On Risk Control in Coal Mine Safety Inspection due to Information Asymmetry

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Abstract: The Asymmetric information is not only mine safety inspection of reasons, as well as coal mine safety inspections have risk factors. The coal mine safety inspection through the certain technology and the method, gains the information for the government control section, seeks the countermeasure, avoids because the information asymmetrically creating the hidden danger the existence or the security accident occurrence. In the coal mine safety inspection, there are external and internal asymmetric information. Construction of Coal Mine Safety Inspection information platform, the establishment and perfection of the check diary and review system is to reduce the risk of Coal Mine Safety Inspection of important measures.

Keywords: Coal mine safety inspection; Asymmetric information; Moral risk; Reversion choice

1 Introduction

Coal mining industry is the country's largest high-risk industries, as China's coal industry in the market. Coal production safety problem is getting to people's attention. China is the world's coal mine accidents occurred most frequently, coal mine accidents remains high, particularly serious accidents have occurred frequently, resulting in the people's lives and property of significant losses, but also a serious impact on the coal industry's image. Therefore, inspection and supervision is important measure. However, due to the existence of asymmetric information, the mine safety inspection can not avoid risks and serious impact on the inspection results. This article takes the information economics theory as the instruction, discusses the control and the management about the coal mine safety inspect risk.

2 Concept of Coal Mine Safety Inspection Risk and Performance

The nation supervises and the local supervising and managing and the business enterprise be responsible for, is the basic structure and form of coal mine safe work in our country. The vertical management and the graduation supervision coal mine safe supervision organization is embarks from our country coal mine production particularity, the coal mine safety in production experience and teaches through the summary history in, the model overseas coal mine safe supervision success experience establishes administration law enforcement. It legally fulfills the coal mine supervision responsibility to the local all levels of people's government and the coal enterprise which the country entrusts with.

Mine Safety Inspection risk generally refers to coal mine safety supervision departments to be examined coal enterprises of the safety situation and perform functions related to the situation in inappropriate comments and evaluation, or inspection of the mine was made wrong decisions dealing with punishment. First, the serious mine safety problems have not been identified risk; the second is issued by an improper inspection or issued a decision to inspect the inappropriate risk. "Inappropriate" contains two aspects: First, objectively wrong things for the correct judgment, to be sure, “Takes the false risk ”; the second is to objectively correct things for the wrong judgment, given the negative, is “abandoning real risk”. Because the inspect personnel's opinion or conclusion are establishments to judge foundation in a kind of occupation reviewing and the profession. Since is a judgment, may deviate objective fact, even is quite the contrary with objective fact. Be also say, get the inspect conclusion has indetermination to some extent. This kind of indetermination sometimes gives to be inspected unit and relevant everyone to bring to lose, cause to inspect a section or inspect personnel to undertake a responsibility to the result and this kind of possibility constituted to inspect risk.

In the meantime, Mine safety inspection should include checking functions risk. The government carries
on the security check to the coal mine the basic function is carries on the surveillance to the coal mine safety in production. If the government safety inspections of this function can not be full and comprehensive implementation, for the government it is no longer necessary, and it may be the functions of other government departments of supervision and inspection functions replaced. Therefore, Government safety inspection departments can be fully and comprehensively fulfill its safety oversight functions; it is an objective functions risk. As a result, among the discussion government coal mine safety inspect risk must contain the inspection function risk.

Mine safety checks and inspections risk, information asymmetry is a key factor. Entrusts appearance which the agent relates, caused the government control section (request side) and the coal mine operator (proxy side) between appears the information not to be asymmetrical, thereupon has had the inspection. Inspect through certain techniques and methods for government departments to obtain information, find countermeasures, avoid this asymmetric information security risks caused by the presence or safety incidents occur. And Risk is also due to inspect and monitor coal mine checked the information asymmetry.

3 Mine Safety Inspection Risk Mechanism Based on the Asymmetry Information

Asymmetric information is not only mine safety inspection of reasons, as well as security checks of risk. According to the scope, it mainly reflected in the external and in the internal.

