Reform in Deep Water Zone: How Could China Reform Its State-Dominated Sectors at Commanding Heights

Yingqi Tan

July 2020

M-RCBG Associate Working Paper Series | No. 153

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REFORM IN DEEP WATER ZONE:
HOW COULD CHINA REFORM ITS STATE-DOMINATED SECTORS AT COMMANDING HEIGHTS

MAY 2020

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Acknowledgements

I would like to thank Fan Li, the Deputy Director of Research Department I of China Develop Research Foundation, for the opportunity to explore these important questions in China’s reforms. His support and advice throughout the study is highly valuable.

I am grateful to my faculty advisors, Meg Rithmire and William Overholt, for guiding me and pushing me to think more comprehensively and creatively.

The encouragement and love of my family and friends is what keeps me up at night, they mean a great deal.

Finally, I would like to thank many leaders, experts, and officials, including John Haigh, Henry Lee, Qiren Zhou, Yasheng Huang, Wendy Leutert, Zhijun Yang, Jinhao Chen, Longhai Qian. They have offered valuable advice through this study, who offered commentary, recommendations, insights, and counsel to help guide me in the development of this proposal. I am in debt to all those whom I interviewed for this paper. Some of my interviewees are concerned about being quoted on the record, so I only list out the names of organization at which they work: People’s Bank of China, Energy Research Institute of the National Development and Reform Commission, China Life Investment Holding, State Grid Corporation of China, China Southern Grid Corporation of China, China Mobile, China Unicom, and China Railway Corporation.
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<td>ABC</td>
<td>Agricultural Bank of China</td>
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<tr>
<td>AMC</td>
<td>Asset management company</td>
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<tr>
<td>BOC</td>
<td>Bank of China</td>
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<tr>
<td>CAISO</td>
<td>California Independent System Operator</td>
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<td>CALPX</td>
<td>California Power Exchange</td>
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<td>CBS</td>
<td>Central Bank Bills Swap</td>
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<td>CCB</td>
<td>China Construction Bank</td>
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<td>CEE</td>
<td>Central East Europe</td>
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<td>CFDA</td>
<td>China Food and Drug Administration</td>
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<td>CFETS</td>
<td>China Foreign Exchange Trade System</td>
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<td>CHIBOR</td>
<td>China Interbank Offer Rate</td>
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<td>CPUC</td>
<td>California Public Utilities Commission</td>
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<tr>
<td>CR</td>
<td>China Railway</td>
</tr>
<tr>
<td>CRC</td>
<td>China Railway Corporation</td>
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<tr>
<td>CSG</td>
<td>China Southern Grid</td>
</tr>
<tr>
<td>CSRC</td>
<td>China Securities Regulatory Commission</td>
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<tr>
<td>DPLU</td>
<td>Direct Purchase of Large Users</td>
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<tr>
<td>DRC</td>
<td>Development Research Center of the State Council</td>
</tr>
<tr>
<td>DRG</td>
<td>Diagnosis related groups</td>
</tr>
<tr>
<td>ECD</td>
<td>Energy Conservation Dispatch</td>
</tr>
<tr>
<td>ESOP</td>
<td>Employee stock ownership plan</td>
</tr>
<tr>
<td>ESP</td>
<td>Electricity service provider</td>
</tr>
<tr>
<td>FERC</td>
<td>Federal Energy Regulatory Commission</td>
</tr>
<tr>
<td>GEM</td>
<td>Growth Enterprise Board</td>
</tr>
<tr>
<td>GPO</td>
<td>Group Purchase Order</td>
</tr>
<tr>
<td>HSR</td>
<td>Household responsibility system</td>
</tr>
<tr>
<td>ICBC</td>
<td>Industrial and Commercial Bank of China</td>
</tr>
<tr>
<td>IOT</td>
<td>Investment-Operation-Transfer</td>
</tr>
<tr>
<td>IOU</td>
<td>Investor owned utilities</td>
</tr>
<tr>
<td>IPO</td>
<td>Initial public offering</td>
</tr>
<tr>
<td>Abbreviation</td>
<td>Definition</td>
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<tr>
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<tr>
<td>IPP</td>
<td>Independent power producer</td>
</tr>
<tr>
<td>LMBO</td>
<td>Leveraged management buyout</td>
</tr>
<tr>
<td>LPR</td>
<td>Loan Prime Rate</td>
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<tr>
<td>MEI</td>
<td>Ministry of Electronic Industry</td>
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<tr>
<td>MII</td>
<td>Ministry of Information Industry</td>
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<tr>
<td>MLF</td>
<td>Medium-term Lending Facility</td>
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<td>MOEP</td>
<td>Ministry of Electric Power</td>
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<td>MPT</td>
<td>Ministry of Posts and Telecommunications</td>
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<tr>
<td>NCMS</td>
<td>New Cooperative Medical Scheme</td>
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<tr>
<td>NDRC</td>
<td>National Development and Reform Commission</td>
</tr>
<tr>
<td>NEA</td>
<td>National Energy Administration</td>
</tr>
<tr>
<td>NHSA</td>
<td>National Health Security Administration</td>
</tr>
<tr>
<td>NPL</td>
<td>Non-performing loan</td>
</tr>
<tr>
<td>OB/GYN</td>
<td>Obstetrics and Gynecology</td>
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<tr>
<td>OMO</td>
<td>Open Market Operation</td>
</tr>
<tr>
<td>OTC</td>
<td>Over the counter</td>
</tr>
<tr>
<td>P/B</td>
<td>Price to book ratio</td>
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<tr>
<td>P/E</td>
<td>Price to equity ratio</td>
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<tr>
<td>PBOC</td>
<td>People’s Bank of China</td>
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<tr>
<td>PG&amp;E</td>
<td>Pacific Gas &amp; Electric Company</td>
</tr>
<tr>
<td>PSBC</td>
<td>Postal Savings Bank of China</td>
</tr>
<tr>
<td>PSL</td>
<td>Pledged Supplementary Lending</td>
</tr>
<tr>
<td>PURPA</td>
<td>Public Utility Regulatory Policies Act of 1978</td>
</tr>
<tr>
<td>PVC</td>
<td>Peripheral venous catheter</td>
</tr>
<tr>
<td>RR</td>
<td>Reserve Requirement</td>
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<tr>
<td>SAFE</td>
<td>State Administration of Foreign Exchange</td>
</tr>
<tr>
<td>SARFT</td>
<td>State Administration of Radio, Film and Television</td>
</tr>
<tr>
<td>SARS</td>
<td>Severe acute respiratory syndrome</td>
</tr>
<tr>
<td>SASAC</td>
<td>State-owned Assets Supervision and Administration Commission</td>
</tr>
<tr>
<td>SCE</td>
<td>Southern California Edison Company</td>
</tr>
<tr>
<td>SCRES</td>
<td>State Commission for Restructuring the Economic System</td>
</tr>
<tr>
<td>SDG&amp;E</td>
<td>San Diego Gas &amp; Electric Company</td>
</tr>
<tr>
<td>SETC</td>
<td>State Economic and Trade Commission</td>
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<tr>
<td>SG</td>
<td>State Grid</td>
</tr>
<tr>
<td>SHIBOR</td>
<td>Shanghai Interbank Offer Rate</td>
</tr>
<tr>
<td>SHSE</td>
<td>Shanghai Stock Exchange</td>
</tr>
<tr>
<td>SLF</td>
<td>Standing Lending Facility</td>
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<tr>
<td>Abbreviation</td>
<td>Description</td>
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<td>--------------</td>
<td>--------------------------------------------------</td>
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<tr>
<td>SLO</td>
<td>Short-term Liquidity Operation</td>
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<tr>
<td>SOE</td>
<td>State-owned enterprise</td>
</tr>
<tr>
<td>SPCC</td>
<td>State Power Corporation of China</td>
</tr>
<tr>
<td>SZSE</td>
<td>Shenzhen Stock Exchange</td>
</tr>
<tr>
<td>T&amp;D</td>
<td>Transmission and distribution</td>
</tr>
<tr>
<td>TFP</td>
<td>Total factor productivity</td>
</tr>
<tr>
<td>UEBMI</td>
<td>Urban Employee Basic Medical Insurance</td>
</tr>
<tr>
<td>URBMI</td>
<td>Urban Resident Basic Medical Insurance</td>
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</tbody>
</table>
Introduction

“Socialism with Chinese characteristics is still socialism instead of any other ideology. We cannot lose this principle. Some suspect that China is adopting capital socialism, or state capitalism, or crony capitalism. Those are all false. China has been, is, and will be on the road of socialism despite any reform or opening up.”

- Xi Jinping, On Continuing the Advancement of Socialism with Chinese Characteristics, March 2019

The word socialism is associated with two interpretations: one conveying the certain idea of equity, freedom, and welfare, and the other depicting certain formations of societies. The former can reconcile with a democratic system, manifested as anarchism, democratic socialism, libertarian socialism, liberal socialism, and so on as we observe from Paris Commune to Bernie Sanders. As for the latter, the historical formation of socialist societies is concentrated in countries under the control of a Communist Party. It is not my intention to engage in the debates about what is true socialism, rather, this book sets out to explain certain phenomena of a socialist China, defined according to the criteria of a certain school of thought.

The ebb of socialist countries—defined by countries controlled by communist parties in this paper—is apparent over the past decades. Belarus, Bulgaria, Hungary, Poland, Romania, and others have abandoned Marxism-Leninist banner after reform failure and social turmoil; Ethiopia, Angola, Mozambique lost the communist ruling in face of local riots and military coup; and the Soviet Union collapsed and broke into multiple countries in pursuit of democratization. Nowadays, the only countries under communist control are China, Cuba, Laos, North Korea, and Vietnam.
2019 marked the 70th anniversary of socialist China. The rise of China in terms of economic development, poverty alleviation, military catch-up, business opportunities have torn the world into suspicion and questions. China’s socialist system has been in direct contrast with what other developed countries behold dearly, yet it has weathered the storms through waves of uncertainty with the strong grip by the Communist Party. China projects opportunities and doubts at the same time: too large of an opportunity for any business and political organization to ignore, and at the same time too uncertain to project its future because no other socialist country has reached China’s special point on the development trajectory. China had been following the master of the Soviet Union until it became the flag bearer in socialism as the master diminished and collapsed after the Cold War.

Despite decades of communication and interactions, no matter how heavily economically interdependent China and the world grow to be, the world’s understanding of China still falls far short to capture its complexity. The blame goes to both sides: China could have done better in explaining and communicating its school of thoughts and historical contexts; to a larger extent, the world, especially democratic superpowers, could have made the slightest endeavor to objectively observe, understand, and respect the choices made and the historical responsibility. With the rise of China’s economy, the world is acquitting the eastern beauty through the veil of many doubts.

The purpose of this book is to shed light on the hidden truth in the bush of criticism and to explain certain whys that the world has the least understanding yet of supreme importance to the development and sustainability of China’s socialist society. Even though the official discrediting and criticism on socialist China will unlikely to dwindle, the private understanding can hopefully accumulate.

★ ★ ★

The central pillar of a socialist society and the body of communist power is its state-controlled political economy. It is also this dominating state ownership in the Chinese economy that attracts the most criticism from both domestic and western scholars. These criticisms are mainly focused on three aspects: low efficiency,
competing interest, and prevalent corruption. However, despite all the drawbacks of the state-owned sector, the government is reluctant to withdraw state support.

Why is the state sector so important for China? The fact of the matter is that the emphasis of the state economy is not unique to China. The examination of all socialist countries confirms heavy reliance on the state sector at all stages of economic development. The question that should be asked is why the state economy is critical to a socialist system.

Yet, almost all socialist countries in the 1980s were affected by a plague of stagnation. The old development model, namely centrally planned and state-sector led investment, reached its limit. Socialist societies experienced frequent, intensive, and chronic shortages. State institutions indulged in a soft budget constraint. As János Kornai (1979, 1980 and 1986) has forcefully demonstrated, the “soft budget constrain” syndrome, which means that the government finds it impossible to keep an enterprise on a fixed budget without subsidies, is inherently unbalanced and unsustainable. Economic consequences of the “soft budget constrain” syndrome fall into five categories: (1) credit misallocation (Dewatripont and Maskin, 1995; Qian, 1994; Qian and Xu, 1998), (2) unproductive organizations (Segal, 1998), (3) economic shortage (Qian, 1994), (4) indebted or insolvent government authorities (Moesen and van Cauwenberge, 2000; Wildasin, 1997), and (5) solidified monopoly (Segal, 1998).

In light of the economic challenges, compounded by social dissatisfaction, the socialist world bifurcated into two camps: with a majority adopting rapid transition known as the shock therapy, and a few others adopting a more gradual approach to reforms. Russia, for example, followed the prescription of its Finance Minister Yegor Gaidar and western economists such as David Lipton and Jeffery Sachs. It carried out aggressive measures of privatization. China, under the leadership of Deng Xiaoping, resorted to gradualism instead of a sudden overhaul of the previous model.

As a background, Chapter 1 examines the literature on socialist reforms, including the debate about if, why, when, how, and what reforms should be undertaken, and the reasons behind their failures and success. The discussion goes back to Ludwig von Mises, Oskar Lange, and Friedrich von Hayek, and continues with Aslund, Sachs, Lipton, Kornai, Blanchard, Shleifer and many other
distinguished scholars. This precious historical lens sheds a bright light on the
e external context of which China was situated in.

The analysis of the socialist reforms is important for three reasons. First, the
social experiments in other socialist countries form a rich and valuable data bank
of lessons for China’s future reform options. Many of the suggestions, criticism,
proposals to China are no different from those raised in the debates three decades
ago. I have come across many discussions in various settings, including casual
conversations with friends, academic discussions with scholars, meetings and
dinners with investors, and random debates with my mother, where they would
question why the government would not do this, why the government would not do
that. To them, I say, because this and that have been tried in similar situations in
other socialist countries, and they failed miserably. Heraclitus said no man ever
steps into the same river twice. Let’s hope China does not step into a similar river.
Or at least it should know with clarity what are the risks and challenges if it has no
choice but to step in. Even though it might be argued that what didn’t work in
another society in the past does not guarantee its failure in China in the future, the
comprehension of past failures helps shape our proposals for actions. Second, the
Soviet failure has been intensely assessed and analyzed by Chinese leaders, and its
lessons continue to guide some of the fundamental principles of China’s on-going
reforms until today. The historical sense involves a perception, not only of the
pastness of the past, but of its presence. Chinese leadership within has bifurcated
opinions on reforms, and these opinions might find its root back to their
differentiated interpretation of historical accounts. Third, even though China has
managed to avoid the fate of other socialist countries in the 1990s, some common
challenges leading up to socialist reforms in the past are starting to build up in
China today. As Lincoln put it, we cannot escape history.

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2018 marked China’s 40th anniversary of opening up and on-going reforms.
The story of China’s miracle, no doubt, is written by thousands of ordinary men
and women who plowed the hard earth, who risked their worldly possessions, who
endured the winter of hardship, who struggled and sacrificed, for the rising tide of
prosperity and the still water of stability. But the one leader who receives the most credits for guiding China’s past reforms is Deng Xiaoping.

It all starts with the household responsibility system ("HRS"). But Deng did not invent HRS. Local peasants did. Zhou (2018) points out that as early as 1956, peasants at Yongjia Country of Zhejiang Province volunteered to organize labor through an allotted collective mechanism to fight famine. Deng’s contribution, he argues, is that Deng provided legitimate recognition and legal protection to self-initiated contracts. The seed of delineation of rights Deng planted blossomed into a nation-wide movement that shaped China’s fate.

The following four decades have witnessed China’s unceasing efforts to reform its economy, from liberation to deregulation, to legalization; from trial to pilot, to national adoption; from “dual-track” to “grasping the large, letting go of the small”, to “mixed-ownership”. These reforms are market-based, but not privatization-centered; they are results-driven, but less ideology-restricted, they are action-guided, not debate-focused.

At the center of the storm is the state sector. Policies have either directly shaped it or indirectly affected its development. State-owned enterprises (“SOEs”) used to account for more than 90 percent of the whole economy, now that number dwindled to be less than 40 percent. The dive is less of a result of SOE privatization, but mostly because of the healthy thrive of private business especially in respective industries. Deng’s innovation in overcoming the systemic flaw of the socialist economy was to liberalize a majority of the service sector, where shortage is projected to appear, and civil dissatisfaction is expected to rise.

A thriving private environment in the service industry is partly why China has not yet followed the path of the Soviet Union and other socialist countries in eastern Europe and fallen into the trap of political turmoil and economic collapse when forced reforms started to shake the very foundation of a socialist society. But the encouragement for private involvement is not a complete repudiation of state intervention. Never did Deng, or any other top Chinese leaders, disavow the importance of the state sector, even during its utmost disaster.

The concept of liberalizing part of the economy was not new. Lenin coined the phrase “commanding heights” in 1922 at a party convention after he permitted
a resumption of small trade and private agriculture and was criticized for selling out the country to capitalists. He responded that while the government could free up competition in service sectors, the state would always retain tight control over industries essential to the economy like power generation, transportation, money production, natural resources, and heavy manufacturing. He claimed that control over the commanding heights would ensure primitive socialist accumulation.

Maybe Deng is not what the New York Times (1997) called “a political wizard who put China on the Capitalist Road”\(^1\), but a true believer and an abiding student of Marxism-Leninism, in which the state’s intervention in the economy, especially over the commanding heights, is unshakable.

This divergence of liberalization and control is vividly evidenced in the market landscape we see in China today. In industries in the downstream of the value chain such as retail, real estate, and manufacturing, markets are fully competitive and private dominated. For industries within the circle of commanding heights, such as utilities, telecom, transport, energy, finance, and basic services such as healthcare, the state dominance prevails (Naughton 2017).

Chapter 2 documents past reforms of China’s state sectors, including their intention, implementation, and results. Through the examination, we see an unspoken principle lingering behind. I put forward the view that market reforms in the past four decades have been oriented towards addressing the internal conflicts of China’s state-controlled economy, rather than overhauling the nature of this configuration. The purpose of SOE reforms in the past is not to rid them of the market or to gradually privatize them, rather it is to enhance SOE competitiveness in upstream industries while allowing competition to creep in downstream service sectors.

Before we dive into further discussion about future reforms, it is necessary to objectively evaluate and learn from what worked and what did not. Past reforms have exhibited four unique features: (1) the central theme of building a market system where market plays a divisive role in resource allocation; (2) the important characteristics of gradualism so that reforms are meticulously carried out in stages;
(3) the adoption of a dual-track strategy to incentivize new elements to grow and develop which in turn push for changes in the old components; and (4) the critical steps of piloting before any policy is diffused widely.

It is also equally important to objectively assess where we stand today. What role does the state sector play in China’s economy today? Are the SOEs weak and inefficient as the criticism often portrays? Or are they really strong and advanced as the Fortune 500 list depicts? When it comes to the detailed financial and operational analysis of individual firms, this paper focuses more on the central SOEs under the supervision of the State-owned Assets Supervision and Administration Commission (“SASAC”). The proprietary dataset constructed for this research can be helpful to future research in the field of the state economy.

Market reform 1.0 has been a success in many regards. But during the process, some important issues got swept under the rug. Some trade-offs got pushed off. Some imbalance started to build up. Some fundamental adjustments got shelved due to path dependency. These risks have been kept at bay in the environment of rapid economic growth. But these small compromises, if left unattended down the road, can manifest into some bigger problems that endanger China’s macroeconomic and political stability.

Past reform is a double-edged sword. On the one hand, it largely reduced the institutional costs of China’s economy and allowed China to build up economic competitiveness (Zhou, 2018); on the other hand, it sets the system on the path where the new form of institutional costs emerge and fester.

The commanding heights industries fall victim to path dependency (Wu, 2010). As China’s on-going reforms proceed from peripheral to the core, they enter what President Xi Jinping calls the deep-water zone, where low-hanging fruits are picked, and the problems left to be resolved are all difficult and challenging ones. Reforming in the deep-water zone is like running a marathon on a treadmill, it is a lot of efforts, but it does not seem to go anywhere.

Why are reforms in the commanding heights sectors so challenging? What are the constraints? I would argue that market reform 2.0 faces the upmost challenge in
striking a balance between market liberalization and social welfare, between unsustainable fiscal burden and unfulfilled promise to citizens, and between economic efficiency and social stability.

I analyze four commanding heights industries: healthcare, railway transportation, electricity power, and telecommunications. The common theme is that these state-dominated sectors are subsidized by administrative measures to keep up with the surging demand of citizens, and the soft-budget constrain solidifies their monopolistic or dominant market position. Social capital is encouraged to invest, but the market mechanism makes it challenging, if not unprofitable, for private capital to enter and shoulder the cost of development with the government. Public hospitals are heavily subsidized by local and central fiscal authorities, railways are operating at a loss, electricity prices and dispatching are controlled, and telecommunications operators are struggling to stay off red. Private businesses in these sectors struggle to find the right market segment where they have reliable and even moderate returns. As a result, the underinvestment solely by the government is inadequate sometimes, evidenced by the long waiting time at public hospitals, the congestion at the train station to purchase a ticket, and the long power outage compared to other industrial countries. I only focus on these four industries as examples. But the common theme I extrapolate is by no means unique to these four, instead, it can be extended to explain the challenges in other commanding heights industries.

