This chapter is to explain the China Model characterized with “high economic growth rate concomitant with high frequency of vicious accidents” by constructing a formal model of the local government–firm collusion. Section 2.1 introduces three famous or infamous events about PX (p-Xylene) projects in China and raises two questions relevant to these events. Section 2.2 makes a literature review of theoretical interpretations of the China Model and elicits the argument of the whole chapter. Section 2.3 defines the basic elements of the model of the local government–firm collusion. Section 2.4 discusses optimal equilibrium collusion contract and optimal prevention collusion contract and testifies to major propositions of this chapter. Section 2.5 provides an interpretation of different results of the three PX projects mentioned above. Section 2.6 discusses other factors that might have an impact on collusion. Section 2.7 is a summary of the chapter.

2.1 Three PX Projects

In recent years, mass incidents came thick and fast in Dalian, Ningbo, and Xiamen where residents congregated to protest against the construction of PX projects. These incidents commanded a great concern both at home and abroad. PX, the shortened form for p-Xylene, is a colorless and aromatic yet flammable and toxic liquid mainly used for the manufacture of plastic and polyester. Its production output is a far cry from being sufficient to meet increasing demand. For instance,
it was estimated by sina.com (a Website for the Chinese communities worldwide, covering a full array of news, entertainment, financial information, science and technology, and lifestyle tips) that China produced and supplied 4.8 million tons of p-Xylene in 2009, but its domestic demand was estimated to be 8.17 million tons. In 2010, China became the largest producer and consumer of this poisonous chemical, with its production capacity accounting for 20% and consumption for 30%.\(^1\) As far as economic efficiency is concerned, the output value of a PX project (estimated to be as high as tens of billions of Chinese Yuan [CNY]) is absolutely alluring despite its huge cost of construction (estimated to be more than CNY10 billion\(^2\)). At present, in Mainland China, 15 PX projects have been completed or are still under construction. Nearly all of them are concentrated in the eastern coastal provinces.

### 2.1.1 Dalian XP Project: Relocation and Expansion\(^3\)

The Fujia-Dahua PX project in Dalian, a well-known deepwater seaport city in Liaoning Province, Northeast China, was approved by National Development and Reform Commission (NDRC) in December 2005, and it was put into production in June 2009. Fujia Dahua Co. Ltd. was co-founded by Dahua Group (underwriting CNY49 million), a Dalian-based holding company under the control of the Dalian Municipal Government and Fujia Investment Co. Ltd. (underwriting CNY51 million), a private enterprise.

Devastated by a disastrous typhoon Muifa on August 8, 2011, the breakwater protecting the Fujia-Dahua plant collapsed and the surging seawater rose near p-Xylene storage tanks. Although it was officially claimed that later the risk of p-Xylene leakage had been removed, the company’s prevention of journalists from making a field investigation was widely spread within the national mass media. Furthermore, the media disclosed a bombshell that the plant’s practical operation preceded its completion acceptance. On August 14, tens of thousands of Dalian dwellers congregated on the People’s Square and protested against the PX project. The Dalian Municipal Government announced that night that Fujia-Dahua should immediately discontinue its production and decided to relocate the project. But no one knew when and where the project would be relocated.

In August 2012, a year after the Dalian Municipal Government’s announcement of the project relocation, Dalian Daily reported that the relocation plan had passed the review conducted by the authoritative
China International Engineering Consultant Corporation Limited. According to the plan, Fujia-Dahua would be relocated from Dagushan petrochemical enterprise complex to Changxing Island Industrial Zone. On October 29, 2012, people.cn, a news platform created by China’s most influential newspaper *People’s Daily*, released an article titled “Fujia-Dahua PX project still in operation, capacity doubled to 1.4 million tons”. In late December 2012, *Shanghai Business Daily* quoted from a Dalian official that the PX project was up to the standard after a thorough rectification and “production has been resumed recently”.

### 2.1.2 Xiamen’s PX Project: Relocation

In February, the State Council approved the Haicang PX project financed by a Taiwan-funded enterprise Dragon Aromatics in Xiamen (Amoy), a famous seaport city directly under the jurisdiction of Fujian Province, Southeast China. The factory, with an estimated annual production of 700,000 tons of p-Xylene would be constructed in Haicang District. According to the original plan, the construction project commenced in November 2006 and it was put into production in 2008.

In March 2003, Zhao Yufen, an Academician of the Chinese Academy of Sciences, and other 105 members of the National Committee of the Chinese People’s Political Consultative Conference initiated a draft resolution “Proposal about the relocation of Haicang PX project”, but later this proposal failed to get approval.

On May 30, 2007, the Xiamen Municipal Government resolved to delay the PX project. The Fujian Provincial Government demanded the Xiamen Municipal Government to make a more comprehensive environmental appraisal about the project.

The next day, thousands of Xiamen residents had a demonstration before the Municipal Government Hall. In December 2007, on the basis of environmental appraisal, Internet vote and two rap sessions attended by city residents, both the Fujian Provincial and the Xiamen Municipal Governments decided to abide by public opinion and relocate the PX project to Gulei Peninsula, Zhangzhou.

On January 9, 2009, the National Environmental Protection Department approved in principle the PX project of Dragon Aromatics (Zhangzhou). The project’s total investment amounted to CNY13.78 billion, of which CNY0.83 billion was earmarked for environmental protection. The annual discharge amount of sulfur dioxide was 3644 tons and annual chemical oxygen demand (COD) was 56.16 tons.
2.1.3 Ningbo’s PX Project: Abortion

In the Twelfth Five-Year Plan (2011–2015), the Ningbo (a seaport city under the jurisdiction of Zhejiang Province, East China) Municipal Government proposed to introduce a series of petrochemical refinery and integration projects (including a PX project). The prospective site would be situated in the Economic and Technological Development Zone, Zhenhai District, Ningbo. It was estimated that the total investment would be CNY55.873 billion. If it were completed, Zhenhai Refinery & Chemicals Engineering Company would be the largest complex oil refinery enterprise in Asia.

In early October 2012, some villagers near the would-be construction site, through the Public Voice System, complained with the Zhenhai District Government against possible environmental disaster and requested to relocate their homes. On October 22, nearly 200 villagers also filed their complaints with the Ningbo Municipal Government. Since then, a legion of local villagers and city dwellers consecutively expressed their resentment, appealing to the authorities to halt the project.

