Study on the Law and Curve of Enterprise Safety Demand
Based on Economic Analysis

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Abstract. The author uses the economics theory of supply and demand, analyzes the relation and difference between consumer demand and corporate safety requirements, the changing law of the safety of the demand curve, the amount of the safety requirements of enterprises increases with the safety price, along with the decrease of safety prices, reflected in the demand curve, is a curve on the right tilt the paper interprets and demonstrates the viewpoint; economics inclined safety demand curve to the right at the top of the studied safety demand distortions, analyzes the correction and application of ideas. The research conclusion provides the basic theory of economics for the government to formulate the safety policy scientifically, improve the safety demand and desire of the enterprise, and increase the safety input.

Introduction

Using the theory of economic demand, the author analyzes the changing law of safety demand curve [1]. It is proposed that the active demand for safety will increase with the increase of safety and passive input, and decrease with the decrease of safety passive input. This change is reflected in the demand curve diagram, and it is a view of the curve to the right, and the author demonstrates it. The research results provide the basic theory of economics for the government to formulate the safety policy scientifically, improve the safety demand and desire of the enterprise, and increase the safety input.

The Connection between Consumer Demand and Enterprise Safety Needs

Implications of Consumer Demand

Economics suggests that demand is the relation between the various possible prices of a commodity and the number of consumers willing and able to purchase at these price levels. A product may be sold at a different price on the market, and as the price varies, the number of consumers willing and able to buy is changing. The relationship between the different prices and the corresponding demand is demand, and must be the ability to meet the demand. If the price level of a commodity, consumers are willing to buy a certain number, but does not have the corresponding ability to pay, or that some commodities have the ability to pay to purchase a certain amount, but not willing to buy, these two cases are not counted as demand [1]. The requirements D curve of general goods as shown in Figure 1 (a).

Implications for Enterprise Safety Requirements

In order to meet the market demand and realize its economic benefits, enterprises need to produce products and services in a relatively safe production environment. Therefore, the enterprise has safety requirements or safety aspirations. Then, what is the safety requirements associated with? This is the first question that all enterprises should answer before conducting safety activities. This
is also the primary issue to improve the safety awareness and safety input of enterprises. Here is the introduction of a safety related important concepts: safety demand price, namely in certain period (such as one year) all passive safety of the sum of the input.

The author proposes that the so-called safety refers to the needs of enterprises, in a certain period of time, the sum of all enterprise safety input (passive safety demand price) and in these safety requirements on the price level, the relationship between the number of manufacturers are willing and able to buy safety products and services. In a certain period of time, the greater the sum of the passive investment in the enterprise, the stronger the safety demand and desire, the more the amount of safety products and services purchased, and conversely, less. That is, the higher the safety demand, the higher the demand for safety, and on the contrary, less.

If the safety requirements of a certain level of prices, manufacturers are willing to buy a certain number of safety products and services, but does not have the corresponding ability to pay, or that have the ability to pay to buy a certain number of safety products and services, but not willing to pay the purchase, the two cases are not counted as safety requirements. For example, when the coal mine safety accident damages is very low, even if the strength and ability of coal mine safety investment, enterprises prefer to pay compensation for the losses is not willing to carry out safety input, as shown in Figure 1 (b) D curve shown in the demand for enterprise safety. Here, the D curve of enterprise safety requirements slopes to the right, completely different from the general commodity (normal) demand curve, D, to the lower right. The D1 curve shown in Figure 1 (b) is the enterprise safety requirements curve at a distorted safety price.

Reflected in the demand curve is a curve downward to the right. The D1 curve shown in Figure 1 (a). Safety requirements follow the law of safety requirements. The general rule of the so-called safety needs of enterprises, is that when other factors affecting the safety of demand remains unchanged, demand for enterprise safety increase with the rise of safety prices decreased with the decline in the price of safety. Reflected in the demand curve is a curve up to the right. The D2 curve shown in Figure 1 (b).

**The Economic Interpretation of the Curve of the Safety Demand Curve to the Upper Right**

The author puts forward that the safety demand of enterprises for their own safety production increases with the increase of safety demand and price, and decreases with the decrease of safety demand and price. Reflected in the demand curve, it is a curve to the right, which is the law of safety demand. The main reason is that:

**The Market Demand for Safety Needs is Low, and the Demand for Safety is Low**

If in order to save investment, enterprises active compression safety input, the safety level of the enterprise is low, the production will be sent on the accident probability increases, each accident loss is large, if the amount of compensation for corporate casualties is very low, due to the lack of safety knowledge, other accident economic loss and social loss to the calculation, thus causing the accident losses borne by enterprises is lower than the true occurrence of accident loss. In other words, many accident losses cannot be internalized into the safety costs of an enterprise, borne by the victim, the employee or the community. In this way, the amount of accident compensation and accident loss of enterprises is low, that is, the demand for safety is lower, which leads to less demand for safety of enterprises, and enterprises do not have the initiative to carry out active safety input.

