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Case Report

A Dual-Subject Safety Determination Mechanism in Production Based on Hedonism Theory

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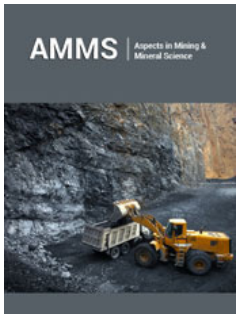

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Abstract

This paper proceeds from the two perspectives of Enterprise and Workers at the same time, systematical analyses behaviors in safety production firstly. Then, utilizing Hedonism Wage Theory, it proposed and explained "the Dual-subject Safety Determination Mechanism", which refers that Entrepreneurs and Workers conduct rational decisions of their own behaviors to make production safer under the inner drives of each interest; besides, their behaviors would influence each other to determine jointly the levels of safety in production eventually.

Keywords: Dual-subject; Safety determination mechanism; Hedonism; Safety management; Safety economy

Introduction and Assumptions

Most scholars mainly focus on the investigations of Entrepreneurs with the lack of workers' safe production behavior, it is impossible to fully understand the deep reasons behind the insufficient safety investment. This paper proposed and explained "Dual-subject Safety Determination Mechanism in production", which comprehensively investigate enterprises and workers. To simplify the problem, we make some assumptions as follows:

I. The market is cleared and there is no surplus and no shortage.

II. Market participants are all perfectly rational.

III. The market is under perfect information.

IV. The workers allow for full mobility while providing maximum benefits.

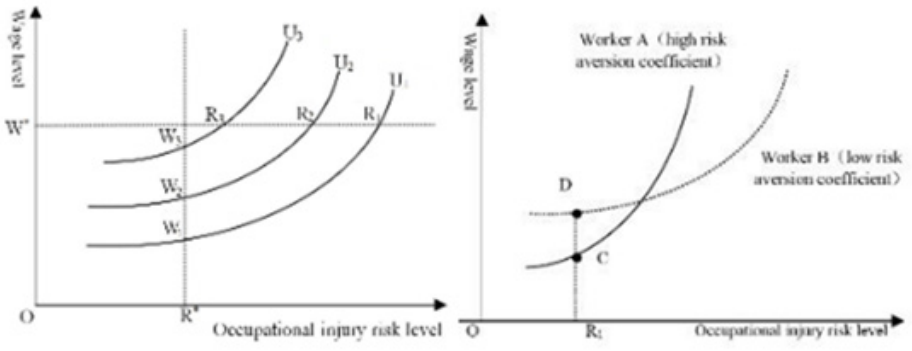

Figure 1: Workers' indifference curve for occupational injury risk level and wage level.

Their own utility maximization. When the work gets more and more dangerous, the enterprise would cost more as the compensatory extra pay, which make the worker's indifference curves are concave (Figure 1). While the injury risk increases, the worker's utility

will reduce. So, the worker will get the compensatory extra pay for the increased injury risk. Thus, the worker's indifference curves slope upward.

Model Analysis of Workers in Safety Production

On the assumption that the task remains the same, the higher the work reward, the more people will engage in the occupation. Tasks and worker preferences are the key factors in the process of matching workers to jobs. For convenience, let's assume only the degree of injury risk is different among the other characteristics of non-economic compensation for a job. Foreign scholars have studied the problem of safety manufacturing since a long time ago, and it is divided into three stages: Compensating Wage Differentials [1], Hedonic Model [2] and Asymmetric Information and Hedonic Model [3-7]. Then, the scholars have been doing research along the way of Adam Smith. Hedonism wage theory [2] assumes that people always aim to provide enjoyment (utility) and avoid of negative effect (pain). So, it is possible to utilize the Hedonism model to explore the degree of different workers to avoid occupational injury risk. When choosing work, workers will consider both salary and working level of risks to realize. To maintain the utility remains unchanged, it is significant that the increased compensatory extra pay given to those who are risk-averse should be higher than that give to those who are risk-neutral. In any dangerous degree, the indifferent curves of those who have high risk aversion coefficient are steeper than others. As shown in the worker A

Economic Behavior Analysis of Entrepreneurs in Safety Production

Entrepreneurs will compare Marginal Benefit (MBS) and Marginal Cost (MCS) to determine the level of safety input to guarantee the profit maximization. When enterprise choose the level of wage and safety production degree, they mainly depend on the assumptions as follows: 1: It will cost a lot to reduce the level of occupational injury. 2: Competitive pressure may make many enterprises operating in zero profit. 3: All other work characteristics are given. Based on these assumptions, if an enterprise plans to reduce accident risk, it must lower wages to remain competitive. Figure 2 shows an enterprise's isoprofit curves of wage and occupational injury risk level. In addition, when the enterprise is at N point in (Figure 2), it shows that the enterprise security level is quite high, and those relatively easier to eliminate has been eliminated. So, the isprofit Curve of entrepreneur in the N point is relatively steep. That means the isoprofit Curve of enterprise is convex at the top of the left, and it is also a corporate security spending reflect the assumption of the diminishing marginal returns. Different entrepreneurs have different isoprofit Curves because different entrepreneurs have different cost to eliminate the risk (such as X, Y in Figure 2). So, the slope of entrepreneurs' isoprofit Curve shows its cost to reduce the injury risk and can reflect the efficiency of the enterprise security investment.

