



# Impact of rent-seeking on productivity in Chinese coal mine safety supervision: A simulation study



Hong Chen<sup>\*</sup>, Qun Feng, Dandan Zhu, Shuai Han, Ruyin Long

School of Management, China University of Mining and Technology, China

## HIGHLIGHTS

- We discussed rent-seeking behavior in Chinese coal mine safety supervision.
- We explored the characteristics of coal mine productivity.
- We investigated the impact of rent-seeking on coal mine productivity in three scenarios.
- We found rent-seeking led to great fluctuations in productivity with a dualeffect.
- We proposed a model strategy for Chinese coal mine safety supervision in three areas.

## ARTICLE INFO

### Article history:

Received 29 September 2015

Received in revised form

28 February 2016

Accepted 29 February 2016

### Keywords:

Back-propagation neural network

Coal mine safety

Productivity

Rent-seeking

## ABSTRACT

During the “golden decade” (2001–2011) of the coal industry in China, rent-seeking increased in coal mine safety supervision alongside significant improvements in coal mine safety status and increased economic benefits in the coal industry. To explore this internal relationship, we developed a Matlab simulation system and simulated the impact of rent-seeking from each level of the supervision department on coal mine productivity in different scenarios. The results showed the following. (1) Rent-seeking had no significant influence on the average level of material productivity but it had an adverse effect on the average level of mental productivity. Due to the effects of rent-seeking, productivity tended to exhibit unstable and destructive fluctuations, and rent-seeking had the dual effect of promoting and restraining productivity in a wide range with a high frequency. (2) In the supervision scenario, supervision by the high-level department was efficient, and productivity was promoted more by the national and provincial supervision department. (3) In the rent-seeking scenario, each level of the department had an intensity threshold above which coal mine accidents occurred. We also propose suggestions that focuses on the improved supervision of Chinese coal mine safety in three areas based on the “new normal” safety concept.

© 2016 Elsevier Ltd. All rights reserved.

## 1. Introduction

The coal industry plays an important role in China's national economy. Between 2001 and 2011, China's coal economy developed strongly. However, due to the special characteristics of China's national conditions and the coal industry, the current number of employees in the coal industry is large and the working environment is complex and poor, where gas explosions,

flooding, and other accidents occur frequently. During 2001–2010, it the State Administration of Coal Mine Safety reported that 28,868 coal mine accidents occurred and 47,875 people died (Chen et al., 2012). Thus, the issue of coal mine safety has attracted much attention. In China, the Work Safety Committee of the State Council and the State Administration of Work Safety are the highest administrative institutions that supervise safety production. Relevant institutions have also been established with a vertical management structure in the provinces and cities (Chen and Qi, 2013). Thus, the coal industry, especially its safety management, is closely linked to government regulation, which creates opportunities for members of the government to seek rents. Research shows that rent-seeking activities exist extensively in China's coal mine safety supervision systems (Chen

<sup>\*</sup> Correspondence to: School of Management, A506, China University of Mining and Technology, Nanhu Campus, Xuzhou, Jiangsu province 221116, China

E-mail addresses: [hongchenxz@163.com](mailto:hongchenxz@163.com) (H. Chen), [liezihuzheng@163.com](mailto:liezihuzheng@163.com) (Q. Feng), [zhudandan113@foxmail.com](mailto:zhudandan113@foxmail.com) (D. Zhu), [hessa1222@163.com](mailto:hessa1222@163.com) (S. Han), [longruiyin@163.com](mailto:longruiyin@163.com) (R. Long).

et al., 2014). During the actual practice of safety supervision, the relationship between each level of the supervision department and the coal enterprise is subtle and complex. Therefore, if the supervision departments use their authority to seek rents from coal mine enterprises, this may have different effects on the coal mine enterprises: 1) a negative effect on the quality and efficiency of safety development; 2) a positive effect by gaining extra power and resources through accepting rent seeking; and 3) preserving rent-seeking because coal mine enterprises hold information about the rent-seeking activities of supervision departments (Chen et al., 2014). According to the new classical theory, rent-seeking, which is regarded as a pernicious behavior, is closely linked to the “waste of resources” (Buchanan and Tullock, 1962). Rent-seeking is considered to be an obstacle to economic development and it has a negative impact on society (Iqbal and Daly, 2014; Spinesi, 2009). Thus, a coal mine supervision department may use its power to seek rents for personal gain, which inevitably results in low quality and inefficiency in the development of safety for coal mine enterprises, and this is accompanied by a decrease in the productivity level. However, it should be noted that coal mine safety has improved gradually in China during the past decade, despite extensive rent-seeking activities in coal mine safety supervision. There has been an annual decline in the number of coal mine accidents as well as the death rate per million tonnes, while coal production has increased every year. Compared with 2001, the numbers of coal mine accidents and deaths were 80.89% and 81.50% lower in 2013, respectively, and the death rate per million tons had decreased by 94.18% (Deng et al., 2014). These results suggest a departure from the viewpoint that rent-seeking activities are harmful. Based on the analysis given above, we accept the view that rent-seeking leads to a waste of resources, and we also pose a new question from another perspective: why have rent-seeking activities persisted in China’s coal mine safety supervision system for such a long time? Furthermore, in the background of the Chinese culture of “guanxi” and insufficient regulations, has rent-seeking had a strangely “positive” effect on the development of productivity? If rent-seeking has a dual effect on productivity, how are the results presented?