For example, the enterprise casualties’ compensation standard is very low, business owners or managers often have this kind of mentality: buy a coffin is much cheaper than to buy medicine, accident compensation and accident loss is much smaller than the active safety input, increase the active safety economy. In fact, this attitude is also a disregard for miners' life. This attitude will directly affect the safety awareness of coal mine operators and the level of safety requirements. Because they are lucky, the desire for safety needs is not strong, do not want to take the initiative to increase safety input. In this way, the accident compensation is very low, the passive safety investment is low, the safety demand is lower, the safety demand is not high, and the enterprise's
active safety investment will be lower. For example, assume that the coal industry only two A and B coal company, the exploitation of natural conditions, production technology and production capacity is the same, start the A safety investment is higher, the number of accidents per year is very few, the accident loss rarely, such active safety investment and passive safety investment is relatively high, and B safety investment rarely, so B accident probability and accident loss also occurred frequently, but the accident compensation is low, active safety investment and passive safety investment is still relatively low, the total cost of this safety company A company is higher than that of B company and A company in the market will lose the price advantage, competitiveness as B company, in order to obtain the competitive advantage in the market, A will also take the initiative to reduce the safety investment, safety investment for a period of time due to reduced can be transformed into profit At this time, although the business accidents will increase, the accident losses will correspondingly increase, so long as the safety investment saved is more than the increase in the accident losses, it is economic. As shown in Figure 1, in a low safety demand, low price P₁, the safety requirement is Q₁.

![Figure 1. General commodity supply and demand curve and the supply and demand curve of enterprise safety.](image)

**High Safety Prices, High Demand for Safety**

Assuming that the accident losses are very large, the enterprise has a high standard of compensation for the accident, that is, the safety demand and the price increase, which lead to the increase of the safety demand of the enterprise. This is due to a much larger accident loss and accident compensation than corporate enterprises active safety investment, enterprises to increase the active safety can inhibit the occurrence of accidents, so as to reduce the accident damages and losses caused by the accident, so as to increase enterprise safety investment is very active economy, enterprises will have a strong demand for safety.

Therefore, as long as the enterprise produces the safety production accident, especially the casualty accident, the relevant system of safety production ensures that the business owners bear huge economic compensation and economic losses. For example, when a person dies in an enterprise, the enterprise must compensate the casualties according to the sum of their life, economic value and social value. In high-risk industries coal mine, coal mine "is to let people can-not afford to die", from the source to solve the safety awareness of the owners is not strong, safe demand, excessive pursuit of economic interests rather than investment in safety problems.

In other words, greatly enhance the enterprise accident compensation, because of fear of enterprises bear huge compensation for accidents and economic losses, there must be a strong demand for safety, pay attention to increase the active safety investment, reduce the accident probability and accident loss. Therefore, passive safety input is high, and the demand for enterprise safety is high, and will increase the active safety investment. The safety requirements and low willingness, active safety less investment enterprises, must be the probability of the accident, the accident loss is great, because the enterprise compensation is very high, the long term total safety investment in these enterprises will be very safe, high cost, weak competitiveness of enterprises, will be eliminated by the market.
If the accident damage compensation is very high, it will cause the entire industry to increase the safety demand, and even the whole industry safety level continues to improve. Still take two A and B coal company as an example, if you start the A safety investment is high, the annual accidents are few, the accident loss is little, so the active safety and passive safety investment and investment is relatively high; while B due to safety requirements is not high, active safety investment is very few, so B accident a greater probability of accidents, so the accident compensation amount of the company's commitment B will be very high. At this point, B's active safety investment plus passive safety investment is much higher than A's, that is, the total cost of safety will be high. B company will lose the market price advantage, in order to obtain the competitive advantage in the market, B company will improve the safety requirements and will take the initiative to improve safety investment, reduce the probability of accidents and reduce accidents, accidents bear the loss is also reduced, when the marginal cost is equal to the loss of accident of safety investment increases, it to achieve optimal economic safety investment point. As shown in Figure 1, in a secure, higher priced P2, the demand for safety is high for Q2.

The intrinsic relationship between the safety price and the safety demand is shown in figure 2. As shown in Figure 1, the safety requirement is raised to a higher Q2 by raising the safety price to P2, and the safety requirement is increased by Q2 - Q1. It is certain that the demand for safety will continue to increase as safety prices rise further. Therefore, there is a positive correlation between safety price and safety demand. Reflected in the safety demand curve, is a curve to the right.

