



# Unintended consequences of China's coal capacity cut policy

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## ABSTRACT

In early 2016, China introduced additional capacity cut policies to rebalance supply in the coal market to match demand that had been reduced by slow economic growth and strict environmental regulation. Ensuing disruptions to the coal market caused these policies to be revised and, subsequently, discarded as decision makers tried to find a balance between efficient supply, economic and social stability and environmental sustainability. This paper explores the causes of these unintended consequences using an extended version of the KEM-China model. The results reveal that full and partial compliance with the capacity cut policies results in a significant gap between supply and demand. This suggests that implementation of the policy was technically infeasible, even allowing for a significant increase in coal prices and economic costs. Besides, significant differences in coal prices and output profiles are registered across the country. We argue that the heterogeneous nature of the Chinese coal market and policy compliance was a major factor leading to the unintended consequences rendering a single national price benchmark inappropriate as a policy gauge. We propose that the capacity cut policy should be differentiated across regions and even types of coalmines, market approaches would be preferable to the command-and-control instruments, and policy distortions that cause excess capacity should be removed.

## 1. Introduction

Economic expansion, industrial policies and generous subsidies led to substantial overcapacity in various sectors of China's economy, including coal industry, which poses significant problems under the 'new normal growth model' (Hao et al., 2015). In the short run, it puts significant pressure on coal prices and, hence, profitability of domestic producers, their ability to service their debt and pay their employees on time. In the long-run, a bigger share of coal consumption would contravene China's energy development and environmental targets, as well as its international commitment to peak CO<sub>2</sub> emissions by 2030. As the most carbon intensive energy source, coal will also be affected by the national emission trading scheme (ETS). Substitution of coal with lower emission energy sources is also the key measure to combat air pollution issues in China. These environmental policies can add constraints on coal demand and further justify the need for capacity cuts to balance the market in the future. Therefore, policies to tackle overcapacity issues have been gradually escalated in the past few years (State Council, 2010, 2013, 2016) but the implementation has not been linear.

One of the additional coal capacity cut policies, the working day limit (State Council, 2016), went through all major phases of its life

cycle in 2016, from design to enforcement, revision and eventually, retirement. The objective of this policy was to address the detrimental effects of the overcapacity on the coal market since the Chinese government believed that the issue would not be sufficiently resolved by market forces alone (Shepherd, 2016). However, major disruptions to the coal market caused by the capacity cut initiative demonstrated the difficulty of balancing competing priorities in a complex system of economic, social and environmental goals subject to both administrative measures and market forces.

The unintended consequences arising from this policy initiative present an opportunity for a compelling case study in the domains of China's energy policy, public policy and governance in general. In this specific case, contradictory mandates, strong support of mining operations by local authorities, and complaints of high coal prices, caused decision-makers to think again. As observed in 2016, the collision between policies and market dynamics led to an upwards shock in coal prices, undermining the elimination of inefficient production capacity.

Since the Chinese coal industry accounts for a half of global production and consumption, studying China's overcapacity issue is significant for the global community. Due to strong economic growth, China's energy demand has increased consistently since the 1980s and

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experienced a surge in the 2000s. Consequently, China's share of global coal consumption rose from about 30% in the early 2000s to 50.5% in 2015 (BP, 2016), and accounts for around 15–25% of global imports (ITC, 2017). Variability in China's coal production is likely to have a great impact on the world coal market. More generally, the excess capacity indicates that other producing countries are unlikely to gain additional market share in the Chinese market (Huw McKay and Song, 2010).

To our knowledge, no study has explored the 2016 coal capacity cut policies and its repercussions and there is no quantitative assessment of the impact of any overcapacity issue in China. A number of studies have examined China's overcapacity issues in various sectors including coal, heavy chemical, refinery, steel and power generation in the past two years, but none of them addresses this important issue as in this case study. There are primarily focused on the outlook for the power generation capacity (Yuan et al., 2016); overall review of the overcapacity situation of China's thermal power industry (Zeng et al., 2017); measurements for over-capacity of refining industry (Pan et al., 2017); estimation of the impacts of policy mix for resolving overcapacity in heavy chemical industry (Li et al., 2017); and the measurements or reasons of overcapacity in the coal industry (Zhang et al., 2016, 2017).

This paper examines why the capacity cut policies and remedial policy interventions in 2016 did not have the intended effect, how the coal market responded to these interventions and what lessons can be learned more generally about the transition from planned/mandated to competitive/liberalized markets. It intends to make contributions to several strands of research by: 1) Studying an important policy experiment and drawing conclusions that can inform international policymakers; 2) Identifying the unintended consequences of the policy, which may support calibration of future capacity control policies in coal and other industries; 3) Revealing the impact of regional and compliance heterogeneity due to information asymmetry –using the KAPSARC Energy Model of China (KEM-China); and 4) Deepening the understanding of energy policy and governance in China.

