Whether Executive Incentives Restrain Corporate Violations: An Empirical Study Based on the Statistical Data of Listed Companies

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Abstract. Corporate violation of listed company has always been one of the researches focuses in the field of corporate governance, and executive incentives are considered to be an effective way to solve the principal-agent problem. This paper uses 454 companies that were publicized in the A-share market due to corporate violation in 2013-2017 as the research objects to explore the impact of salary incentives and equity incentives on listed companies' violations, and explore the adjustment of the above-mentioned influence mechanism by the gender and age of executives' effect. The study found that the compensation and equity incentives provided by shareholders of listed companies to executives can effectively suppress the violations of listed companies. Female executives can strengthen the inhibitory effect more than men, and the older the executives, the more the inhibitory effect can be strengthened.

1. Introduction
At present, China's economy is at a critical stage of high-quality development. Although the government attaches great importance to the operation and control of the market, as China's capital market continues to expand, listed companies continue to have violations of different levels, which have shown an upward trend in recent years. Violations of listed companies will distort the effective allocation of social capital and affect the efficiency of capital's optimization of the market. Corporate violations are inseparable from senior management's decision-making [1].

We take 454 listed companies that were publicized in the A-share market due to corporate violation from 2013 to 2017 as the research objects, constructs a logit regression model, and explores the impact of salary incentives and equity incentives on listed companies’ violations. At the same time, the gender and age of executives as a moderating variable, explore its moderating effect on the above-mentioned influence mechanism.

2. Research hypothesis and model design
2.1. Theoretical basis
Generally, scholars believe that monetary compensation incentives are an effective mechanism to alleviate the agency problems of shareholders and managers. Most of existing literature has shown that monetary compensation incentives can improve corporate performance [2].

Du and Wang also found that monetary compensation incentives are an effective measure to motivate executives to improve company performance [3]. For executives who have become more restrictive, monetary compensation incentives can enable executives to satisfy their immediate preferences while
satisfying their own interests. It also reduces violations caused by its self-interested motives. When shareholders implement remuneration incentives for executives, because remuneration incentives are short-term incentives for executives and are extremely limited to their own income, this kind of income is very likely to be less than the income of executives’ violations. Therefore, for executives, compensation incentives cannot reduce the possibility of corporate violations.

However, when the benefits of compensation incentives are greater than the cost of executive violations, it will reduce the incentives for executives to violate regulations and profit and reduce the possibility of corporate violations. However, considering the actual situation of my country's capital market, the amount of executive compensation incentives implemented in my country is a high return. In view of this, we propose the following hypothesis:

H1: Salary incentives for senior executives may restrain corporate violations.

Coles, Daniel, and Naven found that when the proportion of corporate executives’ equity incentives is higher, executives are more inclined to choose risky long-term investment projects[4], which means that executives' risk tolerance increases, and then executives The future income of the company is linked to the company’s long-term risk investment, which leads to a reduction in the tendency of senior executives to violate the rules for a long time, and ultimately the possibility of the company’s violations will also decrease. Based on the above analysis, we propose the following hypothesis:

H2: Equity incentives for senior executives may restrain corporate violations.

Dreber and Johannesson found that female executives have fewer opportunistic behaviors, and the implementation of executive incentives to female executives has significantly higher positive feedback than male executives, which to some extent shows that female executives are inhibited the impact of executive incentives on company violations [5]. When Gan, Xu and Lin studied corporate anti-ethical violations [6], they found that when the senior management is female, the probability of corporate violations is significantly reduced. When the company’s shareholders adopt an incentive mechanism, the positive role of female executives in restraining the company’s violations becomes more prominent.

Wiersema and Bird's research showed that the age of executives has a direct effect on risk propensity [7]. The younger the executives, the more adventurous they are, so the decision-making is also high-risk propensity. Which means that when shareholders give incentives to senior executives, they receive less positive feedback than older executives, so older executives are less likely to violate regulations than younger executives. At the same time, the research of Gu and Liu also found that the senior management’s age is significantly negatively correlated with company violations, that is, the younger the senior management, the benefit of violation exceeds the cost, and younger senior management will increase the possibility of violations [1]. Liang and Zhan used the "natural experiment" provided by the share reform and found that the stronger the equity incentive, the lower the possibility of the company's violations [8].

In view of the above analysis, we propose the following hypotheses:

H3: Female executives can strengthen the inhibitory effect of executive incentives on corporate violations more than male executives;

H4: Older executives can strengthen the inhibitory effect of executive incentives on corporate violations more than younger executives.