On October 27, the Ningbo Municipal Party Committee and the Ningbo Municipal Government held a symposium, making a comprehensive survey of the project. The next day, under the pressure of continuous massive demonstrations, a spokesman of the Ningbo Municipal Government expressed explicitly: “Ningbo will resolutely give up on the PX project; the petrochemical refinery and integration project will be immediately discontinued until a scientific research testifies to its feasibility.”

Two questions are elicited from the above three cases about the PX project: (1) Why did some local governments defy resistance and pressure from local residents and doggedly push forward p-Xylene projects? (2) Why were some projects aborted while others were put into operation smoothly or relocated?

2.2 The China Model Driven by Government–Firm Collusion

It is necessary to make a general review of recent literature concerning the China economic growth model before we make a research on the China Model from the perspective of government–firm collusion. The China model is two-fold: high economic growth rate concomitant with high frequency of vicious accidents. To do it justice, the publications
as to the China Model explain well either side (positive or negative) of the model, but none of them analyzes within the same framework both sides of it.

Large quantities of literature ascribe high economic growth to the local governments and especially underscore the role they play in competing for GDP aggregate (Yang 1998; Zhang and Su 1998). Qian and Xu (1993) and Maskin et al. (2000) argue that the Chinese authoritarian regime is a multidivisional government structure where each division, which is very much like a business department within a gigantic business corporation, has a similar industrial structure. That is why local governments can carry out yardstick competition. But why do local officials have the incentive to participate in GDP competition? Some researchers believe that local officials could gain from faster economic growth more financial revenues since the implementation of local financial contract system in the early 1980s and tax-sharing system in 1994 (Oi 1992; Lin and Liu 2000). In terms of contract theory, the gain-sharing contract crafted by the central government as the principal can alleviate moral hazards of the local government as the agent. Unlike Oi’s Local State Corporatism, this type of political centralization and economic decentralization is labeled as market-preserving federalism (Weingast 1995; Qian and Weingast 1996; Jin et al. 2005). Other researchers observe that government officials with better economic performances are more likely to be politically promoted to a higher position. Bo (1996) makes an empirical study on the political promotion of all provincial governors and provincial vice-governors since the founding of the PRC in 1949 and draws a conclusion that their promotion is linked up with their economic achievements, especially with the tax revenue paid to the central government. Li and Zhou (2005) and Chen Ye et al. (2005) draw a similar conclusion. However, only a few articles accentuate the costs incurred by competitions between local governments. These costs include: local protectionism and repetitious construction (Shen and Dai 1990; Zhou 2004; Bai et al. 2004); local governments’ collusion with local firms to evade taxes or escape administration, thus undermining the central government’s monitoring capacity (Cai and Treisman 2004); local governments’ conflicting multitasks—such as a vanity project versus a livelihood project (Nie and Li 2006) and the widening developmental gap between regions (Zhang et al. 2007).

Obviously, cost and revenue in the process of China’s economic growth are the two sides of the coin of the China model. However,
as far as I can tell, there is no article or monograph which can explain high economic growth rate concomitant with high frequency of vicious accidents. Much literature focuses on the one side and just mentions the other side through extended discussion. From the perspective of economic research, a self-consistent theory must get its own cost and revenue from the same set of assumptions and then decides the optimal option. In its realistic sense, a story of the China Model must explain why its high economic growth rate is concomitant with high frequency of vicious accidents. By introducing a sound mathematical model, Nie and Li (2006, 2013) explain, within a government–firm collusion framework, why this concomitance occurs in China. This chapter is mainly devoted to the political–economic model of government–firm collusion.

This model has three game players: the central government (principal), local governments (supervisor), and firms (agent). Since a local government is authorized by the central government to supervise a firm’s production activities, the principal knows little about the firm’s cost production but the supervisor knows a thing or two. Under the situation of information asymmetry, the local government colludes with the firm to choose a bad and inexpensive mode of production over a good and expensive one for the purpose of accelerating economic growth and thus earning more profits by reducing cost input. However, a bad and inexpensive mode of production is highly likely to incur vicious accidents. Therefore, the local government–firm collusion is the root of the concomitance of high economic growth with high frequency of vicious accidents. This book presents an optimal equilibrium-collusion contract, where the central government will turn a blind eye to the collusion when the collusion-proof costs surpass the prospective advantages. This book also offers an optimal collusion-proof contract where the central government will devise an optimal collusion-proof mechanism if the costs arising from collusion are beyond the bounds of allowed proceeds. Under the optimal mechanism, the emoluments paid to the local government and the firm is endogenous, so are the punitive measures against them. Finally, we take the PX project as an example to show that the main conclusions of this chapter have been supported by empirical evidence.

The government–firm collusion model makes the following contributions to existing literature.

First, it offers a new perspective from which to analyze the China Model and thus have a panorama (analyzing both cost and proceeds)
of China’s economic growth. A large amount of recent literature—such as Young (2000), Chow and Li (2001), Cheung (2008), Brandt and Rawski (2008)—attempts to offer a reasonable explanation of China’s high economic growth. Unlike the literature mentioned above, this book lays equal emphasis on the successful side of economic growth and on China’s economic decentralization and cost of local competition.

Second, it offers a microeconomic basis on which to understand economic growth in terms of information asymmetry. Some literature reveals that local competition will generate negative effects, such as reduction in public goods and relaxation of control environment (Gordon 1983; Oates and Schwab 1988; Bandhan and Mookerjee 2000) and other literature analyzes the weakening of the central government’s authority and governing competency due to local competition (Cai and Treisman 2004). However, the driving force of the above literature is the negative externalities of local competition; but the driving force of the model in our book is information asymmetry, and moreover, it endogenously explains why the central government allows collusion.

Third, it enriches the theoretical literature concerning collusion and authorization. Since Tirole (1986), there is a large set of mechanism design literature on collusion, such as Kofman and Lawarree (1993), Laffont and Martimort (1995), and Faure-Grimaud et al. (2003). The literature above discusses how to prevent collusion while the model in this book discusses both collusion-proof measures and equilibrium collusion. The classical collusion model is an adverse selection model, but this model is a moral hazard model which implies that the agent’s action is endogenous. In addition, this chapter can be considered as an application of equilibrium collusion and collusion-proof model to the environment of China’s political economy. This chapter shows, through a three-tier (principal-supervisor-agent) analytical framework, that the Chinese-style authoritarian regime characterized by the combination of political centralization and economic decentralization can also be analyzed within the framework of a classical contract theory.