The paper proceeds as follows: The next section introduces the issues and the hypotheses. Section 3 briefly describes the model and extensions added for the purpose of this study. Section 4 presents the model results and analysis. Regional heterogeneity, information asymmetry due to a lack of reliable statistics, implementation problems and heterogeneous agent behaviour are explored in this section. Section 5 concludes the paper and summarizes the key policy implications.

## 2. Background and hypotheses

### 2.1. Excess capacity and its causes

The issue of excess capacity has been explored for several decades in the literature. It has been described as a common phenomenon of the market economy due to the presence of business cycles (Stiglitz, 1999). It can also occur under monopoly conditions as a deterrent to prevent potential entrance of competitors (Barzel, 1970). Chamberlin (1938) found that excess capacity is a common phenomenon in a monopolistic market. Excess capacity has also been revealed in market economies and less concentrated industries, such as European car manufacturing (Jullien, 2015).

However, the main reasons for excess capacity in China are different from those observed in market economies. These include government distortions, such as inappropriate industrial policies and a vast array of subsidies (Anderlini, 2013). Haley and Haley (2013) find that subsidies, in a broad sense, including cheap land and credit, discounted utilities and tax breaks, account for about 30% of industrial output and represent the major driving factor for excess capacity. The overcapacity problem has become prominent in recent years due to overreaction by the Chinese government to the global financial crisis. This has been shown to drive down profits and even threaten the growth dynamics, with recent efforts to slow down demand further exacerbating the

problem (Anderlini, 2013). Local government support is another important driver of overcapacity. Local government tends to distort mines' economic behaviour to increase their popularity by increasing jobs, GDP and deferring bankruptcy (Shi, 2009). The overcapacity of Chinese industries also causes significant problems outside China, as it produces nearly half of the world's coal, aluminium and steel, and about 60% of global cement.

Despite significant progress in liberalizing the Chinese economy in general, and the coal industry in particular (Shi, 2009), the government often resorts to policy interventions as a means of sectoral regulation (Shi, 2013). The coal capacity cut is a recent intervention by the Chinese government, gradually targeting stricter controls after 2008.

The objectives of the policies have changed over time, as have the instruments used. Initially, elimination of excessive and less efficient capacity was regarded as a step towards achieving strategic goals of transforming economic development, adjusting economic structure and promoting energy conservation and emission reduction (State Council, 2010). In 2010, the State Council strengthened the elimination of backward production capacities and issued specific targets for more than ten key industries, including coal (State Council, 2010). As the issues surrounding overcapacity became more serious, the focus shifted to specific problems and their consequences. The Guiding Opinions issued by the State Council in 2013 and 2016 emphasized the need to rectify misallocation of resources in order to prevent industry losses, non-performing loans, safety problems, unemployment and environmental degradation (State Council, 2013, 2016). In 2013, the capacity cut policy was institutionalized through supply-side reforms ('Gonggeice Gaige') (Acheson et al., 2015; State Council, 2013).

Nowadays, relevant policy documents stress the importance of market mechanisms (supported by administrative measures) in resolving the overcapacity issue, as it extends its detrimental effect on the coal market. However, China's policymakers grew distrustful of the ability of the market to resolve this issue. Lian Weiliang, the deputy minister of National Development and Reform Commission (NDRC), argued that government intervention was needed to avoid "bad money driving out good money" (Shepherd, 2016).

Indeed, the market has been not effective enough in driving out inefficient or failed companies, often referred to as 'zombie enterprises'. They rely on 'life support' received from local governments (reliant on these enterprises for economic growth, taxation and employment indicators) and banks (not wanting to write off or make provisions for bad debts) (Shi, 2009). Companies, that are *de jure* or *de facto* controlled by local governments, tend to be driven by both economic efficiency, to protect the interest of investors, and by imposed social obligations. This makes divestment, scaling down operations or closure less likely (Hao et al., 2015). Moreover, the regulatory uncertainty can prevent the firms from exiting a market if they expect government intervention to send prices back up.

However, past experience suggests that despite being initiated in good faith, such interventions often lead to outcomes that diverge from original intentions causing significant economic loss and damaging the credibility of the government (Andrews-Speed, 2004; Andrews-Speed et al., 2003; Shen and Andrews-Speed, 2001; Shen et al., 2009; Shi, 2013). The track record of past policy interventions in China's coal industry suggests that there are significant challenges in the choice of policy tools, enforcement mechanisms, estimation of policy outcomes and balancing economic, social and environmental needs (Andrews-Speed, 2004; Shi, 2009; Yuan et al., 2016; Zhang et al., 2017).

### 2.2. Evolution of the 2016 capacity cut policies

At the start of 2016, the Chinese coal industry was in a critical stage. China's coal prices plummeted from May 2013 until the end of 2015 (see Fig. 1). According to a survey (sxcoal.com, 2017a), only 10 out of 265 sampled mines in Shanxi, Shaanxi and Inner Mongolia, the three key coal producing provinces, were able to make a profit from

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