2.2. Sample selection
We take as the research object the listed companies with corporate violation that were publicized in the A-share market from 2013 to 2017. In order to make the sample more representative and observable, we adopt the following measures: (1) eliminate companies with missing data; (2) eliminate newly listed companies this year. The sample data come from CSMAR; (3) exclude financial and insurance listed companies. After screening, 454 usable sample data were finally obtained.

2.3. Variable selection
We use the violations announced by the China Securities Regulatory Commission as the explained variable (be named VIO1). If there is a violation during 2013-2017, VIO1=1; if there is no violation,
VIO1=0. We calculate the number of shares held by executives/total number of shares issued by the company to obtain a measure of the company’s equity incentive level (SR1). We use the difference between the total remuneration of the top three top executives of listed companies in the previous year and the corresponding value of the year to determine the company’s monetary compensation incentive level (CTR1). In this paper, the average actual age of senior management is used to represent the age of senior management (Age), and Gender is used to represent the gender of senior management. When the gender of senior management is female, the value is 1, otherwise it is 0. In addition, we control the company’s size, property rights, asset-liability ratio and other factors that affect the company’s violations (Table 1).

Table 1. Variable definition and measurement.

| Explained variable | Explanatory variables | Control variable |
|--------------------|-----------------------|-----------------|
| Corporate violation | VIO1 | Whether the company violates the regulations, take 1 when it violates the regulations, otherwise it is 0 |
| Salary incentives  | CTR1 | The difference between the natural logarithm of the total salary of the top three executives of the year and the corresponding value of the previous year |
| Equity incentive   | SR1 | Executive shareholding ratio |
| Executive gender   | Gender | If the gender of the executive is female, the value is 1, otherwise it is 0 |
| Executive Age      | Age | The natural logarithm of the company’s assets at the end of the period |
| Company size       | Size | Liabilities/Assets |
| Gearing ratio      | Lev | The value of non-state-owned enterprises is 1, otherwise it is 0 |
| Nature of property | SOE |

2.3.1. Main effect model. We mainly use the logit regression model to test the impact of executive incentives on corporate violations:

\[ VIO1 = \beta_0 + \beta_1 CTR_1 + \beta_2 Size + \beta_3 Lev + \beta_4 SOE + \epsilon_1 \]  
\[ VIO1 = \beta_0 + \beta_1 SR_1 + \beta_2 Size + \beta_3 Lev + \beta_4 SOE + \epsilon_2 \]  

Equations (1) and (2) are salary incentives, equity incentives, size is the size of the company, Lev is the company's asset-liability ratio, and SOE is the nature of the company's property rights.

2.3.2. Moderating effect model. We establish the cross-products, and the two regulatory variables of senior management’s age and gender, respectively. Four cross-products to test the moderating effect of executive gender and age characteristics on executive incentives. Realized by the following model:

\[ VIO1 = \beta_0 + \beta_1 CTR_1 + \beta_2 SR_1 + \beta_3 Gender + \beta_4 Gender \cdot CTR_1 + \beta_5 SR_1 + \beta_6 Gender \cdot SR_1 + \beta_7 Gender + \beta_8 Size + \beta_9 Lev + \beta_10 SOE + \epsilon_3 \]  
\[ VIO1 = \beta_0 + \beta_1 CTR_1 + \beta_2 SR_1 + \beta_3 Age + \beta_4 Age \cdot CTR_1 + \beta_5 Age + \beta_6 CTR_1 \cdot Age + \beta_7 SR_1 \cdot Age + \beta_8 Size + \beta_9 Lev + \beta_10 SOE + \epsilon_4 \]  

According to the test specification of the moderating effect, if the regression coefficient \( \beta_1 \) and \( \beta_2 \) in formula (3) and (5) are significant (sig<0.1, the same below), and the regression coefficient \( \beta_1', \beta_2', \beta_4' \) and \( \beta_5' \) in formula (4) and (6) are significant at the same time, the moderating effects of gender and age may be certified. Since the main effects are negative, so if \( \beta_4 \) and \( \beta_5 \) are negative, the negative main effects may be strengthened, and vice versa.