In light of the investment inadequacy and economic shortage, to attract social capital into these industries, the natural solution is to raise prices. As I will show in Chapter 3, the lack of efficiency or corruption fails to fully explain why some of these commanding heights industries are unprofitable. The critical impediment to profitability is price controlled by the government. According to the basic economic law of supply and demand, any traditional market-based reform will likely lead to higher prices for end customers, namely the general population.

If the peanut butter of higher prices is spread evenly on the bread of society, the ones affected the most are likely to be the less well-off bodies of the population. A higher-priced train ticket will not affect how affluent businessmen travel, but it can dissuade a migrant worker from going home for Spring Festival. A higher price outpatient service will have a limited impact on a middle-class
family, but it can influence the life-or-death decision of a rural farmer about whether to go to a hospital. Higher electricity prices will add little to the financial burden of urban families, but they can affect people’s choice of lifestyle in rural areas.

Thus, market reform 2.0 is faced with this dilemma that requires constant evaluation, balancing, and innovation. With the constraints and challenges in mind, under the guidance of practicality, I set out to provide analysis on the possible menu of options on the table. The new sets of solutions call for imagination, creativity, iteration, and experiment to tackle these challenges. Reforms in the deep-water zone should be treated with the utmost caution, like walking on a thin line with an abyss on either side.

The Chinese government has never loosened its grip on the commanding heights, nor is it likely to do so soon. The purpose of this book is also to offer incremental suggestions for the government to consider, on tackling the dilemma. The essence of my prescribed solutions is three-fold. First, there needs to be a mechanism for the price to act as an effective signal for resource allocation. Second, the political constraints of social welfare must be considered. Third, narrative and active communication are critical. To use healthcare as an example, when raising prices for healthcare services renders fiscal subsidies unnecessary to keep hospitals afloat, fiscal resources previously sucked in can be converted into expanding healthcare coverage. Under this arrangement, theoretically, the patients are not paying more out-of-pocket, but the price signal of insurance reimbursement becomes effective at encouraging efficiency improvement. The government as a whole is not paying extra but shifting expenditures from one pocket to another.

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At the crux of resource allocation stands China’s financial system. Huang et al. (2013, 2017, 2019) point out that repressive financial policies in the past four decades have facilitated cheap credit to state-owned enterprises and enabled rapid economic growth. China established large and dominating financial institutions with growing financial assets and repressive cost base. These financial institutions have been extending lower-cost credit to state-owned enterprises than to their
private peers (Lardy, 1998, 2018). Cheap funding has been a de facto subsidy to the SOEs. Repressive financial policies have lifted a portion of the fiscal burden to support SOEs’ massive investments in some strategically critical and socially pertinent areas such as infrastructure. This Stiglitz effect (Huang and Wang, 2017; Stiglitz, 1994) effectively converts saving into investment and support financial stability.

However, repressive financial policies have three negative side effects. First, they are ill-suited to support innovation and industrial upgrading. Second, the cost of sterilized financial policies is borne by ordinary citizens due to suppressed returns on savings and a lack of investment avenues other than housing. Third, the build-up of non-traditional financial innovation, both by banks and non-bank entities, as a means to circumvent financial repression is threatening the financial stability of the system.

The call for financial liberation comes from all directions. Academics stress the efficiency loss in resource allocation; private businesses complain about discriminatory lending criteria, which makes it difficult to obtain funding; middle-class citizens demand more investment options for diversification purposes; the U.S. trade representatives accuse China of unfair competition because of SOEs’ access to cheap financing from the state.

Yet, apart from using the state-controlled financial system to shoulder the fiscal burden, financial liberation is not a no-brainer for Chinese policymakers. Financial liberalization took place in the developing economies in the late 1980s and 1990s as part of the general prescriptions from the so-called Washington Consensus, a term coined by economist John Williamson in 1989. The Washington Consensus recommends “three big ideas”: macroeconomic discipline, the market economy, and openness to the world (Williamson, 2002). Financial liberation falls in the category of structural reforms, calling for interest rate liberalization and the opening up of the capital account. However, the continuous financial crisis in Japan and the U.S. at the end of the 1980s and later in Latin American and Asian countries in the second half of the 1990s raised serious doubt about the merits of financial liberalization.

Chapter 4 examines the positives and negatives of a state-controlled and repressive financial system. The need to change the repressive nature of China’s
financial sector becomes increasingly imperative. To answer the question of how reforms should be staged, one has to understand the reform history of the financial system as well as the lessons learned from the experience of the 1990s in other liberalization processes.

Finance is one of the commanding heights, but I have singled it out in a separate chapter for three reasons. Firstly, its importance and interconnection with all other sectors merit a more extensive discussion. The state-dominated financial system has been the power to the machine of China’s state economy. Secondly, the constraints and dilemma of financial reforms differ significantly from those of reforms in other commanding heights sectors. Other sectors need to attract private participation to become sustainable in fiscal projection and sufficient in investment needs. The financial sector does not lack private interest. Other sectors have subsidized prices for citizens, while financial policies sacrifice citizens’ return on savings. Market reforms in other sectors might face pain in the short term that yields gains in the long run. Short-term pain involves inevitable price hikes which warrant dissatisfaction or even protests. Market reforms in the financial sector are projected to have the exact opposite effects—gain for citizens in the short term which brews instability over the long run. Thirdly, many of the solutions I proposed in Chapter 3 when discussing specific sectors rely on a more efficient and developed financial system. The insurance management in healthcare, securitization of individual lines for railways, the futures market for electricity, and the spin-off of new business segments for telecommunications operators, all require more professional financial institutions, more capable risk management, and more sophisticated capital markets. Financial reforms are not only reforms of one industry, instead, they have the potential to be the Holy Grail of shaping all SOE reforms in the deep-water zone.

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The remainder of the book is organized in the following ways. Chapter 1 starts by tracing the ideological evidence of the state sector and socialism; it then examines the phases of state sector evolvement in socialist societies, reforms carried out in the past, and their consequences. Chapter 2 focuses on China’s past and present of the state sector, including its historical root, previous reforms, its
recent development and bifurcation, and its current status. Chapter 3 dives into the specific four sectors, exploring the situation, challenges, constraints, best-practice and case studies of other countries, and finally proposing a set of solutions. Chapter 4 discusses how the financial system shaped the development of the state economy and how its self-evolution can play a critical role in future state-economy reforms. Chapter 5 concludes.

Some statements in this book are supported by statistics, however, I must caution that the empirical evidence might fall short of clarifying or substantiating all the problems raised. Some of the figures in the official statistics contain distorted or misleading information because the data gathering might not be comprehensive, or the reorganization might have disrupted the statistical standards. In some cases, phenomena are better explained by anecdotes, personal experience, and case in point. I am fully aware of the potential bias embedded in these non-empirical observations, and they shall serve as a lens, not the only lens, to our examination.

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Finally, I would like to add a personal note. I was raised in Chengdu in the 1990s, a child of two high school teachers in an ordinary family. Both of my parents “dived into the sea of business” from their public-school jobs when I was three years old. They have experienced first-hand the enthusiasm, the uncertainty, the joy, and the tears of China’s market reforms. My mother’s business now employees hundreds of people in the medical device circulation field. Compared to other entrepreneurs such as Ren Zhengfei of Huawei, Ma Yun of Alibaba, Niu Gengsheng of Mengniu, Cao Dewang of Fuyao, and Wan Long of Shuanghui, my mother’s story is much less glamorous, but it is a story closest to me, it is a story most legendary to me, it is a story that cultivates what I come to believe.

I am no expert or professional in any of the industries I opine on. I graduated from Yale College and worked in investment banking for four years before coming to Harvard. I have worked with SOEs on transactions, I have discussed with SOE leaders about meaningful topics of the reform, I have talked to investors to understand their views of particular industries and particular firms, and I have
researched through literature, reports, and interviews, but I am far from being an expert on the state economy reform. I am an amateur.

But there is something unique about amateurs. The word *amateur* comes from the Latin word *amare*, which means to love. The dictionary definition of amateur is someone who does something purely for the love of it. I am writing this paper out of my deepest love, curiosity, concern, and passion for the future of the country. I am happy to be an amateur in this regard.

The common concern I have received is that this paper sets to take on too many facets of complicated issues at the same time, that it can lose focus. After all, reforms in any one of the four industries can probably be analyzed in a 400-page report and countless policy memos. It is a valid concern. But I believe now is probably the best time for me, unattached and unbridled, to embark on an investigative journey with honesty, to take on such an ambitious project that crosses sector lines, and to distill common themes and propose a top-level design with unrestricted imagination. The natural tendency of bureaucracy is to only mind its respective administrative tasks, to make suggestions that can enrich its bureaucratic capacity, and to push back against changes because reforms are like a revolution, you run the risk of getting neutralized.

I planned, wrote, and researched by myself. Never did anyone direct me on what to write or expect their advice to be fully incorporated in my work. I have received special assistance, but by no means I rendered independence. I appreciate the precious opportunity to dive into the complicated network of challenges without any external influence of agencies. Without pretending to achieve objectivity, I have tried to present the matters in its origins with the purity of my heart. This investigative process is by no means praise or criticism of any agent therein, but a purely academic endeavor that I hope will be helpful for future scholars and policymakers with an interest in China’s socialist system.
The State Sector and Socialism

“To remain ignorant of things that happened before you were born is to remain a child.”

- Marcus Tullius Cicero

Almost all socialist countries share the same characteristics in terms of property form. Kornai (1992) points out that the disproportionately high percentage of the state sector in all socialist countries compared to capitalist countries (Figure 1). Why is the state sector dominated economy essential to socialism? It goes back to the ideological origin of socialism.

Figure 1 Share of the State Sector: A Comparison

Source: Kornai (1992)
Marxism and Socialism

Karl Marx did not invent the idea of socialism or communism. When he became a revolutionary in the early 1840s, he joined the already-circulating socialist movement by criticizing its utopian blueprints. In the *Economic and Philosophic Manuscripts of 1844*, he strongly disagrees with what he calls “crude communists” who equate the abolition of private property and its replacement by collective property with liberation. Marx views that linkage as an “abstract negation of the entire world of culture and civilization” (Marx, 1844). He believes that the negation of private property is only a first abstract negation since it only scratches the surface of juridical relations. He calls for a “negation of this negation” to focus labor emancipation on the critical aspect, namely the transformation of conditions of labor (Marx, 1844).

In the *Communist Manifesto*, Marx states “the theory of the Communists may be summed up in the single sentence: abolition of private property.” However, he also argues that the abolition of property relations is not the sum and substance of Communism (Marx and Engels, 1848). These seemingly contradictory statements point to the difference between private property and property relations. Specifically, private property refers to means of productions owned by a class other than the working class.

Marx rejects the notion of anarchic order. As he makes clear in his critique of Proudhon, the mere abolition of a free market does not constitute socialism. Instead, socialism requires *one single master*, who could bring order to the society based on factory production and division of labor, who can serve as the “principle of authority”.

Marx’s work largely aims to provide an alternative to private property and the market. In his greatest theoretical work *Capital*, he critiques the logic of capital. He believes that a positive alternative becomes knowable only through a negative critique of the existing. He describes an inspiring future: “Let us finally imagine, for a change, an association of free men, working with the means of production held in common.”

But Marx nowhere mentions that the role of the state in holding the means production. Nor would he, because in his arguments, the state, which is based upon
the existence of classes, would come to an end in socialism or communism. Many post-Marx Marxists, including Lenin, muddied the waters by claiming that the first phase of communist society requires all citizens to be transformed into hired employees of the state (Lenin, 1917; Hudis, 2019).

The Commanding Heights

The term “commanding heights” goes back to November 1922. The policy of War Communism, in effect since 1918, had brought the Soviet economy to the brink of total breakdown by 1921. Out of desperation, Vladimir Illyich Lenin had initiated the New Economic Policy on the 10th Party Congress Meeting in March 1921, permitting a resumption of small trade and private agriculture. The die-hard communists in his party attacked him for selling out the country to capitalism. Eager to alleviate internal concerns, Lenin addressed party members at a convention in 1922 to defend the program. He declared, the reforms were rather modest, and the state would always retain control over the “commanding heights,” the most important elements of the economy. By “commanding heights,” Lenin meant sectors that dominated economic activities, including power generation, heavy manufacturing, mining, transportation, and money production. These sectors were the foremost drivers of employment, production, and consumption. By controlling these sectors, Lenin believed that the government could maintain control over the economic life of the nation. A communist government can afford to allow competition and private ownership in less significant sectors, Lenin argued, because as long as the government-controlled the “commanding heights,” it can always effectively influence the whole.

Lenin’s successor Joseph Stalin took the concept to an extreme, extending the notion that not some, but almost all elements of the socialist economy need to be controlled and planned by the central government. The Soviet Union under Stalin almost completely obviated the private markets.

The battle between government and the marketplace has been long-lasting. Yergin and Stanislaw (1998) demonstrate in their book The Commanding Heights: The Battle Between Government and the Marketplace that is Remaking the Modern World, that the global trend of government and the market forces has shifted. The
aftermath of world wars and economic depressions have given rise to state control and planning across the globe, the governments took control of the economy in Europe, the United States, and the developing world. Even though industrialized Europe gradually adapted to a mixed approach where the market was given some air, the tide did not turn until the 1970s. Margaret Thatcher kindled the idea of free market, competition, deregulation, opening up, and privatization, setting out to overturn Britain’s mixed economy. The grand transformation to allow market decide allocation, is itself a bumpy road, evidenced by Latin America’s wrenching move from dependency, shock therapy in the East European countries and the Soviet Union, and many instabilities that followed suit. Will there be a swing back from the market? Who will occupy the “commanding heights” in the next century, the government, or the market? Socialists are sowed with the belief in a state-controlled economy.

**Phases of State Sector Development in Socialist Societies**

The pattern of development in socialist societies was similar. When I was reading Kornai’s book written in the 1970s, I was utterly astonished by the similarities between what he documented for the East European countries including the Soviet Union and China. On multiple occasions during my research, I thought I was reading a book about China. Only until I stared at the turning-yellow pages of a loosely-bonded book, did I return to reality that this was a book of the past.

The Socialist economy converges to the development pattern in four stages: initial construction, forced growth, reform, and privatization.

**The Initial Construction Phase**

The elimination of private property and the creation of the state economy are the consequences of revolutionary actions by the ruling party and state apparatus. The process is not a result of spontaneous economic activities. Either through legislation, regulation, confiscation, or nationalization, the parties act as “the
expropriation of the expropriators”\(^2\) in the initial stage of socialization. The Marxist-Leninist ideology demands a process of liquidating private ownership as the morally justified path towards socialist construction. The conversion of the means of production into social property marked the cardinal point of the socialist economic system.

Socialism differs first and foremost from capitalism in the main property form. This is deeply rooted in the socialist value system. Intrinsically, capitalists are no longer exploiting the workers, and the workers as a collective are now the owner of their means of production. Instrumentally, the property acquired by the bureaucracy is a very critical means to solidify the bureaucracy’s power.

Marx and later Lenin have emphasized that socialism is superior to capitalism, not primarily manifested on an ethical plane, but importantly in its economic potentials.\(^3\) They argued that socialism, through the state sector and planning, can prevent waste caused by private property, competition, and the market. Workers freed from exploitation can work more enthusiastically and efficiently, which leads to performance enhancement and lower supervision requirements.

Of course, when one examines any society, most are in fact “mixed” in ownership. A state predominated socialist system still leaves room for private property to exist, even though they are confined to a relatively small scale or in service or downstream industries. Examples of the second economy are: (1) production of service activity such as typing, translation, housebuilding, cleaning; (2) production of agricultural products such as meat, fruit, and vegetables; (3) private commerce outside the framework of state-owned; and so on.

The mixed nature of property forms does not render our analysis fertile because we can observe a clear divide in the political will of the ruling party. In socialist systems, the ruling party exercises undivided and uncontested power with the state, and they are committed to containing private property in the initial phase

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\(^2\) Marx and Engels brought up this concept in Soch., 2\(^{nd}\) ed., vol. 23, pp. 772-73. “The monopoly of capital,” wrote K. Marx, “becomes a fetter upon the mode of production, which has sprung up and flourished along with and under it. Centralization of the means of production and socialization of labor at last reach a point where they become incompatible with their capitalist integument. This integument is burst asunder. The knell of capitalist private property sounds. The expropriators are expropriated”

\(^3\) See, for example, V.I. Lenin, “Socialism calls for greater productivity of labor – compared with capitalism and on the basis achieved by capitalism”, (1969, p. 248)
of societal formation. With a nonsocialist system, on the other hand, the society might develop into a hybrid of private and public ownership according to its own accord, but no party in undivided power wants to eliminate the predominance of capitalist private property.

The Growth Phase

After the initial construction phase of socialist societies, a phase of economic growth follows. This specific type of growth is referred to as “forced growth”\(^4\) or “haste growth”\(^5\) by scholars. They argue that at the back of rapid economic growth in socialist countries, is a strong expansionary drive to prove socialist superiority. The drive to grow was quoted in Stalin’s speeches,\(^6\) evidenced in Mao’s Great Leap Forward campaign, expressed in every five-year plan, and carried out through ubiquitous fixed-asset investments. The belief that socialist societies can catch up with the developed countries in a short period is deeply rooted in the original promise from the communist party. It then trickles down to every level of the bureaucratic system.

The USSR

Since the Bolshevik revolution, the Soviet Union has transformed its agriculture-dominated poor economy to be a modern industrial state with a GNP second only to that of the United States. From 1928 to 1985, the Soviet economy grew by a factor of ten, and the level of GNP per capita grew more than fivefold. In the early 1960s, after the era of rapid Soviet growth and Sputnik, scholars were debating when would the Soviet Union overtake the United States. However, in the next two decades, the Soviet growth slowed down significantly, even to 1-2 percent in the mid-1980s. The shifted gear of growth altered the scholar debate as well as the political debate to be whether the Soviet system can support the return of sustained and rapid economic growth. What are the drivers of Soviet rapid

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\(^4\) See G. Ofer (1987) and Kornai (1992)
\(^6\) Stalin’s famous call in 1931: “We are fifty or a hundred years behind the advanced countries. We must make good the distance in ten years. Either we do it or they crush us”
growth till the late 1950s? What changed in the 1960s and 1970s that caused growth to decline?

In the review study by Ofer (1987), he finds that during the entire period, Soviet growth was generated by high rises in inputs and declining growth of input productivity. Inputs can be broken down into labor and investment in capital. First, from the 1920s to the 1950s, labor inputs grew at a substantially higher rate than population growth because of the higher labor participation rate. This trend of labor inputs was slowed and even reversed since the 1950s. What is more significant in the inputs growth is the Soviet’s high rates of investment. The Soviet capital stock has been growing at an annual rate of 7.5 percent, \(^7\) and the growth rate remained between 8-9.5 percent until 1975 before it slowed down to 6-7 percent. With a sharp decline in the growth rate of labor since the 1960s, investments became the sole carrier of the growth of the Soviet economy. The other side of the coin of Soviet growth is the little contribution from the rise in overall productivity. The introduction and diffusion of new technologies are among the main victims of the central planning system. The counterargument usually points to the technology advancement the Soviet Union has mastered, in the military, in space, and other elements in the Cold War. After all, the Soviet Union was competing on the same level as the United States for dominance in the technology space. Indeed, Lange (1938) is right in identifying the economic advantages of socialism based on mustering all resources necessary to advance scientific development programs, and the Soviet achievements, especially in the military and space sectors, are outcomes of this mission-oriented system. But what hurts the productivity rise is the incorporation of R&D into production units. Managers of state-owned enterprises are reluctant to adopt new technologies if they need to make short-term sacrifices or take an unpredictable risk. The single-goal and mission-driven technology cannot be diffused to daily operations of corporations of production lines.

Thus, the rapid growth of the Soviet Union during the till the late 1950s was almost entirely carried by (1) the growth of labor input, as a result of SOEs organizing workers more efficiently, and (2) the growth of capital input, as a result

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\(^7\) Excluding World War II years when capital was destroyed
of forced investments. Technology, or total factor productivity (“TFP”), especially with regards to technology that improves the efficiency of production, lagged.

**Other Socialist Countries**

Investment-led forced growth is not unique for the Soviet Union, it is the overarching theme of almost all socialist economies. Pryor (1985) compares seven “socialist, centrally administered economies” with twenty-one “capitalist, market economies”, and arrives at a rather surprising conclusion: the form of political-economic organization is more or less irrelevant to economic performance. Between 1950 – 1979, he finds little difference in fluctuation in GDP or industrial production, but one feature that does differ significantly between these two groups is gross fixed capital investment (Figure 2).