3.1 The exterior asymmetry information
Agency relationship, the emergence make government management (clients) and the mine operator (agent) between the information asymmetry, hence solving asymmetric information means and methods appeared. However, Mine Safety Inspection departments, as a third party, despite the adoption of certain technologies and methods to understand the unit being inspected message but check before its mastery of the unit being inspected less information. In the meantime, in China, in order to maintain a high degree of independence of the inspection, some of them “job exchange” system. Therefore, the inspectors have to leave a familiar environment, that is, to abandon certain existing information resources to a totally unfamiliar environment for the conduct of inspection; this reinforces the government's coal mine safety inspection departments and units to be examined between the degrees of information asymmetry.

3.2 The internal asymmetry information
Inspection by the supervisory departments send an inspection team completed, but the inspect team be again constitute by several inspect personnel. In the course of the inspection could not check all together inspections, but according to people's abilities and skills, and for the scientific division, each responsible for part of the inspection. Therefore, the information feedback channel is: the inspectors --- the inspect teams --- work safety supervision departments. Work safety supervision and inspection departments take risks, but not the unit being inspected first grasp the information, must pass in the frontline inspectors. Therefore, the work safety supervision and inspection personnel, the sector have become control safety information disadvantage at the client, and the inspectors will have information superiority as an agent. Such principal-agent relationship determines officers were control safety departments access to the coal mine safety inspection was an important way of information.

3.3 Coal mine safety inspection risk analysis of the formation mechanism based on the information asymmetry
From the above analysis, it is not control safety departments and units checked the information asymmetry, the risk must exist inspection, the information dissymmetry is an existence inspect the essential condition of the risk, but isn't a full condition. In other words: On the one hand if the control safety sector has been checked with the same unit's information (There is no information asymmetry), the inspect risk can also lower to 0; On the other hand, the information asymmetrical is the objective existence, however, if the inspected unit to cooperate fully, the information which holds own completely unfolds in the inspection for the department, similarly also can reduce the inspection risk.

3.3.1 The moral hazard analysis of coal mine safety inspection
Mine safety inspection is the main safety supervision and management departments, legal protection
mandatory. In China this stage, the main notarization is not for the purpose of inspection, but supervision and inspection, as well as law and discipline and punishment for the Suppression. Such inspection is a combination of punishment purpose will be examined with some units or its staff conflict of interest. Therefore, the two sides of the asymmetric information on emerging security departments to monitor the risk of moral hazard

(1) The moral risk of exterior
To provide authentic and transparent information on the status of Coal Mine Safety Inspection is the bounden duty. But in real life, the unit being inspected to the disclosure of information is not satisfactory, the false information was opaque and inspection of a coal mine important feature. Be inspected unit to well occupy the safe information of own unit with its personnel, knowing this unit safe aspect well, where exist safety concealed. Knowing own behaviors violate the rules. For evading a punishment, protecting own vested interest, by all means conceal toward the section of control safety sector disadvantageous to oneself of information. Thus, the formation of safety supervision departments is facing external moral hazard.

(2) The morals risk of inner
Violations of law exist to the units and individuals, on the one hand, tried hard to cover up for their disadvantage true situation, to avoid other adverse information found after punishment, also roped in safety screening personnel. And the inspection personnel has already discovered to be inspected an unit safety as well under the influence of oneself character and morals concealed suffer from an information to conceal because of accepting "rental" not to report of circumstance. Hence it became the internal morals risk of section.

3.3.2 Adverse selection in mine safety inspection
(1) Adverse selection before inspection
Judging from the current safety inspection of the actual operation of view, because of the security checks, the unit being inspected to conduct a comprehensive and detailed understanding, subject to inspection cost constraints, it is very difficult to implement. Therefore appeared to make selective inspect. On one hand, to the unit being inspected for the violation of law is not likely to be investigated, on the other hand, led to the unit being inspected to the adverse selection. When supervision departments dealt with the problem is the lack of incentive, lack of checks on power.
Under normal circumstances, based on historical experience, the unit being inspected is a clear understanding and supervision departments such practices. For security reasons, often conducted by the unit and its units in the security act to consider whether a violation of law. Usually choose to give up. But the unit been seldom make selective inspect, because of think to be inspected all a rate to be very small, more safe, generally would take risks. This, created inspection department inspection units and individuals who violate the discipline likely to be smaller, and little or no examination of departments and individuals who violate the discipline of a possibly larger, Such adverse selection risk of a major opportunity cost in the form of manifestation.

