

Employee Stock Ownership Plans for Tobacco Concept Stock Listed Companies and Corporate Innovation Investment

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Objective: In this study, we discussed the influence of employee stock ownership plan (ESOP) on innovation investment in Chinese tobacco concept stock listed companies. **Methods:** we firstly performed empirical research method to investigate the differences in innovation investment between companies implementing ESOPs and companies not implementing ESOPs by using the panel data of tobacco concept stock listed companies from 2014 to 2020. Secondly, we further performed case study method to test the changes in innovation investment of tobacco concept stock listed companies before and after implementing ESOPs by choosing Hengfeng Paper as a research subject. **Results:** In tobacco concept stock listed companies, companies implementing ESOPs had higher level of innovation investment than companies not implementing ESOPs. After implementing the ESOP, Hengfeng Paper significantly increased its investment in innovation. **Conclusion:** In tobacco concept stock listed companies, the implementation of ESOP with ordinary employees as the main incentive object helps to promote innovation investment.

Key words: tobacco concept stock listed companies; employee stock ownership plan; innovation investment
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Because employees as the main body of enterprise innovation determine the success or failure of innovation, how to fully stimulate the vitality of employees and promote enterprise innovation has become a hot issue of all walks of life. Equity incentive links employee wealth with company value, which helps to fully mobilize employee's enthusiasm and establish a long-term incentive and restraint mechanism of benefit sharing and risk sharing. Therefore, equity incentive is one of the effective means to stimulate employee's innovation vitality. Equity incentives generally include equity incentive

plans and employee stock ownership plans. The former focuses on one-way incentives, with executives as the main incentive object, while the latter focuses on benefit sharing with ordinary employees as the main incentive object. Therefore, the existing research conclusions on equity incentive plan and enterprise innovation may not be applicable to employee stock ownership plans.

Employee Stock Ownership Plans (ESOP) refers to the institutional arrangement whereby a listed company enables its employees to legally acquire and hold shares of the company for a long time according to the wishes of its employees and shares

are allocated to employees according to the agreement. The ESOP in China originated in the early 1980s in the form of stock certificates issued to employees in state-owned enterprises. However, for more than 30 years, the ESOP has not been widely implemented in listed companies due to objective conditions such as immature Chinese regulatory system and policy constraints. On June 20, 2014, the China Securities Regulatory Commission issued the *Guiding Options on the Pilot Implementation of Employee Stock Ownership Plans for Listed Companies* (hereinafter referred to as *Guiding Opinions*), which marked the beginning of a new era for the ESOP, and also set off a new wave for listed companies to implement the ESOP.

In spite of high enthusiasm of Chinese listed companies to implement ESOP, the ESOP has not achieved satisfactory market performance. According to statistics from Shanghai Securities News, 156 ESOPs in Shanghai and Shenzhen Stock Exchanges will expire from July 1, 2014 to December 31, 2018, of which 80 are still in a floating loss state, accounting for more than 50%. Due to the unavailability of early data of ESOP in China, the current research of Chinese scholars mainly focuses on the relationship between equity incentive plans and corporate innovation. At the same time, the previous researches on the implementation effect of ESOP mostly focused on enterprise performance and shareholder wealth, while the research on the relationship between ESOP and enterprise innovation was still in its infancy and focused on the effect of ESOP on innovation output, ignoring the influence of ESOP on innovation investment.^{1,2}

Although the ESOP is mainly aimed at ordinary employees, it also includes management personnel. A review of the announcement of the ESOPs of listed companies in the PRC revealed that the majority of the ESOPs launched by listed companies involved senior executives. On the one hand, the implementation of ESOP will have an incentive effect on both senior executives and ordinary

employees, while the equity incentive for senior executives will have a direct impact on innovation investment.³ On the other hand, ordinary employees will participate in corporate governance and supervise the decision-making process of management when they have shareholder status, thus indirectly affecting innovation investment.⁴

In western countries, tobacco companies are import part of listed companies in capital market.^{5,6} However, tobacco industry is an administrative monopoly industry in China, and China National Tobacco Corporation is an oligopoly enterprise in the monopoly industry, managing the production, industry, sales, import and export of tobacco in the country. Since the tobacco reform has not yet begun, none of the subsidiaries of China Tobacco Corporation has been listed in A-shares. However, there are 22 tobacco concept stock listed companies in China's A-share market. They produce and sell tobacco-related products (e.g. cigarette paper, tobacco labels and tobacco essences, etc.) or provide services for tobacco producing companies.

Competition among the 22 tobacco concept stock listed companies is fierce because they produce similar products and their most important customers are Chinese Tobacco Corporation and their subsidiaries. How to motivate employees to research and develop competitive products becomes very important. Therefore, this paper takes Chinese tobacco concept stock listed companies as the research object to explore the impact of the implementation of ESOP on enterprise innovation investment, in order to provide new ideas for the tobacco concept stock listed companies to enhance innovation capacity.