**Figure 2 GDP and Capital Investment Growth in Socialist and Capitalist Countries**

![Graph showing GDP and capital investment growth in socialist and capitalist countries]

*Source: Pryor (1985)*

Scholars in the socialist countries distinguish factors contributing to growth between extensive and intensive methods. The extensive method refers to factor growth, such as growth in the labor force, growth in the area of farmland, and growth in capital investments. The inclusive method corresponds to factor-productivity growth, such as technical progress, labor efficiency, and
organizational improvement. The socialist system is primarily dominated by extensive methods under conditions of forced growth. Even though various empirical studies might disagree on methodologies to calculate the exact split of extensive and intensive methods, they don’t contradict this qualitative conclusion.\(^8\)

**The Reform Phase**

The rise of the private sector is the most important trend in the socialist economy during the reform process. The inducement behind the retreat of the state sector is less of an intentional push by the party-state, but more of a voluntary undertaking on a private property basis. Tens of millions of people move from SOEs to private enterprises and various forms of private property mushroom.

In the Soviet Union case, in the 1960s and 1970s, when the industrial Soviet embarked on a deep economic transformation, private economic activities flourished across the whole country. The private sector, also known as the second economies, derived from structural inadequacies in the socialist planning system. Several studies estimated the second economy to be nearly 10 to 50 percent of the formal economy in consumer, agriculture, and distribution industries respectively.\(^9\) The second economy is not unique in the Soviet Union. In Hungary, according to micro surveys by Timar (1985) and Belyo et al. (1985), the private economy accounted for 33 percent of the total economy in terms of the distribution of household time, and 87 percent in terms of repair and maintenance services.

The rise of the private sector clashes with the official ideology of socialism. According to Marx, the future will bring an end to private ownership: “The monopoly of capital becomes a fetter upon the mode of production, which has flourished alongside and under it. The centralization of the means of production and the socialization of labor reach a point at which they become incompatible

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with their capitalist integument. This integument is burst asunder. The knell of capitalist private property sounds. The expropriators are expropriated.” Engels continues: “society will take all forces of production and means of commerce, as well as the exchange and distribution of products, out of the hands of private capitalists and will manage them following a plan based on the availability of resources and the needs of the whole society. The abolition of private property is doubtless the shortest and most significant way to characterize the revolution in the whole social order which has been made necessary by the development of industry, and for this reason, it is rightly advanced by communists as their main demand.” Lenin warns against even small-scale private flourishing: “small production engenders capitalism and the bourgeoisie continuously, daily, hourly, spontaneously and on a mass scale.”

Alongside the surge of private sector involvement is the bigger role played by the market as the basic coordinator in the socialist economy. Most socialist countries in the reform phase yielded to allow the market to play a dominating role in determining price, wages, investment, and other economic activities. Without aiming to be exhaustive, the following historical trend towards market socialism is worth pointing out: Yugoslavia from 1950, Hungary from 1968, China from 1978, Poland from 1981, Vietnam from 1987 and the Soviet Union from 1985.

The debate on market socialism started earlier than its practice. The challenges of market socialism came from a famous study by the Austrian economist Ludwig von Mises (1935), in which he claims that socialism, without private property, is impossible of obtaining complete information and making rational calculation. Mises calls socialism “the abolition of rational economy”. Oskar Lange (1956) disagrees with this view. He proposes that an economy, in which firms are in public ownership and follow a goal of profit maximization, is capable of balancing supply and demand. He argues that central planning could adopt the operating principle of the market by adjusting prices continually when they see signals of excess supply or demand.

Lange’s theory of socialist planning has attracted a strong influence in the intellectual and policy-making sphere. But it also invited sharp repudiation from

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10 Summary account of the debate can be found in P. Roberts (1971), D. Lavoie (1985), G. Temkin (1989) and A. de Jasay (1990)
others. Among them, the most famous is Friedrich von Hayek (1935, 1940).\textsuperscript{11} Hayek challenges the feasibility of price adaption in Lange’s theory. He suggests that Lange’s use of an equilibrium model assumed moving toward some final equilibrium set of prices would be a one-time adjustment, whereas in reality, it would be a never-ending process “where constant change if the rule”. In this world of constant change, Hayek believes that the market, competition, and free enterprise are indispensable in providing incentives for thousands of actors in the system to react to widely dispersed information.

The state sector’s affinity in the market socialist economy during the reform process is complicated by the bureaucratic influence. The Lange model takes as a given that the state-owned enterprises are profit-maximization entities and that a Central Planning Board can co-exist with the autonomy of managers who determine inputs and outputs of production units. However, the reality usually deviates from Lange’s paradigm because the resistance usually comes from the bureaucracy who are also managers of SOEs. The leaders of state-owned firms demand independence, but only halfheartedly. When firms are enjoying growth, and everything is in order, they would rather be left with full autonomy to decide wages and retain profits. But when a problem or even insolvency arises, they would be counting on government intervention and inter-agency assistance. Managers of troubled SOEs lobby hard for government bailouts, credit extension, and regulatory leniency. Market socialism relies on the reconciliation of central control and firm independence. But the dominance of public ownership renders true independence because the incentive structure of managers is skewed in the bureaucratic calculation.

The implication of this incompatibility is a rather envious relationship between the state and private sectors. SOEs envy the private sector of its autonomy. One manifestation of it is the fact that the private sector pouched often the best labor force because they can afford to pay higher wages whereas SOEs are constrained. Meanwhile, the private sector envies the privileges of the state sector. These privileges include SOEs’ advantages in credit, critical means of production, market

\textsuperscript{11} For a full account of Hayek’s opposing views on socialism, one can find in B. Caldwell (1997)
access, bureaucratic connections, financial subsidies, and their higher social status perceived by society.

The semi-deregulated public sector and the private ownership especially at the downstream of value chains both resort to personal connections. Managers to SOEs use personal connections with officials in the bureaucracy to protect privileged positions enjoyed by their firms; private entrepreneurs try to establish personal connections with upstream SOE leaders, state-controlled financiers as well as government regulators. In both scenarios, often bribery is attempted.

In short, the state sector in the market socialism phase often fails to induce real market behavior. Managers of SOEs continue to be half-businessmen and half-bureaucrats, who rely on personal connections and other means to defend their advantages and to advance their bureaucratic career. At the same time, the state sector continues to control the critical means of production in commanding areas, and market coordination mechanism falls short.

In 1986, Gorbachev acknowledged the problems with past reforms in his almost-six-hour long report to the 27th Congress of the Soviet Communist Party and pledged to embark on a “truly revolutionary change”, “a total economic and social reconstruction” of the Soviet society.

**The Privatization Phase**

In 1989, political revolutions spread across Eastern Europe. The communist systems collapsed one after another, from Albania to the USSR. By 1991, all the former socialist societies embarked on creating a market economy with primarily private ownership to replace their existing state-dominated economies. The common view in the literature points out that the inherent incompatibility of market reform and socialist ideology, fragile financial position of the state, together with the mounting macro tension within socialist societies, are the fundamental drives to mass privatization.\(^\text{12}\) Privatization started around the same time, but the process differed widely across different states.\(^\text{13}\)

\(^{12}\) Kornai 1990; Sachs and Lipton 1990; Sachs 1993; Savas 1992; Boycko, Shleifer, and Vishny 1995

\(^{13}\) Frydman, Murphy, and Rapaczynski 1998; Stark and Bruszt 1998; Lavigne 1999; Frye 2010
The Reasons for Privatization

Literature places a lot of emphasis on economic efficiency. Kornai (1990) argues that state-owned enterprises suffer from careless spending and excessive investment because they face soft budget constraints by state finance. Privately-owned companies contribute to the efficient market by enforcing rational resource allocation. Lipton and Sachs (1990) point out that unrestrained wage claims of employees of state-owned enterprises are the major cause of hyperinflation in East European countries, and the inflation pressure is likely to result in financial collapse and economic recession. They believe that the only effective way to intercept this downward spiral of sky-rocketing wages and dire economic situation is to turn public properties to private. Aslund (1991) stresses that creative destruction or innovation can only be perpetrated by private enterprises whose goal is profit maximization over the long term.

Other than economic efficiency, some scholars also point to the political implication of a sound market economy and extensive private ownership. They argue that private ownership is a necessary condition for democratization to flourish and for democracy to sustain. Blanchard et al. (1991) warn the risk of uncoordinated exploitation of national wealth by members of the communist nomenklatura14 if the state does not initiate comprehensive and supervised privatization. Major (1993) adds to this argument the “East European reasons”, namely political groups and citizens view privatization as “doing justice” to those whose properties were confiscated by the Communist Party. They advocate for full or partial privatization of state-owned properties as a way to restore social justice.

Not all reasons have long-term, strategic, and macro elements baked in, some argue that privatization is an immediate patch to a dire economic situation and state finance. Major (1993) puts forward a hypothesis that communist states have accumulated gigantic government debt to undertake overly optimistic development projects, therefore privatization serves as an attractive solution to tame immediate financial pressure on government finance. Selling off state-owned enterprises to

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14 The nomenklatura (Russian: номенклатура) were a category of people within the Soviet Union and other Eastern Bloc countries who held various key administrative positions in the bureaucracy, running all spheres of those countries’ activity: government, industry, agriculture, education, etc., whose positions were granted only with approval by the communist party of each country or region.
garnish potential revenue streams upfront in a lump sum can be used as a means of restoring the budget balance of the bureaucracy.

The reasons for privatization outlined above are neither comprehensive nor exclusive. They offer different angles, which overlap with one another, that contribute to the overall debate of privatization. Behind different reasons are divergence in ideology as well as competing political interest, which eventually lead to an amalgam of approaches that different states adopted down the road.

**The Debate over the Pace of Privatization**

How fast should the privatization be carried out? Some scholars propose that rapid privatization is both feasible and necessary because the efficiency gains from private ownership and effective capital markets are obvious low-hanging fruits. They acknowledge that there might be concerns regarding potentially inappropriate distribution during a rushed process, but they are confident that the capital markets will eventually reshuffle ownership through takeovers, mergers, sales, and buyouts to reach fair equilibrium.

Blanchard *et al.* (1991), Lewandowski and Szomburg (1989), Lipton and Sachs (1990), Aslund (1991) all advocate for rapid privatization through free distribution of shares. They called for establishing the market economy dominated by private owners within a very short period (2-4 years). The new owners of the freely distributed shares can be newly established institutions such as privatization holding companies or mutual funds, subordinate to the government.

Not all agree with rapid privatization. Other analysts like Kornai asserts that the shift from state-dominated economies to primarily private ownership should be an organic and time-consuming process, and the sale of enterprises should be handled carefully on a one-by-one and step-by-step basis.\(^{15}\) In his view, the apparatus of the state “is obliged to carefully handle the wealth it was entrusted with until a new owner appears who can guarantee a safer and more efficient guardianship”.\(^{16}\) Kornai’s further elaborates on the importance of creating

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\(^{15}\) Scholars who are in favor of organic privatization include Andreff (1992), Bolton and Roland (1992), Brabant (1992), McKinnon (1992), Murrell (1992a, 1992b), Murrell and Wang (1993), and Poznanski (1992)

\(^{16}\) Kornai (1990, p.82)
institutions that guarantee full legal security of the private sector, as he sees it as the premise of full liberalization of private businesses.

Kornai’s gradualist approach is well respected by many East European governments, however, when it comes to implementation, political reality squeezes room for gradualism. A few months after regime changes, new East European governments faced growing dissatisfaction and mistrust due to economic recessions and financial difficulties. To secure their power base, new governments were under a tremendous amount of social and ideological pressure to rush to reallocation of national assets. Vaclav Klaus of Czechoslovakia (Minister of finance of Czechoslovakia) and Tibor Liska of Hungary (Head of Entrepreneurial Research Group of the Karl Marx University of Economics) have all been advocates of free distribution to the population. Before a “grand design” rolled out, governments needed to take fairly short-sighted actions to stay in power.

Gradualism, or piecemeal changes in economic institutions, runs the risk of retreating to mandatory central planning. The essence of socialist countries is its reinforcing and self-sustaining system of politics and economies. The power of habit is strong. To break up the petrified institutions and the routine attraction to the status quo, “the detachment of economy and the political sphere must go even beyond the level that is prevalent in most Western countries” (Major 1993).

**The Methods of Privatization**

State-owned enterprises can be privatized by two broad strategies: share sale, and free distribution. Each encompasses several specific methods, and one can be used separately or in complement to another. Some countries, such as Poland, used three strategies concurrently depending on the size of firms to be privatized.

**Share Sale**

The most frequently used method of privatization is to launch an initial public offering or an outright sale. As an initial step, governments usually convert state-owned enterprises into joint-stock companies. Then the sale of joint-stock shares can be organized in the framework of an invite-only auction, or an outright sale to pre-selected buyers, or on rare occasions an open tender.
Three methods fall under the category of sale: initial public offering ("IPO"), leveraged management buyout ("LMBO"), and employee stock ownership plan ("ESOP").

- **IPO**: Naturally, public offering or secondary share sale was easier executed by state-owned enterprises who were already in business with foreign trade partners or were of monopoly positions with financial soundness. For them, privatization would require that ownership be vested in several groups of owners, mainly foreign buyers. In Hungary, the government initially expected that IPO would account for about 40 to 50 percent of all privatization deals.\(^\text{17}\)

- **LMBO**: Medium-size firms could sell the majority of their stakes to a single buyer, either through a leveraged management buyout ("LMBO"), or a sale to outside groups, both domestic and foreign. In this case, managers were supposed to negotiate the sale price with the state agency, invest their own resources, and borrow the rest from banks. Management buyout was estimated to account for 20 to 30 percent of privatized property in value.

- **ESOP**: The third method, used in small-scale privatization mainly in retail trade or light industrial sectors, was to transfer ownership to the firms’ workers through “employee stock ownership plan”. Hungary and Poland envisaged that this method would take up at most 10 to 20 percent of the assets.\(^\text{18}\)

The critical aspect of an outright sale was who would have enough capital, especially in an environment where state ownership was 70 to 90 percent of the economy, to settle the purchase. In Poland, for example, total private money savings are sufficient to purchase a mere 5 percent of enterprise assets at book value (Walkowiak et al., 1990). The ratio was even lower for Hungary and the USSR.\(^\text{19}\) The insufficient capital within the state forced the agencies to solicit


\(^{18}\) For Hungary, see previous footnote; for Poland, see “Privatization in Poland: Program and Achievements”, Ministry of Privatization, Warsaw, August 1991.

\(^{19}\) For Hungary, see Blue Ribbon Commission, 1990; for the USSR, see Savas, 1992.
purchase from foreign buyers, which raised serious mistrust and social unrest among domestic citizens as national assets were seen as sold cheaply by the state.

The privatization methods are by no means exclusive, the case study of Shuanghui shows that the company has employed all three of the methods during its reform and privatization process.

**Box 1: The SOE Reform and Privatization of Shuanghui**

Shuanghui Group, publicly-traded meat and food processing company headquartered in Luohe in Henan Province, is the largest pork producer and packaged meat producer in the world. The story of Shuanghui is a reflection image of many reform and development stories in China.

The company’s history traced back to Luohe Cold Storage, a state-owned company established by the commerce bureau of the local government in 1958. It was renamed as Henan Luohe Meat Products Processing United Factory in 1977. Mr. Wan Long was elected to be the head of that factory in 1984. In 1989, the “Shuanghui” brand was created, and the first ham sausage carrying the Shuanghui brand entered the market. In 1994, the government merged Henan Luohe Meat Products Processing United Factory and Luohe Canned Foods Company Limited into one entity called Shuanghui Group. The local state-owned asset authority held 100% ownership interests in Shuanghui Group. The main subsidiary of Shuanghui Group is Shuanghui Development, and it engaged in meat processing, production, and the sale of packed meat products.

In 1998, Shuanghui Development was listed on the Shenzhen Stock Exchange (ticker: 000895 CH), with Shuanghui Group holding 71 percent of Shuanghui Development and public shareholders holding the remaining 29 percent.

The company expanded aggressively. In Wan Long’s first year as the chairman of Shuanghui, he turned around a struggling company from a net loss to a net profit of RMB5 million. By 2006, Shuanghui was the largest food processor in a diversified market in China.

The local government at the time was faced with fiscal difficulties and was open to the idea of selling its shares in Shuanghui Group to raise funds. At that time, according to the CEO of Shuanghui Mr. Yang Zhijun, the PRC laws prohibited leveraged management buyout, namely that the management cannot borrow from banks to buyout the company. The management put up its own money, but that was not enough. They had to reach out to external investors to buyout Luohe government shares together.

In May 2006, Rotary Vortex, agreed to acquire 100 percent equity interest of the local state-owned asset authority in Shuanghui Group for a consideration of RMB2,010 million (c.

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20 Data and information from company filings, prospectus, and merger agreements of WH Group.
US$252.1 million) in cash. Rotary Vortex was owned by Goldman Sachs as to 51 percent and CDH Fund as to 49 percent.

In 2010, to recognize and reward the contribution of key management, Shuanghui adopted the Share Award Plan. Employees, including Wan and Yang, together obtained 6 percent of the company’s then issued share capital.

In 2013, Shuanghui merged with Smithfield. The transaction was valued at $7.1 billion, including $4.7 billion for Smithfield shareholders, and $2.4 billion for Smithfield debt owners. This transaction is one of the largest foreign direct investments in the U.S. Smithfield Foods was the world’s largest hog raiser and pork producer, with sales of $13.2 billion in 2013. Shuanghui International has less than half of its sales, and only a local focus. Yet, Shuanghui managed to delist Smithfield from the New York Stock Exchange.

In 2014, the merged entity of Shuanghui and Smithfield, named the WH Group, floated its shares through an IPO on the Hong Kong Stock Exchange. Wan Long, the rainmaker who turned a loss-making meat factory into the largest pork producer across the world, was handsomely rewarded after the IPO. He took home US$759 million in salary and stock between 2013 and 2017, making him the highest-paid executive of a Hong Kong-listed company. He built up his stake in the listco from 5 percent before IPO, to about 19 percent in 2017.

**Free Distribution, or the Voucher Privatization**

One of the major challenges of privatization by sale is how to value state-owned enterprises, especially in countries whose capital markets are still nascent. The absence of accounting standards and the complication of internal revenue transfers among subsidiaries make valuation decidedly capricious. To push aside this valuation challenge, state authorities intended to implement a radically different way of privatization: namely, the free distribution of a considerable part of the state-owned property to citizens and/or employees. Czechoslovakia sold state-owned enterprises against vouchers that were distributed among the whole population for a nominal registration fee. Albania also saw similar proposals. In Poland, Privatization Minister Lewandowski proposed distributing shares of joint-stock SOEs to mutual funds set up by the Polish government and headed by government-appointed domestic and foreign managers. Finally, shares in the newly established mutual funds would have been distributed among all adult Polish citizens. In Romania, the parliament passed a law that stipulated 30 percent of the

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state-owned enterprises’ assets would be distributed to the adult citizens through mutual funds. Russia also opted for large-scale free distribution, detailed in the three-year plan for stabilization and privatization by the Gaidar government. In addition, Lithuania and Estonia also followed suit in this form.

Free distribution solved the funding and valuation problems of privatization, but it also has obvious shortcomings. For example, the government received no revenue in this process, exacerbating the problem of the budget deficit. Widely dispersed ownership leads to the principal-agent problem, for small shareholders value the enterprise no different from what they formerly owned under socialism. Most importantly, free distribution has given rise to oligarchs.

**Constraints of Privatization**

Bolton and Roland (1992) divide all major constraints to privatization into five categories: stock-flow, fiscal, informational, administrative and political.

- **Stock-flow constraint:** as mentioned above, it denotes the fact that the stock of assets to be sold is large compared to the flow of new savings of households or the flow of future profits of enterprises. The constraint can be relaxed by selling to foreigners at give-away prices. However, foreigners face exchange rate risk which is difficult to hedge.

- **Fiscal constraint:** As the economy shrinks, social expenditures increase, and enterprise profits fall, a large budget deficit tends to emerge. One way of reducing the deficit could be to sell much of state assets at ‘reasonable’ prices. This would require slowing down the pace of privatization. Keeping the deficit low is needed to achieve macroeconomic stability, while privatization is needed to speed up microeconomic restructuring. As a result, the fiscal constraint considerations may imply that there exists a trade-off between macroeconomic stability and privatization.

- **Informational constraint:** outsiders have limited ability to value enterprises in the new (market) environment. Ascribing excessive importance to the concept of book value, or stressing the need to provide independent assessments of the value of assets has nevertheless proved time-consuming.
• **Administrative constraint**: the constraint favored the choice of simple privatization techniques and forced the use of outside consultants. The exchange process for cash and non-cash bids requires similar monitoring efforts, in identifying serious buyers and evaluating bids. This will then inevitably slow down the pace of privatization.

