



Economic analysis of reform policies for small coal mines in China

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Abstract

Over the last three decades, China's coal industry has achieved dramatic increases in coal production, both in absolute terms and relative to the world as a whole. This achievement is due largely to its coal policies. Yet facing increasing pressures of environmental sustainability and market transition, the Chinese government was forced to make deep reforms and adjustments to regulate the coal industry effectively. This paper presents an historical overview of China's coal economic policies, paying particular attention to the current reform policy of closing mines and restricting the yield for the small coal mines (SCMs) in the context of economic theories and methods. We argue that the SCM closure policy would not likely be efficiently enforced if a feasible market mechanism were not built up. The failure of closure policy is due largely to problems of property rights, coal pricing, ownership, and objectives.

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Introduction

Coal has played an important role in China's economy over about five decades. The Chinese government treats it as a strategic resource and places high priority on the security of energy supply. However, the latest several years saw a sudden drop in demand for energy in China, and the coal industry was most heavily affected. Coal inventories grew drastically, and prices in the domestic market plummeted. In spring 1998, production from the state-owned coal mines (SOCMs) was suspended for two months to solve the oversupply problem. Nevertheless, it became apparent in late 1998 that this was not a temporary phenomenon and that urgent action was required to protect the interests of the SOCMs because large amounts of state investment had poured into these enterprises.

As a result, the Chinese government announced a radical reform policy on closing the small coal mines (SCMs) and restricting the yield, as well as closing up and making bankrupt a number of SOCMs. This programme planned to close some 25,800 illegal and "irrational" mines (mainly SCMs) by the middle of 2000 to cut annual output by 250 million tonnes (Mt) (Table 1). By July 2000, it was announced that this number of mines had already been closed, resulting in an effective reduction of less than 200 Mt. In addition to the SCMs, a number of larger mines near the end of their lives were also closed and some enterprises made bankrupt.

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¹ These included, for example, UNITAR International Conference on the Future of Small-scale Mining, Mexico, 1978; Workshop on Mineral Policy for Small-scale Mining, India, 1984; UNECA on the Enhancement of the Contributions of the African NON-fuel Mineral Sectors Towards the Region's Economic Advancement, Zimbabwe, 1990; UN Interregional Seminar on Guidelines for the Development of Small/Medium Scale Mining, Zimbabwe, 1993; World Bank Roundtable on Artisanal Mining, USA, 1995; Global Conference on Small/Medium Scale Mining, India, 1996.

Table 1
Classification of illegal and irrational SCMs in China

Type	SCMs	Number of mines	Output (Mt)	How to handle
I	I ₁ without both mining and producing licenses	11,200	63	Illegal mines. Must be cancelled ^b
	I ₂ within the reaches of SOCM, after 1 January 1997 ^a	400	13	Illegal mines. Must be cancelled
II	II ₁ within the reaches of SOCMs with mining licenses before 1 January 1997, while without coal producing licenses	6900	70	Must be closed ^b
	II ₂ beyond the reaches of SOCMs with mining licenses, but without coal producing licenses	3400	41	Must stop producing in order to be consolidated. Those that could not meet the requirement of mining and producing licenses by the end of February 1999 were to be closed. This type of SCMs totalled to 31,900 mines with annual output of 259 Mt before the latest round of closures occurred, but only 3400 were to be closed
	II ₃ with high sulphur and ash without protect counter-measures	600	5	
III	Within the limits of SOCMs, legally run with both mining licenses and producing licenses before 1 January 1997	3300	60	Legal but irrational distribution mines. To be closed up. Give appropriate compensation
Total		25,800	252	

Data source: Zhang (1998).

^a The date when the amended Mineral Resources Law (PR China) entered into effect.

^b A “cancelled” mine is different from a “closed” mine. Cancelled mines have their licences confiscated but their mine mouths may not be ruined. Closed mines have their mine mouths ruined by explosives or closed with the cement.

mining on their agendas. In 1995, the World Bank² hosted a seminal meeting on small scale and artisanal mining, including representatives from 25 countries. One of the key conclusions of this conference was the need for integrated solutions to the problems of the sector and improved co-operation between the various institutions. Further meetings respectively convened by United Nations Industrial Development Organisation (UNIDO) and International Labour Organisation (ILO) involving bilateral and multilateral institutions reiterated the need for a coordinated approach towards artisanal and small scale mining if significant progress was to be made³. However, almost no analysis has been conducted regarding economic dimensions of government policies designed for small-scale mining.