THEORY ANALYSIS AND HYPOTHESIS DEVELOPMENT

The Incentive and Governance Effects of ESOP

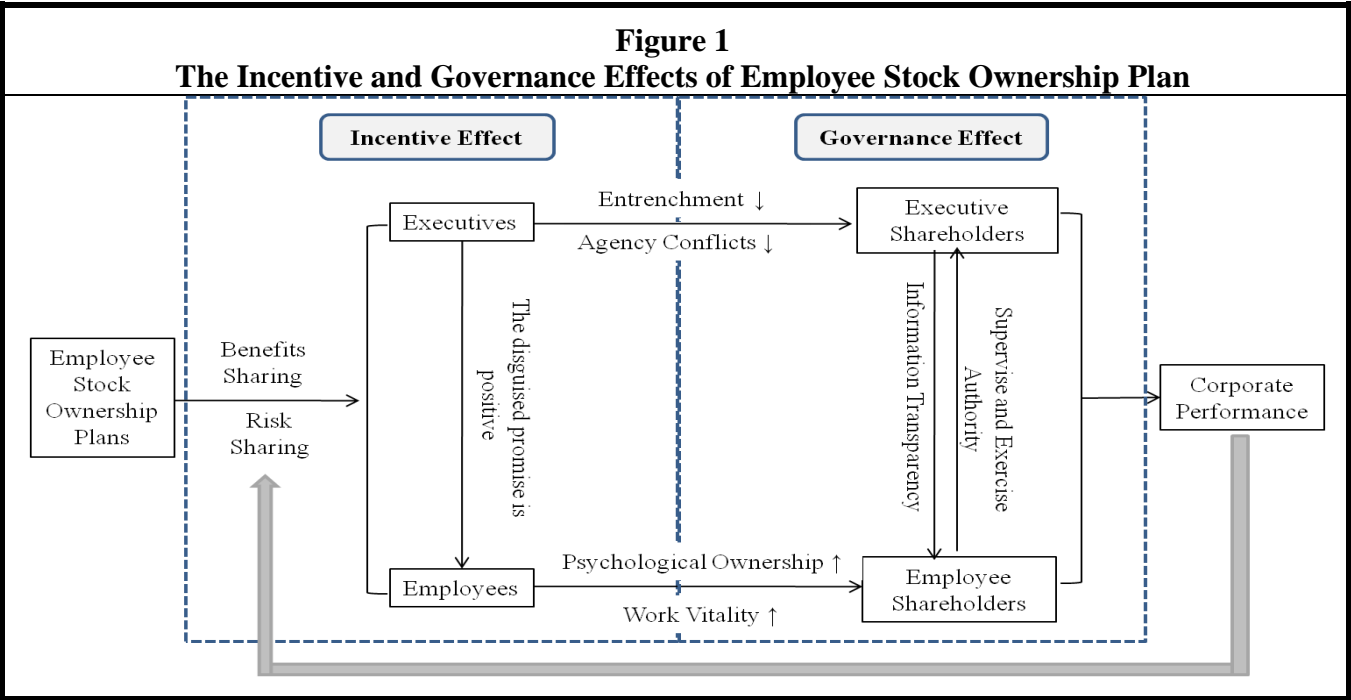
Existing research suggests that ESOP is an institutional arrangement with both incentive effect and governance effect.⁷ The implementation of ESOP will change the status of enterprise employees (including executives) from laborer to laborer and owner, so that all the employees participating in the plan can share the benefits and risks with the enterprise. In this way, employees who are

shareholders are promoted to have a sense of ownership and a sense of identity with the enterprise, because if the enterprise loses money, employees also have to bear the loss because of their shareholder status. Therefore, employees will be motivated and diligent, that is, the activated employees will have a positive impact on enterprise performance, and the profits of enterprise growth will be shared with employees. Thus, the ESOP has an incentive effect.

The implementation of the ESOP expresses a strong confidence in the future of the company, that is, as far as the enterprise is concerned, the executives have made an implicit commitment to the employees participating in the plan, believing that the future benefits will be positive; as far as the capital market and enterprises are concerned, the capital market will respond positively to the positive signal that the

enterprise implements the ESOP. As a result, the executives will bear the pressure from the promised income of the staff, the expectation of the shareholders and the pressure from the analyst's evaluation while being encouraged, which will reduce the managerial entrenchment behavior caused by their nearsightedness, the pursuit of salary and management rights, and help to alleviate the agency problem between the shareholders and the managers. Ordinary employees can exercise shareholders' rights (or authorize third parties to exercise shareholders' rights) to participate in corporate governance by representing or setting up corresponding institutions, and can play a certain role in supervising management and controlling shareholders, which is the governance effect of ESOP.

Figure 1 summarizes the incentive and governance effects of ESOP.



Financing Constraints and Agency Problem in Innovation Investment

The enterprise innovation studied in this paper refers specifically to the technological innovation represented by R&D activities, and innovation investment is all the expenses needed by the enterprise for R&D activities. According to the theory of industrial organization,

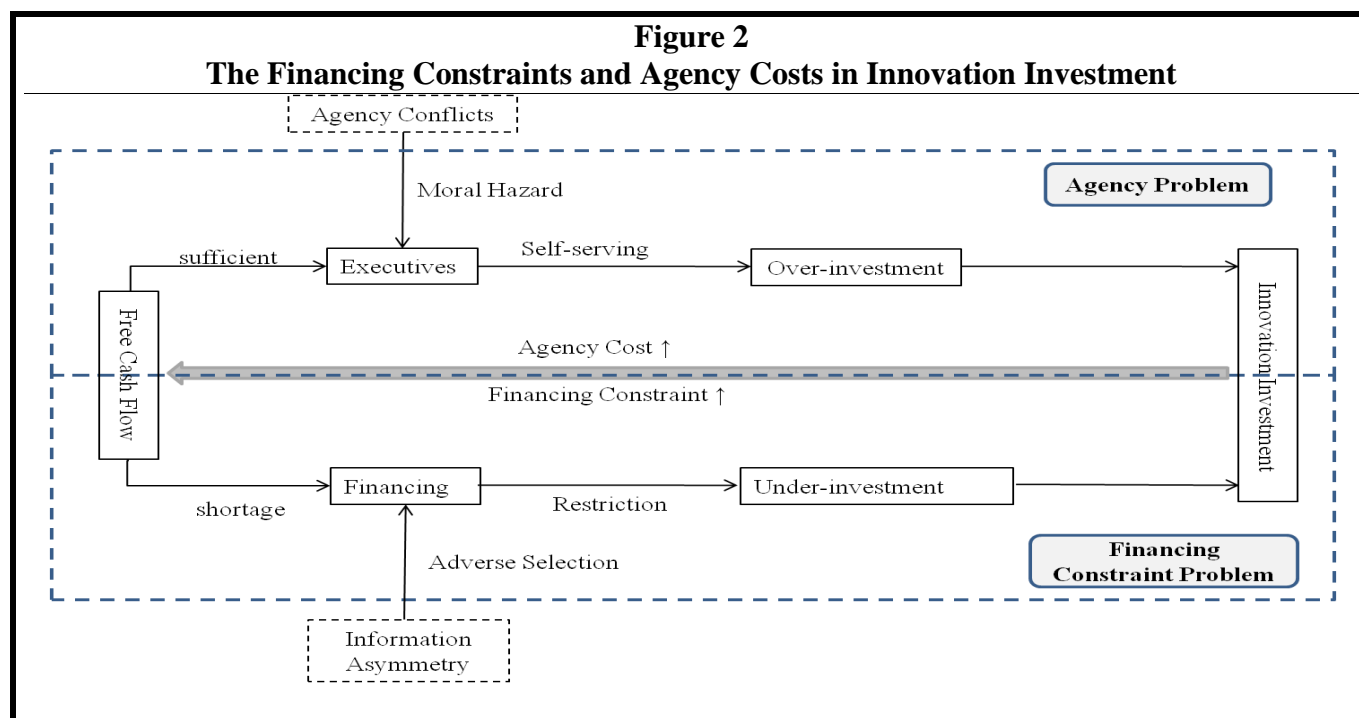
innovation investment is characterized by long cycle, high risk and long conversion cycle, which are quite different from ordinary investment, resulting in high uncertainty in the value of R&D assets. Moreover, the intellectual capital generated from research and development is intangible assets, making it difficult to provide guarantee for enterprises.⁸ In addition, due to the fierce market competition and the protection of