• **Political constraint**: public attitudes towards privatization, start as strongly positive, may dwindle during the process. Unjust asset sale, high unemployment, foreign predatory takeover are all ingredients for disappointment. Shrinking public support leads to a lack of continuity at the top, and therefore a lack of continuity of policy implementation.

**The Result of Privatization**

To settle the debate between rapid privatization and organic growth of the private sector, Kornai (2000) looks back ten years after the privatization onset and concluded that his recommendations of gradualism have yield superior results than the proposals from the other camp.

He identifies Hungary and Poland\(^{22}\) as the follower of his proposed strategy. With a tamed level of corruption and minor abuse of power, these two countries have achieved impressive economic improvements in the decade. Labor productivity in Hungary in 1998 was 36 percent higher than in 1989, while in Poland it was 29 percent higher (Economic Commission for Europe, 1999). The organic growth of private sectors exercised strong attraction on foreign capital, which was one of the main contributors to the productivity increase.

The representatives, which have adopted rapid privatization through free distribution, are the Czech Republic and Russia. Czech Republic’s initial program of dispersed voucher distribution quickly fell back to shares being held by mutual funds. These funds dealt mainly with large commercial banks or other financial institutions whose major owners remained as the state. Russia painted an even darker picture. Ownership reform has been manipulated to be a game for privileged managers and bureaucrats. Natural resources such as oil and gas were extensively expropriated by the oligarchs. The privatization was hijacked by the very people of

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\(^{22}\) Kornai states that occasional statements appeared pointing to the possibility of adopting rapid privatization, however, economic policy in practice stick with bottom-up growth in Poland.
the old regime it intended to tame. The performance of Czech and Russia has been disillusioning and tragic. Labor productivity in the Czech Republic in 1998 was only 6 percent higher than in 1989. In Russia, labor productivity was even 33 percent lower than in the last year of socialism.

Not only did the economic performance of different countries vary drastically, but the performance of privatized enterprises also differed. Comparative studies find that in a long run, firms privatized by insiders perform in par with those still under state ownership, and both underperformed compared to those privatized by outsiders, especially foreigners (Frydman, Gray, and Rapaczynski 1999; Claessens and Djankov 2002). However, those comparative empirical studies are inconclusive to prove that privatization enhances firm performance because of selection bias. During the privatization process, outsiders might have chosen the already well-run and profitable SOEs, while the unprofitable ones were left untouched.

The Post-Socialism Phase

20 years after privatization first spread, the early 2000s witnessed the re-emergence and consolidation of state-owned industries in the post-socialist countries. Against what most people would expect in a post-socialist society after decades of deep and far-reaching privatization, governments in once pro-market reform countries such as Hungary and Poland have declared their intentions of expanding the state’s role in the market economy.

It is believed that SOEs are relicts of the past, inefficient and incapable to compete with private enterprises, and they have no space in the political economy of post-socialism. This expectation is proven empirically wrong. Regional data shows that SOEs in post-socialist economies play an outsized role, despite their smaller numbers and reduced percentage. A study by Pula (2017) shows that in 2009, among the CEE region’s top 500 firms, about one-fifth are under state ownership. While SOEs represent a minority of the total number of firms, they are nonetheless concentrated at the higher ranks. The most striking fact is that seven out of ten of the region’s top-performing firms are under state ownership.
The return of large SOEs might not just be the symptom of socialist countries but across the world. Flores-Macias and Musacchio (2009) put the thesis that there is a return of state-owned enterprises in the global economy. According to them, the importance of SOEs in recent years has grown and will continue to grow in the future. A similar statement appears in Bremmer (2010) and Florio (2014). Kwiatkowski (2014) calculates shares of SOEs on the Fortune Global 500 list from 2005 to 2012. The number of state-owned enterprises and their share of employment, revenue, profits, assets, and equity all increased during this period.

Table 1 Shares of SOEs on Fortune 500 List, By Criteria, Percentage

<table>
<thead>
<tr>
<th>Year</th>
<th>By Quantity</th>
<th>By Employment</th>
<th>By Revenues</th>
<th>By Profits</th>
<th>By Assets</th>
<th>By Equity</th>
</tr>
</thead>
<tbody>
<tr>
<td>2005</td>
<td>9.8</td>
<td>18.4</td>
<td>8.0</td>
<td>8.2</td>
<td>8.9</td>
<td>9.2</td>
</tr>
<tr>
<td>2006</td>
<td>10.8</td>
<td>19.9</td>
<td>8.8</td>
<td>9.9</td>
<td>9.2</td>
<td>11.3</td>
</tr>
<tr>
<td>2007</td>
<td>11.0</td>
<td>19.7</td>
<td>9.2</td>
<td>10.4</td>
<td>8.8</td>
<td>12.3</td>
</tr>
<tr>
<td>2008</td>
<td>11.4</td>
<td>19.9</td>
<td>10.3</td>
<td>12.0</td>
<td>9.1</td>
<td>13.8</td>
</tr>
<tr>
<td>2009</td>
<td>13.8</td>
<td>23.6</td>
<td>14.5</td>
<td>11.9</td>
<td>15.7</td>
<td>16.5</td>
</tr>
<tr>
<td>2010</td>
<td>15.0</td>
<td>24.8</td>
<td>15.3</td>
<td>9.3</td>
<td>18.8</td>
<td>17.7</td>
</tr>
<tr>
<td>2011</td>
<td>17.2</td>
<td>27.7</td>
<td>17.8</td>
<td>16.9</td>
<td>22.2</td>
<td>19.2</td>
</tr>
<tr>
<td>2012</td>
<td>19.0</td>
<td>29.8</td>
<td>19.6</td>
<td>22.2</td>
<td>19.3</td>
<td>21.1</td>
</tr>
</tbody>
</table>

Source: Kwiatkowski (2014)
The State Sector in China

“It doesn't matter whether the cat is black or white, as long as it catches mice”

- Deng Xiaoping

The Historical Root

The emergence of state monopolies in China can be traced back to the Western Han Dynasty. Emperor Wu (157 BCE – 87 BCE), one the longest ruling and most powerful rulers in the ancient Chinese history, was a determined military campaigner. At every border, from the nomadic Xiongnu confederacy at the north, to the rebellion Mingyue and Nanyue in the south, Emperor Wu was charged with the ambition to conquest and expand. To finance his military campaigns, without hiking tax burden, Emperor Wu adopted a string of policies including nationalizing the salt and iron business, erecting a price stabilization scheme, and later monopolizing all money production and elements of the liquor trade. The contribution of state monopoly to the overall Han economy was enormous. Profit from the salt business alone was half of Han’s domestic fiscal revenue. Since Emperor Wu, state-owned enterprises and state-controlled financial system have been the honey pot for every ruler in over 2,000 years of Chinese history.

The nuances of any SOE-related debate today, can find its similarity in a debate held at the imperial court in 81 BCE regarding whether the Han dynasty should continue Emperor Wu’s policies of state monopolies. This debate on salt and iron, between reformist scholars and the imperial secretary Sang Hongyang, shed light on several issues that are still relevant for our discussion of SOEs and the state power today.

23 The record of the debate can be found at Sources of Chinese Tradition, compiled by Wm. Theodore de Bary and Irene Bloom, 2nd ed., vol. 1 (New York: Columbia University Press, 1999)
First of all, the main purpose of monopolies on salt and iron, or the purpose of state-owned enterprises in general, was to obtain funds needed for central government budgets without imposing additional burdens on ordinary citizens.\textsuperscript{24} The absolute authority of taxation, along with the powers of legislation, adjudication, enforcement, and war-making, is what political philosopher Thomas Hobbes described as the “essential rights of sovereignty” in effective government.\textsuperscript{25} Sang Hongyang defended Emperor Wu’s state monopolistic policies by stretching the sovereignty right of taxation to the state’s right to profit.

The reformist scholars disagreed with equating taxation with state monopolies. They argued that taxes and levies took more from people who were rich in an equitable manner, while in state monopolies, the government took the same absolute amount from every citizen. In addition, the government officials had tremendous power in deciding at what price can farmers sell, and who got the contract. The incentive for corruption was significant.

Three objections that the critics of state monopoly raised in the Han Dynasty—inefficiency, unfairness, and corruption—have ebbed and flowed throughout the history of China, amid dynasty changes. However, state monopolies have never disappeared nor dwindled from Chinese society since Emperor Wu. Why did all choose to stick with state intervention in profitable business areas like salt, iron, liquor, tobacco, and money production? Perhaps the answer lies in Sang Hongyang’s response to the reformist scholars. He rebutted by asking the question: What would be the alternative to finance wars and state-building? The other critical question left unasked was: what would be the alternative to solidify authoritarian power?

Criticizing is easy. Pointing out the vulnerabilities of a socialist state-led economy is easy. But that alone is not enough to change the course of societal advancement. What is challenging is proposing a feasible solution that fulfills the dual mandate of state-building and party control.

\textsuperscript{24} In Chinese, 民不益赋而天下用饶
\textsuperscript{25} Thomas Hobbes touched on the right of taxation in his masterwork \textit{Leviathan} (1651)
Past SOE Reforms

Figure 4 The History of China’s SOE Reforms: State-Controlled Industrial Enterprises

Contract Management Responsibility System

The theory of contracting stems from Berle and Means (1932)’s separation of ownership and control. The USSR first experimented with the implementation of such power separation in the 1960s, guided by their interpretation of Karl Marx (Qu, 2000). China followed its footprint soon in the 1980s.

In face of the encouraging success of the household responsibility system especially in the agricultural space, the State Council implemented a series of market-based policies in the state sector, later known as the contract management responsibility system for SOEs. The main objective of the program was to better

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26 In October 1981, the State Council issued *Opinions on the Issues Regarding the Implementation of the Industrial Enterprises Contract Management Responsibility* (关于实行工业企业经营责任制若干问题的意见)
align interest with SOE management, to increase enterprise productivity, and therefore improve profitability. The program allowed management to keep a pre-determined portion of the excess profit, after fulfilling the base profit targets and output quotas. The government promised to refrain from intervening in the daily operations, granting autonomy in production planning, procurement, staffing, and investments. The contract management responsibility system spread quickly across the board. The number of SOEs adopting the program increased from 6,600 in 1980, to 42,000 in 1982, and almost all SOEs by 1983 (Huang, 1999).

To support the reforms in autonomy and incentive, two steps of “tax for profit” reform were implemented.27 In the first step, SOEs would pay a 55 percent tax on total operating profits and retain a proportion of after-tax profit remittance. The second step of “tax for profit” combined tax and profit remittance for the state into one single tax rate for each enterprise (Wu, 2018).

The economic logic of these policies is persuasive, but both contract management responsibility system and “tax for profit” reform failed to fully achieve their original objectives. A World Bank empirical research analyzes roughly 500 Chinese SOEs datasets in *A Survey of Chinese State Enterprises: 1980-1989* and found no positive association between performance contracts and productivity (Shirley and Xu, 1997). The unintended consequence of the contract responsibility system was the inflation surge in the mid-80s. To maximize profit, SOEs in monopoly sectors charged high prices in the marketplace. Five-year average inflation since 1984 jumped to 12 percent, from a moderate 2-3 percent in the past.28

The contract management responsibility system had a number of problems, both in theory and in practice:

- First, it failed to separate corporations from government control in the administrative aspects. The state still had a dominant influence on strategically important issues such as investment and employment. SOE managers relied on the state to decide who would get the contract, what subsidies they could get, and how much resources they could leverage.

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27 In Chinese, 利改税改革
28 Data from National Bureau of Statistics of China
Second, the negotiation of the contracts was lengthy and subjective. Every business differed drastically in terms of the industry trend, competitive landscape, upstream and downstream bargaining power, as well as profitability. Every negotiation, therefore, was on a case-by-case basis, and was subjective by nature.

Third, the contracts were difficult to enforce especially when firms failed to meet the quota for profit remittances. It was hard to make up the loss of SOEs from punishing their managers, so the contract became a game with no downside and moderate upside.

Fourth, the contract encouraged short-term profit-seeking at the cost of long-term capacity building. To maximize one’s personal profit, managers were incentivized to delay much-in-need capital expenditure, in order to inflate current-term profitability.

Why was the contract system successful in the rural reforms but failed to replicate its triumph in the SOE space? I would argue is because the importance of those two arenas to the state and the Party vary significantly, therefore the impetus to intervene is rather different. Agricultural production is relatively straightforward with a small cluster of households, thus little information asymmetry; however, SOEs manage thousands of employees, operate in the complicated business environment, and generate profits as a significant component of the government budget. To avoid misappropriation of information, internal corruption, and strategic missteps, the government felt much more impelled to tighten the grip on monitoring SOEs than agricultural households. As a result, households enjoyed full autonomy with who to employ and how to conduct their business, but SOEs could not. The length of contracts for the agricultural sector was 15 years to begin with and later extended for another 15 years, while the length of contracts for SOEs was 3-5 years.
The Shareholding System\textsuperscript{29} and Modern Enterprise Institution\textsuperscript{30}

In 1985, the World Bank (1985) published a country economic report that addressed long-term development issues and offered suggestions to state enterprise reforms. The report proposes to give strategic decision-making authority in each enterprise to a board of directors and to spread the ownership of each state enterprise among several different institutions.

Accordingly, a Peking University Economics Professor, Yining Li, analyzed the necessity and practicality of the shareholding system in SOE reforms. Li (1986) urges the government to establish a diversified shareholding structure in SOEs and suggested a specific mechanism to convert contract system enterprises to joint-stock companies.

Yet, the design and implementation of shareholding reform were stalled due to several reasons. The essential one was its conflict with the prevailing ideology of socialism. The question “whether the shareholding system of SOEs belongs to a modern capitalist society or socialist society” echoed at the background of the reform. Advocates of the shareholding system were on the borderline of pushing China to resort to a capitalist solution in a then socialist ideology-dominated society. In addition, both economists and policymakers lacked a comprehensive understanding of the ownership theory. The shareholding of pilot enterprises was composed of state shares, legal person shares, employee shares, and public shares.\textsuperscript{31} The executive manager was also Chairman of the board and legal person of the company. The initial design violated the principle of power balancing among owner and operator of the company, making the board of directors more of bric-a-brac in corporate governance.

The turning point that broke the gridlock is when Deng Xiaoping voiced his determination to push for structural reform in his famous “southern tour” in 1992. He stressed that the goal of China’s economic reform was to establish the socialist

\textsuperscript{29} In Chinese, 股份制
\textsuperscript{30} In Chinese, 现代企业制度
\textsuperscript{31} State shares and legal person shares were not tradable.
market economy, and the shareholding reform of SOEs was non-negotiable and did not conflict with socialist ideology.

In 1992, the State Commission for Restructuring the Economic System ("SCRES") issued in total 14 policy papers, including *The Pilot Measures for Joint-Stock Enterprise*, and *Opinions on Standards for Limited Liability Companies*. By the end of 1992, over 3700 enterprises participated in the pilot program, of which 69 traded their shares on the Shanghai and Shenzhen stock exchanges. At the same time, the government set up the China Securities Regulatory Commission ("CSRC") as a watchdog agency to regulate and supervise the securities market.

In 1993 and 1994, the National People’s Congress passed the *Company Law* and *Competition Law*. These legislations were substantial steps towards establishing the regulatory and legal framework for the joint-ownership reforms. For the first time, the government officially acknowledged the importance of modern enterprise institutions, the separation of ownership and management, and proper corporate governance.

**Grasping the Large, Letting Go of the Small**\(^{32}\)

The strategy of “grasping the large and letting go of the small” was first brought up at the 5th plenary session of the 14th central committee in September 1995, and it was officially implemented after the 15th Party Congress in October 1997 and the 9th National People’s Congress in March 1998. The policy attempted to consolidate resources to facilitate the growth of 1,000 large-sized and strategically important SOEs, and to privatize the small and medium-sized SOEs through selling, auctioning, merging, leasing, and bankrupting.

The consolidation and ownership reform process ebbed the number of SOEs and shrank the SOE labor force. From 1995 to 2003, the number of SOEs declined from 118,000 to around 34,000; the SOE labor force fell from 60 percent of the total labor force to less than 40 percent. As a result of mixed ownership, a group of state-controlled holding firms emerged (Song, 2015).

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\(^{32}\) In Chinese, 抓大放小
The incentives to facilitate the strategy of “grasping the large and letting go of the small” are more of a reactive response as opposed to a proactive initiative. 1995 marked the calamitous point for SOE performance. According to a report by the Development Research Center of the State Department, more than 40 percent of SOEs were in the red, and average leverage reached 78.9 percent. The deterioration of asset quality in SOEs also spread to the banking system. Non-performing loans started to accumulate. Especially after the 1997 Asian Financial Crisis, NPLs were estimated to have reached 42 percent of the big four state-owned banks’ loan balance (Ma & Fung, 2002). State-owned banks were technically bankrupt before the government recapitalizes them through the establishment of 4 asset management corporations (“AMCs”).

Smaller SOEs, most of them also unprofitable, were pushed to privatization, merger, or bankruptcy. While the 1,000 better-run large ones enjoyed concentrated support in credit, policy, subsidies, and tax benefits. The government selected 6 companies—Baosteel, Haier, Jiangnan Shipbuilding, Huabei Pharma, Founders Group, and Changhong—as the forerunners of the reform, pouring unlimited resources in every aspect and hoping they can flourish to be in the camp of Fortune 500 Companies by 2010.

From a financial perspective, ownership reform has been marginally successful. Song (2015) finds that SOE’s return on equity increased from less than 2 percent in 1997 to more than 7 percent in 2002. Other metrics like return on assets and annual profit rate also increased substantially and narrowed the gap with those of private and other non-state enterprises. Even though the share of loss-making firms in the overall SOE sector was still as high as 30 percent, the larger enterprises with state support grew rapidly and profitably for an extended period of development.

The reform, however, also comes with a cost. One outcome of the reform was massive labor layoff and unrest across the country. The official count of laid-off workers reached 17.24 million in 1998, while the actual number of unemployed in urban areas could be much bigger (Chinese Labor Statistics, 1999). The collective action of laid-off workers included the demonstration of grievances and demands, as well as public protests.
Restructuring and Corporatization

Coming out of massive losses in SOEs, the central government solidified the strategy of “grasping the large” by emphasizing corporate governance especially in medium- and large-size SOE restructuring. In 1999, *The Decision on Major Issues Concerning the Reform and Development of State-owned Enterprises* was adopted on the Fourth Plenary Session of the Fifteenth Central Committees of the Communist Party. *The Decision* called for the establishment of modern enterprise system, composed of the following pillars that got carried out in stages afterwards.

The Separation of Bureaucratic Agencies and Business Activities

In the planned economy, for industries such as electricity, healthcare, telecommunication, and commerce, respective ministries control resource allocation, production planning, personnel appointment, and other business decision approvals. As the first step towards commercialization and corporatization, the central government started to remove bureaucratic burdens from business undertakers.

There are three steps and therefore three corresponding degrees of definition for the separation of bureaucratic activities and business. First is the separation of ownership and management within bureaucratic agencies. Second is the separation of management and operation for state-owned assets. Third is the diversification of ownership from the one and single founding entity to multiple affiliates.

Take the creation of State Grid in the electricity industry as an example. Until the mid-1990s, the Ministry of Electric Power (“MOEP”) was responsible for the planning, coordinating, supervising, and managing the whole electricity industry, while the day-to-day operations were carried out by regional power bureaus. The idea of power commercialization and corporation was introduced alongside the wave of restructuring in several other countries in the late 1980s, however, it took almost a decade for other reforms to be in place before the separation of government and business functions can happen. Other reforms included the adoption of the bankruptcy law, the creation of the stock exchange, and more.

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33 In Chinese, 中共中央关于国有企业改革和发展若干重大问题的决定
34 Yin (1998)
35 Xu (2017)
importantly the Electricity Law of the People’s Republic of China. In December 1996, the central government created the State Power Corporation of China ("SPCC"), 100-percent state-owned, to which MOEP transferred all of its assets and business activities.

**The Breakup of Monopoly and Introducing Competition**

Initially, SPCC was too large, too bureaucratic, too dominant, and too complex in terms of structure to be effective. The need to reform was imminent, but the method to do so attracted disagreement and even political power struggles at the very top. Some called for the radical unbundling of SPCC; some opposed the breakup.\(^{36}\) To what extend should the industry be unbundled? Should the unbundling happen vertically on the function level, or horizontally breaking into regional companies? Finally, after rounds of discussion and various proposals to reform SPCC, the State Council settled the debate by releasing the Electricity Reform Plan in December 2002. The objectives of the reforms were to “break up monopoly, introduce competition, improve efficiency, reduce costs, and optimize resource allocation”. These objectives pointed to a market-based but centrally managed solution in the power sector, as generation could be carried out by multiple competitive enterprises, but T&D networks must remain centrally controlled and organized.