Small-scale coal mines have played an important role in China's economy because of the need for coal as an energy source and the promotion of rural development. However, the pressures from coal oversupply over many years and the concerns about environmental pollution

and resource damage from the SCMs have forced the central government to adjust its coal policy. Accordingly, the government decided to restrict the SCMs in a time of oversupply, the result of protecting the large SOCMs. As a result, whether the current policy on the SCMs has been effectively implemented caused wide debates in China. Some argued that the policy has achieved great progress since the reduction in coal oversupply has become obvious. Others suggested that the ultimate positive effects of the policy remain to be seen (Shi, 1999). From historical perspectives, there has been a lack of any clear long-term and relatively stable policies for the SCMs in China over the past decades.

The literature on government policies towards SCMs has focused respectively on the social (Jennings, 1999), financial (Kumar and Amaratunga, 1994), environmental (Simpson, 2000), and safety, legislative and political aspects (Bugnosen, 1998), paying relatively little attention to the economic policy evolution. One of the major objectives of this paper is to review the policy changes on China's coal industry over the past 50 years, particularly policy reforms affecting the SCMs and their economic situation. Another is to explore a feasible economic approach to compare the SCMs with the SOCMs and hence to identify some reasons why the current policy failed to regulate effectively the SCMs.

² Towards an integrated solution, see <http://www.ifc.org/mining/key/artisanal/artisanal.html>, para 2.

³ See ILO communication (No. 30), July 1999, at <http://www.ilo.org/public/english/bureau/inf/magazine/30/mines.htm>.

History of SCM policies

The monopolistic period of the State-owned coal mines (pre-1978)

The pre-1978 period in China was characterised by a policy of self-reliance for energy. All policies were implemented in the form of a series of five-year plans (beginning in 1953) rather than via market mechanisms. It was this centralised planning system that resulted in monopolistic coal enterprises highly controlled and solely owned by the state to enhance the state's role in guiding the economy.

China's coal mines formed a centrally planned vertical hierarchical system, which included major SOCMs (run by the previous Ministry of Coal—MOC), through local SOCMs (run by local governments) to SCMs at the lowest level of towns and villages. Industrial production and construction were mainly regulated by the state via mandatory planning and direct control. Thus responsibility for economic development was shared between all five levels of governments—the centre, provinces, prefectures, counties, villages and towns. This rigid system remained basically the same until the early 1990s when the economic and institutional reforms were introduced gradually.

Beginning at the end of the 1940s when China was liberated, the Chinese government decided to rejuvenate her administrative operations and rehabilitate the overall economy, placing high attention on heavy industry. This policy was greatly favourable to the coal industry. In late 1952, the Chinese government decided to adopt the development model of the Former Soviet Union (FSU) and undertook long-term economic planning. To advance socialist transformation during the First Five-Year Plan (1953–57), priority was still given to the development of heavy industry. For example, one large factory or mining construction project went into operation every three days on the average (Dorian, 1994). As the Chinese Communist Party (CCP) stressed the importance of the massive programme of socialist industrialisation, large-scale increases in coal production capacities expanded throughout the 1950s.

The small-scale coal industry was first stressed by Chinese leaders during the Great Leap Forward,⁴ and the output of SCMs rose rapidly (Fig. 1). Most current SCMs, however, were initially developed through the ownership of the people's communes⁵ in the Great Leap

Forward period because state ownership of factors of production was the key rule of Chinese socialist system at the time. This characteristic was well evident in China's coal industry during the pre-1978 period.

Following the Great Leap Forward, a dramatic decrease in coal output occurred immediately. This drop involved the closure of many inefficient SCMs in China and disrupted operations at large mines (Dorian, 1994, p. 65). Some efficient SCMs were consolidated and expanded, and operations of large existing mines became normalised. Afterwards, coal production rebounded gradually.