trade secrets, enterprises are more cautious about information disclosure related to innovation, which further aggravates the problem of information asymmetry between external fund providers and enterprises, resulting in high financing costs and difficulty in obtaining financing for enterprises.^{9,11} The inability of the company's own funds to meet the demand for innovation will force the enterprise to abandon promising projects, resulting in insufficient investment, which will lead to financing constraints.

In the case of separation of ownership and management rights, the principal-agent problem will arise when the objectives of shareholders and professional managers are inconsistent. When enterprises have free cash flow, self-interested managers are more likely to make

unprofitable investments to shareholders or even with negative NPV in order to increase their management rights or the management is more likely to arbitrarily control internal funds for irrational investments due to arrogance or short-sightedness.¹¹ Existing studies have confirmed that companies with more disposable funds are more likely to make inefficient investment decisions.¹² There is a more serious agency problem in companies with abundant free cash flow, and over-investment in listed companies in China.¹³ Excessive investment by professional managers caused by moral hazard under incomplete contracts will increase agency costs and aggravate agency conflicts between shareholders and managers.

Figure 2 summarizes the financing constraints and agency costs in innovation investment.



The Implementation of ESOP and Innovation Investment

Based on the previous theoretical analysis of ESOP and innovation investment, it is believed in this paper that ESOP mainly acts on innovation investment through the following

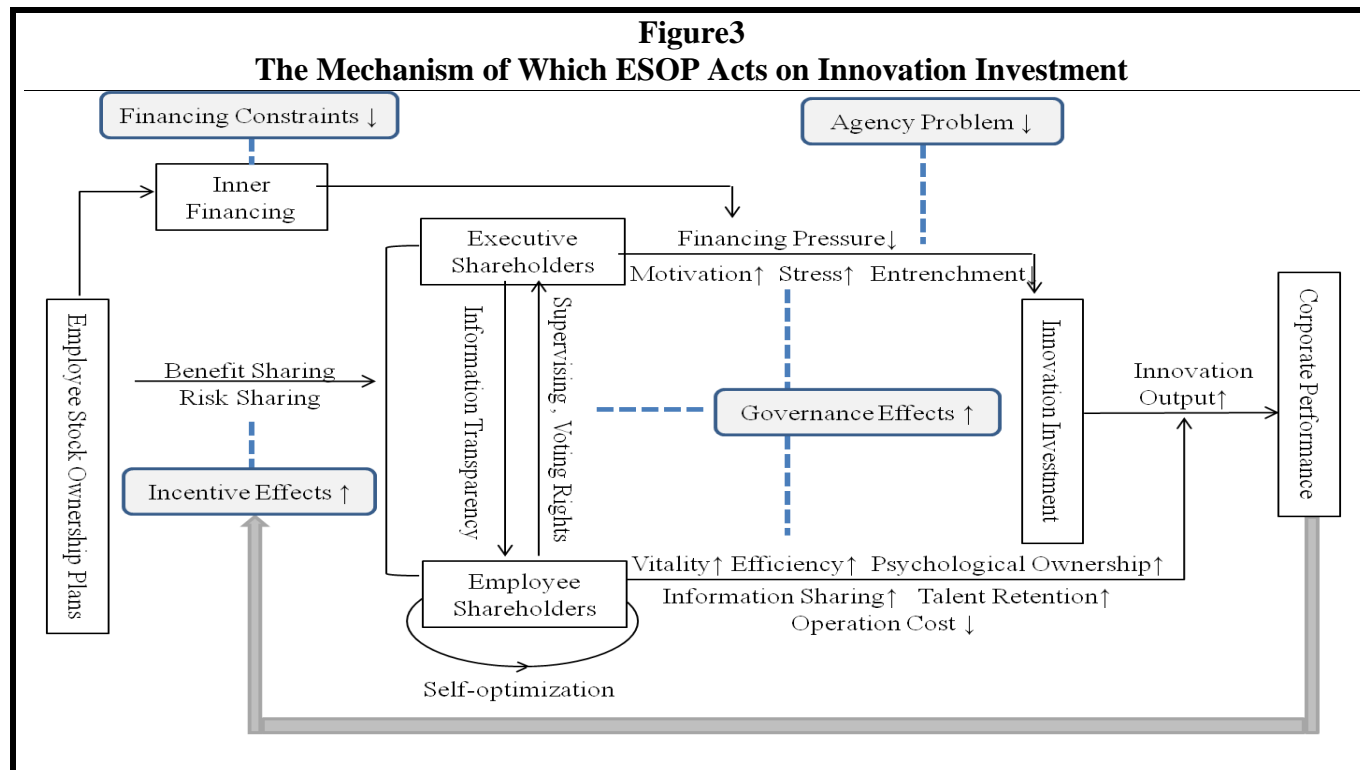
ways, the mechanism of which is shown in Figure 3.