The research reveals that the GDP- or financial revenue-oriented Performance Assessment System for government officials should be reformed so as to remove the negative externalities resulting from local competition.
2.3 Government–Firm Collusion Model

2.3.1 Game Players

Consider a three-tier vertical structure composed of a principal, a supervisor, and an agent and they are respectively represented by the central government, a local government, and a firm. Suppose among them there is an official grand contract by which the central government authorizes the local government to supervise the firm’s production activities. The local government plays a central part in this structure because the central government is unlikely to directly oversee the production activities of all firms due to the limitations of time and information. As a production unit, the firm pays taxes to the central government. In reality, the central government refers to all central organs which are authorized by the constitution or other relevant laws to exercise macro-regulation over the production activities of all firms. In a broader sense, the local government refers to any of the CPC’s committees, the executive branches, and legislative People’s Congresses at the levels of provinces, counties, and townships and, in addition, other agencies such as administrations of work safety, of quality supervision, inspection, and quarantine, and bureaus of environmental protection. The firm is engaged in production activities within the range of permissions prescribed by the central government and gets economic surpluses. In reality, the principal–supervisor–agent relationship exists not only in production activities but also in the provision of public goods.

Suppose the central government’s target output is $x$ (measured in terms of GDP), which, in this context, is standardized as 1. The central government imposes tax $t$ out of the total 1 on the firm, and reserves part of it as rewards $w = \alpha t$ to the local government and reserves for itself $(1 - \alpha)t$, $\alpha, t \in (0, 1)$. Here, tax $t$ denotes all sorts of taxes and tolls and $\alpha t$ denotes the financial revenues the local government gains. There are two modes of production $c$ for the firm to choose: the good yet expensive one whose cost is expressed as $\bar{c}$ and under which no accidents will occur; the bad yet inexpensive one whose cost is expressed as $c$ and under which accidents will occur with a certain degree of probability $p$. The verifiable ex post accidents, often referred to as coalmine disasters, environmental pollution, and unexpected mass incidents, incur extra social costs $C$, which usually include direct costs—such as loss of lives and damage to and loss of properties—and indirect costs—such as political
pressures driven by public opinions (public resentment against and non-cooperation with both the central and local governments). Extra social costs undermine social stability and are eventually undertaken by the central government. Given $0 < c < \bar{c} < 1$, $\Delta c = \bar{c} - c$, $\Delta c$ represents quasi-rent, i.e., the cost saved by the firm if it chooses a bad mode of production. A good and expensive mode the production for coalminers, for example, increases the production cost because ventilation and drainage systems and many other facilities should be installed to guarantee the safety of coalminers. According to the law stipulated by the central government, accidents are classified into different severity levels. For example, an accident with the loss of 10–30 lives is ruled as a “serious accident” and an accident with the loss of more than 30 lives as a “severe accidents with heavy fatalities.” Accordingly, different punitive measures are set forth for different severity levels. As for accidents in environment pollution, energy consumption, and economic bubbles, there are different definitions of severity levels, but they do not have any slight effect on our analysis.

2.3.2 Information Structure

The central government does not know what production technology or manufacturing technique the firm is to opt for, but the local government does because the firm is required to get a license from the local government before it chooses a mode of production. This signifies information asymmetry between the central and local governments. This firm may choose an *ex ante* good mode of production with the cost $\bar{c}$ to avoid accidents, or it may collude with the local government and choose a bad one with the cost $c$) under which accidents may occur with a certain degree of probability $p$. The accidents may be reported to the central government by the fourth party (mass media) with the probability of $\rho$. We summarize the four possibilities as follows:

1. When the firm chooses $\bar{c}$, no or few accidents may occur.
2. When the firm chooses $c$, accidents may not occur with the probability of $1 - p$.
3. When the firm chooses $c$, accidents may occur with the probability of $p$, and the fourth party discovers the accidents with the probability of $\rho$. 
4. When the firm chooses $c$, accidents may occur with the probability of $p$, and the fourth party may not discover the accidents with the probability of $1 - \rho$.

Probabilities $p$ and $\rho \in (0, 1)$ are common knowledge. In the possibilities of (2), (3), and (4), the local government may collude with the firm. Since accidents are verifiable hard information, the central government can conclude that the local government colludes with the firm.

### 2.3.3 Utility Function

The central government is risk neutral, and it simultaneously takes into consideration economic growth and social stability. As a principal, the central government is the sole subject whose responsibility is to undertake all costs of economic growth and design an official grand contract stipulating for rewards and punitive measures that the local government and the firm deserve. To be more specific, the central government maximizes the total revenue $(1 - \alpha)t$ and subtracts extra social cost $C$ that might be incurred due to the occurrence of vicious accidents.

Both the local government and the firm are risk neutral. They undertake limited liabilities, and their reservation utility is standardized 0. As the supervisor, the local government oversees the firm’s production activities. However, the local government does not take into social cost into account because major officials are not locals and their tenure is usually short. To make it simple, let us assume that the local government negotiates an agreement without giving in. This means that once the local government decides the optimal strategy, it can give the firm a “take-it-or-leave-it” offer. In this case, the local government decides the firm’s option for production technology and then the firm has to accept it. The local government may collude with the firm and sign a private side contract: the local government permits the firm to opt for a “bad” mode of production at the cost of $c$ on the condition that the latter pays the former a sum of transfer payment $b = k\Delta c$ no matter whether accidents occur and any undue irregularities are disclosed by the fourth party in the future. $k \in (0, 1)$ represents the proportion of quasi-rent shared between the local government and the firm. The transfer payment may be in various forms: surcharges, recruitment of officials’ relatives or more local people, the equities of the firm, and even direct bribery. Suppose this private side contract is, for both the local
government and the firm, is Pareto-improving and self-enforcing (Tirole 1992). Now, we ignore temporarily the transaction cost between them.\textsuperscript{17} The local government gets reward $w$, and meanwhile the firm gets $1 - t - k\Delta c - c$ under the following two conditions: (1) not any accident occurs; (2) not any accident is disclosed even if it occurs. If the central government is informed, through the mass media or other news channels, of the local government–firm collusion, it will inflict penalties $F_S$ and $F_A$, respectively, on the local government and the firm. In reality, the most common forms of penalty on local officials are dismissal or demotion. Obviously, the local government burdens only limited liabilities.

