests into consideration. Murphy and Jensen[2] put forward that the key to the improvement of relation between principal and agent is the reduction of agency cost. Based on the principal agent theory, principal must provide appropriate incentive or benefit to agent such as senior executives, and make thorough as well as specific contract in order to lower agency cost. As a result, agents will maximize interests of principal and insure their own profit at the same time.

Maslow's hierarchy of needs[5] present that humans are all in need, while the desire to meet their need is also the motivation and stimulation to their work. These need can be classified into several levels, sorted as physiological, safety, belongingness and love, esteem, self-actualization, and self-transcendence. After basic level is satisfied, humans will start to chase stronger sense of achievement to meet higher level need, which may include incentive and reputation mentioned in our research.

3 Modeling

Based on the research framework in this paper, we take earnings per share (EPS) as dependent variable, salaries of of senior executives, shareholding ratio and company reputation as independent variables. Therefore, a multiple regression model about the influence of incentive method towards executive on corporation performance is built and shown as follows:

$$B = \alpha_1 + \alpha_2 \cdot salary + \alpha_3 \cdot share + \alpha_4 \cdot reputation \qquad (1)$$

where $B, salary, share, reputation$ denote EPS, basic salary of senior executives and company reputation.

4 Experiments

4.1 data collection

The object of this research is the American public company. In this paper, three IT companies—Apple, Google and Intel—are chosen as the objects. The reason is that competition among IT companies becomes more serious nowadays. Once there emerge sometroubles and problems about the management of a company, it would be easy for this company to quit the market. Therefore, there exists a relatively strong relationship between incentive methods towards senior executives and corporation performance.

In this paper, we collect relevant data of these three companies through American Securities and Exchange Commission (SEC). SEC is authoritative and publishes all required reports such as annual reports of public corporations every year. After persistent research, we succeed in finding what we want from corresponding reports.

(1) In *financial statements and supplementary data* of *10-K* (see Fig. 1), we could find the total number of restricted stock units of a company each year (which denotes Tr).

Restricted Stock Units

A summary of the Company's RSU activity and related information for 2015, 2014 and 2013, is as follows:

	Number of RSUs (in thousands)		Weighted-Average Grant Date Fair Value Per Share	Aggregate Intrinsic Value (in millions)
Balance at September 29, 2012	105,037	$	49.27	
RSUs granted	39,415	$	78.23	
RSUs vested	(42,291)	$	45.96	
RSUs cancelled	(8,877)	$	57.31	
Balance at September 28, 2013	93,284	$	62.24	
RSUs granted	59,269	$	74.54	
RSUs vested	(43,111)	$	57.29	
RSUs cancelled	(5,620)	$	68.47	
Balance at September 27, 2014	103,822	$	70.98	
RSUs granted	45,587	$	105.51	
RSUs vested	(41,684)	$	71.32	
RSUs cancelled	(6,258)	$	80.34	
Balance at September 26, 2015	101,467	$	85.77	$ 11,639

Fig. 1

(2) In *security ownership of certain beneficial owners and management* of *Proxy Statement* (see Fig. 2), we could find shares of common stock owned by senior executives (which denotes C) and the total number of corporation common stock (which denotes Tc).

**SECURITY OWNERSHIP OF
CERTAIN BENEFICIAL OWNERS AND MANAGEMENT**

The following table shows certain information as of January 5, 2015 (the "Table Date"), unless otherwise indicated, with respect to the beneficial ownership of the Company's common stock by: (i) each person the Company believes beneficially holds more than 5% of the outstanding shares of the Company's common stock based solely on the Company's review of SEC filings; (ii) each director and nominee; (iii) each named executive officer listed in the table entitled "Summary Compensation Table—2014, 2013, and 2012" under the section entitled "Executive Compensation"; and (iv) all directors and executive officers as a group. As of the Table Date, 5,825,955,000 shares of the Company's common stock were issued and outstanding. Unless otherwise indicated, all persons named as beneficial owners of the Company's common stock have sole voting power and sole investment power with respect to the shares indicated as beneficially owned. In addition, unless otherwise indicated, the address for each person named below is c/o Apple Inc., 1 Infinite Loop, Cupertino, California 95014.

Name of Beneficial Owner	Shares of Common Stock Beneficially Owned(1)	Percent of Common Stock Outstanding
BlackRock, Inc.	317,371,796(2)	5.45%
Angela Ahrendts	55,531(3)	*
Tim Cook	950,767(4)	*
Eddy Cue	22,229(5)	*
Mickey Drexler	14,056(6)	*
Al Gore	716,765(7)	*
Bob Iger	42,637(8)	*
Andrea Jung	164,185(9)	*
Art Levinson	1,534,677(10)	*
Luca Maestri	33,330(11)	*
Peter Oppenheimer	0(12)	*
Ron Sugar	15,351(13)	*
Sue Wagner	1,646(14)	*
Jeff Williams	2,608(15)	*
All current executive officers and directors as a group (16 persons)	3,797,795(16)	*

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Fig. 2

(3) In *outstanding equity awards* of *Proxy Statement* (see Fig. 3), we could find the number of restricted stock owned by senior executives (which denotes R).