First, the implementation of ESOP helps to alleviate the agency problem, because the smooth implementation of the ESOP can convey the company's strong confidence in its own development and future performance. In

fact, in the internal planning and publicity of the enterprise, the ESOP can be regarded as a disguised commitment made by the management to the staff to be involved that the company will carry out a positive expected return project, in which the management and ordinary staff familiar with the company are expected to get a higher return through hard work (and the possibility of loss of principal is not excluded). Predictably, executives are not only motivated by uncertain earnings but also under greater pressure because of possible losses due to stock price fluctuations, so they need to lead employees to improve performance guarantee returns, strive to meet the expectations of employees and shareholders, and respond to market evaluation. In the innovation activities, the project direction, planning and resource allocation are all led by senior executives, who are more motivated and pressured by participating in the ESOP, which

reduces the nearsightedness of being too cautious in risk avoidance, pursuing short-term performance and living comfortably while neglecting long-term development, thus reducing agency costs and alleviating agency problem.

Secondly, the ESOP is an internal financing behavior with low cost and is relatively easy, which can effectively ease the financing constraint problem in innovation investment, so its implementation helps to increase the free cash flow of the enterprise. Enterprises' innovative projects are usually trade secrets, so the use of endogenous financing will make it easier to launch projects, so that enterprises can quickly invest in suitable projects to carry out research, and avoid cutting necessary investment or missing opportunities due to the restriction of financing constraints.



Thirdly, the ESOP can improve the company's performance through the role of incentives and

governance, and then promote the increase of innovation investment. It will not only motivate

executives, but more importantly, turn more employees into shareholders, so that the transformation from laborers to capital owners gives employees a sense of honor, enhances employees' sense of identity with enterprises, and stimulates employees' enthusiasm and vitality for work, making them more willing to share information for consistent goals and interests, improve work efficiency and quality, and then have a positive impact on enterprise performance.

Employees with working experience often choose to change jobs when they are dissatisfied with their salary or when they encounter a promotion ceiling. At this time, the ESOP can not only make welfare compensation for the employees' salary, but also keep the excellent employees in the enterprise because of the design of the longer duration of the ESOP, that is, it completes the self-optimization of the staff team, and saves the company's lost time and the recruitment and training costs of the employees who fill the vacancies. However, the old employees are very handy in doing things. They not only know how to maximize the efficiency of resource utilization, but also have a strong will to share the benefits with the company and create profits for the company by saving costs.

As the company needs to disclose information to the employee shareholders participating in the ESOP who have a more in-depth and detailed understanding of the company than the external investors naturally, they can effectively identify the manipulation and deception of the shareholders by the executives due to information asymmetry, so the executives are more effectively supervised. In addition, employee shareholders can also exercise shareholders' rights through the Holders' Committee or a third party organization to participate in corporate decision-making to a certain extent, and improve the corporate governance environment.

The incentive effect of ESOP enhances employees' sense of identity to the enterprise, promotes their work efficiency and quality, retains talents for the enterprise and saves operating costs. The governance effect of ESOP improves the corporate governance structure and reduces agency costs. The results of incentive effect and governance effect will ultimately be

reflected in the company's results. The accumulation of corporate profits will enrich the free cash flow of enterprises and provide strong financial support for enterprises to carry out high-risk innovation activities, thus promoting the increase of innovation investment.

To sum up, the incentive effect and governance effect of ESOP can help alleviate the agency problem and financing constraint problem in innovation investment, and then promote innovation investment. Thus, the following hypothesis is made:

Hypothesis 1: In tobacco concept stock listed companies, the implementation of ESOP helps to increase investment in innovation.

METHODOLOGY

Sample Selection and Data Source

In this paper, June 20, 2014 when the Guidance was released is taken as the time point for the formal implementation of ESOP, and 22 tobacco concept stock listed companies at the stock markets of Shanghai and Shenzhen from 2014 to 2020 are selected as the research samples. Among them the announcement information of the ESOP is from the Wind database, and the relevant information of the ESOP is collected by manually consulting the announcements of the listed companies. The draft ESOP approved by the shareholders' meeting is taken as the symbol of the formal implementation of the ESOP and as the implementation year of the ESOP. After sorting out, only 4 tobacco concept listed companies were found to have formally implemented the ESOP. In order to increase the number of regression samples, this paper adopts panel data of 22 listed tobacco concept stocks from 2014 to 2020. As some sample companies were listed later than 2014, the panel data in this paper includes 117 observations. To reduce the influence of extreme value, all continuous variables are winsorized at the 1% percentile on both tails of their distributions. In addition, innovation investment data comes from Wind database, and corporate characteristics and governance structure data come from CSMAR database.

Table 1 provides an overview of the 22 tobacco concept shares in China capital market. Among them, 10 companies listed in Shenzhen Stock Exchange and 12 companies listed in Shanghai Stock Exchange. Only 4 tobacco concept stock listed companies have implemented ESOP during the year from 2014 to

2020, including Yuanwang Valley (002161), Shunhao Corporation (002565), Linda Corporation (300125) and Hengfeng Paper (600356). Since the tobacco reform has not yet begun, none of the subsidiaries of China Tobacco Corporation has been listed in A-shares. Therefore, the A-share tobacco-related concept shares are companies producing and selling tobacco-related products or providing services for tobacco companies, such as cigarette paper, tobacco labels and tobacco essences.

Variable Definition

Dependent and independent variables

In this paper, innovation investment (*RD sales*) is chosen as the dependent variable of research,

specifically all expenses needed by enterprises for research and development activities. Referring to most scholars, the definition of innovation investment is as follows:

$$\text{Innovation investment} = \frac{\text{current R\&D expenditure}}{\text{current operating income}}$$

Where, the current R&D expenditure is the sum of capitalized R&D expenditure and expensed R&D expenditure disclosed in the annual report of listed companies.

The independent variable in this paper is the formal implementation of ESOP. We design a binary dummy variable (*ESOP_dummy*) to describe the implementation of ESOP for a firm. When the firm is implementing ESOP in the current year, then *ESOP_dummy* takes the value of 1, and 0 otherwise.

