

The Impact of Corporate Wages on Innovation: A Research based on Industrial Enterprise Data

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Abstract

This paper constructs the OLS and fixed-effects model, using the micro-enterprise data from the 2001-2006 China Industrial Enterprise Database to verified how employee wages affect enterprise innovation. The results show that a higher level corporate wages, would lead to a higher level of innovation of the company. In addition, The increase in the minimum wage standard will also have a positive impact on the innovation investment of enterprises.

Keywords

Wage; Innovation; Minimum wage.

1. INTRODUCTION

Since the reform and opening up, the wages of employees in our country have continued to rise. According to the report of the National Bureau of Statistics, the average salary of employees in my country was 615 yuan in 1978. By 2018, the average salary of non-private employees in urban areas reached 82,461 yuan, which was 134 times that of 1978. After deducting price factors, the actual increase was 18.3 times. Regardless of whether it is based on the national average or sub-industry data, the growth rate of wages is higher than the growth rate of GDP.

In the more than 20 years of rapid economic growth in China, both the country's scientific research and education and the company's own R&D investment have been clearly at a low level. In this case, the economy can also tell development that an important factor is to lower the price of labor, that is, the wages of employees in enterprises. If wages can only maintain the minimum living standards of workers, it is difficult to expect them to have higher production efficiency, let alone innovation.

Rising wages will encourage companies to adopt labor-saving production technologies, which will promote corporate innovation(Acemoglu,2001).For Chinese companies, can wage increases also promote innovation. Under pressure, enterprises will use less high-priced production factors, so they have the motivation to innovate and improve the utilization efficiency of resource factors. High wages induce innovation.It can achieve equilibrium in the long run. ium.

Innovation not only requires the necessary capital investment, but also high-quality human capital investment, that is, the investment of talents with high education level. High-level talents can increase the probability of success of innovation activities and reduce the risk of failure of innovation activities, thereby making enterprises more willing to carry out innovation activities. Increase the probability of success of activities and reduce the risk of failure of innovation activities, thereby making enterprises more willing to carry out innovation activities. In other words, the increase in corporate wages will help improve the quality of talents, and thereby increase corporate investment in innovative activities.

2. METHODOLOGY

2.1. Theory of the Impact of Wages on Innovation

The research on the relationship between rising wages and innovation can be traced back to the 1970s. Hicks (1963) found that rising real wages would reduce corporate profits in the short term. But in the long run, it would promote corporate innovation. Then the development research on the United States shows that when labor costs rise, increasing labor productivity through technological innovation is an effective way to reduce labor costs. In fact, higher wages played an important role in industrial technological progress and innovation during the industrialization period in Britain and the United States. Some domestic scholars, Zhang and Li (2011) also verified new evidence that rising labor costs are beneficial to innovation.

The ability of enterprise innovation will weaken with the decrease of employee wages (Romer, 1987). In China, with the disappearance of the demographic dividend advantage, companies cannot rely on the input of cheap labor to make up for the loss of production efficiency, so the domestic economy must be realized through technological innovation.

In typical innovation activities, innovation output depends not only on capital input, but also on labor input. In the case of a given capital investment, if the quality of the laborers participating in innovation is higher and their learning ability is stronger, the possibility of innovation success will be greater, and thus the return on investment of increasing innovation will be higher. Dong and Liu (2016) believe that the increase in real wages not only affects the innovation of enterprises through the quantitative factor of labor, but also affects the innovation behavior of enterprises through the quality of labor. That is to say, the wage level determined by the equilibrium of the labor market actually reflects the quality of the workers. A higher wage level is relatively easier to attract better talents to serve the enterprise.

The minimum wage standard of labor will also affect the R&D investment of enterprises. Tang and Li (2019) believe that an increase in the minimum wage standard will encourage companies to increase R&D investment. On the one hand, according to the theory of efficiency wages, an increase in the minimum wage standard will force low-skilled workers to continuously improve their skills through learning, thereby reducing their risk of unemployment. The improvement of employee skills plays an important role in enterprise innovation. More importantly, an increase in the minimum wage standard will force companies to find ways to improve production efficiency, such as training and learning. On the other hand, the increase in the minimum wage will cause companies to seek new alternative factors to replace labor, which in turn encourages companies to invest in R&D.