(2) The adverse selection of Mine Safety Inspection process
Currently, as the relevant laws and regulations on the inspection unit to provide false information punishment inadequate, therefore, formation of the inspection process of adverse selection. At this stage, coal mine safety inspection is mainly dealt with coal production safety hazards mainly supervised checked, it expose and access to the unit being inspected safe production of information has become the focus of safety checks. But the inspection, the unit being inspected to actively cooperate with the general inspection teams to understand and grasp favorable or sound information, deliberately hidden their negative information, and increase inspection of difficulties and resistance, but also increased the risk of censorship. Above, the supervision departments and units to be examined objectively exists between asymmetric information, supervision departments at the information is inferior client, and the unit being inspected is at the edge information agent, This agency relationship exists, the decision to check the existence of risk, it is impossible to evade.

4 Mitigation Information Asymmetry and Reduce Coal Mine Safety Inspection Risk
Asymmetric information in the case, coal mine safety supervision departments face great risks. Provided valuable information, or information gathering cost information asymmetry will exist objectively. Because information asymmetry will bring about risks and supervisory departments should actively collect information on the unit being inspected message to circumvent inspection risk. However, as fully understand and grasp the unit being inspected to the high cost of the safety situation, thus the total elimination of supervision departments and inspection units in the asymmetric information is not possible. To reduce the security monitoring asymmetric information, the need to strengthen the following aspects:

4.1 Strengthening work safety supervision system information platform
Asymmetric information is affecting the efficiency of inspection; the inspection triggered the important reasons for the risk. Therefore, efforts to collect checked mine of information is to alleviate the problem of important means. We suggest the state control safety organizations throughout the government security surveillance system to establish a unified, shared the mine safety information base. First, the local safety supervision department in accordance with the "territoriality" principle, the comprehensive collection is supervised the coal mine the comprehensive information. Mine include the internal and external information. Secondly, national security supervision departments establish a unified database format. Local supervision departments will be collected by the inspection unit of information, based on unified format for data were recorded. Finally, national safety supervision departments to gather information on the data and the creation of integrated service platform in the national security surveillance system free information services. Local supervisory departments, before the inspection, through the information service platform, it is easier to understand some of the unit's main message, which will effectively increase the amount of inspection departments.

4.2 Multi-channel, and multi-faceted information on the mine's inspection information.
Safety inspections alone on its own strength and technology acquisition mine safety information is limited, therefore, we must broaden their horizons, expand the channels, and multi-faceted, multi-level access to the mine's safety. First, building inspection and reporting system. When the inspection team to check points, held a big check into points, distributed in the media, publicity inspection work, also announced inspection, and acceptance of key link in the form of reports, so that the unit being inspected location to monitor the masses are aware of the department concerned departments are inspected welcome the masses of the respective departments for the problems to report. Secondly, visiting the relevant departments to check against the unit being inspected reports materials, check with the focus screening for inspection useful clues and information.

4.3 The use of information screening techniques, rationally define the key points of inspection
4.3.1 Screening information
During checks, subject to the screening, thereby determining reasonable focuses. Mine's situation is different, each mine has the characteristics. It is not easy to grasp of the essentials. Therefore, we can mine by geological conditions, mining methods, such as security performance classification years of inspection experience for the inspectors in determining the focus of inspection provided an important reference.

4.3.2 Scientific choice checkpoints
In monitoring collection unit being inspected message, the unit being inspected also monitor efforts to understand the information sector, understand how to monitor targeted sampling to determine how to focus and how to inspection.

3.3.3 Use of reverse thinking
Reverse thinking means that the people to achieve certain objectives, from the opposite angle to consider the issue, guiding inspiration from the way of thinking. Faced with new things, new problems, we should learn things from different aspects. Different perspective to the study of new things, solve new problems. Coal Mine Safety Inspection, leading people to the way of thinking would be to check the effective screening information added. But it is easy to overlook some "relatively safe and difficult problem" areas. Therefore, in conventional thinking screening information, identify key check, Reverse thinking should also be used to choose something that can not be problem areas as a secondary focus,
arrangements must manpower and time for careful examination.