Table1
The Overview of the Tobacco Concept Stock Listed Companies

Stock code	Company name	Listing location	ESOP implementation	Tobacco-related products or services
000812	Shaanxi Gold Leaf	Shenzhen	No	cigarette filter materials
002161	Yuanwang Valley	Shenzhen	Yes	tobacco bulk labels
002191	Jingjia Corp.	Shenzhen	No	cigarette label printing
002565	Shunhao Corp.	Shenzhen	Yes	vacuum aluminized paper
002812	Enjie Corp.	Shenzhen	No	high technology cigarette labels
002836	Xinhongze	Shenzhen	No	cigarette label printing
002951	Jinshi Technology	Shenzhen	No	cigarette label printing
300125	Lingda Corp.	Shenzhen	Yes	heating does not burn tobacco products
300678	Zhongke Information	Shenzhen	No	tobacco intelligent manufacturing services
300741	Huabao Corp.	Shenzhen	No	tobacco essences
600235	Minfeng Special Paper	Shanghai	No	cigarette paper
600356	Hengfeng Paper	Shanghai	Yes	paper for tobacco industry
600433	Guanhao High and New	Shanghai	No	tobacco fiber white cardboard
600830	Sunny Loantop	Shanghai	No	subsidiary of China Tobacco Corporation
601515	Dongfeng Corp.	Shanghai	No	cigarette label printing
603020	Aipu Corp.	Shanghai	No	tobacco essences
603058	Yongji Corp.	Shanghai	No	cigarette label printing
603429	Jiyou Corp.	Shanghai	No	cigarette packing and sealing paper
603607	Jinhua Laser	Shanghai	No	laser holographic anti-counterfeiting packaging materials
603687	Dashengda	Shanghai	No	packaging services for tobacco companies
603733	Xianhe Corp.	Shanghai	No	paper for tobacco industry
603867	Xinhua Corp.	Shanghai	No	tobacco essences

Note.

The data in the table come from the annual reports of Chinese listed companies collected by authors.

Control variables

In this paper, referring to the existing related literature^{14,15}, the following corporate characteristics and governance structure variables are selected as control variables:

(1) Company size(*Size*), that is, the natural logarithm of total assets at the end of the year. Since Schumpeter, an economist put forward the innovation theory, the existing research has centered on Schumpeter Hypothesis, and the company size has always been considered as an important variable affecting the technological innovation capability of enterprises. The larger the company is, the easier it is to share research and development expenses by taking advantage of its own economies of scale. Therefore, large-

scale companies have stronger innovation investment capacity than small-scale companies.

(2) Financial leverage(*Size*), that is, asset-liability ratio. Chen et al. confirmed that asset-liability ratio is negatively correlated with technological innovation of enterprises.¹⁶ The greater the debt pressure of the company, the more managers tend to reduce the high risk investment activities such as innovation investment. High liabilities put greater financial pressure on managers, so their incentive to invest in innovation is greatly reduced considering possible financial risks. However, large R&D expenditure of enterprises under less debt pressure can act as a tax barrier for the company, so managers tend to increase R&D expenditure.

(3) Funds constraints (*Cash*), that is, the ratio of monetary fund to total assets at the end of the year.

Monetary capital, as the most direct cash flow component of an enterprise, determines the degree of financial constraints of the enterprise. Song et al. found that companies with high cash holdings have many characteristics, such as strong profitability, good growth, small agency cost, etc., and the cash-cash flow sensitivity of companies with high financing constraints is significantly positive, which makes listed companies have strong tendency and preference for cash accumulation.¹⁷ Companies with loose financing constraints have a higher tendency and ability to carry out innovative activities and invest in innovation.

(4) Asset structure (*Tangible*), that is, the ratio of net fixed assets to total assets at the end of the year. Due to the poor liquidity and high value of fixed assets, the higher the proportion of fixed assets in total assets, the lower the proportion of current assets and the weaker the liquidity of the enterprise. Relatively speaking, enterprises with a high proportion of fixed assets are less risk-resistant and more likely to reduce investment in innovation because of risk aversion.

(5) Independence of the board of directors (*Independence*), that is, the proportion of independent directors to the number of board of directors. Zhao & Wen confirmed that the proportion of independent directors is significantly positively correlated with innovation investment, i.e. companies with a high proportion of independent directors have a higher innovation investment level than those with a low proportion of independent directors.¹⁸

(6) Executive compensation (*Exe_salary*), that is, the natural logarithm of the total compensation of the top three executives. Existing studies have confirmed that executive compensation can significantly promote innovation investment. Yang & Luo proved that the monetary compensation of senior executives plays a significant role in stimulating and promoting the innovation activities of enterprises based on the theory of top echelon and the theory of compensation incentive.¹⁹ Gu et al. confirmed that the executive compensation incentive of GEM enterprises has a positive effect on innovation investment.²⁰

(7) Executive shareholdings (*Exe_share*), that is, the proportion of executive shareholdings in the total share capital of the company. Zahra et al. confirms that the shareholding ratio of senior executives is significantly positively correlated with corporate innovation activities.²¹ Principal-agent theory holds that managers holding too little or not holding the shares of the company will cause managers' business objectives to deviate too much from the maximization of shareholders' interests. In this case, managers' income is closely related to short-term performance, but not related to long-term performance, which leads to managers' nearsightedness. Because the high risk of innovation activities increases the possibility of the decline of short-term business performance, managers will face greater occupational risks, so managers will give up innovation to maintain the existing performance.

(8) Growth rate (*Growth*), that is, the growth rate of operating income. Generally speaking, companies with a higher growth have better market prospects, a stronger willingness to carry out innovation activities, a greater motivation to invest in innovation, and a better material basis for expanding innovation investment due to performance growth.

(9) Company performance (*ROA*), that is, returns on assets, which is used to measure the profitability of each unit of assets. Enterprises need to continuously invest in innovative activities. When the return on assets of enterprises is high, enterprises will have more motivation and ability to carry out innovative activities. When the return on assets of enterprises is low, it is difficult for the enterprise to maintain its operation, and it is even more unwilling and impossible to carry out innovative activities.

(10) Equity concentration (*Shr1*), that is, the shareholding ratio of the largest shareholder. Xu & Yin believed that stable large shareholders have sufficient power and motivation to supervise managers' behavior, and the preference of large shareholders will affect the company's innovation strategy.²² Yang et al. believed that shareholders, as investors, tend to avoid risks, confirming that the higher the equity concentration, the less the innovation investment.²³

(11) Equity balance (*Balshr*), that is, the ratio of the shareholding ratio of the second largest shareholder to the shareholding ratio of the largest shareholder. Zhang & Yuan found that the impact of equity checks

and balances on corporate innovation activities is significantly different for enterprises in growth or decline period from life cycle perspective that equity checks and balances in growth period have no impact on corporate innovation, but those in

recession period have a positive impact on corporate innovation.²⁴

In addition, the year fixed effect will be controlled in the model. See Table 2 for the specific definition of each control variable.