3. Data analysis

3.1. Descriptive statistical analysis

The descriptive statistical results in Table 2 show that the average value of VIO1 is 0.28, indicating that there are a large number of non-violating companies in the selected samples that meet the criteria; the average natural logarithmic change in the total compensation of the top three executives is 0.144, the maximum It is 2.949 and the minimum value is -2.831, which indicates to a certain extent that the
The average value of executive shareholding ratio is 6.121, the maximum value is 73.561, and the minimum value is 0.00, indicating that the shareholding ratio of executives among different listed companies shows a large fluctuation range; the average gender of executives is 0.573, indicating that in the sample studied, there are more female executives than male executives; the age of executives is 50.731, the oldest value is 80 and the minimum value is 26, indicating that different companies have different ages of executives.

### Table 2. Descriptive statistics results.

|        | Mean  | Minimum | Maximum | Standard deviation |
|--------|-------|---------|---------|-------------------|
| VIO1   | 0.43  | 0.00    | 1.00    | 0.569             |
| CTR1   | 0.144 | -2.831  | 2.949   | 0.495             |
| SR1    | 6.121 | 0.00    | 73.561  | 12.375            |
| Gender | 0.573 | 1.00    | 0.00    | 0.495             |
| Age    | 50.731| 26.000  | 80.000  | 8.132             |
| SIZE   | 22.332| 19.221  | 26.587  | 1.076             |
| Lev    | 0.551 | 0.022   | 9.317   | 0.447             |
| SOE    | 0.28  | 0.00    | 1.00    | 0.449             |

### 3.2. Regression statistical analysis

As shown in Table 3, the results of the main effects tested by models (1) and (2). In model (1), executive compensation incentives and corporate violations show a strong and significant negative correlation ($\beta_{1} < 0$, sig.$< 0.05$), H1 is verified; In model (2), Executive equity incentives and corporate violations also show a very significant negative correlation ($\beta_{3} < 0$, sig.$< 0.01$), H2 is verified.

### Table 3. Empirical test results.

|        | 1       | 2       | 3       | 4       | 5       | 6       |
|--------|---------|---------|---------|---------|---------|---------|
| Model  | Hypothesis | 1       | 2       | 3       | 4       |        |
| CTR1   | -0.981** | (-2.93) | -0.124**| (-3.94) | -0.091**| (-1.98) |
|        |         |         | -0.122**| (-2.663)| -0.077* | (-2.013)|
| SR1    | -0.163***| (-4.129)| -0.107***| (-2.567)| -0.099**| (-2.024)|
|        |         |         | -0.153**| (-2.529)| -0.076**| (-1.593)|
| Gender | -0.875* | (-3.11) | -0.7891*| (-2.79) |         |         |
| Age    | -0.0191**| (-1.71) | -0.0153*| (-1.09) |         |         |
| CTR1* Gender | -0.026*| (-1.672) |         |         |         |         |
| CTR1* Age |         |         | -0.037* | (1.564) |         |         |
| SR1* Gender | -0.2918*| (-1.71) |         |         |         |         |
| SR1* Age |         |         |         |         | -0.1931*| (2.76)  |
| Size   | -0.102**| (-4.522)| -0.238***| (-4.751)| -0.099**| (-3.716)|
|        |         |         | -0.076**| (-2.143)| -0.091**| (-2.921)|
|        |         |         | -0.074**| (-2.588)|         |         |
| Lev    | -0.409  | (-1.567)| -0.651  | (-1.985)| -0.507  | (-1.677)|
|        |         |         | -0.398  | (-1.487)| -0.494  | (-1.629)|
|        |         |         | -0.363  |         |         |         |
| SOE    | 0.011   | (0.627) | 0.021   | (0.793) | 0.014   | (0.644) |
|        |         |         | 0.013   | (0.685) | 0.014   | (0.632) |
|        |         |         | 0.013   |         |         |         |
| Adjusted $R^2$ | 0.012  | 0.018  | 0.017  | 0.012  | 0.016  | 0.013  |

*Note: *, **, *** mean significant at the level of 10%, 5%, and 1%, respectively.*

From model (3) to (6), the tests of moderating effects of executive gender and age show:
β₁ and β₂ in model (3) are significant (β₁ < 0, sig.<0.05; β₂ < 0, sig.<0.01); β₃, β₄, and β₅ in model (4) are significant (β₃ < 0, sig.<0.05; β₄ < 0, sig.<0.05; β₅ < 0, sig.<0.01), which mean that executive gender has a negative moderating effect on the negative effect of executive incentives on corporate violations, i.e., female executives can strengthen the inhibitory effect of executive incentives on corporate violations more than male executives, H3 is verified.