During the early years of the Cultural Revolution, China's coal output dropped heavily and created a serious energy deficiency between 1966 and 1967. Although the Chinese government instituted rationing policies for private coal consumption, China's SCMs were particularly hard hit by the 10-years' political movement (Barnett, 1981). In 1976, their output totalled about 71.3 Mt, or about 15% of national coal production.

The market-transition period (1978–1992)

The most evident characteristic post-1978 was the change of attitude of the central leaders, who made ambitious efforts to invigorate the domestic economy by introducing limited market mechanisms and decentralisation. Nonetheless, the planning mechanism still played a great role in the coal decision-making. After years of turmoil, the Chinese leadership decided to recoup the economic losses and accelerate economic growth by drawing up a ten-year plan. It was this economic decision-making⁶ that led to an erroneously high prediction for coal demand in 2000. Prior to the 1980s, there existed an overwhelming notion among Chinese energy planners that increases in the gross national product (GNP) were always accompanied by proportionate increases in energy consumption. Owing to the planned GNP in 2000 to be twice that required by the central government, the Chinese energy planners forecasted that the target of energy consumption was predicted to quadruple the increases in the GNP. With respect to coal's supply side, the targets for coal production did not likely rely on the SOCMs as the sole source of supply.

Consequently, early in the 1980s the central government issued a series of economic policies to improve the SCMs. On 12 December 1981, the then MOC implemented four major policies (Gao, 1999): subsidies

⁴ The Great Leap Forward was instituted in early 1958 as a means of greatly accelerating economic growth and advancing socialist construction according to China's specific economic conditions.

⁵ In April 1958 the People's Commune Movement started. It was an unparalleled institutional change in Chinese history, aiming at establishing multi-purpose units responsible for managing industrial, agricultural, commercial, cultural, and military affairs. The People's Commune was de facto operated mostly as a state-owned institution.

⁶ In 1977–78, Mao Zedong's temporary successor Hua Guofeng introduced a 10-year economic plan to build China into an independent industrial and economic system from 1976 to 1985. Hua's proposal directly impacted the coal mining of China. This plan proved a failure owing to lack of sufficient capital funds and advanced technologies to support its planned projects. Nonetheless, coal output had continued to rise. By 1980 China's coal output reached the third in the world.

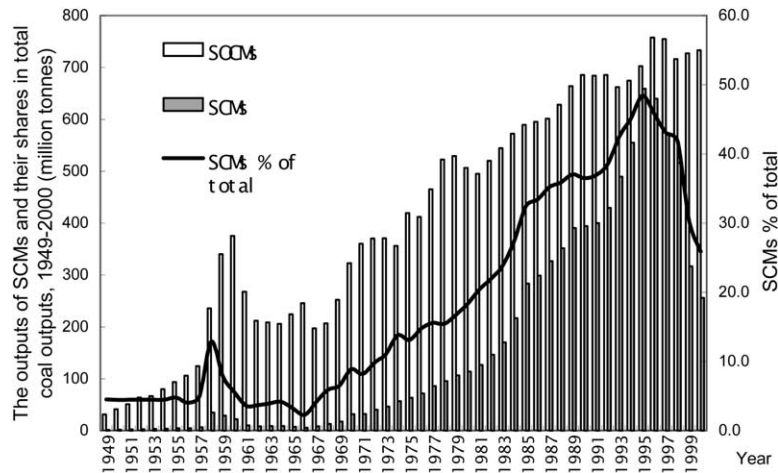


Fig. 1. Coal production by SCMs and SOCMs in China, 1949–2000. Data sources: (1) data from 1949 to 1996 from Ye and Zhang (1998); (2) data from 1997 to 2000 from State Bureau of Coal Industry (2000).

for losses, partial waiver of taxation, added equity, and maintenance fees for the SCMs. In March 1983, Hu Yaobang, then general secretary, pointed out the guiding principle that all owners of state, collective and private mines were allowed to exploit resources. Afterward, the MOC drafted a report titled ‘The Report on Accelerating the Development of Small Coal Mines and Eight Measures to Be Taken’.