Along the lines of the Plan, SPCC was unbundled and divided into 11 enterprises in 3 big categories: (1) power generation: Huaneng, Datang, Guodian, Huadian, and China Power Investment Corp; (2) grid: State Grid Corporation of China, and China Southern Power Grid; (3) power service: China Power Engineering Consulting Group, China Hydropower Engineering Consulting Group, China Water Resources and Hydropower Construction Group, and China Gezhouba Group.

**The Public Listing of SOEs**

The public listing of SOEs, initially on the domestic stock exchanges, was a key reform measure at the turn of the new century. Many scholars have expected the public listing to be the unique way for China to “privatize” its state sector, and

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\(^{36}\) Officials and electricity professionals criticized the central government for the incomplete electricity reform, while SPCC was defensive of the bundling.
to swiftly “transfer shares into the hands of private interests”. However, this view was quickly rebutted by statistical evidence during the unfolding process.

In the Chinese stock market, shares of publicly listed companies include state, legal-person, and public shares. State shares are held by government agencies or state-owned investment companies; legal-person shares are held by entities and institutions with a legal person status, including state institutions, domestic institutions, foreign founders, and domestic founders. The transfer of state and state institutions’ legal-person shares require special approval from the government, and they are not part of the free float on the A-share market. Though at different hands, state and state institutions’ legal-person shares are essentially state-controlled. Figure 5 shows the ownership trends of the largest shareholder of all publicly listed companies on the A-share market from 1998 to 2003. Indeed, the state shares declined from 68 percent to 24 percent. However, the state institutions’ legal-person shares surged from 2 percent to 44 percent. In essence, state ownership did not decline, but rather shifted from government agencies to state-owned institutions.

China’s stock market was established not to privatize the state sector, but rather in part to restructure SOEs through corporation, commercialization, merger and acquisition, and at the same time, to attract private and foreign capital to finance the SOEs. In a paper that pointed out the vulnerability of China’s state sector and financial markets, Lin and Li (2005) argue that as a result of the quota system, provincial government were incentivized to mainly submit local state-
owned enterprises for listing approval, therefore only 7 percent of listed companies on Chinese stock markets were not state-owned, and over 70 percent of all shares were restricted from floating.

**Figure 5 Ownership Breakdown of Single Largest Shareholders**

![Figure 5 Ownership Breakdown of Single Largest Shareholders](image)

Source: WIND

**The Creation and Rise of SASAC**

The proposal to set up holding companies at various levels of governments traced back to the mid-1990s, when Wu (1993) and Zhou *et al.* (1994) suggest converting state assets to shares held by holding companies. A decade after the initial proposal, in 2003, State-owned Assets Supervision and Administration Commission was set up. SASAC, which manages 96 central SOEs as of 2019, has substantially grown its total assets under management from RMB6.9 trillion initially to RMB76.2 trillion in 2017.\(^{42}\) From 2003 onwards, many industrial SOEs have experienced magnificent growth. The number of central SOEs ranked in

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\(^{42}\) According to 国务院关于2017年度国有资产管理工作情况的综合报告
Fortune Global 500 List jumped from 11 out of 196 in 2003 to 48 out of 97 in 2018. Figure 6 below demonstrates this significant surge of industrial SOEs, including both central and local SOEs.

Figure 6 The Surge of Industrial SOEs, 1998 – 2017

Source: National Statistics Yearbook

The more recent stages of SOE reforms continued after the Third Plenum meeting in 2013. The central government proposed to shift SASAC’s role from the management of state enterprises to the management of state capital, indicating more autonomy to be granted to day-to-day operations of SOEs. In 2015, the government released The Guiding Opinions of the Central Committee and State Council on Deepening the Reform of SOEs, in which SOEs were classified as “public class” and “commercial class”. The Guiding Opinions stipulated different supervision requirements, mixed-ownership plans, and reform procedures for these two different groups. In short, the “commercial class” SOEs would be granted more freedom to pursue mixed ownership, employee share compensation, and other market-based corporate governance mechanisms, while the “public class” would remain the majority or sole of state ownership.
A Snapshot of SOEs Now

After more than three decades of development and reforms, where do SOEs stand at this juncture of time? China’s state sector has grown significantly in absolute size, but its share in the whole economy has dwindled to a minority level. The Chinese government has a non-insignificant portion of fiscal revenues coming from SOEs indeed, but a majority of the SOE contribution is in the form of taxes paid. Even if China privatizes all its SOEs, taxes paid to the central government will not disappear. The only portion that matters with regard to corporate ownership is SOEs’ paid-in profits, which only account for less than 5% of central government’s fiscal revenue per year.

Contribution to Economy

As of 2017, state-owned or state-controlled enterprises account for less than 50 percent of national treasury income, less than 40 percent of GDP, fixed-asset investment, and outbound investment, less than 20 percent of urban employment.\(^{43}\) The state economy as a percentage of the whole has dived consistently from before. The lower percentage of state economy is less of a result of deliberate gradual privatization of SOEs, but mostly because of the healthy thrive of private businesses especially in industries outside of the commanding heights arena. In industries in the downstream of the value chain such as retail, real estate, manufacturing, markets are fully competitive and private dominated. For industries within the circle of commanding heights, such as utilities, telecom, transport, energy, finance, and basic services (healthcare, education, etc.), the state dominance prevails (Naughton, 2017).

Contribution to Central Government Fiscal Revenue

SOEs’ contribution to the central government comes from two major sources: taxes paid and profits turnover. The 2019 budget report from Minister of Finance expects total fiscal revenue of the central government to be RMB8.98 trillion, in

\(^{43}\) Data comes from a press release by National Development and Reform Commission on September 6, 2018
which RMB8.25 trillion comes from taxes, and RMB0.56 trillion from SOE paid-in profits.

To evaluate the claim that the central government needs to maintain its grip on the state economy for fiscal support, we need to focus on the paid-in profits instead of taxes. Any company, public or private, pays taxes depending on

Paid-in profit as a percentage of central government total fiscal revenue has come down from more than 50 percent before the 1980s to a single digit for the past two decades (Figure 7). As of 2017, SOEs’ paid-in profits only accounted for 4.5% of total fiscal revenues for the central government.

**Figure 7 Composition of Central Government Fiscal Revenues, From 1950 - 2017**

![Composition of Central Government Fiscal Revenues, From 1950 - 2017](image)

*Source: National Statistics Yearbook*

**Breakdown**

Chinese SOEs can be divided into three categories based on their regulators. Central SOEs are supervised by the central SASAC, local SOEs by local SASAC, financial state-owned assets are under the supervision of Minister of Finance and Central Huijin Investment Co., Ltd, and China Railway Corp is directly supervised by the State Council. As we can see from the 2018 Report on the Management of
State-owned Assets to the State Council,\textsuperscript{44} central SOEs had 38 percent of all SOE assets, and 28 percent of all SOE equity (Table 2).

Table 2 Total Assets and Net Assets of SOEs in 2018

<table>
<thead>
<tr>
<th></th>
<th>Total Assets</th>
<th>Net Assets</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Amount (RMB trillion)</td>
<td>Percentage</td>
</tr>
<tr>
<td>All Industrial SOEs</td>
<td>210.4</td>
<td>100%</td>
</tr>
<tr>
<td>• Central SOEs</td>
<td>80.8</td>
<td>38%</td>
</tr>
<tr>
<td>• Local SOEs</td>
<td>129.6</td>
<td>62%</td>
</tr>
<tr>
<td>Financial State-Owned Assets</td>
<td>264.3</td>
<td>-</td>
</tr>
<tr>
<td>China Railway Corp</td>
<td>7.6</td>
<td>-</td>
</tr>
</tbody>
</table>

Source: 2018 Report on the Management of State-own Assets to the State Council

Financials of Central SASAC SOEs

Macro Level

The profitability profile of central SASAC SOEs as a whole has been challenging for the past decade. Return on assets rose to its peak in 2007 at 6.7 percent, but then it started to trend down to a low of 2.4 percent in 2016 (Figure 8).

The return on assets number might be overstated given the amount of subsidies companies have received. Subsidies are not unique to SOEs. Many direct subsidies are targeted at promoting industrial policies set by the government. Lardy (2018) studies the subsidies given to listed nonfinancial companies on the Shanghai and Shenzhen stock exchanges, and he finds the following. Subsidies are given to both private and state nonfinancial enterprises. Yet, the degree varies. Subsidies received by listed state companies accounted for 14.6 percent of their pre-tax profits, while subsidies to listed private companies were 10.4 percent of their pre-tax profits.

There are a number of possible explanations of this variation. One is that subsidies are granted more to industry leaders of larger-size enterprises, which are

\textsuperscript{44} This is the only report that was made available and public, other financial data of all industrial SOEs can be found at Minister of Finance website
dominatingly state companies. Second, subsidies might be concentrated in some specific industries that need upgrading or shifting, such as energy or heavy manufacturing, and private companies are more prevalent in service industries.

The leverage ratio of central SASAC SOEs has been on the rise from 56.1 percent in 2005 to 66.7 percent in 2016. The correlated phenomenon of rising leverage is the percentage of bank loans floated to state-owned companies from previously private company channels. Especially after 2013, a rising proportion of bank loans has flown to state-owned nonfinancial enterprises. This number stood at 83% in 2016.

**Figure 8 Return on Assets and Leverage Ratio of Central SASAC SOEs**

![Chart showing the return on assets and leverage ratio of central SASAC SOEs from 2005 to 2017.](chart)

*Source: SASAC*

**Figure 9 Flows of Bank Loans to Nonfinancial Enterprises by Ownership**

![Chart showing the proportion of bank loans to nonfinancial enterprises by ownership from 2010 to 2016.](chart)

*Source: Lardy (2018)*
Micro Level

I collect data from companies’ audited filings and their group level bond issuance perspectives or rating reports from year 2015 to 2018. Even though many of the central SOE groups have listed companies, it is important to look at the consolidated group level numbers.

After reorganization and corporation, a majority of 97 central SOE groups have issued bonds over the past several years or have rating reports with audited financials. I summarize them below in Table 3.

The size of a central SOE is skewed by a number of large enterprises, such as Sinopec, State Grid, CNOOC, and China Construction. In 2018, the average total assets of a central SOE was RMB658 billion, the average net assets stood at RMB253 billion. But their standard deviation was also as large as RMB750 billion, and RMB370 billion.

Table 4 ranked central SOEs by the size of their total assets in 2018. Table 5 ranked central SOEs by the size of their net assets in 2018. Profitability, in terms of return on net assets, is higher for companies with large real estate presence. It is challenging for other industrial producers. Table 6 ranked central SOEs by their return on net assets in 2018.
### Table 3 Summary of the Financials of Central SOEs

<table>
<thead>
<tr>
<th></th>
<th>2015</th>
<th>2016</th>
<th>2017</th>
<th>2018</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Number of Observation</strong></td>
<td>71</td>
<td>75</td>
<td>75</td>
<td>74</td>
</tr>
<tr>
<td><strong>Total Assets (billion RMB)</strong></td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Mean</td>
<td>536</td>
<td>560</td>
<td>615</td>
<td>658</td>
</tr>
<tr>
<td>Median</td>
<td>382</td>
<td>373</td>
<td>396</td>
<td>444</td>
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<tr>
<td>St. Dev</td>
<td>651</td>
<td>686</td>
<td>724</td>
<td>750</td>
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<tr>
<td><strong>Total Equity (billion RMB)</strong></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Mean</td>
<td>199</td>
<td>208</td>
<td>231</td>
<td>253</td>
</tr>
<tr>
<td>Median</td>
<td>117</td>
<td>117</td>
<td>149</td>
<td>164</td>
</tr>
<tr>
<td>St. Dev</td>
<td>355</td>
<td>361</td>
<td>364</td>
<td>370</td>
</tr>
<tr>
<td><strong>Sales (billion RMB)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean</td>
<td>287</td>
<td>284</td>
<td>321</td>
<td>359</td>
</tr>
<tr>
<td>Median</td>
<td>190</td>
<td>196</td>
<td>206</td>
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<tr>
<td>St. Dev</td>
<td>411</td>
<td>395</td>
<td>467</td>
<td>544</td>
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<tr>
<td><strong>Net Income (billion RMB)</strong></td>
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<td>Mean</td>
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<td>14</td>
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<td>5</td>
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<td>7</td>
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<tr>
<td>St. Dev</td>
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<td>17</td>
<td>18</td>
<td>20</td>
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<td><strong>Average Asset Turnover Ratio</strong></td>
<td>53.6%</td>
<td>50.7%</td>
<td>52.2%</td>
<td>54.7%</td>
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<tr>
<td><strong>Average Leverage Ratio</strong></td>
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<td>62.9%</td>
<td>62.5%</td>
<td>61.6%</td>
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<td><strong>Average Return on Equity</strong></td>
<td>5.6%</td>
<td>5.1%</td>
<td>5.4%</td>
<td>5.7%</td>
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<tr>
<td>Company Name</td>
<td>2015</td>
<td>2016</td>
<td>2017</td>
<td>2018</td>
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<td>--------------------------------------------------</td>
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<td>中国石油天然气集团有限公司</td>
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**Note:** * means that the group information is not available, but the company is a publicly listed company where financials are available on WIND
Reforms at the Commanding Heights

“If you are a conservative at twenty, you have no heart. If you are a liberal at forty, you have no brain.”

- Winston Churchill

1. Healthcare

The Healthcare industry in China is diverse and complicated. China is the second-largest healthcare market globally with total healthcare expenditure reaching RMB5,800 billion (c. US$892 billion) in 2018, a number projected to reach US$2.4 trillion by 2030.45 It is not the intention of this paper to recapitulate every aspect of it, ranging from pharmaceuticals, medical devices, medical technology, to healthcare services. The scope of our investigation is limited to healthcare services mainly delivered by various levels of hospitals.

Hospitals, including clinics, are the center of all healthcare activities. Patients receive treatment, obtain a prescription, purchase medicine and medical services, and spent most of their time interacting with hospitals; insurance schemes, either public or private, advance payments to hospitals and decide which one to be included in reimbursement, reflecting directly on how medicine got administrated; medical suppliers sell products, services, or technological software to hospitals, or via hospitals. At the core of healthcare service delivery is trust and expertise, and hospitals are the only viable option that is equipped with both.

However, China now faces emerging challenges in meeting citizens’ healthcare needs for quality service delivery. In 2018, 85.2 percent of the hospital

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visits come from state-owned hospitals, even though only 46 percent of hospitals in China are state-owned. We are beginning to observe the trend that is shared in other commanding heights industries, namely a service shortage caused by unsustainable financing mechanism, suppressed profitability levels, and a lack of desire to invest both in human capital and in infrastructures.

**Current Challenges**

After decades of reforms and initiatives, China’s healthcare system has developed and made substantial progress: achieving near-universal health insurance coverage, expanding insurance benefits to lower out-of-pocket spending, improving average life expectancy at birth from 43.7 years in 1960 to 76.3 years in 2016. Apart from these big-picture gains, healthcare service delivery has improved from a customer satisfaction perspective.

At the same time, a number of structural headwinds pose emerging challenges to the system.

**Growing Demand – Aging Population and Chronic Disease**

Reductions in mortality and fertility means, and the one-child policy together point to a rapidly aging population. In 2013, China had 202 million people aged 60 years or older, which made up 15 percent of China’s total population. But this number is expected to double by 2030 and grow to account for 36.5 percent of the population by 2050 (United Nation, 2015) (Figure 10).

The demographic trend of the aging population has profound implications for the healthcare demand, as well as social welfare policies that are funding healthcare. First, the mortality profile changes. Previously, the major cause of mortality in China came from injuries, affectations, communicable diseases, newborn, nutritional and maternal conditions (World Bank, 2019). Now, cardiovascular disease and cancers account for 68 percent of China’s total mortality (WHO, 2014) (Figure 11). Second, healthcare demand shifts. As chronic

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46 Data from National Statistic Yearbook and Statistics Report of the National Healthcare Development (卫生健康事业发展统计公报)
47 Data from World Bank. In comparison, United States’ life expectancy is 69.8 years in 1960 and 78.7 years in 2016. China has increased life expectancy twice as fast as developed countries.
diseases such as cardiovascular disease, diabetes, and chronic respiratory disease start to dominate, they require higher frequency and duration of healthcare services delivered at hospitals, a longer period of treatment and sustained cost to individuals and social welfares. In addition, chronic diseases, if unattended, have ripple effects on society because they result in lower labor productivity and early withdrawal from the workforce.

Figure 10 Aging Population in China

![Aging Population in China](image)

*Source: UN Department of Economic and Social Affairs*

Figure 11 Causes of Mortality in China

![Causes of Mortality in China](image)

*Source: WHO*
The aging population and the prevalence of chronic diseases have contributed to the rise of total utilization and the saturation of capacity especially in large, public hospitals. In less than two decades, hospital visits have almost quadrupled from 2.12 billion person-visit in 2000 to 8.18 billion in 2017. Population did not grow as fast, therefore hospital visits per personnel also surged (Figure 12). Increasingly, Beds utilization is reaching saturation especially for hospitals. The bed utilization rate for hospitals peaked in 2012 at startling 90.1 percent (Figure 13). According to statistics from the Centers for Disease Control and Prevention (CDC) of the United States, in 2015, the occupancy rate at all hospitals was 65.5 percent.

**Figure 12 Rising Hospital Visits**

![Graph showing rising hospital visits](source)

*Source: National Statistics Yearbooks, World Bank*

*Note: Hospital visits per capital = hospital visits / total population, population data from the World Bank.*

**Figure 13 Reaching Capacity Saturation: Beds Utilization Rate**

![Graph showing beds utilization rate](source)

*Source: National Statistics Yearbook*
Rising Costs and Concerns About Affordability

Healthcare expenditures have been rising rapidly compared to income. Total expenditures increased over a hundredfold from RMB 38 billion in 1987 to RMB 5,260 billion in 2017. Over the same three decades, healthcare expenditure as a percentage of GDP increased from 3.12 percent to 6.36 percent.\textsuperscript{48} Who is paying for the rising expenditures? Mostly the government. Figure 14 illustrated the composition of health spending in China from 1978 to 2017.\textsuperscript{49} Note that most of the social expenditures are social health insurance, which is financed by the government budget. Out-of-pocket expenditure as a percentage of total costs has come down significantly from its zenith of 60 percent in 2001 to 29 percent in 2017, driven mainly by the expansion of tax-funded social health insurance coverage.

Figure 14 China’s Health Spending Composition in RMB Billion

\begin{center}
\includegraphics[width=\textwidth]{health_spending_composition.png}
\end{center}

\textit{Source: National Statistics Yearbook}

\textsuperscript{48} Data from National Statistics Yearbooks
\textsuperscript{49} National Health Commission of the PRC gives the following definitions: government expenditures include fiscal budgets from all levels of governments spent on public health and medical cares; social insurance includes expenditures by the social security system, private health insurance plans, social donations, and administrative operations; out-of-pocket expenditures include cash or cash equivalent payments by patients themselves
Rapid growth in healthcare expenditures raises concerns about the sustainability of government subsidies. Reporting even from the state media pointed out the mounting pressure for government insurance plans, claiming that some regions’ insurance funds could only cover less-than-half-a-year of expenditures.\(^5\) Long et al. (2013) finds that local governments in China’s less-developed regions were faced with tight fiscal constraints to meeting healthcare funding needs, mandated by the central government.

**Widely Differed Availability and Quality of Care**

First, the divergence exists between state-owned and private hospitals. Private hospitals are large in numbers, but small by size\(^5\) and low in terms of utilization.\(^5\) In 2018, the number of public hospitals was 12,032 with an average of 399.1 beds per hospital, while the number of private hospitals was 20,977 with 8.5 beds per hospital; utilization rate was 91.3 percent in public hospitals and 63.4 percent in private hospitals;\(^5\) 85.2 percent of the treatments were carried out by public hospitals and the remaining 14.8 percent by private ones.\(^5\)

Second, quality of care differs widely between rural and urban (Gao et al., 2001; Zhang and Kanbur, 2005; Akin et al., 2005). For example, China’s urban doctor-patient ratio was 2.8 doctors per 1,000 people. In rural areas, the ratio was 0.95 doctors per 1,000 people.\(^5\)

Third, profitability varies between different classifications of hospitals. Chinese hospitals are classified into three tiers: primary, secondary, and tertiary, or Class I, II and III. A primary hospital is typically a township hospital, while a tertiary hospital is the most sophisticated. Within tertiary institutions, three grades of A, B, and C are assigned based on the level of service provision, size, management levels, medical quality, and technology. Table 7 illustrates the divergence, where Class III hospitals face full saturation, but Class II and Class I

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\(^5\) Measured by beds per hospital

\(^5\) Measured by beds utilization

\(^5\) Data from National Health Commission

\(^5\) Data from National Health Commission, treatment = hospital visit

\(^5\) Data from National Health Commission
hospitals are under-utilized. Class III hospitals charge a premium for their service delivery. The average outpatient expense per visit for Class III hospitals was RMB 322.1, 17.6 percent more than the average for all hospitals; the average inpatient expense per person per day was RMB 1,390.0, 38.6 percent more than the average for all.