Table2
The Definitions of Research Variables

Variable symbol	Variable definition
RD_sales	<i>RD_sales</i> surrogates corporate innovation investment, which is equal to the current year R&D expenditures divided by the current year operating income.
ESOP_dummy	<i>ESOP_dummy</i> means the implement of ESOP, which is equal to 1 when firm is implementing ESOP, otherwise equal to 0.
Size	<i>Size</i> surrogates the firm size, which is the natural logarithm of total assets at the end of the year.
ROA	<i>ROA</i> means return to assets, which is the net income in current year divided by the total assets at the end of the year.
Lev	<i>Lev</i> means the firm's leverage, which is equal to the total liability divided by total assets at the end of the year.
Growth	<i>Growth</i> is the growth rate of revenue, which is the difference between current year revenue and last year revenue divided by last year revenue.
Cash	<i>Cash</i> surrogates firm's funding constraints, which is equal to the monetary fund divided by total assets at the end of the year.
Tangible	<i>Tangible</i> surrogates the structure of assets, which is equal to the fixed assets divided by total assets at the end of the year.
Independence	<i>Independence</i> means the board independence, which is equal to the number of independent directors divided the total number of board directors.
Exe_salary	<i>Exe_salary</i> means the salary of executives, which is the natural logarithm of the total compensation of the top three executives.
Exe_share	<i>Exe_share</i> is the level of managerial share ownership, which is equal to the number of shares held by executives divided by the total shares of the firm.
Shr1	<i>Shr1</i> surrogates the ownership concentration, which is equal to the number of shares held by the largest shareholder divided by the total shares of the firm.
Balshr	<i>Balshr</i> surrogates the equity balance degree, which is equal to the share proportion of the second largest shareholder divided by the share proportion of the largest shareholder.

Model Building

In order to verify Hypothesis 1, the following empirical model is constructed, combining the previous research results of related theories and literature:

$$\begin{aligned}
 RD_sales_i = & \alpha_0 + \alpha_1 ESOP_dummy_i + \alpha_2 Size_i + \alpha_3 Lev_i \\
 & + \alpha_4 Cash_i + \alpha_5 Tangible_i + \alpha_6 Growth_i \\
 & + \alpha_7 ROA_i + \alpha_8 Independence_i \\
 & + \alpha_9 Exe_salary_i + \alpha_{10} Exe_share_i \\
 & + \alpha_{11} Shr1_i + \alpha_{12} Balshr_i + \sum Year + \varepsilon_i
 \end{aligned}$$

(1)

Model (1) is used to test whether the

implementation of ESOP promotes the increase of innovation investment in tobacco concept stock listed companies, with the dependent variable of innovation investment, and the independent variable of the implementation of ESOP. The significance level of coefficient α_1 will be investigated in regression analysis. If α_1 is significantly positive, Hypothesis 1 will be supported.

EMPRICAL ANALYSIS**Descriptive Statistics*****Descriptive statistics for the full sample***

Table 3 shows descriptive statistics of research variables for the whole sample. *RD_sales* has an average value of 4.069, which indicates that in tobacco concept stock listed companies, the average proportion of innovation investment in the current operating income of the company is 4.069%. *ESOP_dummy* has an average of 0.120, which indicates that in tobacco concept stock listed companies, the proportion of companies implementing employee stock ownership plan is 5.8%. The mean value of *Lev* is 0.289, indicating that tobacco concept stock listed companies have low level of debts. The mean value of *ROA* is 0.056, indicating that each unit of assets of

tobacco concept stock listed companies can obtain 0.056 unit net profits. The mean value of *Growth* is 0.430, indicating that tobacco concept stock listed companies have high level of growth. The mean values of *Cash* and *Tangible* are 0.186 and 0.249, respectively, indicating that tobacco concept stock listed companies have 18.6% cash assets and 24.9% tangible assets on average. The mean value of *Independence* is 0.380, which indicates that the average proportion of independent directors in tobacco concept stock listed companies' board is less than 50%. The mean value of *Exe_share* is 0.060, which indicates that the average proportion of executive shareholdings in tobacco concept stock listed companies is very low. The mean values of *Shr1* and *Balshr* are 0.360 and 0.306, respectively, indicating that tobacco concept stock listed companies have relatively concentrated equity.

Table3
Descriptive Statistics of Research Variables for the Full Sample

Variable name	N	Mean	S.D.	Min	Max	p25	p50	p75
RD_sales	117	4.069	3.119	0.000	17.760	2.150	3.720	4.840
ESOP_dummy	117	0.120	0.326	0.000	1.000	0.000	0.000	0.000
Size	117	21.635	0.751	19.593	23.747	21.269	21.681	22.066
Lev	117	0.289	0.129	0.055	0.625	0.177	0.289	0.387
ROA	117	0.056	0.062	-0.189	0.280	0.022	0.047	0.096
Growth	117	0.430	1.158	-0.494	10.702	0.053	0.171	0.451
Cash	117	0.186	0.125	0.024	0.635	0.102	0.147	0.248
Tangible	117	0.249	0.143	0.021	0.582	0.159	0.245	0.337
Independence	117	0.380	0.061	0.333	0.667	0.333	0.333	0.429
Exe_salary	117	14.581	0.548	13.635	16.555	14.201	14.564	14.833
Exe_share	117	0.060	0.139	0.000	0.698	0.000	0.001	0.022
Shr1	117	0.360	0.181	0.120	0.882	0.225	0.316	0.459
Balshr	117	0.306	0.255	0.016	0.935	0.112	0.210	0.396

Note.

See Table 2 for the variable definitions.

Descriptive statistics for the grouping sample

Table 4 shows the descriptive statistics of related variables of companies that implement and do not implement ESOP. From the perspective of innovation investment, the average innovation investment of companies implementing ESOP is 8.230, which is significantly higher than that of companies not implementing ESOP, which is

consistent with Hypothesis 1. From the perspective of corporate characteristics, compared to companies not implementing ESOPs, companies implementing ESOPs have lower level of profitability but higher level of growth. From the perspective of governance structure, compared to companies not implementing ESOPs, companies implementing ESOPs have greater board independence but lower equity concentration.