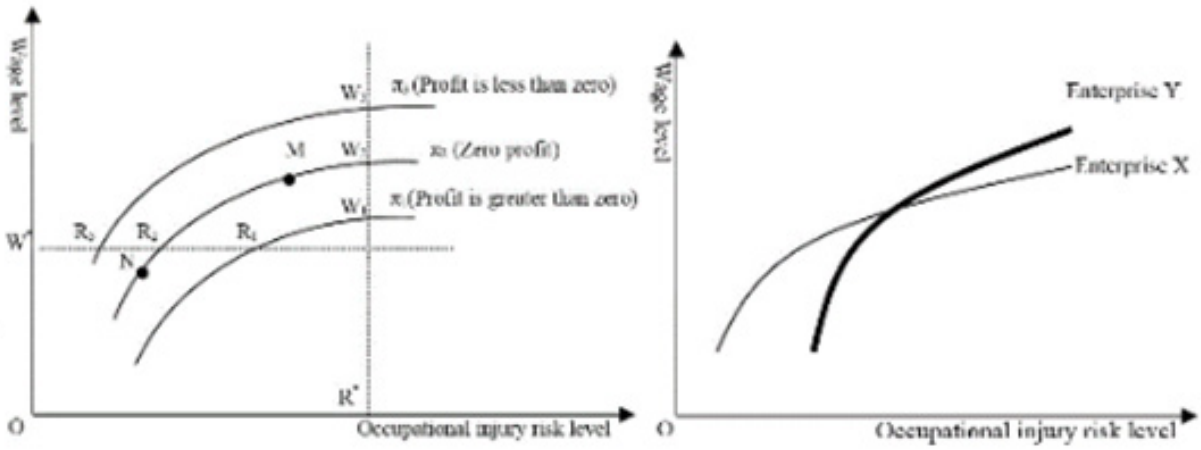

Figure 2: Isoprofit curve of enterprise.

Combine the Behaviors of Entrepreneurs and Workers in Safety Production

Workers will choose the one with the low occupational injury disk level or with the higher wage. In a word, they will choose to stay at the isoprofit Curve with the highest utility (or the upper left one). Enterprises will consider both the wage level and the occupational injury risk level. At the same time, competitive pressure may make many entrepreneurs operating in zero profit. In the wage level of WAX and the risk level of RAX, the worker A working in the enterprise X can achieve the largest utility; and in the wage level of WBY and the risk level of RBY, the worker B working in the enterprise Y can make the utility maximization (Figure 3). Further, if worker A chooses the job which is chosen by worker B (WBY and RBY), the utility A_1 that he or she can reach is below A_2.

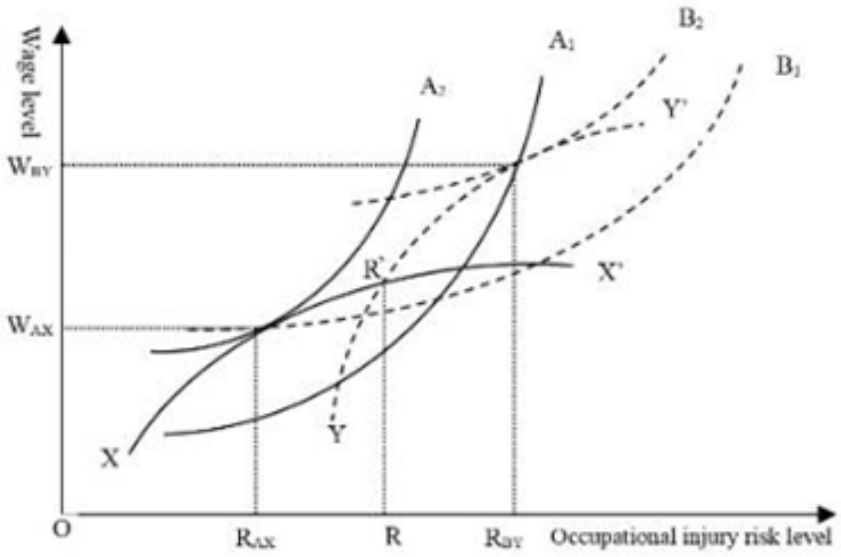

Figure 3: Matching of entrepreneurs and workers.

Therefore, there is no doubt that A combine with X. And B chooses Y inevitably without any accidents. It is logical for X to attract the workers who are risk-averse just like A. Similarly. Y can also remain competitive to hire workers using higher wages. The matching process like above can be extended to many entrepreneurs and workers.

Conclusion

Under the market rules, the matching of workers and entrepreneurs is like that entrepreneur provide jobs which workers accept as rational prices to maximize their own benefits and preferences. Therefore, according to the Dual-subject Safety Determination Mechanism in production, we can get the following awareness: the specific contents of the two-sides subjects play as same as important roles in their safety investments determinations in production and Dual-subject Safety Determination Mechanism in production means that workers with strong preference for security tend to accept job with low wage and low risk which are provided by those entrepreneurs with high efficiency of safety investment, while those risk-averse workers prefer the work opportunities with high wage and high risk provided by those entrepreneurs with low efficiency to increase the degree of safety in production. So, the above discovery shows us a now possibility to improve the safety lever in production effectively.

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