Table 7 Divergence Among Hospital

<table>
<thead>
<tr>
<th></th>
<th>Number</th>
<th>Beds</th>
<th>Bed Utilization (percent)</th>
<th>Average number of outpatients per year (thousand)</th>
<th>Cost per outpatient visit</th>
<th>Cost per inpatient person</th>
<th>Personnel</th>
</tr>
</thead>
<tbody>
<tr>
<td>Class III Hospitals</td>
<td>2,548</td>
<td>&gt;500</td>
<td>97.5</td>
<td>~520</td>
<td>322</td>
<td>13,313</td>
<td>&gt;1.04 doctors per bed</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>&gt;0.4 nurses per bed</td>
</tr>
<tr>
<td>Class II Hospitals</td>
<td>9,017</td>
<td>100-499</td>
<td>83.0</td>
<td>~120</td>
<td>204</td>
<td>6,002</td>
<td>&gt;0.88 doctors per bed</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>&gt;0.4 nurses per bed</td>
</tr>
<tr>
<td>Class I Hospitals</td>
<td>10,831</td>
<td>20-99</td>
<td>56.9</td>
<td>~30</td>
<td>N/A</td>
<td>N/A</td>
<td>&gt;0.70 doctors per bed</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>&gt;3 doctors and 5 nurses in total</td>
</tr>
</tbody>
</table>

Source: National Health Commission, 2018 Health Development Statistics

**Social Pressure on Capacity Strain**

Social pressure is the natural result of all the structural headwinds articulated above. Unequally distributed healthcare resources and inadequate development of primary care have propelled patients to be concentrated at Class III public hospitals. Sometimes patients need to travel long haul from rural villages to go to big city hospitals, then wait for days to be admitted in when there are no beds available. As a result, the society complains about getting access to quality care that patients trust. Among those who get treatment at Class III hospitals, dissatisfaction may stem from the procedural inconvenience, crowded space, little time spent by doctors, over-servicing, and high out-of-pocket costs. The following industry presentation summaries the strain well.⁵⁶

“As perceived high-quality services and physicians are mainly concentrated in class 3 public hospitals, patients often prefer to seek care

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⁵⁶ From the prospectus of Healthy Harmony’s SEC filing. Healthy Harmony is the largest private operator of general hospitals and clinics.

<https://secfilings.nasdaq.com/filingFrameset.asp?FilingID=13699659&RcvdDate=10/25/2019&CoName=NEW percent20FRONTIER percent20CORP&FormType=PRER14A&View=html>
in such hospitals regardless of the severity of their conditions. As such, Tier 3 Chinese public hospitals in particular face severe overcrowding and related issues ensuing from high capacity utilization that adversely affect both the availability and quality of care at such facilities, which has led to increased demand for private alternatives. Such utilization issues can include bed occupancy rates of over 90 percent, long average wait times to see physicians, with only 5-minute consultations. Class 3 hospitals face the most pressure, representing 8 percent of total hospitals while receiving 50 percent of the outpatient visits. Wait times for consultations and procedures are typically much longer at public hospitals, especially the overcrowded Class 3 hospitals, as compared to private hospitals, and can extend to weeks for some specialties. These issues are exacerbated by a shortage of doctors. According to the World Bank DataBank, in 2018, China had only 1.9 physicians per 1000 citizens, compared to 3 or 4 for developed countries. Pressure on the public healthcare system is expected to increase as the Chinese population continues to age, budget restraints, and government crackdowns on under-the-table payments, also known as “gray income,” lowers physician effective income, reducing the attractiveness to physicians to work in the public system. Finally, endemic hospital budget deficits and nursing shortages also are known to result in poor service quality at public Chinese hospitals.”

Past Reforms

Starting from the early 1980s after Deng Xiaoping heralded a period of decentralization of political power in the public sector, until the most recent nationwide reforms from 2009, China has experienced three major phases of reforms. Hospitals efficiency has improved significantly, medical technology has developed and even reaching world-class levels in some concentrations, and the difficulties in access to care have greatly reduced. However, healthcare reforms are still considered to have fallen short of expectations (DRC, 2007).
Phase I: Local Financing and Price Ceilings

The economic difficulty in the 1980s and 1990s was associated with the reform of state-owned enterprises and massive layoffs. Alongside the transition from a planned economy to a market economy, the central government shifted its healthcare financing responsibilities to local authorities. Hospitals and clinics remained under central government ownership, but the funding of its services and operations was shouldered by the local government via local taxes. As we see in Figure 14, out-of-pocket expenditures as a percentage of total health spending have risen steadily during this period from 21 percent in 1980 to nearly 60 percent in 2001. Healthcare spending became a smaller portion of the central government’s budget.

As the central government spending in retreat, local governments failed to make up the gap left behind. The shift to local financing forced Chinese hospitals to rely on the sale of services, pharmaceuticals, and diagnostics, to generate revenues. To control the skyrocketing cost of healthcare on personal finance, the National Development and Reform Commission (“NDRC”) imposed price regulation at the same time. Prices were set for all state-owned hospitals with regards to outpatient visits, surgeries, diagnostic tests, and basic pharmaceuticals. NDRC imposed a 15 percent mark-up cap for all tests and drugs sold through public hospitals.

The intentions of healthcare privatization and affordability were noble, but the central financing withdrawal and price ceilings have placed hospitals in dire financial conditions (Eggleston et al., 2008). A nation-wide study commission by the Ministry of Health finds that 96 percent of the service items had a unit cost higher than their corresponding regulated fees (Liu, 1996; Liu et al., 2000). On the basis of cost accounting in the first few years of the reform, about one-third of the public hospitals operated at a loss (Shi, 1987). The financial gaps were covered by government subsidies.

The emphasis on revenue generation from out-of-pocket expenses, coupled with the price ceilings, gives strong incentives for hospitals to over-prescribe high-tech diagnostics and drugs to subsidize unprofitable basic services, in order to stay afloat. To generate demand, hospitals pegged compensation package for doctors
with revenue generated. The main proportion of physicians’ total incomes were directly linked with department revenues.

The casual link between payment incentives to quality of care is difficult to prove empirically because of a lack of control groups, namely how hospitals would perform and how the quality of care would change if there were no such price schemes and funding issues. Nevertheless, it is categorically agreed by scholars, government bodies, and societal opinions that the incentive structure contributed to the over-prescription of profitable pharmaceuticals (Eggleston et al., 2008).

**Phase II: Healthcare Insurance Coverage, Price Schedule Reforms, Privatization Trial and Its Pullback**

In the late 1990s, China initiated the expansion of healthcare insurance coverage by introducing the Urban Employee Basic Medical Insurance ("UEBMI") scheme in 1998, the New Cooperative Medical Scheme ("NCMS") in 2003, and the Urban Resident Basic Medical Insurance ("URBMI") in 2007. UEBMI focuses on providing insurance to the working population in formal sectors, NCMS offers subsidized insurance for China’s rural population, and URBMI for the urban poor and informal sector workers.

The expansion of government-funded insurance has been remarkable, as China is approaching almost universal health insurance coverage (Figure 15). Gradually, these insurance schemes have expanded their coverage of hospital services from only inpatient expenses to include also outpatient services, lowered copayments for basic care, and included more high-tech diagnostic and treatment products in reimbursement. Universal health insurance coverage coincided with the rapid growth of hospital visits and inpatient services we see in Figure 12 (Liu and Zhao, 2014; Babiarz et al., 2012).

In 2000, the government sought to resolve the market distortion caused by price ceilings. The government proposed to increase the prices of basic services and reduce the price of high-tech products. This proposal was criticized for two reasons. First, an increase in basic services made care less affordable for the poor population. Second, even with a reduction in price for high-tech products, they were still very profitable and served as the revenue engine for hospitals (Meng et al., 2002).
Drug price reforms have also begun in the 2000s, but the results failed to meet its policy targets. The government shifted from putting a mark-up cap on any pharmaceutical product to only controlling retail prices for certain basic care products. However, this new pricing policy could not contain drug expenditures, because hospitals can circumvent the regulation and maintain its revenue source by increasing drug prescription for basic services and products and shifting prescription to those that were profitable and unregulated (Meng et al., 2005).

**Figure 15 Social Health Insurance Coverage in China**

During the second phase of healthcare reforms, the government also conducted some bold experiments—the privatization and operation of for-profit healthcare institutions. Suqian City was approved to pilot a privatization program of its whole municipal healthcare system from 2000 to 2006. The Suqian government sold public hospitals to individuals, partnerships, and private holding companies.

The full-scale privatization in Suqian brewed mixed, if not opposite, conclusions. On the one side, official assessment and some scholars declared that privatization was a huge success. The average health care expenditure per visit fell from 75.49 to 70.19 yuan at the city-county level, and from 37.62 to 27.84 yuan at the village level. The average charge per bed per day also fell by 4 percent at the city-county level, and by 17 percent at the village level. Waiting time was reduced by 30 minutes. Not only did health care spending fall, private hospitals also
Reforms at the Commanding Heights

provided better services. The private supply side successfully improved efficiency, profitability, and patients’ experience by introducing competition (Chow, 2009). Five years after the privatization, the mayor of Suqian called the “complete exit of governmental forces on the supply side of Suqian’s healthcare system” a huge success.\(^57\) On the other side, scholars such as Li Lin (2006) conducts separate studies to show that privatization has given rise to over-prescription, over-examination, over-surgery, and therefore higher medical costs for patients. She highlights six vulnerabilities in the report: (1) higher medical costs, (2) lack of investment in local medical infrastructures in the tiered system, (3) the underdevelopment of basic medical institutions, (4) the underdevelopment and unsustainability of doctors, (5) lack of adequate regulation, and (6) lack of healthcare investment in a long term. The academic debate about the result of Suqian privatization was headed by Zhou Qiren from Peking University and Wei Fengchun from Tsinghua University on one side, and Li Lin on the other.

Even if individual privatization pilot like Suqian was successful in some respects, but it also raised concerns in other areas that prevent it from being adopted and expanded at the national level. First, in the event of disastrous epidemic disease, fragmentedly owned institutions lack communication channels for a coordinated response. The SARS outbreak in 2003 reminded policymakers of the importance of central administration. A group of scholars and government officials commissioned by the Ministry of Health attributed the under-reporting of SARS to decentralization and the lack of information sharing in the privatized healthcare system of Suqian. Second, private ownership might exacerbate the existing market distortion of revenue-driven in healthcare service delivery. The worry was that in void of price regulation, private hospitals will price out the less-well-off population and focus on increasing profits by selling high-margin products and services. Information asymmetries are by nature severe in healthcare. Patients rely on physicians to diagnose and prescribe. Therefore, a full privatization of state-owned hospitals was considered extremely risky from a social perspective.

\(^{57}\) Health Care Reform Case in Point: Suqian’s Road of Privatization, Econ. Observer, July 8, 2006. This mayor, named Qiu He, was later promoted to be the Deputy Governor of Jiangsu Province, Party Chief of Qunming City, and Deputy Party Chief of Yunnan Province. Qiu was arrested for corruption in 2015.
Phase III: Expanded Coverage, Primary Care, and Zero Markup

In 2009, “Opinions of the Central Committee and the State Council on Deepening the Health Care System Reform” marked the start of the third phase of China’s healthcare reforms. The Opinions called for the expansion of UEBMI, NCMS, and URBMI to cover more than 90 percent of the population. It also further emphasized the importance of primary care and local health facilities in meeting citizens’ growing demand for healthcare services. In addition to the expansion of population coverage, the national polities also set to reduce outpatient copayments for chronic conditions. After piloting, in July 2015, the government officially launched tax-covered insurance schemes to cover catastrophic illnesses.

Since 2009, a number of specific reform policies were published to promote primary care at local levels and its integration to the whole system. Primary care was expected to be the first point of contact before patients go to general hospitals in big cities. To do that, policies called for substantial investments in community-level health institutions as well as training of the local physicians at the village and township levels. The integration of the tiered care service delivery system was also the key to provide adequate quality care if primary care deemed necessary. The government has made a huge commitment to building the tiered system. Billions were denoted to building new facilities and buying equipment for village clinics and community health centers. New sets of information systems were installed at community-level institutions to ensure smooth referral and transfer between the vertically integrated system.

The biggest change to the whole healthcare system was the policy to remove markups on drugs sold through hospitals. This radical price scheme revolution stroke right at the heart of the incentive problems, namely that hospitals and physicians, under the new government insurance schemes, were financially incentivized to overprescribe medicine, thus resulting in skyrocketing pharmaceutical expenditures (Meng et al., 2012; Yang and Wu, 2014). Since 2000, more than 40 percent of public hospitals’ revenues came from pharmaceutical sales. The average percentage of revenue among OECD countries was 20 percent. The zero-markup drug policy stimulated that hospitals could charge no markup on

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drugs in the national essential drug list, which included over 500 drugs for treatment and surgical use.

Numerous and amounting studies try to assess the effects on zero markup policies. First, at the care outcome levels, zero markup policies have shown promising results. Tao et al. (2011) find that outpatient provision of care increased by 25 percent since the implementation. Jin et al. (2010) show that zero markup policies contributed to the increase of care provision in township hospitals and community health centers. Second, zero markups seemed effective in controlling pharmaceutical expenditures. Sun et al. (2012) show that per-visit outpatient and inpatient expenses were reduced in 6 township health centers in Anhui Province. Wang et al. (2012) investigates 60 township health institutions in Shandong, Hubei and Sichuan provinces and echoed the results by Sun et al. and Chen et al, where the average medical expense per outpatient and per inpatient declined by 26 percent and 25 percent respectively. In addition, Yang et al. (2013), Song et al. (2012) and Shi et al (2013) find similar results in Hubei, Shandong and Beijing. Third, the effects on the financials of healthcare institutions were unclear yet. Scholars like Su (2015) argue that while the reform led to decreases in the drug revenue of hospitals, it also resulted in an increase in outpatient and inpatient visits and therefore an overall increase in hospital revenues even with no or minimal government subsidies. But concerns for rural health facilities were serious. Unlike urban general hospitals, rural health facilities relied heavily on drug sales. In anticipation of financial difficulties, the government began providing subsidies to rural health facilities. However, whether these subsidies were enough or for how long should these subsidies be in place are questions without clear answers yet. As of 2017, 32.5 percent of basic primary care institutions’ revenues came from fiscal subsidies, while that number was only 8.3 percent for general hospitals.\footnote{Data from China Health Statistics Yearbook}

**Phase IV: Two Invoice, 4+7, and Cost Control**

In 2015, the State Council issued *Deepening the Healthcare System Reform*. It emphasizes on cost control for healthcare expenditures. The top examples of cost control measures are the two-invoice policy and the 4+7 drug procurement reform.
Since April 2016, the provincial governments have begun to release specific policies in response to the two-invoice requirement promulgated by the State Council. The two-invoice policy means that manufacturers can only utilize one layer of distributors to deliver products to hospitals, namely one invoice from the manufacturer to the distributor and a second invoice from the distributor to the hospital, as opposed to the existing multilayer system. The policy target of the two-invoice system is to lower healthcare expenditures by cutting down the middlemen.

In late 2018, China started to adopt a new drug procurement scheme, called the “4+7” reform, to dramatically cut the amount paid for generic drugs. The reform was carried out by the National Health Insurance Bureau and supported by the National Health Commission. The program is composed of 3 stages: (1) bidding, (2) implementing, and (3) evaluation. The bidding process is cutting throat. For each drug, the lowest bidder will automatically become the preliminary candidate. If two or more companies offer the same low price, the committee will decide which company wins the bidding based on their production capacity and market reputation. The second-lowest bidder will become the backup candidate in case the preliminary candidate cannot satisfy the quantity requirement. The vast market size guarantee and the “winner-take-all” market situation under the “4+7” reform scheme provide incentives for pharmaceutical companies to submit a much lower bid than the existing market rate. The second stage of the bidding process is a price negotiation. The basis for a price cut is 10% off the lowest bidding price. The preliminary result of the “4+7” reform is encouraging. Based on the rough estimation by the NHIB, the average price cut was 52%, and the highest price cut was 96%.

Constraints

The Profitability Constraint: Attractiveness for Social Capital

The economics of the healthcare service industry has always been challenging. Even though returns on paper have been positive and steady, one of the distorting factors is the government subsidies. The healthcare service industry as a whole relies heavily on government subsidies to stay afloat. Profitability of the industry without government subsidies have been negative for an extended period
of time, and it has deteriorated after the phase III of reforms kicked in. Return on net assets without government subsidies was -5.3 percent in 2008, and this negative return number exacerbated to -9.4 percent in 2017.\textsuperscript{60} But as the government subsidies stepped up to make up the losses, return on net assets with subsidies is showing as stable at around 5 percent.

\textit{Public Hospitals}

The following patterns can be seen in Table 8. Government subsidies are important to note because they contributed to the under-development of private hospitals in China.

- \textit{First, government subsidies are almost all for public health institutions.} In 2017, 16.5 percent of total revenues of public institutions were from government subsidies, while private health institutions only have 0.9 percent of their revenues subsidized. Government subsidies restored public institutions’ net profit margin from -9.1 percent to 2.6 percent.

- \textit{Second, without government subsidies, basic medical institutions (including village and township hospitals) would be deep underwater.} 32.5 percent of their revenues were from government subsidies in 2017, a significant step up from 20.7 percent in 2008 before phase III of healthcare reforms and zero markup policies initiated. Without government subsidies, the net profit margin of basic medical institutions was startling -38.6 percent in 2017.

- \textit{Third, even Class III public hospitals, the best-performing assets of all public institutions, rely on subsidies to stay profitable.} 7.2 percent of their revenues in 2017 was from subsidies, without which their net profit margin would be -1.2 percent. Situations for Class II and Class I hospitals were worse. Their net profit margin without subsidies would be -7.5 percent and -12.0 percent respectively in 2017.

Therefore, the privatization of public hospitals or health institutions would in theory struggle to find a private buyer, because the moment a public hospital gets

\textsuperscript{60} Return on net assets without government subsidies is calculated by \[\frac{(\text{total revenues} - \text{subsidies revenues}) - (\text{total costs} - \text{subsidies costs})}{\text{net assets}}\]
privatized, subsidies disappear, and it turns into a loss-making asset for the buyer assuming all else being equal.

Table 8 Selected Financials of Healthcare Institutions

<table>
<thead>
<tr>
<th>Subsidies as a percent of Total Revenues</th>
<th>Net Profit Margin</th>
<th>Net Profit Margin w/o Subsidies</th>
</tr>
</thead>
<tbody>
<tr>
<td>Year</td>
<td>2011</td>
<td>2017</td>
</tr>
<tr>
<td>All Institutions</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Public</td>
<td>15.0%</td>
<td>14.7%</td>
</tr>
<tr>
<td>Private</td>
<td>16.0%</td>
<td>16.5%</td>
</tr>
<tr>
<td>All Hospitals</td>
<td>1.7%</td>
<td>0.9%</td>
</tr>
<tr>
<td>General Hospitals</td>
<td>8.7%</td>
<td>8.3%</td>
</tr>
<tr>
<td>Specialty Hospitals</td>
<td>7.8%</td>
<td>7.6%</td>
</tr>
<tr>
<td>Basic Medical Institutions</td>
<td>12.1%</td>
<td>9.7%</td>
</tr>
<tr>
<td>Public Class III Hospitals</td>
<td>29.3%</td>
<td>32.5%</td>
</tr>
<tr>
<td>Public Class II Hospitals</td>
<td>7.1%</td>
<td>7.2%</td>
</tr>
<tr>
<td>Public Class I Hospitals</td>
<td>9.9%</td>
<td>13.0%</td>
</tr>
<tr>
<td>Public Class I Hospitals</td>
<td>13.9%</td>
<td>17.8%</td>
</tr>
</tbody>
</table>


Notes: 1. Private means the combination of private ownership, collective ownership, and individual ownership; 2. Net profit margin = (total revenues – total costs)/total revenues; 3. Net profit margin w/o subsidies = [(total revenues – subsidy revenues) – (total costs – subsidy costs)]/(total revenues – subsidy revenues)

**Private Hospitals**

Private institutions have the highest profitability across the industry. The net profit margin of private institutions was 7.6 percent in 2017. This might be a result of the following combinations. First, private capital is bounded by the break-even constrain to find profitable areas to enter in the first place, like specialty hospitals in eye, obstetrics and gynecology (“OB/GYN”), and pediatrics. Second, some private hospitals are run with higher efficiency and management expertise. Third, they are not bounded by government insurance schemes or reform policies to set their price.