Of course, the safety price is low, the safety demand is low; with the improvement of the safety price, the safety demand increases, and this rule has certain conditions. When the marginal input of the safety investment equals the marginal value of the accident loss, the equilibrium point is reached. This shows that the governments improve the accident compensation standards, the essence is to change the "margin" of marginal cost and safety investment is equal to the loss of the accident conditions, so as to improve the safety and safety of the enterprise will need active. The internal mechanism of the safety price and safety demand is shown in figure 2.

![Figure 2. Analysis diagram of cyclic relation between safety price and safety demand.](image)

The Distortion, Correction and Application of the Law of Safety Demand

Distortion of Enterprise Safety Requirements

In the past few years, China's accident compensation is far below the economic value of employees, compared with developed countries, the amount of accident compensation is very low.

The author believes that the calculation of the accident losses in China is still unscientific, especially the amount of compensation for accidents is still too low, so that the total loss of accidents undertaken by enterprises is lower than the actual amount of accident losses. The safety investment benefits of enterprises are distorted and reduced. The distortion of enterprise safety price will inevitably lead to the distortion of the safety demand curve. In other words, enterprises will stay at the bottom of the safety demand curve for a long time, that is, low safety, low safety and low demand. The D1 curve in Figure 1 (b).

In addition, the lack of government supervision, and some enterprises can be lucky to compensate the victims of the accident is much lower than the actual or government compensation for the accident.
The Correction of Enterprise Safety Price

The correction of enterprise safety demand is the correction of enterprise safety price. In narrow sense, safety price includes passive safety investment. In broad sense, safety price includes two parts: active safety investment and passive safety investment[2]. There are 3 main methods to calculate the accident loss abroad. One is the Heinrich method, the other is the American Symonds method, and the three is the Japanese Noguchi Miro method [two]. As Japan and China belong to Asia, the history and culture are relatively close. The following is the calculation of the safety price by the Japanese Noguchi Miro method [3]. This method calculates the safety price, which is helpful to correct the safety price of enterprises in our country.

Noguchi Miro put forward the following Japan from 1 to 7 of the costs related to sum up, Estimate the total loss of an accident.

- Legal compensation expenses (the insurance company pays the insurance portion). Nursing compensation (including long-term injury compensation; compensation) rest (by insurance payments); disability compensation (pensions for survivors); compensation; offering funeral expenses.
- Statutory compensation costs (the company part of the burden, for 4 days following the layoff compensation fee).
- Expenses other than statutory compensation. Visit the various fees, compensation fees (refer to the company's rules, agreement); post retirement gold fill amount; fees, fees and other offerings wreath; company held a funeral expenses or funeral subsidies; beyond legal compensation for the hospital nursing funds; other statutory outside funds.
- The loss of human beings caused by an accident. 1) the loss of an injured person. It consists of three parts: the loss of working hours; loss of working hours during the working hours for; loss caused by medical or other reasons. 2) loss of other personnel. It includes six parts: the cause and nursing assistance, contact the non-working time; downtime caused by the loss of working hours; the accident investigation, countermeasures and records caused by non-working time; to return to work, finishing cost of non-working time; visit, nursing and other non-working time; chaos caused by non-boosing onlookers, working time.
- The loss of the goods caused by the accident. Losses of buildings, equipment, etc.; loss of machinery, apparatus and tools; losses of raw materials, materials, semi-finished products and finished products; losses of protective equipment; losses of power, fuel, etc.; loss of other objects.
- Production losses. Restore the amount of money that is due to the losses caused by an accident; reduce the amount of profits caused by accidents resulting from production and production.
- Special losses. The new replacement workers skills shortage of all wage losses; the injured to return after the workshop increased loss of payment of wages; accident treatment expenses, communication fees; external reception fee; according to the results of litigation and litigation expenses; for failing to complete the contract and payment delay fees and other expenses; new record of cost; the newly hired workers spend training fees; the injury occurred less than second times the losses caused by the accident; on the third visit, compensation, reward and funding; recovery needed for the production of financial measures fee and interest burden; with other accidents and the burden of funding by the operator.

The author thinks that we can objectively and fairly calculate the accident loss of the enterprise. So as to achieve the goal of correcting the safety price of the enterprise, and scientifically correct the safety demand and safety will of the enterprise.

Conclusion

The law of safety demand is that the demand for safety increases with the increase of safety price and decreases with the decrease of safety price. Reflected in the demand curve is a curve up to the right. It is a powerful illustration of why the effect of "high death compensation" is superior to the previous administrative order. Therefore, in the case of low safety level of enterprises, using the law of safety demand, the long-term mechanism of enterprise safety can be established by means of
economic means and market. In order to make the business owners attach great importance to safety in production, we can raise the safety price through the system to improve the passive safety cost, so as to improve the safety level.

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