Owing to the same preferential policies, the SCMs rapidly developed during the sixth five-year plan (1981–85). Coal output of SCMs increased from 113.6 Mt in 1980 to 283.2 Mt in 1985, and their share in the total coal output of China grew from 18.3% to 32.5%.

The dramatically increasing outputs of the SCMs was stimulated greatly by the guideline of “the mass ran the mines but the state built the road” (Gao, 1999), which was pointed out by the then premier Zhao Ziyang. Due to lack of effective regulations, it was difficult for the state to control and supervise the SCMs. Consequently, different kinds of SCMs were built up with such a rapid speed that the output of SCMs in 1986 was significantly more than that of the planned target in 2000.⁷ Under such misleading policy, the corresponding regulations of ‘different kinds and scales of coal mines development at the same pace’ was made and implemented. As a result, the coal output of the SCMs in 1985 first reached about one-third that of the total of China (Fig. 1). Yet late in the period of the seventh five-year plan (1986–90), a Three-Year Austerity Programme (1988–91) was introduced to cool the nation’s overheated economy. Price controls were reimposed on key raw materials (including raw coal) in 1988, signalling failures in China’s ambitious reform programme to allow the market-place to set prices (Dorian, 1994, p. 80).

⁷ According to the plan of MOC, in 1984, output from SCMs should have been less than 400–500 Mt.

The sustainability-dominant period (post-1992)

After debates on decentralisation policy, the Chinese senior leader, Deng Xiaoping, made an important tour in southern China in 1992, stressing steadfast support for the market-oriented reform policy. This tour caused another major policy change during the eighth five-year plan (1991–95). China implemented major reform in the coal industry and freed coal prices, insisting on the principle of ‘developing large, medium and small coal mines simultaneously’. This policy allowed coal production and prices to shift from centrally planned to market determined. As a result, the SCMs achieved the third rapid increase in raw coal output. In 1995, the SCMs once again fulfilled the raw coal output more than that of the SOCMs. The collective and private mines of the SCMs occupied 94% output increase of the total raw coal in China in 1995 (Fig. 2).

With the rapid development of the SCMs, China faces significant challenges from environmental sustainability in terms of water and air pollution, solid waste disposal, resource losses and damages. China’s increasing market

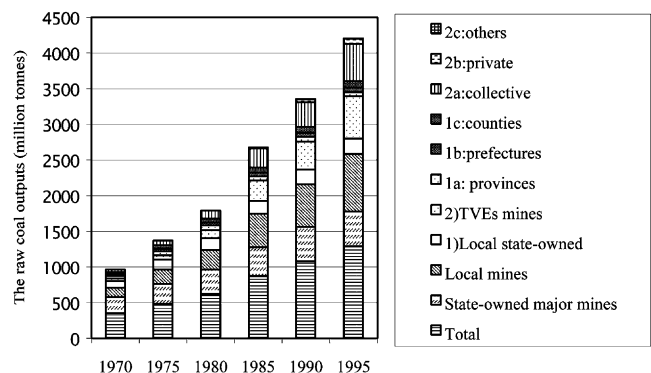


Fig. 2. The structure of raw coal output within the SCMs in China, from 1970 to 1995. Data source: Yan (1997).

orientation opens the possibility of using the market-based mechanisms to internalise the environmental costs of coal production. Full-cost pricing was introduced to encourage more efficient production and ensure priority given to exploit washed, lower sulphur and ash coals. At the same time, consideration has to be given to the use of taxation when pricing signals are not adequately internalising environmental factors. As seen in the later discussion, nonetheless, local enforcement for the SCMs does remain a problem.

Recognising the serious environmental impacts, the Chinese government enacted a guiding policy of ‘support, transform, rectify, unify and improve’ the SCMs in 1994. Further rectification of the SCMs was carried out in 1997. By the closure policy in 1998, 14,700 illegal wells had been closed. However, some problems still existed and even became more serious than before. This led to a further large-scale closure and restriction campaign in late 1998.

Why did the policy of closure and restriction on SCMs fail?