\subsection*{2.3.4 Time Line}
This is a complete information dynamic game model. The time line is as follows:

1. The central government decides to “allow” or “deter” the local government–firm collusion, and then gives the local government and the firm a “take-it-or-leave-it” grand contract. The game continues if and only if both the local government and the firm accept the grand contract. Otherwise, the game terminates.
2. The local government decides to take either a conservative or aggressive strategy, but both of them underscore safety measures and economic growth. If an aggressive strategy is chosen, the local government and the firm collude and sign a contract.
3. The firm decides to choose good or bad mode of production. Once it chooses a bad one, it colludes with the local government and the contract is executed.
4. When a bad mode of production is chosen, accident will occur with a certain degree of probability $p$ and may be disclosed with the probability $\rho$.
5. The grand contract is executed.

We can describe this time sequence as a game tree (see Fig. 2.1). $U_i^j$ represents the expected revenue of the game participant $i$ under the condition of $j$. The subscripts $P$, $S$, and $A$ represent, respectively, principal (the central government), supervisor (the local government), and agent (the firm); the superscripts $c$ and $cp$ indicate collusion and collusion-proof; the underline indicates the expected revenue corresponding to the conservative strategy.
2.4 The Optimal Equilibrium Collusion and Collusion-Proof Contract

2.4.1 Equilibrium Collusion

The backward induction will be employed to tackle with this game. It is necessary for us to take into consideration the firm’s choice before analyzing the central government’s optimal strategy. As a matter of fact, the local government’s choice is the foremost important key factor in that it is the supervisor of the firm. Given that the central government allows the local government to collude with the firm, what is the optimal choice for the local government? Suppose the local government chooses a conservative strategy, it will demand the firm to choose a good mode of production. In this case, the expected revenues of the local government and the firm are, respectively, as follows:

\[ U^c_S = \alpha^c t^c \]  

\[ U^c_A = 1 - t^c - c \]  

Contrarily, if the central government chooses an aggressive strategy, the firm will choose a bad mode of production. In this case, the expected revenues of the local government and the firm are, respectively, as follows:

\[ U_{S}^{p} = \alpha^{c} t^{c} + k \Delta c \]  

\[ U_{A}^{p} = 1 - t^{c} - k \Delta c - c \]
It is obvious that the local government’s dominating strategy is aggressive if the central government allows collusion and the firm’s expected revenue is not negative.\textsuperscript{19} The reason is intuitive: collusion can bring the local government additional transfer payment $k \Delta c$. Similarly, in this case, the firm’s dominating strategy is to choose a bad mode of production.\textsuperscript{20} Because of $k \in (0, 1)$, the firm can get extra profit from the collusion. In a word, both the local government and the firm can get more revenues in the collusion than could they do without collusion. Thus, we come to the following proposition:

**Proposition 2.1** Given that the central government allows collusion, the local government and the firm will collude and adopt a bad mode of production so as to boost economy more rapidly (compared with a better mode of production) within a short period of time. In this case, the officials will have more opportunities to be promoted but the frequency of vicious accidents is also likely to be higher.

For Proposition 2.1 to be more comprehensible, let us suppose that a province has two cities A and B. To produce 1 unit output, City A adopts a bad mode of production at the lower cost of $c$, and then it gets the gross profit $1 - t^c - c$; City B adopts a good mode of production at the higher cost of $\bar{c}$, and then it get the gross profit $1 - t^c - \bar{c} < 1 - t^c - c$. In other words, City A gains a higher economic growth than City B, and causes accidents with higher probability. Against the institutional background of political centralization and economic decentralization, CPC officials’ promotion and assessment of their political merits, to a large extent, are based on their performances in boosting economic growth (Bo 1996; Li and Zhou 2005). This indicates that officials in City A will have more opportunities to be promoted than those in City B because the former outperformed the latter in economic construction. This not only explains the concomitance of high growth rate and high frequency of vicious accidents, but also reveals the defining characteristics of the so-called China Model. From this perspective, we can assert that government–firm collusion is the inherent drive of the China Model.

### 2.4.2 Collusion-Proof Contract

Now that collusion brings extra undesirable social costs on the central government, why does it acquiesce to collusion? For this question to be
solved, it is necessary to make a comparison between the expected revenues in the case of allowing collusion and those in the case of deterring collusion.

Suppose the central government attempts to prevent collusion, it must design an optimal collusion-proof contract which should satisfy the participation constraint or individual rationality constraint (IR) and the incentive compatibility constraint (IC) of local government and the firm. To be more specific, this optimal collusion-proof contract must satisfy all the following conditions.

First, the firm’s individual rationality constraint (AIR) and the local government’s individual rationality constraint (SIR) should be both satisfied.

\[
\text{(AIR)} \quad 1 - t^{cp} - \bar{c} \geq 0 \quad (2.5)
\]

\[
\text{(SIR)} \quad a^{cp} t^{cp} \geq 0 \quad (2.6)
\]

Second, the contract should take into consideration the firm’s incentive compatibility constraints. When the firm prefers a good mode of production, its expected revenue must be greater than or equal to that which is expected in the case of its choosing a bad one.

\[
\text{(AIC)} \quad 1 - t^{cp} - \bar{c} \geq 1 - t^{cp} - k\Delta c - p\rho F_A \quad (2.7)
\]

Third, the local government’s incentive-compatibility constraints (ICC) assure that the expected revenues in the case of noncollusion are greater than or equal to those in the case of collusion.

\[
\text{(SIC)} \quad a^{cp} t^{cp} \geq a^{cp} t^{cp} + k\Delta c - p\rho F_S \quad (2.8)
\]

At last, the firm’s limited liability constraints (ALL) and the local government’s limited liability constraints (SLL) should also be satisfied. Punitive measures should be less than or equal to their total expected revenues.

\[
\text{(ALL)} \quad F_A \leq 1 - \bar{c} - t^{cp} - k\Delta c \quad (2.9)
\]

\[
\text{(SLL)} \quad F_S \leq a^{cp} t^{cp} + k\Delta c \quad (2.10)
\]

According to the assumption, SIR is automatically satisfied. The central government’s objective function is to maximize its expected revenue. Therefore, arranging all sorts of constraint conditions, we get the following planning P1:
According to the collusion-proof principles (Tirole 1986), the mechanism satisfying the above planning $P_1$ must be collusion-proof and the principal cannot get more revenues than this. By combining Lagrange function and Kuhn–Tucker theorem, we can come to the Proposition 2.2. (For the proving procedure, see Appendix A.1).