Outstanding Equity Awards at 2014 Year-End

The following table shows information regarding the outstanding equity awards (consisting of RSU awards) held by each of the named executive officers as of September 27, 2014.

Name (a)	Grant Date (b)	Number of Shares or Units of Stock That Have Not Vested (#)(c)	Market Value of Shares or Units of Stock That Have Not Vested(1) ($)(d)	Equity Incentive Plan Awards: Number of Unearned Shares, Units or Other Rights That Have Not Vested (#)(e)	Equity Incentive Plan Awards: Market or Payout Value of Unearned Shares, Units or Other Rights That Have Not Vested(1) ($)(f)
Tim Cook	8/24/2011	3,360,000(2)	338,520,000	1,960,000(2)	197,470,000
Luca Maestri	3/4/2013	166,646(3)	16,789,585	—	—
	10/7/2013	87,906(4)	8,856,530	—	—
	5/29/2014	28,651(5)	2,886,588	15,708(5)(6)	1,582,581
Peter Oppenheimer	—	—	—	—	—
Angela Ahrendts	5/1/2014	324,037(7)	32,646,728	—	—
	5/1/2014	234,332(8)	23,608,949	121,121(8)(6)	12,202,941
Eddy Cue	9/2/2011	350,000(9)	35,262,500	—	—
	11/2/2011	525,000(10)	52,893,750	—	—
	3/3/2014	159,166(11)	16,035,975	91,294(11)(6)	9,197,871
Jeff Williams	11/2/2011	525,000(12)	52,893,750	—	—
	3/3/2014	159,166(11)	16,035,975	91,294(11)(6)	9,197,871

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Fig. 3

(4) In *executive compensation table* of *Proxy Statement* (see Fig. 4), we could find basic salaries of corporation senior executives (which denotes S).

Executive Compensation Tables

Summary Compensation Table—2014, 2013, and 2012

The following table shows information regarding compensation of each named executive officer for 2014, 2013 and 2012, except in the cases of Mr. Maestri and Ms. Ahrendts, who were not named executive officers in 2013 and 2012.

Name and Principal Position (a)	Year (b)	Salary ($)(c)	Bonus ($)(d)	Stock Awards(1) ($)(e)	Non-Equity Incentive Plan Compensation(2) ($)(f)	All Other Compensation ($)(g)	Total ($)(h)
Tim Cook	2014	1,748,462	—	—	6,700,000	774,176(3)	9,222,638
Chief Executive Officer	2013	1,400,006	—	—	2,800,000	52,721	4,252,727
	2012	1,357,718	—	—	2,800,000	17,274	4,174,992
Luca Maestri	2014	717,211	—	11,335,043	1,608,255	342,292(4)	14,002,801
Senior Vice President, Chief Financial Officer							
Peter Oppenheimer	2014	947,596	—	—	3,437,500	132,624(5)	4,517,720
Former Senior Vice President,	2013	866,061	—	—	1,750,000	16,791	2,632,852
Chief Financial Officer	2012	805,400	—	66,169,750	1,600,000	16,412	68,591,562
Angela Ahrendts	2014	411,538	500,000	70,001,196	1,648,352	790,038(6)	73,351,124
Senior Vice President, Retail and Online Stores							
Eddy Cue	2014	947,596	—	20,000,900	3,437,500	59,743(7)	24,445,739
Senior Vice President, Internet Software and Services	2013	866,061	—	—	1,750,000	31,044	2,647,105
	2012	805,400	—	47,975,262	1,600,000	39,753	50,420,415
Jeff Williams	2014	947,596	—	20,000,900	3,437,500	17,239(8)	24,403,235
Senior Vice President, Operations	2013	866,061	—	—	1,750,000	16,791	2,632,852
	2012	805,400	—	66,269,800	1,600,000	16,412	68,691,612

Fig. 4

(5) In *earnings per share* of *10-K* (see Fig.5), we could find EPS of each corporation.

Earnings Per Share

Basic earnings per share is computed by dividing income available to common shareholders by the weighted-average number of shares of common stock outstanding during the period. Diluted earnings per share is computed by dividing income available to common shareholders by the weighted-average number of shares of common stock outstanding during the period increased to include the number of additional shares of common stock that would have been outstanding if the potentially dilutive securities had been issued. Potentially dilutive securities include outstanding stock options, shares to be purchased under the Company's employee stock purchase plan, unvested restricted stock and unvested RSUs. The dilutive effect of potentially dilutive securities is reflected in diluted earnings per share by application of the treasury stock method. Under the treasury stock method, an increase in the fair market value of the Company's common stock can result in a greater dilutive effect from potentially dilutive securities.