Table4
Descriptive Statistics of Research Variables for the Grouping Sample

Variable name	(1) Control group			(2) Treatment group			Differences=(2)-(1)
	N	Mean	Median	N	Mean	Median	Mean difference
RD_sales	103	3.503	3.600	14	8.230	5.275	4.727***
Size	103	21.624	21.655	14	21.716	21.739	0.092
Lev	103	0.286	0.289	14	0.313	0.289	0.027
ROA	103	0.062	0.060	14	0.010	0.012	-0.052***
Growth	103	0.347	0.162	14	1.045	0.339	0.698**
Cash	103	0.194	0.154	14	0.127	0.118	-0.067*
Tangible	103	0.256	0.250	14	0.200	0.161	-0.055
Independence	103	0.372	0.333	14	0.439	0.429	0.067***
Exe_salary	103	14.575	14.527	14	14.622	14.665	0.047
Exe_share	103	0.065	0.000	14	0.025	0.006	-0.040
Shr1	103	0.376	0.335	14	0.247	0.240	-0.128**
Balshr	103	0.310	0.219	14	0.281	0.201	-0.029

Note.

See Table 2 for the variable definitions.***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

Table5
The Pearson Correlations between Main Variables in Model (1)

Variable name	<i>RD_sales</i>	<i>ESOP_dummy</i>	<i>Size</i>	<i>Lev</i>	<i>ROA</i>	<i>Growth</i>
RD_sales	1					
ESOP_dummy	0.494***	1				
Size	-0.059	0.040	1			
Lev	-0.055	0.068	0.151	1		
ROA	-0.005	-0.273***	0.022	-0.497***	1	
Growth	0.141	0.196**	-0.165*	0.190**	-0.111	1
Cash	-0.129	-0.175*	-0.170*	-0.587***	0.319***	0.074
Tangible	-0.143	-0.126	0.055	0.495***	-0.163*	-0.023
Independence	0.282***	0.355***	-0.034	0.058	-0.185**	0.048
Exe_salary	0.049	0.028	0.484***	-0.224**	0.233**	0.008
Exe_share	0.118	-0.094	-0.276***	-0.049	0.301***	-0.065
Shr1	0.078	-0.231**	-0.052	-0.281***	0.462***	-0.069
Balshr	-0.190**	-0.037	0.066	0.113	-0.114	0.065

Note.

See Table 2 for the variable definitions.***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

Correlation Analysis

Table 5 shows the Pearson correlation coefficients among main variables in model (1). It is observed that the correlation coefficient between the implementation of ESOP and innovation investment is 0.494 and significant at the 1% level, which supports Hypothesis 1. Moreover, the correlation coefficient between innovation investment and board independence is significantly positive at the 1% level, while the correlation coefficient between innovation investment and equity balance is significantly negative at the 1% level. The results indicate that in tobacco concept stock listed companies, greater board independence helps to increase innovation investment, while the increase of equity balance reduces innovation investment.

In addition, the results in Tables 5 show that the correlation coefficients between the variables

involved in models (1) are all lower than 0.6, which indicates that there is no serious multicollinearity problem in the empirical models constructed in this paper.

Multiple Regression Analysis

In order to test the impact of the implementation of ESOP on innovation investment, the model (1) is estimated by regression with a full sample, and the results are shown in Table 6. According to the table, the regression coefficient of *ESOP_dummy* is significantly positive at the level of 5%, indicating that the implementation of ESOP is significantly positively correlated with innovation investment, indicating that the incentive and governance effects of ESOPs in tobacco concept stock listed companies are helpful to promote innovation investment, and Hypothesis 1 is verified.

Table6
Regression of Innovation Investment on the Implementation of ESOP

Variable	Simple regression results			Multiple regression results		
	Coefficient	t-value	p-value	Coefficient	t-value	p-value
ESOP_dummy	4.496***	3.04	0.003	3.393**	2.55	0.012
Size				-0.462	-1.14	0.255
Lev				-1.412	-0.47	0.643
ROA				-1.609	-0.35	0.726
Growth				0.224	0.78	0.438
Cash				-9.013**	-2.29	0.024
Tangible				-5.506*	-1.96	0.053
Independence				5.549	0.96	0.341
Exe_salary				1.070*	1.77	0.080
Exe_share				5.274**	2.6	0.011
Shr1				2.303	0.91	0.367
Balshr				-2.134	-1.27	0.208
Constant	2.782***	4.95	0.000	-2.097	-0.24	0.813
Year FE	controlled			controlled		
Adj. R-sq	0.269			0.431		
N	117			117		
F-Value	2.39**			3.54***		

Note.

See Table 2 for the variable definitions.***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

In addition, the regression coefficient of *Cash* is significantly negative at the 5% level, indicating that the smaller the capital constraint of the company, the more capital it can invest in innovation. The regression coefficient of *Tangible* is significantly negative at the 10% level, indicating that the more capital occupied by fixed assets, the less capital available for innovation investment. The regression coefficient of *Exe_salary* is significantly positive at the 10% level, indicating that the higher the salary of executives, the stronger the incentives they receive, and the more inclined they are to increase investment in innovation. The regression coefficient of *Exe_share* is significantly positive at the 5% level, indicating that the higher the management shareholding ratio, the more consistent the interests of shareholders and managers, and the smaller the agency cost of the company, the more conducive to increasing innovation investment.