**Proposition 2.2** The optimal collusion-proof contract has the following properties:

1. Both AIR and SIR are loose while the other constraint conditions are tight.
2. All endogenous variables are determined by the following expressions:

$$a^{cp} = \frac{(1 - p\rho)k\Delta c}{p\rho(1 - c) - \Delta c(1 - k + p\rho k)}$$  \hspace{1cm} (2.11)

$$t^{cp} = 1 - \bar{c} - k\Delta c - \frac{(1 - k)\Delta c}{p\rho} < 1 - \bar{c}$$  \hspace{1cm} (2.12)

$$F_A = \frac{(1 - k)\Delta c}{p\rho}$$  \hspace{1cm} (2.13)

$$F_S = \frac{k\Delta c}{p\rho}$$  \hspace{1cm} (2.14)
3. The firm’s profit is

\[ R = 1 - \bar{c} - t^{cp} = (1 - k) \left( \frac{1}{p} - 1 \right) \Delta c > 0 \]  

(2.15)

In Proposition 2.2, conclusion (1) reveals that the expected revenues of both the local government and the firm must be greater than their reservation utility, i.e., they both obtain positive information rent in the case of information asymmetry. This conclusion is different from the moral hazard model where the agent’s participation constraint is tight. Since the central government does not know the exact type of the firm’s cost, it should give the local government and the firm part of information rent so as to encourage the firm to adopt good mode of production. In the case of deterring collusion, the participant constraints of the local government and the firm can be satisfied even if central government merely gives them zero reward and zero profit. Therefore, a collusion-proof contract reduces the central government’s well-being.

Conclusion (2) implies that the optimal tax rate of deterring collusion is \( t^{cp} \) and that, under the tax-sharing system, the tax proportion distributed to the local government is \( \alpha^{cp} \). \( F_A \) and \( F_S \), respectively, denote the penalties inflicted by the central government on the local government and the firm. The expression of optimal penalty is extremely intuitive: Pecuniary penalty should be equal to expected rent. In other words, under the protection of limited liability, both the central government and the firm gain nothing at most even if the central government knows their collusion.

A further discussion of collusion-proof mechanism is conducive to explaining the implications of some policies.

**Corollary 2.1** The optimal collusion-proof contract has the following comparative statics: (The proving process is omitted here due to its simplicity)

1. \( \frac{\partial \alpha^{cp}}{\partial p} < 0 \), \( \frac{\partial t^{cp}}{\partial p} > 0 \), \( \frac{\partial F_A}{\partial p} < 0 \), \( \frac{\partial F_s}{\partial p} < 0 \), \( \frac{\partial R}{\partial p} < 0 \);

2. \( \frac{\partial \alpha^{cp}}{\partial \Delta c} > 0 \), \( \frac{\partial t^{cp}}{\partial \Delta c} < 0 \), \( \frac{\partial F_A}{\partial \Delta c} > 0 \), \( \frac{\partial F_s}{\partial \Delta c} > 0 \), \( \frac{\partial R}{\partial \Delta c} > 0 \).

The proof of Corollary 2.1 is quite simple and can be omitted here. Conclusion (1) implies the stronger the supervisory ability of the mass
media, the less the sharing proportion distributed to the local government, the higher the tax rate, the lighter the penalty, and the lower the information rent given to the firm. So far as the central government is concerned, mass media supervision improves its probability to perceive collusion. Conclusion (2) reveals that the more the quasi-rent, the more the sharing proportion distributed to the government, the lower the tax rate, the heavier the penalty, the more the information rent given to the firm.

2.4.3 Allowing Collusion Versus Deterring Collusion

How does the central government decide to allow or deter collusion? Obviously, the key to this essential decision problem lies in making a comparison between the expected revenues, respectively, brought about by equilibrium collusion contract and collusion-proof contract.

Let us consider equilibrium collusion contract first. In the case of allowing collusion, it is not necessary for the central government to urge the local government to supervise the firm’s choice of a good mode of production. Thus, the local government’s participant constraint is satisfied even if it gets zero reward, and this signifies $\alpha_c = 0$. Now that the firm’s reservation utility is also 0, the central government leaves the firm zero profit. We can infer the following:

$$U^c_A = 1 - t^c - c = 0$$ \hspace{1cm} (2.16)

$$t^c = 1 - c$$ \hspace{1cm} (2.17)

It is noted that, in this case, no penalties have been inflicted on both the local government and the firm because the government-firm collusion is “legitimate.” As a matter of fact, the central government burdens all extra social cost $C$ even though it gains all surpluses by setting the optimal tax rate. Although the local government negotiates an agreement with the firm without any compromise, it cannot seize any surplus in that the central government has first-mover advantage. Thus, under the equilibrium collusion contract, the central government’s expected revenue is:

$$U^c_p = 1 - c - pC$$ \hspace{1cm} (2.18)

Now let us calculate the central government’s expected revenue under the collusion-proof contract. According to proposition 2–2, its expected utility is:
Proposition 2.3 can be obtained from the above comparison between expected revenues in the case of allowing and deterring collusion.

**Proposition 2.3** If and only if \( pC \leq \frac{\Delta c}{pp} \), the central government allows local government–firm collusion, but not the other way around.

For Proposition 2.3 to be more intuitive, suppose in an extreme case \( p = \rho = 1 \), i.e., the choice of a bad mode of production will inevitably incur accidents and they will be undoubtedly disclosed by the mass media, then the central government’s maximal expected revenue is \( \max U^{cp} = 1 - \bar{c} \). In this case, the corresponding critical condition is \( C \leq \Delta c \). This means that it is worthwhile for the central government to allow collusion so long as the extra social cost is less than the quasi-rent arising from a bad mode of production. When the critical condition is defined as \( G \equiv \frac{\Delta c}{pp} - pC \), more interesting comparative static conclusions can be drawn.

**Corollary 2.2:** If Proposition 2.3 is true, then \( \frac{\partial G}{\partial \Delta c} > 0 \), \( \frac{\partial G}{\partial p} < 0 \), and \( \frac{\partial G}{\partial \rho} < 0 \).

This reveals that ceteris paribus, the higher the quasi-rent, the less probability for accidents to occur, the less probability of the accidents to be disclosed, and the more likely for the government to allow collusion. To conclude, the probability of equilibrium collusion is positively correlated with the collusion-proof cost.