Despite enforcement of the closure policy, the coal glut in China has not yet been reduced, although the actual number of closed SCMs exceeds the planned target of the central government. Since closure policy implementation in 1999, although more than about 30,000 illegal and irrational SCMs had been closed (4200 more than the planned 25,800 as shown in Table 1), there were still 38,900 SCMs in 2000. Of these, less than 54% have both mining and production licenses; about 18,100 SCMs, which either have no production license, or mining or production licenses, are continuing to produce coal illegally (State Bureau of Coal Industry, 2000).⁸

Why did the closure policy fail? Intuitively, closing mines and reducing output should be separate issues—the former being governed by regulation and laws, the latter by the market mechanism. If this was the case, these two objectives could be achieved by ways of laws and economic principles, respectively. In simple terms, the closure should be strictly based on the laws and regulations of coal mining whilst the reduction of coal output may be adjusted via both the mechanisms of market economy and the constructive controls of different levels of governments as well. Other reasons can also lead to the policy failure above. For example, there exist differ-

ences in thoughts, knowledge, and perspectives on closure and output reduction; the lower levels of authorities might take their countermeasures against the policies of the central government. The most important reasons may lie in issues of the property rights, coal pricing, mine ownership, and enterprise objectives.

Free access to coal resources versus well-defined property rights

For China’s SCMs in the 1980s, access to coal mining was completely unrestricted. Free access to coal resources created two kinds of externalities: a contemporaneous externality and an intergenerational externality (Tietenberg, 1992). The former, which was borne by the current generation, involved the over-commitment of resources to mining, which resulted in too many SCMs. As a result, the SCMs earned a substantially lower rate of return on their mining activities. The latter, borne by future generations, occurs because over-exploitation reduces the coal stock that, in turn, lowers future profits from coal mining.

Natural resources economics treats resources in the ground as capital assets (Tietenberg, 1992). Under conditions of well-defined property rights and a perfect market, the owners will be indifferent between holding the resources in the ground and extracting them. An intergenerational externality occurs because the size of coal reserves is reduced, causing future profits to be lower than would otherwise be the case. Moreover, the resource owner with exclusive property rights could balance the use value against the asset value. Yet exclusivity was lost when access to the coal reserves for the SCMs was unrestricted.

Free access to coal resources also violates both efficiency and sustainability criteria. Economic theory assumes that if resource markets are competitive, resource owners will deplete the resources at a socially optimal rate. If this is the case, the only reason why governments intervene in resource markets would be as follows (Pearce and Turner, 1990): (a) if social rates of discount are different than the private rate of discount used by the resource owner; (b) if there are externalities from resource use; and (c) if markets are not competitive. Under the anarchic competition condition among SCMs, the government intervention by closure policy was doomed to fail because of the lack of clear and exclusive property rights. Nonetheless, if the ownership of mining rights was clarified and made more secure, the closure policy would fulfil the above criteria.

The fixed price versus the free market price

One of the most contentious problems has been coal pricing, and the failure to solve it has been a major deterrent to foreign investors (Thomson, 1996, p. 743).

⁸ According to recent reports from BBC Monitoring Asia Pacific and *Mining Journal*, 25 May 2001, the mine accidents over the past six weeks, which killed more than 500 miners, prompted the State Council General Office to issue an urgent circular closing small mines throughout China. All small state-run mines should have been closed down by the end of June 2001.

According to Marxist theory, raw materials should be priced as low as possible. In the past socialist economy of China, it was widely considered that the prices should just cover production cost. Until 1965 the average ‘producer’ price per tonne for coal from SOCMs was raised minimally in the interests of counteracting the differential in production costs across China, and then between 1965 and 1978, there was no change in producer price at all (Thomson, 1996, p. 744), despite rising production costs and resource depletion. For much of the period since 1956, the coal from the SOCMs has been sold at half, or even less, of the production costs.