However, the zero-markup drug reform has an unintended consequence on private hospitals. The reform policy does not include private hospitals, namely it
Reforms at the Commanding Heights

does not regulate price setting or drug sales ratios for private hospitals, but it hurts their competitive advantage. When services and drugs at all public hospitals with high quality of physicians are subsidized and are covered partially or wholly by the government insurance, while the expenditures in private hospitals are mostly out-of-pocket, it is hard for private hospitals to charge high prices and remain competitive. The compression of margin is evident. The net profit margin of private institutions came down to 7.6 percent, from 10.2 percent in 2008.

The profitability constraint means that private capital is attracted to only small segments of the whole landscape, and the butter on their small pie is getting wiped away. The private hospital companies listed in Hong Kong, most of which have their main operations in China, has traded down since the 2015 reform (Figure 16).

**Figure 16 Indexed Share Price of Private Hospital Companies**

![Indexed Share Price of Private Hospital Companies](image)

*Source: Bloomberg*  
*Note: Share price indexed to the first day of trading share price = 100*

I have interviewed a number of sophisticated social capital investors who had invested in general hospitals or clinics, such as private equity funds and insurance companies, who had good track records of bringing management efficiency to acquired companies; I have also interviewed management teams of private hospital groups, who have dedicated their time and efforts day and night to improve efficiency of their institutions, the prospects of general hospitals are gloom for private investors because all of them are struggling, and will continue to struggle,
to break even in this distorted environment, until something changes the current competition set up.

**Box 2: Harmony Healthcare Group**

One of the private hospital group I interviewed is Healthy Harmony. Healthy Harmony is one of the most reputable and integrated private healthcare service providers in China, with a nationwide network. Their customers are China’s upper middle class and expatriate communities because only they would be less price-sensitive and willing to pay out-of-pocket expenses. Healthy Harmony opened its first hospital in Beijing in 1997.

They have an industry-recognized management team with expertise in finance, operation, and hospital management; they are backed by professional investors like TPG and industry players like Fosun Pharma; they have a good agent-principle relationship because the CEO of the Healthy Harmony, Roberta Lipson, is the main investor, who traveled to China from the United States and has dedicated more than 35 years of her life ever since to build a high-quality service provider locally. Lipson saw an opportunity for private hospitals in the 1990s, when the Chinese government has instituted policies to attract private capital to divert its mounting pressure on the public hospital system.

However, decades of internal efforts and external policies cannot change the profitability profile of Healthy Harmony. Even though Healthy Harmony did grow bigger in scale, but it has not yet been able to stay in the profitable territory consistently (Figure 17).

**Figure 17 Historical Financials of Healthy Harmony**

<table>
<thead>
<tr>
<th>(in thousands)</th>
<th>For the Six Months Ended June 30</th>
<th>For the Year Ended December 31</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Statement of Operations Data:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Revenues</td>
<td>1,205,533</td>
<td>175,606</td>
</tr>
<tr>
<td>Net (loss)/profit</td>
<td>(120,868)</td>
<td>(17,606)</td>
</tr>
<tr>
<td><strong>Statement of Cash Flows Data:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Net cash provided by operating activities</td>
<td>178,085</td>
<td>25,941</td>
</tr>
<tr>
<td>Net cash used in investing activities</td>
<td>(179,916)</td>
<td>(26,208)</td>
</tr>
<tr>
<td>Net cash (used in) / provided by financing activities</td>
<td>(102,609)</td>
<td>(14,947)</td>
</tr>
<tr>
<td><strong>Balance Sheet Data:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>As of June 30, 2019</td>
<td>RMB</td>
<td>USS</td>
</tr>
<tr>
<td>Total assets</td>
<td>6,757,283</td>
<td>984,310</td>
</tr>
<tr>
<td>Total liabilities</td>
<td>3,516,974</td>
<td>512,306</td>
</tr>
<tr>
<td>Total equity</td>
<td>3,240,309</td>
<td>472,004</td>
</tr>
<tr>
<td>As of December 31</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total assets</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total liabilities</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total equity</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Source: prospectus filing of NFC*
State-Affiliated Hospitals

Other than those that are fiscally funded by the government directly, some hospitals are associated with universities, SOEs, and the military. They receive little subsidies from the government, similar to private hospitals. The losses are made up of contributions from SOE or military budget.

SOEs, especially those that are in natural monopolistic industries such as oil, power, and grid, have built their own hospitals, schools, universities for employees and their families. These institutions later started to operate like other ordinary ones and were open to the public. In 2002, the government asked SOEs to separate their social works from the corporation. In 2009, the new wave of healthcare reform pushed further to separate hospital operations from SOEs. A number of hospital groups were established, to the facility this process through Investment-Operation-Transfer (“IOT”). Hospital groups would invest in capital expenditures and operational expenditures of the medical institution, in exchange for an exclusive management right including management fees. China Resources, Fosun, CITIC, and many other hospital management groups emerged.

The government required that all SOE-affiliated hospitals need to be separated by the end of 2018. To help with that, SASAC appointed six state-owned hospital groups (China Resources, Sino Pharma, Chengtong Holdings, State Development and Investment, General Technology, and China Reform Holdings) to purchase and manage the remaining affiliated hospitals.

Hospital groups who manage state-affiliated hospitals have been in a challenging business environment after the 2015 reform, after their profitability profile or valuation got compressed materially. Two case studies are presented.

Box 3: CR Phoenix Healthcare

In August 2016, Phoenix Healthcare merged with China Resources (“CR”) Healthcare to become the largest medical healthcare groups in China, measured by the number of beds and patient visits. As of June 2019, the combined entity (ticker: 1515 HK) managed and operated a total of 100 hospitals in 10 provinces and cities.

Before Merge – Phoenix Healthcare

Phoenix is one of the leading private hospital groups established in 2007 to ride on the reform initiatives to attract private capital into separating hospitals from SOEs and the military. They have expanded rapidly to be one of the largest in the category. When Phoenix listed its shares on the Hong Kong Stock Exchange, its IPO was multiple times covered within
hours. Investors like the story of IOT as the asset-light model for non-profit hospitals, and they expect the acquisition opportunity to be exemplary given the amount of SOE- and military-affiliated hospitals waiting to be separated.

Valuation of the Phoenix was constantly as high as around 30x P/E, until an announcement came out on October 23rd, 2015. The major shareholder, namely the Chairman, of Phoenix Healthcare announced that he had sold 8.22 percent of the company’s issued capital, at a price 10.37% lower than the last closing price. Starting from then, the share price of Phoenix tanked (Figure 19).

Market rumor at the time was that Phoenix ran into serious operation issues, and its founder is in no mood for continuing this business. In the 2015 annual report, Phoenix reported a sharp net profit drop of 27.4 percent.

Before the merger, Phoenix had 60 hospitals with approximately 5,780 beds in operation in Beijing Tianjin and Hebei, including three Class III hospitals, six Class II hospitals, and nine Class I hospitals.

**Before Merge – CR Healthcare**

CR Healthcare was in the same IOT business, and its managed institutions include: Xukuang Hospital, Huaikuang Hospital, Brain Hospital, 999 Clinic, and Wugang Hospital, with a total of 5,809 beds as of December 31, 2015. CR Healthcare was 100% owned by CR Group.

**The Merger – A Reverse Takeover**

On August 30, 2016, Phoenix agreed to purchase CR Healthcare for a consideration of HK$3.7 billion. The consideration was paid fully in newly issued shares at HK$8.04 per share to the owner of CR Healthcare and some other financial investors. Pro forma, CR Group would own 32.4 percent of the issued share capital of the combined entity, making it the largest shareholder.

The combined entity is renamed to be CR Phoenix.

**Business Model of Hospital Managers**

To maintain its tax benefit of non-profit hospitals, hospital managers sign a contract with the hospital for a very long period of time (50 years in most cases), during which the manager shall provide brand support, capital support, management support, and supply chain service support to the hospital. The hospital remains as it was before, only that it will start to pay a management fee to the manager depending on the profitability level of the hospital.

In addition to the management fees, managers generate revenues by controlling the supply chain of the hospital. The gross profit from Group Purchase Order ("GPO") is one of the major parts of a manger’s revenues.
Take CR Phoenix as an example. General hospital services, management fees, and GPO gross profit accounted for 35%, 22%, and 42% of CR Phoenix’s revenue in 2018.

Figure 18 Revenue Mix of CR Phoenix, 2018

One of the inherent risks of IOT contracts, though, is that they are voluntary and non-legally binding. CR Phoenix has an IOT agreement with Yan Hua Hospital from 2008 to 2055. But in 2018, the hospital unilaterally terminated the Yan Hua IOT agreement. Since then, CR Phoenix was not able to the hospital’s supplier, and not able to collect management fees. CR Phoenix sued Yan Hua Hospital for the violation of their IOT agreement.

After Merge – Improved Operation Statistics, but Declining Share Price

Since the merger completed, CR Phoenix has expanded its operation rapidly, revenues and profits have grown significantly as well (Table 9).

Table 9 Operational and Financial Statistics of CR Phoenix

<table>
<thead>
<tr>
<th></th>
<th>2016</th>
<th>2017</th>
<th>2018</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hospitals under management</td>
<td>103</td>
<td>106</td>
<td>112</td>
</tr>
<tr>
<td>Beds in operation</td>
<td>11,772</td>
<td>9,884</td>
<td>10,380</td>
</tr>
<tr>
<td>Patient visits (million)</td>
<td>7.74</td>
<td>7.78</td>
<td>8.22</td>
</tr>
<tr>
<td>Revenues (RMB billion)</td>
<td>5.92</td>
<td>6.26</td>
<td>6.68</td>
</tr>
<tr>
<td>Core profits (RMB million)</td>
<td>250</td>
<td>380</td>
<td>431</td>
</tr>
</tbody>
</table>

Source: company annual reports

However, the company’s valuation has not reflected the rapid growth of its business and financial results. Share price has declined from HK$13.40 right after the merger to HK$4.63 as to date.
Box 4: China Life and Nanshi Hospital

On December 4\textsuperscript{th}, 2015, Town Health International, a Hong Kong-listed medical group, announced a controlling-stake investment in Nanyang Xiangrui for a maximum consideration of RMB1.2 billion. Nanyang Xiangrui is the hospital manager, investor, and sponsor of the following medical institutions:

- Nanshi Hospital, which has 1,000 hospital beds;
- Youtian Branch, which has 50 hospital beds;
- Erjiao Hospital, which has 50 hospital beds;
- Health Service Center, which has 10 hospital beds.

Town Health’s second-largest shareholder is China Life, and this transaction was initiated, proposed, and executed with China Life’s involvement. Nanshi Hospital is an associated hospital of the Henan University and has been a Class A Tertiary Comprehensive Hospital since 2014. Nanyang Xiangrui has a management agreement with each of the medical institutions for an exclusive 50 years.

Similar to the CR Phoenix case, operational statistics have improved significantly for Nanshi Hospital after the acquisition. Patient visits and inpatient numbers have increased significantly. Bed utilization has been maintained at near full capacity.
Financially, we need to look at the combined account of Nanshi Hospital and Nanshi Xiangrui. The combined revenues have increased by 44.8 percent from 2016 to 2018, but net profit has declined by 43.3 percent.

<table>
<thead>
<tr>
<th>Table 10 The Combined Account of Nanshi Hospital and Its Manager</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
<tr>
<td><strong>Combined of Nanshi Hospital and Nanshi Xiangrui</strong></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td><strong>2016</strong></td>
</tr>
<tr>
<td><strong>Total Revenue</strong></td>
</tr>
<tr>
<td>- Revenues Associated with Medical Activities</td>
</tr>
<tr>
<td><strong>Total Costs</strong></td>
</tr>
<tr>
<td>- Costs Associated with Medical Activities</td>
</tr>
<tr>
<td>- Costs Associated with Business</td>
</tr>
<tr>
<td>- Costs Associated with Management</td>
</tr>
<tr>
<td><strong>Net Profits</strong></td>
</tr>
</tbody>
</table>

There are three reasons that might have contributed to this. First, given the uprising medical demand for better service, Nanshi Hospital hired more doctors. The number of doctors increased from 222 in 2012 to 609 in 2018. As a result, expenses also increased proportionally. Second, Nanshi Hospital lacked pricing power. Nanshi Hospital’s pricing for its service has been below the Class III hospital average (Table 11). Third, some revenues from the supply chain are delayed or compressed due to the new policies such as two-invoice, aiming to lower...
profit margins for the middleman. Net profit margin of Nanshi Hospital and its manager combined has shrunk from 15% in 2016 to 6% in 2018.

**Table 11 Pricing of Nanshi Hospital Compared to Class III Average**

<table>
<thead>
<tr>
<th></th>
<th>2016</th>
<th>2017</th>
<th>2018</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Outpatient fees per visit</strong></td>
<td>Nanshi</td>
<td>Average</td>
<td>Nanshi</td>
</tr>
<tr>
<td></td>
<td>259</td>
<td>295</td>
<td>276</td>
</tr>
<tr>
<td><strong>Inpatient fees per person</strong></td>
<td>8,185</td>
<td>12,848</td>
<td>8,590</td>
</tr>
<tr>
<td><strong>Inpatient fees per day</strong></td>
<td>694</td>
<td>1,273</td>
<td>747</td>
</tr>
</tbody>
</table>

*Source: management account, Health Development Statistics*

**The Affordability Constrain: Government Insurance**

Though now China’s spending on health as a share of GDP is still lower than most OCED countries, it is projected to surpass them in a relatively short period of time if no measures are taken. A World Bank study (2018) predicts that healthcare spending will rise to RMB 18,039 billion in 2035, equivalent to 9.1 percent of GDP. The major drivers of this increase are (1) excess health price inflation, accounting for 26 percent of the change; (2) demographic factors such as population aging and population growth, accounting for 19 percent of the change (Figure 21).

**Figure 21 Main Drivers of Projected Health Expenditure Increases in China (%)**

*Source: World Bank*
If we assume that the government will not shift the expenditure burden to patients for social welfare and stability reasons, then healthcare expenditures can grow to be over 12 percent of the total fiscal budget.

For patients, government insurance has expanded both in terms of coverage as well as reimbursement rate, but there is still a portion of expenses that needs to come out of pocket (Figure 22). Unless the reimbursement rate improves to near 100 percent, the affordability concerns will not be the headaches for the government, but also the problems for citizens.

**Figure 22 Breakdown of Healthcare Payments, by Insurance Type**

![Chart showing healthcare payments by insurance type]

Source: Tang (2014), National Healthcare Security Administration

Note: NCMS = New Cooperative Medical Scheme; UEBMI = Urban Employee Basic Medical Insurance; URBMI = New Urban Resident Basic Medical Insurance

**The Trust Constraint: Brand Image**

Despite all the decades-long efforts to diffuse the congestion clot at public Class III hospitals, to develop a tiered system for primary care and integration, the overall impact of the reforms to promote primary care at the community levels has been limited for several reasons. First, even though capital investments have made community-level health facilities better equipped, but they fall short of attracting and retaining qualified health professionals. At local facilities, the doctors are
disadvantaged in applying for research funding, being promoted in professional ranks, and earning reputation because they are handicapped by the resources at the community level. Salaries at community-level facilities are not adequate to compensate them for the opportunity cost of them working at a higher-level institution in the city. China is short of healthcare professionals, both physicians and nurses, and the current personnel policies on compensation constrain the expansion of the healthcare workforce, therefore the shortage of high-quality professionals at the community level is preventing the tiered system from diffusing congestion at the large urban public hospitals.

The same problem exists in private hospitals. It is difficult for private hospitals to attract full-time highest-quality health professionals. Private hospitals usually will have a number of experts “joining” them on the physician team, but many of them are working part-time at private hospitals outside of normal business hours. Some physicians do quit their jobs at public hospitals, and join private institutions full time, but they are expensive to pouch. As private hospitals are already under profitability pressure from the competition, they can unlikely afford too many medical experts.

In addition to the shortage of high-quality doctors, private hospitals have another trust issue because of many high-profile scandals. The death of Wei Zexi, a 21-year-old college student from Shaanxi, prompted a strong reaction from the public about private hospitals such as the Putian network. The Putian network is a loosely affiliated system that includes 8 of every 10 private hospitals in China, over 8000 facilities, that are connected to the area of Putian in Fujian province. Wei Zexi died after a Putian-linked hospital treated his cancer with a discredited form of immunotherapy and charged Wei’s family over RMB 200,000. Another high-profile scandal of Putian-linked hospital was He Jiankui’s CRISPR baby. The Shenzhen HarMoniCare Women & Children’s Hospital was the Putian-linked hospital that gave permission to the researcher to secretly perform gene editing during the in vitro fertilization process, a direct violation of medical ethics rules and regulations in China. HarMoniCare has been listed on the Hong Kong Stock Exchange with flying colors in financial numbers. The scandal put HarMoniCare’s stock in suspension until even today, after the company’s share price tanked over 70 percent since its IPO.
Private hospitals in the Putian network hide their identity well. They rely extensively on online advertisements and misinformation about their identity. Without serious research, it is hard to spot which one is Putian linked and which one is not. The confusion and complexity discourage patients to trust private hospitals, especially after so many scandals burst out.

**The Quality of Care Constraint: A Balance**

With the rising cost threatening both the government’s and individuals’ affordability, one is tempted to suggest that the government should (1) control the prices billed to insurance/patients and (2) suppress the prices hospitals pay to suppliers such as pharmaceutical companies and medical device companies. This combination is in the right direction in theory because it maintains end price to customers as well as input price to make sure the saved costs come from the high-margin pharmaceutical industry.

However, the actual implementation of this combined strategy calls for two heads-up. First, if China starts to adopt the DRG payment (diagnosis related groups), where insurance will pay a prospective treatment based on the diagnostics results and patient classifications, the hospitals might decide to procure the least expensive equipment to perform the same task, sometimes resulting in a lower quality of care. For example, during our interviews in one Province, as the price for drawing blood is set at a low level, hospitals have to give up using peripheral venous catheters (“PVC”) for inpatient because the unit cost of PVC is higher than the price set. They have to use basic catheters for regular blood drawing to balance the budget. Patients suffer from the low quality of care, though costs are contained.

Another example of this balance is the admission of drugs into the national essential drug list for insurance. As cost is a key consideration in the bidding process, some higher quality products are disadvantaged, and may not be included in the reimbursement list.
Potential Solutions

The Goal and The Root Cause

The challenges of growing demand, resource congestion at public hospitals, long waiting time, rising costs, over-servicing, and many others cannot be addressed all at the same time, nor is it realistic to comprehensively cover every angle in my proposed solution. As capacity is maxing out at public hospitals, efficiency improvement is yielding diminishing marginal returns, and structural reasons are preventing the tiered system from effectively diffusing the clot, the government should consider ways to improve private sector’s engagement so that private investments can help lighten the fiscal burden on government’s shoulders.

The cases we studied show that most governments play a very large role in health care financing, but they do not necessarily need to be dominant in healthcare servicing. The successful example of Canada has the government as the single payer, but healthcare services are delivered by private hospitals and private doctor groups. Canada also restricts that all private hospitals need to be not-for-profit.

Laws and regulations do encourage private capital investment in the healthcare space, however private hospitals are playing a marginal role in the industry. Even though there are more than 20,000 private hospitals in China, constituting 63.5 percent of all hospitals, most of them are very small in size. Private hospitals account for 26.3 percent of all hospital beds, 14.8 percent of hospital visits, and 18.3 percent of inpatient admissions in 2018. Patients view private hospitals as non-trustworthy, especially after multiple scandals linked with hospitals in the Putian network; doctors find it not convincing to join private hospitals full-time; government insurance schemes restrict reimbursement to private hospitals; investors find it difficult to spot investment opportunities that can meet their basic return requirements.

There are indeed many reasons leading up to the marginalization of private hospitals, such as unequal tax burdens, access to financing, and restricted insurance reimbursement. But I believe the major factor of all is the distorting role played by

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61 For example, the “Opinions of the State Council on Comprehensively Scaling up Reform of County-Level Public Hospitals” asked for “implementation of policies to support and guide nongovernment investment in hospitals”.

62 Data from National Health Commission
government subsidies. First, subsidies are putting downward pressure on prices for private health services. Second, they make privatization unrealistic because once a private investor becomes the owner of a previously-state-owned hospital, the sudden disappearance of subsidies renders the investment unprofitable. Third, their existence dis-incentivizes public hospitals to be more cost-conscious and operationally efficient. If management of public hospitals knows any loss hole will be filled with subsidies, they are tempted to procure expensive supplies and pocket in kickback themselves (Rose-Ackerman and Tan, 2014).