### 2.4.4 The Role of Compensation

The role of compensation is ignored in the above analysis. It is implicitly assumed that the compensation for the direct victims (killed or injured coalminers) of the accidents, if compared to the potential profit of the firm, is negligible. In reality, this assumption is sound. According to statistics, the death toll per million tons of coal during the 6 years between 2000 and 2005 is 4.46. If the average compensation for each victim is CNY 200,000, the total compensation per million tons is approximately
CNY 900,000. The gross margin for production of 1 million tons of coal is at least CNY 100,000,000. Since workers in the high-risk industries such as coalmine enterprises and firecracker factories are predominantly poor peasants whose reservation utility is very low and whose supply far exceeds demand, their participation constraints are theoretically negligible. Now, let us relax this assumption that the compensation paid for accidents is decided by law, what role will it play in the optimal collusion-proof mechanism?

Suppose the probability of vicious accidents per unit of output is still $p$, and the compensation which the firm should pay is $m$. A slight modification is made to the optimal collusion-proof contract so as to make sure that the agent pays an additional sum of $m$ in game time sequences (3) and (4) discussed in Sect. 2.3.4 and thus the incentive compatible constraints (AIC) and limited liability constraints (ALL) will be modified accordingly. With the compensation considered, we draw the following proposition.

**Proposition 2.4** On the condition that the compensation is below the threshold $m = \frac{(1-k)(1-p\rho)\Delta c}{\rho(1-\rho)}$, the optimal collusion-proof mechanism is valid, and $\frac{\partial \alpha_{cp}}{\partial m} < 0$, $\frac{\partial \xi_{cp}}{\partial m} > 0$, $\frac{\partial F_{A}}{\partial m} < 0$ (For the proving procedures, see Appendix A.2).

Proposition 2.4 implies that, if the compensation is above the threshold, the optimal collusion-proof contract will be invalidated because the firm, without the lure of information rent, will not choose a good mode of production. If the compensation is below the threshold, the optimal collusion-proof contract is still valid and in this case, compensation plays a certain role in punishing the firm. Compensation has a supervising effect (higher compensation will naturally lower the difficulty degree of supervision) and substitution effect (under the limited liability, higher compensation is likely to reduce the frequency of occurrence of accidents and thus the pecuniary penalty will be accordingly lowered on the whole). It is recommended that, if the compensation is too low, the government should moderately raise statutory compensation so as to make it a positive incentive. Nevertheless, it is advisable that the central government should not excessively rely on compensation for the following three reasons: (1) exorbitant compensation will put the firm at high risk or even into jeopardy because accidents cannot
be at any rate eradicated even if a firm is in normal and regular production, and moreover, the execution cost of law should also be taken into account; (2) exorbitant compensation may force coalmine enterprises to connive with local officials and cover up accidents; and (3) concealment of accidents due to higher compensation invalidate punitive measures and make it difficult to get rid of the negative externalities caused by safety accidents. In reality, whether the central government and the mass media can get the first-hand evidence from accident victims or their relatives or not is very important to effectively fight local collusion. Given the coalmine workers’ extremely low reservation utility, it is very difficult to stipulate the statutory compensation because many factors should be taken into consideration, such as the incentive of the firm’s choice of production mode, the incentive for victims or their relatives’ disclosure of accidents, regional income gap, and execution cost of law and regulations.

2.5 A Case Study

This section will be dedicated to the application of the government-firm collusion mechanism to the PX (p-Xylene) project mentioned in 2.1. Two realistic questions will be discussed.

First, why did some local governments doggedly push forward p-Xylene projects despite resistance and pressure from local residents? According to the collusion mechanism, a PX project is a “bad” production mode which, if compared with a “good” production mode such as tourism and banking industries, will bring the local government more GDP and fiscal revenues at a quicker rate. A PX project with total investment of hundreds of billions of Chinese Yuan, if put into normal and regular production, will produce billions of Chinese Yuan of industrial output and further drive up the local GDP aggregate, thus helping the local government build up their administrative performances, a foremost important yardstick of political promotion. In an era during which nearly all local governments give priority to investment attraction, ambitious projects like building PX enterprises were very popular among them. Developing high-investment, high-revenue, and heavy-polluting project is an expression form of local government–firm collusion. According to 2.1, given that the central government allows collusion, the local government has a great motivation to collude with the firm.
Second, why did some projects abort while others were put into operation smoothly or relocated? This question involves the cost and return of collusion.

Dalian is a city oriented with heavy and chemical industries. In 2011, its GDP totaled CNY 615.01 billion, of which primary industry accounts for CNY39.57 billion, secondary industry for CNY 320.42 billion, and tertiary industry for CNY 255.02 billion, with the proportion of them being 6.4:52.1:41.5. In the secondary industry (mainly including manufacturing, construction and mining), the industrial added value amounted to CNY281.6 billion, of which heavy industry accounted for 64% (or CNY 180.61 billion) of the total industrial added value or 30% of the local GDP aggregate. The added value of petrochemical industry was CNY 58.85 billion. For Dalian, the petrochemical industry is the most important industrial component. A PX project would bring much higher expected revenue to the Dalian city government, which therefore, despite the occurrence of massive protest and the PX project official’s assault of CCTV (China Central Television) correspondents, runs the risk to willfully push forward this profiteering program. According to proposition 2.3, the central government allows collusion if the expected revenue yielding from collusion exceeds that from noncollusion.

Unlike Dalian, Xiamen’s GDP in 2011 totaled CNY 253.58 billion, of which primary, secondary, and tertiary industries, respectively, accounts for CNY2.468 billion, 130.41 billion, and 120.702 billion, with the proportion of them being 1.0:51.4:47.6. In contrast, Xiamen is a tertiary industry-oriented city, whose reputation as a tourist resort is likely to be damaged with the introduction of a PX project because its cost is too high and the prospective revenue will fail to satisfy the city government’s expectation. Furthermore, since Xiamen is adjacent to Taiwan, a massive protest may jeopardize social stability and even involve national security. Since the collusion cost is more than the expected revenue, the provincial and city governments decided to relocate the project in the more remote Peninsular Gulei.

The case in Ningbo is totally different. The enterprise responsible for the integration refinery project is a state-run conglomerate of China Petrochem, which is not subject to local jurisdiction. Only 1/50 of over CNY10,000 million of profit and tax would be retained for the Ningbo government, which would have to assume the huge cost of relocating local residents and facing criticism and massive protests. Eventually, after careful consideration, the Ningbo government decided to give up on the PX project.
2.6 Extended Discussions

An obvious question arises: why is it difficult to eliminate coalmine accidents even though the central government repeatedly orders a nationwide crackdown on safety accidents? Major news media direct their spearhead against collusion between government officials and firms. It is true that the rampant government–firm collusion is the culprit of high frequency of vicious accidents. Besides the form of collusion in which the central government acquiesces under some specific circumstance, there are still other reasons involving policy and implementation.