Post-1978 the Chinese government was decisive in its ambition to allow market forces to play a much greater role in the national economy. Yet some reforms of prices have proven to be problematic except for the success in agriculture prices. The early 1980s saw several upward adjustments to coal prices in China, and a ‘two-tier pricing’ system was introduced in 1984. This system consisted of two sets of prices—fixed and floating. The fixed price was determined by a contractual arrangement of the Ministry of Finance with the MOC, which in turn contracted with its sub-levels of authorities and ultimately with specific mines. The state assigned an output quota to each coal-producing unit that filled the quota by a specified date and sold to the state at a fixed price. To encourage the producers, any output beyond the quota (allocated coal) could be sold to the state at 50% above the base price, or on the open market at free market price. When there existed a great difference between the fixed and free market prices and inflation threatened to go out of control, the government imposed price ceilings on coal sold on the free market and halted trading in coal futures which had begun in 1992. As experiments from 1992 to 1994, the government gradually allowed parts of all the coal produced by the SOCMs to be sold at market prices. The proportion went up from 20% in 1992 to 80% in 1993 and to 100% in early 1994 (Thomson, 1996, p. 745).

The distortion in sale prices made the SOCMs lose money and even become bankrupt. Since the SOCMs in China supplied other state-owned enterprises (for example, large power plants) at low prices and then not paid, over 90% of SOCMs incurred losses in 1993 (Coal Industry Advisory Board, 1999). Despite the rise in coal prices from 1994 onwards, 72% SOCMs still lost money in 1996. In contrast, only half the SCMs were losing money, as they were able to sell much of their coal at higher market prices.

Differences in production costs make it difficult for the SOCMs to compete with the SCMs efficiently and fairly in the market. The SCMs, on the one hand, paid less in production costs than the SOCMs in part because they were not burdened with the same level of social and environmental costs as the SOCMs. In comparison with those of the SOCMs, the costs of SCMs were

extremely low. The direct costs per tonne of coal for SCMs and SOCMs in 1997, for example, were less than RMB Y30 (RMB Y short for Renminbi Yuan, the same hereinafter) and RMB Y18, respectively. The SOCMs, however, additionally had to pay RMB Y52 for other indirect costs and their total costs amounted to RMB Y72 per tonne, which was almost level with the RMB Y80–120 per tonne average pit head coal price (He, 1999).

The administrative monopolistic SOCMs versus free market SCMs

Over the last few decades, state-owned enterprises have dominated the decision-making in China’s socialist economy. As a result, the SOCMs usually played a key role in the planned system and exhibited the five features characteristic of state enterprise identified in the literature (for instance, see Radetzki, 1985)—a complex and blurred goal structure, an unclear relationship between top management and ownership, favourable access to financial supply, and a virtual survival guarantee by the government. Several enterprise behavioural patterns typical of the SOCMs could be derived from the above features. First, the combination of blurred objectives and unclear ownership roles gives management much greater discretion in determining enterprise objectives than is common in the SCMs. Second, the SOCMs are under less pressure to minimise costs than are SCMs because profit maximisation is not the overriding objective of SOCM activity. Third, the SOCMs are more capital intensive than the SCMs. Fourth, over-investment in capacity of SOCMs will be greater than the SCMs, and this results in the bureaucratic tendency of the management of SOCMs to maximise the volume of operations rather than profits.

SCMs act much like entities in free markets (though not completely competitive). The SCMs are presumed to satisfy the local need for production and distribution of coal products in an economically ‘efficient’ way. They are contrary to the SOCMs: the SCMs are normally characterised by small production scales, lower technologies of production, frequent casualties, and severe resource loss. Whilst China faced coal oversupply, the SCMs overproduced, even exploiting and producing coal without licenses, and nibbling at the edges of the SOCMs.

Much coal from the illegal SCMs was sold actively on the black market (Huang, 1999). This was because allowing more and more coal to be sold at floating prices resulted in rampant price extortion and monopolistic market structure. Almost all types of organisations in China—party organs, mass organisations, factories, and even schools and army units—began to act as the middle traders between the producers in coal-rich areas and users in coal-poor areas so as to make profits. This

profiteering caused great differences between the extraction costs and sale prices. The prices of coal sold in coastal regions, for example, might be two and three times as high as the extraction costs in inland regions of China. As a result, the government established four major coal exchanges throughout China so as to eliminate illegal coal transactions. Yet this measure proved a failure; most coal from SCMs continued to be traded on the black market.