2.2. Empirical Model Settings

In order to identify the impact of wages on enterprise innovation, I use the micro-enterprise data from the 2001-2006 China Industrial Enterprise Database. In particular, one can estimate the impact of wages on enterprise innovation with the following empirical specification:

$$\text{innovation}_{it} = \alpha + \beta_1 \text{wage}_{it} + \beta_2 X_{it} + \lambda_t + \delta_i + \varepsilon_{it} \quad (1)$$

$$\text{innovation}_{it} = \alpha + \beta_1 \text{min wage} + \beta_2 X_{it} + \lambda_t + \delta_i + \varepsilon_{it} \quad (2)$$

In the formula (1), α represents the intercept term of the regression. wage represents the income of employees. X represents the control variables. λ is time-fixed effect. δ is individual-fixed effect. ε is the error term. In the formula (2), min wage represents Minimum wage for permanent employees. Innovation represents the output value of the company's innovation.

3. RESULTS AND DISCUSSION

The regression analysis results are shown in Table 1. Column (1) is the least squares regression of the mixed cross section, (2) is a two-way fixed effect model.(3) is also a two-way fixed effect model based on formula(2).

In the first column, the coefficient of wage is 0.187, which is significantly positive at the 1% level. It shows that the wages of employees can promote the innovation of enterprises. The regression coefficient of firm size is significantly positive, which indicates that the larger the size of the firm, the higher the level of innovation expenditure, which also reflects Schumpeter's creative destruction hypothesis. The age coefficient of an enterprise is positively significant, indicating that the operating period of an enterprise can also promote the enterprise's innovative activities. As the so-called survival of the fittest, only continuous innovation can survive and endure. In the second column, time and individual fixed effects are controlled. The coefficient of wage is still significantly positive at the 1% level, indicating that the increase in wages is indeed conducive to promoting the innovation level of enterprises. The increase in wage standards will encourage companies to increase R&D investment. In the third column, the coefficient of minwage is 0.001, which is significantly positive at the 1% level, which means that the increase in the minimum wage will also promote the innovation ability of the enterprise. Because the increase in the minimum wage standard will force low-skilled workers to continuously improve their skills through learning, thereby reducing their risk of unemployment. The improvement of employee skills plays an important role in enterprise innovation.

Table 1. Empirical Analysis Results of innovation and wage or minimum wage

VARIABLES	(1) innovation	(2) innovation	(4) innovation
wage	0.187*** (24.17)	0.074*** (4.96)	
min wage			0.001*** (4.96)
age	0.015*** (32.33)	-0.002 (-0.69)	-0.002 (-0.79)
scale	0.362*** (72.39)	0.281*** (14.00)	0.262*** (13.44)
profit	1.407*** (19.83)	0.243* (1.88)	0.275** (2.13)
rda	0.031 (1.35)	-0.092* (-1.93)	-0.097** (-2.03)
subsidy	0.298*** (38.04)	0.061*** (3.70)	0.061*** (3.67)
finanew	0.155*** (7.21)	-0.091** (-2.23)	-0.095** (-2.33)
Constant	-1.409*** (-46.97)	-0.803*** (-7.73)	-1.115*** (-8.14)
Observations	270,516	270,516	270,449
R-squared	0.037	0.015	0.015
Control	YES	YES	YES
Year FE	NO	YES	YES
company FE	NO	YES	YES

t-statistics in parentheses, *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

4. CONCLUSION

This paper is based on the sample data of micro enterprises, using OLS and two-way fixed effects model to discuss the relationship between the wages of employees and the innovation of the enterprise. First of all, we found that the increase in wages will indeed promote enterprises to conduct research and innovation. As labor costs rise, entrepreneurs will certainly increase capital expenditures while also increasing investment in innovation. In fact, increasing the relative wage level can improve the quality of human capital, which in turn can promote innovation spending. Then we discussed the minimum wage of enterprises, verified the impact of the minimum wage standard on enterprise innovation, and found that the minimum wage standard will have a significant positive impact on enterprise R&D investment in the short term. Therefore, policy makers should pay attention to changes in development patterns and appropriately raise the minimum wage.

REFERENCES

- [1] Daron A , Johnson S H , Robinson J A . The Colonial Origins of Comparative Development: An Empirical Investigation[J]. Ssrn Electronic Journal, 2000.
- [2] Hicks,J.R.,The Theory of Wages.London:Macmillan,1963.
- [3] Li Ping, Zhang Qingchang. Wage rise and relative decline in total factor productivity: 1952-2008 [J]. Nankai Economic Research, 2010(03): 49-63.
- [4] Dong Xinxing,Liu Kun.The impact of rising labor costs on corporate innovation behavior:empirical evidence from listed Chinese manufacturing companies[J].Journal of Shandong University (Philosophy and Social Sciences Edition),2016(04):112-121.
- [5] Tang Manping,Li Houjian.Enterprise size, minimum wage and R&D investment[J].Research and Development Management,2019,31(01):44-55.
- [6] Romer M.Endogenous Technological Change[J].Journal of Political Economy, 1990, 98 (5) :71—102.