4.4 Strengthen the internal supervision to guard against internal moral hazard risks arising from the inspection

4.4.1 Building internal good channel for information exchange

Current security supervision departments in the one-way communication of information feedback channels are not conducive to monitor possession comprehensive examination of the information. Once the information in the inspection or inspection teams were hidden, So as a last resort for inspection risk supervision departments will be impossible to check the comprehensive information. Therefore, the supervision departments of the need for change in this single-channel feedback information, the establishment of a multi-channel feedback, effectively prevent the inspectors and inspection teams, the risk of moral hazard risks caused by inspections. Diary of inspection is an effective method. Diary inspection is the inspectors to artificially units by the time the order reflects its daily implementation of the inspection process of written records, and inspection matters, including the name, check the implementation of the steps and methods to check the data description and quantity. Inspection of professional judgment and to verify the results, other needs of the record. Specific inspection, the inspection requirements of each check in daily after carefully fill. In order to prevent the inspectors subsequently altered, check diary can be designed to fill in the diary of the professional software, once completed it can not be amended so as to reflect the work of the inspection the most primitive and most timely information. Such inspection teams and supervision departments not only through the understanding of the inspectors check information, but also by the inspectors to complete the inspection check the diary to understand information, to some extent due to circumvent the inspectors and inspection teams, the risk of moral hazard risks of screening. Mine inspection because the inspection found that the problems reflect a certain time lag, not the inspectors found problems at that time to reflect on the make. After the inspection and the "bribe" will be very difficult to play a role, because the inspectors or the inspection scene that day had truthfully completed the inspection diary, and through that network has reported. It is not possible subsequent modifications.

4.4.2 The establishment reexamination system, strengthens to the inspection personnel's surveillance

Internal moral risk possibly appears which in view of the inspection group, in order to prevent the inspection personnel uses in the hand to grasp is inspected the coal mine security problem the clue to carry on initiative or passive "seeks" the behavior. The supervisory department may have pointed establishes two levels of reexaminations systems. The so-called two levels of reexaminations system is refer: When safely supervises the department to send out the inspection group safely carries on the inspection to the coal mine to develop two levels the reexaminations. First is inspects the group interior the reexamination. In inspects the component member to complete the inspection task after the inspection implementation plan division of labor, the inspection group sends out other personnel carries on to the inspection key point and the sensitive issue has the choice the reexamination. Next is supervises the department soon completes the inspection task when the inspection group, sends out the specialist to go is inspected the coal mine, also has the choice to carry on the reexamination with emphasis. Like this on the one hand may prevent because the inspection personnel's technology and the level create loses looks up the risk; On the other hand not only can effectively guard against the inspection interior morals risk, but also is advantageous to the promotion inspection personnel in the inspection work more earnest, is even more professional. Because, said to the inspection personnel, if own responsible work is found out the existence major issue, even if cannot determine the inspection personnel hides the related clue on own initiative, also explains the inspection personnel's vocational level, the working ability existence disparity. Therefore, two levels of reexaminations, if on the one hand may effectively guard against the internal morals risk, on the other hand also can promote the inspection personnel to enhance controls quality.

4.5 The usage of the pledge guaranteed

The pledge guaranteed also alleviates one of information not asymmetrical important methods. Because is inspected the unit to exist the illegal violation of regulations the behavior, stemming from need which protects oneself, frequently sedulously hides the illegal violation of regulations the information, perhaps provides after the related information which tampers with, perhaps radically provides the vacation and...
the forge related security primary information, causes the inspection personnel to carry on the inspection in the information serious not asymmetrical situation, inevitably further expands the probability which the inspection risk occurs. Therefore, beforehand requests to inspect the unit to the material authenticity which provides to carry on the pledge, and signs the pledge responsibility book. To is inspected the unit to use deception, to provide the false information the behavior to give by the legal form the severe punishment, to is inspected the unit to constitute the certain deterrent strength, causes it when the inspection does not dare to to the inspection group to provide the vacation the security information.

5 Conclusion

In summary, it is easy to see, safety monitoring are asymmetric information under the conditions, in order to achieve the purpose of monitoring, eliminate inspection risk, it must solve the supervision and inspection by the asymmetric information problems, thereby improving safety standards.

Reference


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