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The following table shows the computation of basic and diluted earnings per share for 2015, 2014 and 2013 (net income in millions and shares in thousands):

	2015	2014	2013
Numerator:			
Net income	$ 53,394	$ 39,510	$ 37,037
Denominator:			
Weighted-average shares outstanding	5,753,421	6,085,572	6,477,320
Effect of dilutive securities	39,648	37,091	44,314
Weighted-average diluted shares	5,793,069	6,122,663	6,521,634
Basic earnings per share	$ 9.28	$ 6.49	$ 5.72
Diluted earnings per share	$ 9.22	$ 6.45	$ 5.68

Potentially dilutive securities whose effect would have been antidilutive are excluded from the computation of diluted earnings per share.

Fig. 5

(6) Moreover, we could find company reputation values (which denotes P) and ratings each year from official website of Reputation Institute.

4.2 Data processing

In the process of collecting data, we figure out that senior executives of these three companies change a lot recently, which results in the data loss of some senior executives. Therefore, based on the different situations of each company, we finally take senior executives who are in position from 2012 to 2014 as objects of this study. Besides, some senior executives are not only the founders of their company but also the principal stakeholders. These senior executives are not considered in this research. Specific senior executivelist is shown as follows.

Table 1

Company Name	Senior Executive	Position
Apple	Tim Cook	Chief Executive Officer
	Peter Maestri	Former Chief Financial Officer
	Eddy Cue	Senior Vice President, Internet Software and Services
	Jeff Williams	Senior Vice President,Operations
Google	Eric.E.Schmidt	Executive Chair
	Patrick Pichette	Senior Vice President, Chief Financial Officer
	David C.Drummond	Senior Vice President, Corporate Development, Chief Legal Officer, and Secretary
	OmidKordestani	Senior Vice President, Chief Business Officer
Intel	Brian M.Krzanich	Chief Executive Officer
	Renee J.James	President
	Andy D.Bryant	Chairman of the Board
	Stacy J.Smith	Executive VIce President, Chief Financial Officer

Based on the data above, each variable of this model could be obtained by computational formula shown as follows.
(1) B=EPS

(2) Salary $= \frac{1}{n}\sum S$

(3) Shares $= \left(\frac{1}{Tc}\sum_{i=1}^{n} C + \frac{1}{Tr}\sum_{i=1}^{n} R\right) X\ 100\%$

(4) Reputation $= P$

Specific data are shown as follows.

Table 2

◢	A	B	C	D	E
1		Salary	Shares (%)	Reputation	EPS
2	Apple 2012	943,480	1.56	78.49	6.38
3	2013	999,547	1.63	74.65	5.72
4	2014	1,147,813	6.95	75.6	6.49
5	Google2012	850,000	13.34	78.05	16.41
6	2013	850,000	11.05	77.15	19.41
7	2014	850,000	8.43	77.3	21.37
8	Intel2012	690,000	8.90	75.42	0.5
9	2013	768,125	1.80	74.98	0.53
10	2014	828,250	2.80	74.9	0.77

4.2 Result analysis

In order to further analyze the influence of incentive method towards executive on corporation performance, we build a multiple regression model. The regression result using professional software SPSS is shown as follows.

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.807[a]	.651	.442	6.19665

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	358.648	3	119.549	3.113	.127[b]
	Residual	191.992	5	38.398		
	Total	550.640	8			

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	−197.661	126.156		−1.567	.178
	VAR00006	1.124E−5	.000	.182	.671	.532
	VAR00007	.930	.563	.502	1.651	.160
	VAR00008	2.498	1.686	.442	1.481	.199

From the above regression result, we could notice that R^2 is 0.651, and adjusted R^2 is 0.442, which indicates that the model fits well and that the dependent variable could

be explained by independent variables. The significance of F in variance test table is 0.127, which indicates that there exists significant linear relation between the independent variable and dependent variables. The significance of *Shares* and *Reputation*in parametric test table is 0.160 and 0.199 respectively, which indicates there exists relatively significant relation between these two independent variables and the dependent variable. The significance of *Salary* is 0.532, which indicates that there does not exist significant relation between this independent variable and the dependent variable. We could obtain the linear equation by SPSS as follows.

$$B = \alpha_1 + \alpha_2 \cdot salary + \alpha_3 \cdot share + \alpha_4 \cdot reputaton \qquad (2)$$

Restricted by the difficulty of searching relevant data, only limited data are used in this research to obtain the multiple regression model. Therefore, the next step of our research is to search more relevant data to verify this model.

5 Conclusion

Nowadays, stockholding system is very common among financial world. According to principal agent theory, we discover the contradiction between principal's profit and agent's benefit, and try to figure out a solution to that. Many researchers have put forward their theory, but many of them only focused on the relationship between basic salary of senior executive and company performance, which is not convictive. During the period of research, we are inspired by the incentive theory and Maslow's hierarchy of needs, and discovered that the combination of salary, stock share and company reputation can bring better effect of stimulation and incentive on senior executive, and further influence on company performance. Based on these conjectures, we built corresponding linear model, and verified the validity of this model by multiple linear regression analysis.

This model has its own practical significance, since a large amount of potential private enterprise appeared along with economic development in China. Compared to state-owned enterprise, they have more operating freedom to implement incentive mechanism, including share allocation and reputation improvement, and finally achieve better company performance.

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