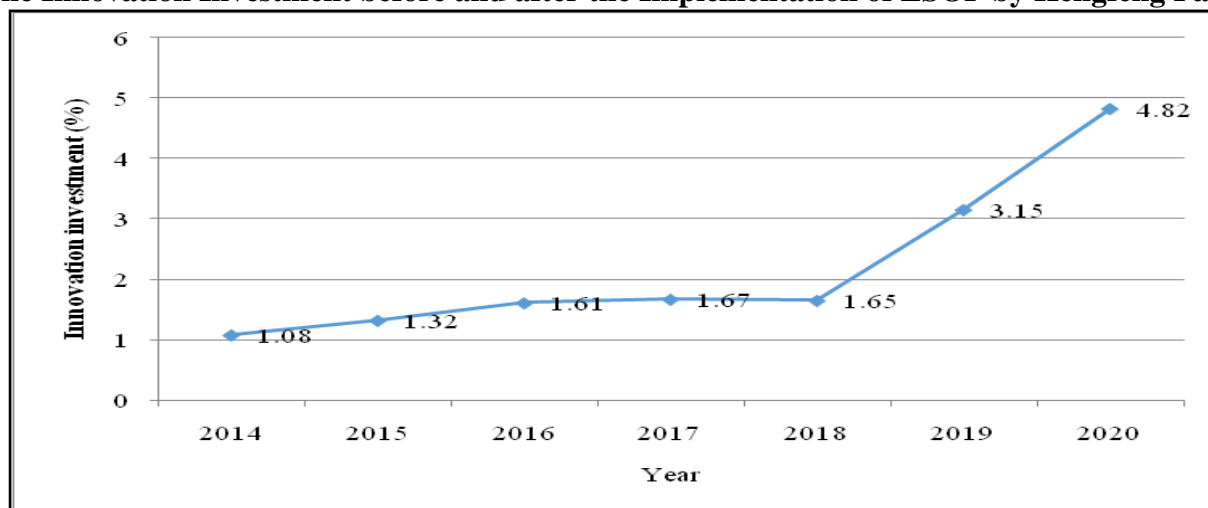
Case Analysis

In order to further test the impact of ESOP implementation on innovation investment in tobacco concept stock listed companies, this paper takes Hengfeng Paper (600356) as an example to analyze the changes of innovation investment before and after the implementation of ESOP. The board of directors of Hengfeng Paper announced

the draft of the first phase of the employee stock ownership plan on June 19, 2018, and the general meeting of shareholders reviewed and approved the draft on July 4, so the beginning year of the implementation of the employee stock ownership plan of Hengfeng Paper is 2018.

As can be seen from Figure 4, in the four years (2014-2017) before the implementation of the ESOP, the innovation investment level of Hengfeng Paper (the proportion of R&D expenses in operating revenue) shows a slight annual growth, with an average annual growth level of less than 0.2%. Although in the year (2018) of the implementation of the ESOP, there is a slight decrease in the level of innovation investment. However, in the two years (2019-2020) after the implementation of ESOP, innovation investment level presents obviously improved and the average level of annual growth is more than 1.5%. Specifically, innovative investment levels increases by 1.5% in the first year after the implementation of ESOP and by 1.67% in the second year after the implementation of ESOP. This indicates that the level of innovation investment in Hengfeng Paper increases significantly after the implementation of the ESOP, further supporting hypothesis 1. In other words, the implementation of ESOP in listed companies with tobacco concept shares is helpful to increase innovation investment.

Figure4
The Innovation Investment before and after the Implementation of ESOP by Hengfeng Paper



Note.

The data of innovation investment of Hengfeng Paper comes from CSMAR dataset.

CONCLUSION AND DISCUSSION

Because employees, as the main body of enterprise innovation, determine the success or failure of innovation, how to fully stimulate the vitality of employees and promote enterprise innovation has become a hot issue at present. On June 20, 2014, the China Securities Regulatory Commission issued the *Guiding Opinions*, which marked the beginning of a new era for the ESOP, and also set off a new wave for listed companies to implement the ESOP. The model of benefit sharing and risk sharing of ESOP is more helpful to arouse the enthusiasm of employees compared with the equity incentive plans.

Considering the specialty of tobacco industry in China, this paper selects tobacco concept stock listed companies as research object, and discusses the impact of ESOP implementation on corporate innovation investment. First, we investigate the differences in innovation investment between ESOP companies and non-ESOP companies by using the panel data of 22 tobacco concept stock companies from 2014 to 2020. Secondly, we further test the changes in innovation investment before and after the company implementing ESOP by choosing HengfengPaper as the analysis sample.

The results show that compared with companies not implementing ESOPs, companies implementing ESOPs have higher level of investment in innovation; after implementing the ESOP, Hengfeng Paper significantly increased its innovation investment. The results above indicate that in tobacco concept stock companies, the implementation of ESOP is helpful to increase innovation investment. Because the implementation of ESOP alleviates agency problem in innovation investment through incentive effect and governance effect, and improves financing constraint problem through internal financing, thus promoting the increase of innovation investment.

The research conclusions of this paper provide practical references for tobacco concept stock listed companies to implement and design ESOP in order to promote innovation activities. First of all, tobacco concept stock listed companies should actively carry out ESOPs. Due to the prevalence of "one share is dominant" in listed companies in China, few employees hold shares of the company, and the imperfect governance structure of listed companies, the enthusiasm of employees has not been fully mobilized. The implementation of ESOP can play the role of both incentive and governance,

so that employees and the company can share interests and risks, fully stimulate vitality, and at the same time promote the development of enterprise innovation activities, and realize the sustainable development of the company.

Secondly, tobacco concept stock listed companies can consider the use of ESOP which is a low-cost, low-difficulty financing method that is conducive to the follow-up development of innovation to deal with the financing constraints in innovation investment. The ESOP has its own fund-raising function, with which not only the internal financing alleviates the financing constraint problem in the innovation investment, but also the incentive and governance effects after the implementation of the ESOP are helpful to the development of innovation activities, and its own signaling effect can also convey the company's confidence in its own prospects to the market.

Finally, the relevant regulatory authorities should actively guide the listed companies to implement the ESOP and create a good policy environment for the implementation of ESOP. In this paper, we find that only 4 companies implemented ESOPs among 22 tobacco concept shares, indicating that most of the tobacco concept stock listed companies are unwilling to implement ESOPs due to the lack of corresponding supporting policies. In addition, although the ESOP in China has developed vigorously, it is likely that the current ESOP's share ratio is generally low due to the strict restriction on the scale of shareholding in the *Guiding Opinions*, which inhibits its effective governance and incentive functions. Therefore, the relevant regulator authorities should develop supporting policies for the implementation of ESOP (e.g. tax preference policy) and relax restrictions on the scale of shareholdings in ESOPs.

Conflict of Interest Disclosure Statement

The authors have no conflicts of interest, financial or otherwise. This research is not funded by any organization related to tobacco production.

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