Most previous studies of the effects of rent-seeking have focused on the relationship between rent-seeking behavior, economic development, policy and tax (Wong, 2011; Brou and Ruta, 2013; Grazhevska et al., 2015; Kwon, 2015; Kahana and Klunover, 2014), whereas few studies have investigated the effects of rent-seeking behavior on coal mine safety supervision. Therefore, based on a deep analysis of coal mine safety supervision, we developed a Matlab simulation with an embedded artificial neural network in order to explore the effects of rent-seeking activities by national, provincial, and local supervision departments on coal production in different scenarios. Based on our results, we propose a model strategy for safety supervision to extend new ideas related to coal mine safety supervision in three areas, i.e., the restraint of rent-seeking behavior, the healthy promotion of productivity, and the enhancement of relationships between managers and employees.

## 2. Literature review

### 2.1. Rent-seeking behavior in coal mine safety supervision and its underlying factors

Buchanan and Tullock (1962) first provided a formal definition of rent-seeking in economics. Given that rent-seeking behavior derives from the economic man’s motivation for seeking benefits and government policies were used as the instrument, he defined

rent-seeking a resource-wasting activity where individual’s seek wealth transfers through the government. One of the most widely accepted rent-seeking concepts is that proposed by Bhagwati (1982), who considered it to be a directly unproductive activity. He noted that rent-seeking behavior itself cannot yield any direct economic output when creating economic profit for economic subjects. McChesney (1991) defined rent-seeking as the behaviors of politicians when helping producers to increase benefits using their power and inducing producers to bribe in order to gain the rents that they create. Rent-seeking behavior also exists in coal mine safety supervision based on the premise of public power, benefit, and human relationships. According to the various definitions of rent-seeking and the actual context of Chinese coal mine safety supervision, we define rent-seeking behavior in coal mine safety supervision as follows. All levels of coal mine safety supervision departments, environmental or geological departments, and other departments related to safety supervision, including the officials in each department, use public power to create rents and require coal mine enterprises to offer rents in order to pursue departmental or personal economic benefit as well as to satisfy the need for *guanxi*. In addition to the rent-seeking behavior of safety supervision departments, reversed rent-seeking by coal mine enterprises also exists (Chen et al., 2014), which refers to the fact that when a governmental department seeks rents, the coal mine enterprise asks for policy support or privileges in exchange for not exposing the department’s rent-seeking activities.

The subjects involved in coal mine safety supervision are mainly the supervision departments and coal mine enterprises. In the present study, by analyzing the interactions between the two and considering the actual operations of coal mine enterprises, we explored the main factors that affect rent-seeking in coal mine safety supervision.

Gong (2011) indicated that enterprises must consider the benefits of stakeholders because the benefits for enterprises can be affected by individuals and groups. For coal mine enterprises, the beneficial relationships are different between each level of the supervision department and safety supervision, while the supervision departments can also have direct effects on safety supervision. Thus, the opportunities for rent-setting and rent-seeking are different for each level of the supervision department. The rent-seeking behaviors that have already occurred may be helpful for decision-making by coal mine enterprises because whether the rent works and its effects can be inferred from previous rent-seeking experiences. According to stakeholder theory, an enterprise needs to invest resources to maintain a beneficial relationship with the government, which is determined by the dependence of the enterprise on the government. If there is a relationship based on a contract or regulation between the enterprise and the government, or if a change in policy will bring a substantial increase in business cost, then the enterprise is more willing to consume resources to maintain good relationships with the government, but it may also attempt to influence public policies in other ways. The same issues apply to coal mine safety supervision. If the supervision department seeks rents, the coal mines will consider the maintenance cost of rent-seeking, the size of the rents, time costs, energy costs, and potential benefits. In general, the subjects of rent-seeking behavior are governments or other authorities. The game process between the government and the enterprise may have various consequences, including “rent-seeking may be exposed” and “penalties and other punishments after exposure” (Cang et al., 2010; Lin, 2004). Therefore, six main factors can influence rent-seeking behavior: the extent of the possible benefits, directness of the influence, effectiveness of the influence, possibility of public disclosure, time and energy costs, and the size of the rents.

Download English Version:

<https://daneshyari.com/en/article/7399259>

Download Persian Version:

<https://daneshyari.com/article/7399259>

[Daneshyari.com](https://daneshyari.com)