β₁ and β₂ in model (5) are significant (β₁ < 0, sig.<0.05; β₂ < 0, sig.<0.05); β₃, β₄, and β₅ in model (6) are significant (β₃ < 0, sig.<0.1; β₄ < 0, sig.<0.1; β₅ < 0, sig.<0.1), which mean that executive age has a negative moderating effect on the negative effect of executive incentives on corporate violations, i.e., older executives can strengthen the inhibitory effect of executive incentives on corporate violations more than younger executives, H4 is verified.

3.3. Robustness test

In order to make our conclusions credible, we redefine corporate violation (be named VIO2), draw on existing research methods, define corporate violations as frequency of violations, measure the natural logarithm change of the total compensation of the previous three directors as the measurement standard of CTR (CTR2), and replace the SR variable with board holdings (SR2). Re-evaluate the level of equity incentives. The analysis shows that except for a slight change in the size of the coefficient, the sign of the correlation coefficient has not changed, and the result is still significant. Which shows that our conclusion is robust (Table 4).

| Model | Hypothesis | 1  | 2  | 3  | 4  | 5  | 6  |
|-------|------------|----|----|----|----|----|----|
|       | CTR2       | -0.151* | -0.121* | -0.091* | -0.132* | -0.077* |
|       | H1         | (-0.91) | (-0.83) | (-0.74) | (-1.003) | (-2.103) |
|       | SR2        | -0.101* | -0.106* | -0.098* | -0.143* | -0.088* |
|       | H2         | (-1.211) | (-1.367) | (-1.012) | (-1.591) | (-1.701) |
|       | Gender     | -0.8147* | -0.7811* | -0.018* | -0.013* |
|       | H3         | (-3.01) | (-2.87) | (-1.541) | (-1.341) |
|       | CTR1* Gender | -0.028* | -0.028* |
|       | H4         | (1.611) | (1.611) |
|       | CTR1* Age  | -0.041* |
|       | H5         | (1.761) |
|       | SR1* Gender | -0.213* |
|       | H6         | (1.69) |
|       | SR1* Age   | -0.2219* |
|       | H7         | (2.81) |
|       | Size       | -0.072* | -0.048* | -0.039 | -0.031* | -0.043* | -0.039* |
|       | H8         | (-2.102) | (-1.991) | (-1.768) | (-1.690) | (-1.911) | (-1.781) |
|       | Lev        | -0.108 | -0.199 | -0.106 | -0.101 | -0.141 | -0.103 |
|       | H9         | (-0.376) | (-0.865) | (-0.617) | (-0.513) | (-0.619) | (-0.364) |
|       | SOE        | 0.024 | 0.022 | 0.023 | 0.018 | 0.021 | 0.019 |
|       | H10        | (0.911) | (0.813) | (0.891) | (0.74) | (0.921) | (0.79) |
|       | Adjusted R² | 0.201 | 0.018 | 0.018 | 0.016 | 0.017 | 0.015 |

Note: *, **, *** mean significant at the level of 10%, 5%, and 1%, respectively.

4. Conclusions and suggestions

The results of our research show that executive incentives are negatively correlated with corporate violations, which means that shareholders’ implementation of executive incentives to executives can effectively curb the occurrence of corporate violations, thereby effectively addressing the self-interest of executives. The problem of inconsistency between motives and shareholders’ pursuit of value
maximization also reduces the losses caused by the company’s violations to shareholders and protects the rights and interests of shareholders. At the same time, by studying the moderating effect of executive characteristics, we find that executive incentives have a stronger effect on corporate violations when the executives are women, and the older the senior executives, the stronger the impact of executive incentives on corporate violations. Which shows that male executives weaken the impact of executive incentives on company violations more than female executives, and older executives strengthen the impact of executive incentives on company violations more than younger executives. The conclusion provides a certain perspective on how shareholders of listed companies select executives, and it also provides theoretical help for investors when choosing investments.

We combine principal-agent theory and high-level theory to study executive incentives on listed companies' violations. It not only enriches the existing theories, but also provides a new perspective. At the same time, the research conclusions provide effective suggestions for reality. Shareholders can take measures to encourage executives to avoid violations of the company's regulations, which will damage their own interests. According to related theories, it can be seen that the parallel approach of salary incentives and restricted equity incentives can more effectively avoid the occurrence of corporate violations. Shareholders can pay more attention to the role of female executives when selecting company executives, especially when shareholders are risk aversion. As an investor, selecting and hiring female executives can effectively reduce the company’s probability of violations, thereby avoiding risks; shareholders should choose older executives when selecting executives, because the personal experience of older executives and their own profit-seeking motives are younger. A low number of executives can effectively lower the company's probability of violations and effectively avoid risks.

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