2.6.1 The Local Government’s Lack of Long-Term Expectation

The above analysis implicitly assumes that the local government in a particular term hopes to get its own expected revenue within a production cycle, i.e., the production cycle is identical to the tenure. In reality, the term of the local governmental leadership and of officials responsible for safety work are determined by many factors with randomicity. Given the local government has a discount factor \( \delta \in (0, 1] \), \( \delta = 1 \) denotes the permanent tenure of the local government, then under the collusion-proof mechanism the local government’s incentive compatibility constraint (ICC2) is:

\[
\delta \text{ at } \geq \delta(\alpha t + k\Delta c) - p\rho F_s
\]

Since the constraint condition is tight, the optimal discount factor is:

\[
\delta^{op} = \frac{p\rho F_s}{k\Delta c}
\]

If the term of the local governmental leadership is too short, or if there is an unexpected personnel transfer, the incentive compatibility mechanism will be destroyed. Below the optimal value, the less \( \delta \), the less the local government’s sharing proportion of tax, the more likely for it to collude with the firm and even merge itself with the firm so as to find extra bonanza. The local government may even extort more bribes \( k \) from the firm and thus instigate the firm to choose a bad mode of production.

2.6.2 Imposition of Exorbitant Taxation on the Firm

In the proof-collusion contract, the optimal tax rate is \( t^{op} \), which takes into full consideration quasi-rent probability of occurrence of accidents, and the supervising ability of the fourth party. However, the prevalent
taxation regime is subject to little change once established by law. Given $t > t^{cp}$, the firm will not be able to undertake the input cost of a good mode of production, but perversely force the firm to choose a bad mode of production. Therefore, it is necessary to deregulate the state-run enterprises so as to let them obtain sufficient information rent.

### 2.6.3 Ineffectiveness of Supervision of the Mass Media

Since the central government does not know the authentic information of the firm’s input cost, it relies on the supervision of the mass media for disintegrating the coalition of collusion. Corollary 2.1 signifies the role that the mass media play in reducing the central government’s reliance on the local government for the firm’s information and containing local officials’ abuse of power. However, under the current system, the mass media will be suppressed by the local government if they dare to disclose work safety accidents and other scandals. The disclosed accidents may only be part of a huge iceberg. How to help the mass media defend their legitimate rights in supervising local government–firm collusion deserves our attention.

### 2.6.4 Lack of Credibility of Punishment

The central government’s crackdown on collusion lacks credibility for the following two reasons. First, some local officials removed from office may get a post in another city or county or province, rendering administrative punishment on them invalidated. If the credibility of penalty is questionable, the local officials will ignore the central government’s relevant regulations. Secondly, when facing the pressure of public opinion due to the occurrence of a serious vicious accident in an enterprise, the central government tends to indiscriminately crack down even all enterprises in the same sector. For the firm, this “time inconsistency” of policy results in a lack of long-term stable expectation to choose a good mode of production (Nie 2005). Improvement of the fourth party’s supervising ability is an important means to increase the credibility of the central government’s commitment. Fortunately, the safety work department directly under the control of the government has decided to strengthen credibility. For instance, the State Administration of Coalmine Safety has decided to publish the progression of crackdown on illegitimate coalmine enterprises.
In addition to the four factors concerning the implementation of policies, there are still others which interact with each other to make it difficult to deter collusion. By comparison, the annual mineral output of the United States is roughly equal to that of China, but its death toll in 2004 was only 28 (see Table 1.1), much lower than China’s 6027. In 1977, the US Congress enacted the Federal Mine Safety and Health Act, declaring that “the first priority and concern of all in the coal or other mining industry must be the health and safety of its most precious resource—the miner.”

It sets forth mandatory safety and health standards and compensation for damage to and loss of properties and victims in the case of accidents. According to this Act, the United Mine Workers of America is responsible for negotiation with the management over wages and safe working conditions; all mine workers must receive a strict training program and safety standards should be strictly enforced. The enforcement of this Act in America validates our above analysis from another perspective.

2.7 Summary

This chapter provides a government–firm collusion model which can simultaneously and endogenously explain the concomitance of high economic growth and high frequency of vicious accidents, thus offering a microbasis interpretation of the China Model. According to our model, under the condition of information asymmetry, local governments collude with firms to choose a bad mode of production for the purpose of bumper fiscal revenue and political promotion. As far as the central government is concerned, if the expected revenue in the case of collusion is more than the expected cost, it will allow collusion; if not, it will deter collusion. In this sense, government–firm collusion is a neutral phrase without prior moral criticism.

The policy implications of this chapter are as follows. If the central government attempts to deter collusion, it should (1) protect mass media’s disclosure of illegitimacy of the local government and the firm; (2) minimize the revenue of collusion, which can be realized by subsidizing good modes of production and strictly enforcing laws concerned; and (3) ensure the stability and sustainability of local government’s policies and preclude its short-sightedness.

This model can explain a series of mishaps: coalmine accidents, environmental pollution, food safety, housing bubbles, jerry-built projects and smuggling, etc. The forthcoming chapters Three, Four and Five will discuss the applications of this collusion model.
Notes


2. CNY, denoting Chinese yuan, is the symbol of the Chinese currency renminbi.

3. All the three cases in this section are all collected and arranged from sources such as Wikipedia and Baidupedia, and some influential newspapers and websites.


5. However, there is still a controversy about the causality between political promotion and economic achievements. Opper and Brehm (2007) observe that GDP growth rate is not as a weighty criterion for an official to be promoted as some analysts have asserted once he manipulates political network or otherwise called relation (*guanxi*) in Chinese. Tao et al. (2010) makes a logical and empirical criticism against the alleged causality between political promotion and economic achievements.

6. Suppose an economist argues that political promotion results in local economic growth and that malignant competition leads to local protectionism, two problems will arise: what are the cost of political promotion and the revenue of malignant competition respectively? In economics, each option has its own cost and revenue.


8. The model in this chapter is principally based on Nie and Li (2006; 2013).

9. Here we temporarily do not distinguish vertical management units (such as customs house) directly affiliated to the central government and from those units under the charge of local governments. We will discuss the impact of the two types of management units on collusion in Chap. 9.