So rectifying the order of the SCMs and standardising their management have become pressing and urgent. One of the key measures is to establish a license system for SCM operations and to set up some necessary limitations by examining the certificates and licenses. Fortunately, the State Council has gradually reorganised the administrative system. The MOC was dissolved in 1998. Its functions on mineral resources management have been transferred to the Ministry of Land and Resources (MOLAR). Other functions were transferred to the State Coal Industry Bureau (SCIB). The SCIB was further dissolved in 2000. The MOLAR is the major government agency for enforcing the Mineral Resources Law and relevant regulations, including issuing exploration rights and mining rights for all mineral resources (including oil and gas, coal, metals and non-metals). So the MOLAR has played a leading role in rectifying the order of both the SCMs and the SOCMs. At the same time, the State Council agreed to enforce the Regulations of Coal Operation and Management.⁹

Multi-objectives of SOCMs versus sole objective of SCMs

As stated early in this paper, the SOCMs still bear the responsibility of social stability and labor employment and thus direct their efforts primarily to earning social benefits, irrespective of production costs. In contrast, the SCMs maximise their profits at the cost of environmental damage and resource wastes. The SOCMs meet multiple objectives from all aspects of both public needs and political pressures because state ownership of factors of production is the rule in socialist economies. These objectives may involve consideration of externalities, enterprise or national employment, income distribution, regional equality, and national sovereignty. Only if the SOCMs fail to accomplish their tasks as efficient producers or if some special non-economic goals (for instance, deposits are too small or marginal to exploit) must be satisfied in the coal production, are SCMs set up.

As a result, the SOCMs and SCMs have different atti-

tudes about environmental externalities and different responsiveness in the costs. Theoretically, under some externalities such as environmental concerns and sustainability related to the marginal user costs, the coal industry could react readily and obviously to a change in its cost structure. In practice, the effect on the SOCMs and the SCMs may be quite different. The SOCMs are forced to reduce their pollution by the environmental regulation, but the SCMs are little influenced because they pay little attention to the environmental costs. Accordingly, the SCMs produced much more coal whilst the output of the SOCMs fell, and it was the SCMs that resulted in the glut of current coal supply.

Summary and conclusions

The preceding analysis presented an historical review of the policy evolution associated with the SCMs in China and an economic analysis of current policy failure. Several conclusions can be summarised as follows:

- (a) The late-1950s, mid-1980s and early-1990s saw sustained increases in output from China's coal mines, mainly driven by growth in SCM output.
- (b) SCM development from 1950 through to the end of the 1990s, while pursued with vigour, ultimately proved disappointing in that it failed to compete with the SOCMs effectively and fairly, triggering the glut in the coal market and an imbalance between supply and demand.
- (c) This glut arose from misguided policies in the past that encouraged the SCM development but ignored its effective regulation. Local interests and protectionism, which support some illegal SCMs, even caused such an impact that some local SCMs were unaffected by the repeated attempts of government to rectify the situation.
- (d) China's coal markets have gradually developed as the state has relaxed its control of the coal price. In the dual-track model of mandatory planning and market mechanism, however, market elements played only an auxiliary role even if there existed some cautious steps towards the introduction of market mechanisms into the coal industry.
- (e) About 20–25% of the SCMs (Zhong, 1999) are still illegal, either in terms of illegal exploiting or in terms of lower price trading, or both, but failure to regulate these illegal SCMs could be due to varying factors—differences in knowledge and interests of the state and localities on the SCMs, the contradiction of closing up the SCMs by administrative action rather than through laws and regulations, and the contradiction of restricting coal output by administrative order rather than through the market mechanism.

⁹ On 22 June 1999, Sheng Huaren, former director of SETC, issued the regulations. In February 2000, the State Coal Industry Bureau (SCIB) was dissolved and parts of the staff were transferred into another new agency—State Coal Safety Supervision Bureau.

- (f) The distorted price differences in the dual pricing system have had quite different implications for the SOCMs and SCMs and how they affect the natural environment.
- (g) Only if property rights, pricing mechanisms, and mining objectives were clearly determined could the closure policy for the illegal SCMs be effectively carried out. Still, closing up the SCMs by the administrative measures alone will not wipe out illegal mining. An integrated measure, by the legal and administrative systems as well as by economic principles, could effectively curb the illegal small coal mining activities. Legalising the SCMs and leaving their output adjusted by market mechanisms may assist in handling the complexities.

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