10. For the central government, it is much less costly to use GDP as an indicator of evaluating or measuring officials’ political performances. Nevertheless, this can also be interpreted as reflecting public preference.

11. In its strict sense, the reward given to the local government is endogenous. Nevertheless, this linear form of share is the optimal form of remuneration. The basic logical reasoning proceeds as follows: moral hazard is inevitable under the condition that the central government entrusts the local government with a package task (far beyond merely supervising the firm’s production activities) but fails to supervise the local government’s
activities. To reduce moral hazard, the optimal contract is undoubtedly sharing contract (Bolton and Dewatripont 2005).

12. Though this assumption is different from other contract theories, our analysis is based on real situations. For instance, it is required that a coalmine enterprise, before its operation, should at least get a mining permit, safety production license, coal production license, business registration certificates issued by governmental departments concerned. The local government at the level of county or township is very well-informed of the firm’s production mode and accident prevention measures. Even if the local government knows with a certain degree of probability the firm’s production technology or techniques, the conclusion is still tenable.

13. Social stability, in its broad sense in this specific context, refers to all incidents that possibly undermine the stability of a regime.

14. Risk neutral plus limited responsibility is equated with risk aversion. This assumption is consistent with Kofman and Lawarree (1993) and Laffont and Martimort (1995). In general, when an accident occurs, the person in charge of work safety is more likely to be given a financial penalty of a certain sum of money instead of a criminal penalty. For instance, according to Coal Mine Safety Supervision Regulations (2000), a coal mine supervision organ can give anyone convicted of covering up an accident, sabotaging the accident scene, and obstructing investigation a fine of CNY 30,000 to 150,000. This shows that our assumption is sound and reasonable.

15. According to the Regulations on Selection and Appointment of Leading Cadres issued by the Chinese Communist Party, officials in the local government, including party secretariats, provincial governors and mayors, can be elected to only two five-year terms of office. Besides, below the provincial level, any leading cadre with the supreme authority of decision making cannot hold a post in office in his birthplace. A data-based research shows that the average tenure for provincial leaders is 3.3 years. (Li and Zhou 2005).

16. A local government is the supervisor of a firm, so the local government can demand that the firm should accept its decision. Relaxation of this assumption may result in some interesting implications.

17. The multiplication of the value of transfer payment by $\phi$, denoting a coefficient of transaction cost will help an expansion of our research. Faure-Grimaud et al. (2001) analyzed the impact of transaction costs of collusion on prevention of collusion.

18. The central government’s optimal strategy is to be discussed in 2.4.3.

19. Technically, we suppose the firm’s expected revenue is always positive. Otherwise, the firm will withdraw from this game.
20. In the real world, the local government can always formulate and promulgate investment attracting policy with a certain orientation. For instance, if the local government acquiesces to operation of some polluting enterprises, those green enterprises with high cost input will be dislodged from the local market.

21. Theoretically, whether the moral hazard model or the choice model is chosen, the fundamental principle is that the principal alienates information rent to the agent with the information advantage so that the hazard of information asymmetry can be alleviated and the agent can be honest and diligent.

22. According to Nie and Zhang (2012), it is not necessary for the local government to supervise a firm which chooses a good mode of production; therefore, its reservation utility is the expected profit in the case of good mode of production. In this chapter the assumption that the firm has no right to choose modes of production is a form of simplification, which will have little or no effect on the major results.

23. The figure is calculated according to the data sorted out by the author of this book through www.coalworld.net.cn and www.chinanews.com.

24. A safety accident (such as an explosion) incurs losses of lives and properties; in addition, it pollutes the local environment. If the direct victims (workers) do not provide evidence of the accident, the indirect victims (local residents) find it more difficult to protect their own legal interests.

25. In China, local governments at all administrative levels were so obsessed with “investment attraction” that it became a defining characteristic over the past three decades. There was an extreme governmental slogan: WHOEVER OBSTRUCTS INVESTMENT ATTRACTION SPITES THE JIAOHE PEOPLE. Jiaohe is a county in the east of Jilin Province, Northeast China.

26. In 2011, I conducted a survey concerning industrial zones in provinces of Jiangsu and Anhui, where the chief officials told me that the local governments in many regions set a higher threshold for enterprises which hope to enter the industrial zone, demanding that a minimum of fixed assets investment should be CNY 2.5 million per mu (a Chinese measurement unit which is approximately 667 square meters), sales volume CNY 5 million per mu and tax revenue CNY 0.15 million per mu.


28. On March 14, 2005, a terrible gas explosion broke out in a coalmine pit in Qitaihe, Heilongjiang, Northeast China, killing 18 workers. Later, the investigation shows that the coalminer Peng Guocai was vice-director of the Administration of Work Safety, Taoshan District, Qitaihe.

29. According to the current system, a higher local government’s arrangement of transfer, promotion and removal of officials in a lower local
government is not strictly identical to the tenure of the local collective leadership. As a matter of fact, the standing committee of the local people’s congress has the authority to approve the appointment and removal of any local official at any time without having to wait until the expiration of the five-year-long office term.

30. To some extent, this is perhaps the reason for a local government’s connivance at illegal operation of dangerous small coal mines, diggings and fireworks workshops because a local government especially below city level cannot find any way to get any revenue from a state-run large- and medium-sized enterprise but can get profit from small plants and factories within the area under its own jurisdiction. Due to unpredictable tenure, a local official may be reluctant to encourage an enterprise to adopt a good mode of production even if they become shareholders of an enterprise.

31. According to our survey, there are two reasons for state-run coalmine enterprises’ reluctance to choose a good mode of production: (1) lack of necessary capital accumulation—due to the sluggishness of the coal industry prior to 1989—to renovate their production and safety facilities; (2) the policy of “compensation for the shortage of electricity with coal” due to the increasing demand for electricity with the acceleration of national industry. According to a report on February 9, 2005 carried in a newspaper Xinjingbao or The Beijing News, approximately CNY68,900 million would be needed to renovate coalmine safety facilities throughout the country.

32. For instance, on August 22, 2005, the General Office of the State Council issued The Urgent Notice Concerning Crackdown on Coalmine Enterprises without Safety Production Conditions, which adjured that functionaries of state organs and state-run enterprises should withdraw their investment in coalmine enterprises. However, no functionaries voluntarily did so by the deadline and many local governments even extended the deadline.


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