To say that fiscal subsidies are the root cause of many problems is not to suggest that subsidies were a mistake or should be eliminated immediately. Subsidies are essential and necessary as the zero markup policies started to affect the financials of public health care institutions. Without subsidies, these institutions, which account for almost 80 percent of China’s healthcare delivery, will face financial pains to various degrees, ranging from a net loss of 3 percent of revenues per year to 38 percent of revenues per year.

Fiscal subsidies are a good band-aid, but it is a band-aid that needs to be removed or reshaped to bridge for a long-term solution over time.

**The Proposed Strategies**

An expanded and integrated private sector role will require that subsidies be gradually reduced while insurance payments replace it, to ensure leveling playing field, healthy competition and capacity expansion.

**Figure 23 Proposed Strategies for Healthcare Reforms**
**Strategy I: Consolidate Leadership in Payment**

Hospitals are getting paid by insurance schemes and government subsidies. In 2018, the government centralized all government insurance schemes under one newly-established agency—the National Health Security Administration (“NHSA”). NHSA oversees the operation of the insurance fund, consolidates purchasing and negotiating power with pharma companies during procurement, clears the payment with hospitals, and sets prices for service provided. But NHSA is separated from government agencies that deliver government subsidies. Government subsidies for hospitals are administrated by municipal or county government’s treasury departments, while the provincial governments, who used to be the price setter for all the services, determine how much subsidy one hospital gets based on a number of factors.

The segregation of leadership in payment creates a gap of information and conflicting incentives. NHSA has a budget to meet and is incentivized to set prices for services or treatments low; local government’s treasury, on the other hand, also has a budget to meet, and want the insurance schemes to shoulder more of the fiscal burden so that subsidies can be smaller.

To address the current fragmented payment landscape, leadership of healthcare financing needs to be unified. This means that NHSA, Ministry of Finance, and their corresponding agencies at local levels need to have a unified taskforce and agree-upon coordination mechanism.

**Strategy II: Shift from Subsidies to Insurance**

The government spending on healthcare includes largely two pockets of fund, fiscal subsidies and insurance contribution by the government. Reform policies can help transfer expenditures from one pocket to another, without impacting the expenses of patients. Specific actions and their corresponding benefits are as follows. These three actions should be integrated and carried out at the same time rather than in sequence.

- **Action 1**: the reduced subsidies should be aggregated as a lump sum payment injection to the social insurance funds under NHSA. The inflated insurance schemes can expand coverage and increase the reimbursement rate
for patients, without triggering concerns about whether the insurance funds are financially equipped to pay the growing need of citizens.

- **Action 2: NHSA can increase guidance prices for medical services.** Hospitals, both private and public, can benefit from the revenue side. In this way, the private investor does not need to worry about the sudden disappearance of subsidies and suddenly the hospital becomes unprofitable. The increased service price will make sure investment opportunities are free from policy contingencies, and focus investors’ attention on how to improve profitability by enhancing operational efficiency.

- **Action 3: NHSA should serve as the main payer, if not the single player, and continue to use its bargaining power to drive down costs.** NHSA is already doing an excellent job of driving a hard bargain on the essential drug list and diagnostic products. It is important to note that NHSA needs to strike a balance between cost and quality of care.
**Strategy III: Create Equal Opportunities for Qualified Private and Public Hospitals**

The government shall implement policies to level playing grounds for private hospitals in terms of SHI insurance reimbursement. If a private hospital fulfills the qualification requirements and continues to meet standards, it should have equal access to insurance reimbursement as public facilities. A competitive environment to drive cost efficiency and operational optimal helps promote the thriving of both public and private health providers, thus expanding the system’s capacity to meet citizen’s growing needs of high-quality healthcare.

**Strategy IV: Strengthen Regulatory Evaluation and Enforcement to Minimize Risks of Bad Apple**

The reputational damage for private hospitals, caused by high profile scandals, is long-lasting. Previous experience with privatization had also disappointing results of overtreatment, high medical costs for families, misinformation marketing, and compromised care quality. There are two ways to rein in the bad actors:

- **Action 1: Use the single/dominating payer system to nudge for good behavior.** Certain quality of care, capital infrastructures, and qualified professional workforce, strong internal control, clear measures and internal procedures for decision making, are all examples of the requirement for private hospital’s admission into the insurance payment plan.
- **Action 2: Enhance regulations to prevent and punish bad behavior.** The government should come up with detailed regulations on practice guidelines, marketing, and other areas related to the quality of care. At the same time, the government should allocate enough resources to make sure these regulations are enforced.

**Strategy V: Integrated Information System Between Public and Private Institutions**

Communication and information sharing are critical to the containment of disastrous epidemic diseases, as we learned in the 2013 SARS incident. Therefore, it is critical to have an integrated information system across all institutions where important disease information can be shared.
This is no easy task. The very fact that there is a lack of such integrated information system even within the public tiered system attests to the difficulty. But the era of 5G and cloud capacity give us hope that a more robust sharing mechanism can be established amongst all health institutions.

**Implementation Considerations: The Pilot Program**

Any top-level design can only stand on its feet if it is supported by implementation evidence from pilot programs. The distinct characteristics of “pilot first, nationwide replication later” help identify execution risks and challenges. Some of the proposed strategies above can be piloted at certain local levels before it is widely adopted. The following elements should be considered:

- **The choice of pilot locations.** The decision of which cities to conduct pilot program pertains to a number of factors:
  - *The share of subsidies in the healthcare system.* The pilot should avoid places where hospital finances are too vulnerable and subsidy shares are too high.
  - *Competition situation of healthcare services.* The pilot should be conducted at a market where there are steady patient flows at public hospitals with a relatively weak private hospital alternative.
  - *Spotlight.* The pilot should avoid spotlight cities such as Beijing and Shanghai where too social concerns can be exaggerated.
  - *Incentives for hospitals and their administrators.* A detailed assessment of local hospitals regarding incentives, both financial and political, for their administrators. Some local hospital administrators can be extremely reluctant to any reform, and they can derail the pilot intentionally.

- **The timing of the pilot.** The pilot program requires a relatively stable macroeconomic and social environment.

- **The timespan of the pilot.** The pilot needs to be long enough to allow the effects of the reform to be fully exposed, but short enough to maintain momentum.

- **Risk management plans.** The pilot program should have a variety of proactive and reactive risk management strategies for potential disruption, ranging from a shortage of medicine to information system disconnection.
2. Electricity Power

The electricity industry comprises four elements: (1) energy generation with inputs such as coal, wind, hydro or nuclear (2) high-voltage transmission, (3) lower-voltage distribution, and final consumption. Three elements in the value chain make the industry extremely sensitive to the supply-demand balance. First, electricity does not have a brand, the end-users have no way of knowing, nor do they care about, who are the generators or how is electricity generated. The most critical, if not the only effective, signal in the system is the price. Second, electricity cannot be stored economically. Demand varies from year to year depending on economic cycles, but supply is much less flexible because it is very expensive to ramp up or close down power generation plants. Therefore, the transmission and distribution system (T&D) is constantly trying to balance out demand and supply with consistent voltage and reliability. Third, electricity has no close substitution and is essential to modern life. The electricity demand is very inelastic.

**Figure 24 Value Chain of the Electricity Industry**

![Value Chain of the Electricity Industry](image)

The price scheme is key to industry economics. Power generators earn a spread between the price sold to T&D companies and the cost of inputs plus operation. Over 70 percent of electricity generation in China was from thermal power, and coal accounts for nearly 80 percent of total costs for thermal power generators. Power generators are specifically subject to the price swing of coal, if
the price sold to T&D does not adjust accordingly.⁶３ T&D companies earn a spread between the price sold to end-users and the purchase price of electricity from power generators. How prices are set, and how price signals are transmitted, are essential to the profitability, efficiency, attractiveness for private investment, and supply-demand balance of the industry.

While the power generation space can have decentralized players, the T&D system is a natural monopoly due to its capital-intensive nature with economies of scale and network effects. These market features determine that there are four models of industry configuration.

- **Vertical Integration**: this is a monopoly where one company is responsible for all elements along the value chain, from generation to transmission to distribution, and retail sales. Almost all countries started with this configuration, even though many developed countries have shifted away from vertical integration to introduce more competition, there are still a sizable number of countries in the world that operate their electricity industry with this configuration.

- **Single Buyer**: power generation is carved out of vertical integration as an independent segment with moderate competition. Transmission and distribution are still bundled together as the agent for end-users, serving as the single buyer for the power generators. Joskow and Tirole (1996) argue that with the right regulation on price competition, namely a labeled global price cap, the disentanglement of power generation and the rest of the value chain can be achieved with efficiency.

- **Wholesale Competition**: Joskow and Schmalensee (1983) first proposed the adoption of wholesale competition in electricity as of the beginning of the 1980s. A wholesale competition creates a market where the T&D company and enterprise customers can transact with power generators based on their prices directly.

- **Retail Competition**: this is the most competitive configuration where retail customers make the ultimate choice about generators. Retail competitions require full access to the grid system by any retailers.

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⁶３ Numbers of year 2017, from China Electricity Power Statistics Yearbook
There is no right or wrong in the choice of market configuration. Each configuration has its pros and cons. The decision depends on country-by-country specifics, its history, and its strategic goals. We have studied the electricity industry reforms of Japan, France, the UK, US California, US PJM, and Northern Europe, and found that they can be plot across the spectrum (Figure 25).

**Figure 25 Four Configurations of the Electricity Market**

<table>
<thead>
<tr>
<th>Illustration</th>
<th>Vertical Integration</th>
<th>Single Buyer</th>
<th>Wholesale Competition</th>
<th>Retail Competition</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Pros</strong></td>
<td>• Economies of scale</td>
<td>• More efficiency on generator side</td>
<td>• Price can reflect supply and demand</td>
<td>• Competitive market, more efficient resource allocation</td>
</tr>
<tr>
<td></td>
<td>• Reliability. And stability</td>
<td>• Lower total cost</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Cons</strong></td>
<td>• Low efficiency in resource allocation</td>
<td>• Destructive competition between generator</td>
<td>• No decision power for small customers</td>
<td>• Low reliability and stability</td>
</tr>
<tr>
<td></td>
<td>• Risk of corruption and fraud</td>
<td>• Costs associated with procurement</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Countries</strong></td>
<td>Japan, France</td>
<td>UK, US California before 2002</td>
<td>Northern Europe</td>
<td>US PJM</td>
</tr>
</tbody>
</table>
**Current Situation**

When I was in my elementary school years, I remember vividly that every now and then, especially in winter, our house will have electricity outage for several hours. Every household has emergency lights ready when the city lost power. I might have finished some homework with my mom holding the emergency light and sitting next to me.

The power outage is now extremely rare in both urban and rural areas of China. In 2017, urban cities on average only have 5 hours of power outage per household in the entire year. China’s electricity reforms have substantially improved the system to solve the severe capacity shortage problems in the 1980s and 1990s. This is just one aspect of example to show how China’s power sector has improved.

Despite the capacity improvement, some structural problems still exist in the realm of the power sector, from generation to T&D, and finally to retail. This government-dominated, price-controlled industry is experiencing a similar dilemma between sustainable financing and social welfare.

**Improved Capacity, Access and Reliability, But Still Low Per Capita Numbers**

China used to be plagued by severe power shortages for more than three decades of industrialization. In 2002, more than 12 provinces reported sustained shortages. Demand grew fast at 11 percent, 15 percent, 16 percent in 2002, 2003, and 2004. As a result, 25 provinces were impacted by severe power shortages by the end of 2005. Failure to expand capacity quickly enough to meet the rising demand created by the rapid macro-economic boom, led to a national deficit of 30GW in 2004 (OECD, 2006).

Growth in the electricity sector has been striking. The previous reforms (discussed in the next section) have expanded the capacity to power China’s rapid economic growth and surging need for energy. Installed capacity increased from 66 GW to 1,777 GW from 1980 to 2017, and power generation increased from 300 TWh to 6,417 TWh during the same period (Figure 26).

Electrification, especially in rural areas, has improved access significantly since Deng Xiaoping’s economic reforms starting from 1979. In 1978, rural areas
with seventy percent of the country’s population, consumed only 13.3 percent of the national power; thirty-one percent of the rural population, or 245 million people, had no access to electricity in 1979 (Zhang and Heller, 2004). Today, China has achieved full electrification for every one of its 1.4 billion population.

**Figure 26 China’s Improved Electricity Power Capacity**

![Graph showing improved electricity power capacity](source)

*Source: National Statistic Yearbook, World Bank (1994)*

Electricity power has become more reliable with decreased power outage hours. Average power outage hours per year per household has come down from 21.5 hours for urban and 40.8 hours for rural in 2005, to 2.59 hours for urban and 5.72 hours for rural in 2014.\(^{64}\) Even though interruption duration numbers have come down from the previous decade, they rebounded back from 2014 to 2017 (Figure 27). Compared to other OECD countries, China’s interruption duration is still relatively high (Figure 28).

**Figure 27 Average Power Outage Duration in China**

<table>
<thead>
<tr>
<th>(hour/household)</th>
<th>Urban</th>
<th>Rural</th>
<th>All</th>
</tr>
</thead>
<tbody>
<tr>
<td>2013</td>
<td>7.47</td>
<td>3.66</td>
<td>8.30</td>
</tr>
<tr>
<td>2014</td>
<td>2.59</td>
<td>5.72</td>
<td>5.22</td>
</tr>
<tr>
<td>2015</td>
<td>4.08</td>
<td>12.74</td>
<td>10.50</td>
</tr>
<tr>
<td>2016</td>
<td>5.20</td>
<td>21.23</td>
<td>17.11</td>
</tr>
<tr>
<td>2017</td>
<td>5.02</td>
<td>20.35</td>
<td>16.27</td>
</tr>
</tbody>
</table>

*Source: China Electricity Power Statistics Yearbook*

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\(^{64}\) Data from China Electricity Power Statistics Yearbook
China’s total electricity consumption has been the highest in the world, but the per capita number shows that there is still ample room for development (Figure 29). The average electricity consumption per capita was 4,475 KWh per person per year for China in 2017, while the same per capita number reached 10,972 KWh for U.S. customers in 2018.
Heavy Reliance on Coal, and the Urgent Need to Shift to Cleaner Energy

Despite government endeavors to diversify energy sources and the rapid growth of renewable energy in China, the entire power generation sector is still coal-fire dominated. In 2017, 62.2 percent of the total power generation is from thermal power (Figure 30).

Figure 30 Breakdown of Power Source for Electricity Generation in China

<table>
<thead>
<tr>
<th>Year</th>
<th>Thermal</th>
<th>Hydro</th>
<th>Nuclear</th>
<th>Wind</th>
<th>Solar</th>
<th>Others</th>
</tr>
</thead>
<tbody>
<tr>
<td>2000</td>
<td>80%</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
</tr>
<tr>
<td>2001</td>
<td>80%</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
</tr>
<tr>
<td>2002</td>
<td>80%</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
</tr>
<tr>
<td>2003</td>
<td>80%</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
</tr>
<tr>
<td>2004</td>
<td>80%</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
</tr>
<tr>
<td>2005</td>
<td>80%</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
</tr>
<tr>
<td>2006</td>
<td>80%</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
</tr>
<tr>
<td>2007</td>
<td>80%</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
</tr>
<tr>
<td>2008</td>
<td>80%</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
</tr>
<tr>
<td>2009</td>
<td>80%</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
</tr>
<tr>
<td>2010</td>
<td>80%</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
</tr>
<tr>
<td>2011</td>
<td>80%</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
</tr>
<tr>
<td>2012</td>
<td>80%</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
</tr>
<tr>
<td>2013</td>
<td>80%</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
</tr>
<tr>
<td>2014</td>
<td>80%</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
</tr>
<tr>
<td>2015</td>
<td>80%</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
</tr>
<tr>
<td>2016</td>
<td>80%</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
</tr>
<tr>
<td>2017</td>
<td>80%</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
</tr>
</tbody>
</table>

Source: National Statistics Yearbook

Thermal power plants have serious environmental consequences. Electricity generation accounted for approximately 50 percent of the coal consumption in China, 40 percent of China’s total CO₂ emission (Yan et al., 2019). According to IEA’s forecast in 2018, China will continue to have a thermal-dominated power mix until 2040 due to thermal’s advantage in cost, reliability, and access. Thus, China’s electricity industry faces intense pressure of undertaking international CO₂ emission mitigation obligations (He et al., 2017; Pu et al., 2019; Wu et al., 2019).

Domestically, air pollution has caused elevated levels of social dissatisfaction. The central government has reaffirmed its commitment to control the deterioration of air quality.65 China is therefore in urgent need to shift to cleaner energy.

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65 China’s 19th Party Congress confirmed the importance of environment in the nation’s dream of rejuvenation. President Xi Jinping vowed tough battle against pollution to boost ecological advancement.
Shifting to clean energy is not a new idea. China has made huge investments in renewable energy, such as wind and nuclear, since 2000. But after two decades of stressed importance, fiscal subsidies, supportive policies, and guided financing, nuclear, wind, and solar only account for 2.0 percent, 9.2 percent and 7.3 percent of total electricity generation in 2018. The problem is less about capacity, but more about the challenge to integrate clean energy into the power system. The level of curtailment, or energy that is generated but not purchased because it cannot get on the electricity grid, has been high. A Paulson Institute study (2015) reports that China’s wind curtailment rate has bounced between 7 percent and 17 percent from 2012 to 2017, a level that is significantly higher than most wind-rich countries at 1-3 percent.

Clean energy has been hard to be integrated for the following reasons. First, previous studies showed that for a period of time cleaner energy is not commercially competitive against coal even after desulfurization (Zhang and Heller, 2004). Second, there is a lack of the coordinate mechanism for trans-provincial dispatch, giving grid companies little incentive to incorporate regionally concentrated wind or solar capacity. Third, renewable energy is less reliable due to seasonality, especially at peak hours.

**Challenging Financial Profiles of Market Participants**

*Independent Power Producers (“IPPs”)*

IPPs’ financial profile is characterized by volatile returns and high leverage. Return on equity of power generators has been on roller-coaster swing as shown in Figure 31. The profitability of the industry is very sensitive to coal prices. Credit Suisse estimated sensitivity to coal prices for IPPs. For a typical plant with 40 percent direct power purchase, the breakeven coal price is at RMB 450 per ton; for average listed IPPs, they face loss when coal price reaches between RMB 550-600 per ton.
Figure 31 Return on Equity of IPPs

![ROE Chart]

Source: China Electricity Council

Figure 32 IPPs’ Sensitivity to Coal Prices

<table>
<thead>
<tr>
<th>QHD5500 price (Rmb/t)</th>
<th>350</th>
<th>400</th>
<th>450</th>
<th>500</th>
<th>550</th>
<th>600</th>
<th>650</th>
</tr>
</thead>
<tbody>
<tr>
<td>IPP – typical plant with 40% direct power purchase</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ROE %</td>
<td>9.0</td>
<td>5.0</td>
<td>0.0</td>
<td>-4.0</td>
<td>-8.0</td>
<td>-12.0</td>
<td>-17.0</td>
</tr>
<tr>
<td>Unit EBITDA Rmb/KWh</td>
<td>0.45</td>
<td>0.38</td>
<td>0.31</td>
<td>0.24</td>
<td>0.17</td>
<td>0.10</td>
<td>0.03</td>
</tr>
<tr>
<td>Unit net cash profit Rmb/KWh</td>
<td>0.31</td>
<td>0.26</td>
<td>0.21</td>
<td>0.16</td>
<td>0.10</td>
<td>0.05</td>
<td>-</td>
</tr>
<tr>
<td>IPP – average listcos</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ROE %</td>
<td>11.7</td>
<td>9.0</td>
<td>6.3</td>
<td>3.3</td>
<td>0.4</td>
<td>-2.5</td>
<td>-5.8</td>
</tr>
<tr>
<td>FCF yield %</td>
<td>5.0</td>
<td>1.7</td>
<td>-1.7</td>
<td>-5.4</td>
<td>-8.7</td>
<td>-12.0</td>
<td>-15.6</td>
</tr>
</tbody>
</table>

Source: Credit Suisse (2016)
Coal fire IPPs’ leverage has been high compared to its domestic and international peers. Domestically, based on the database I have constructed in “A Snapshot of SOEs Now”, most power generators under the supervision of central SASAC have leverage ratios well above all SOEs average (Figure 33). The utility sector internationally has a leverage ratio of 50-60 percent.

**Figure 33 Leverage Level of Central SOE Power Generators**

<table>
<thead>
<tr>
<th>Leverage</th>
<th>2015</th>
<th>2016</th>
<th>2017</th>
<th>2018</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPIC 国家电力投资</td>
<td>82.4%</td>
<td>82.3%</td>
<td>81.4%</td>
<td>78.5%</td>
</tr>
<tr>
<td>Huadian 中国华电集团</td>
<td>81.6%</td>
<td>81.5%</td>
<td>80.7%</td>
<td>77.6%</td>
</tr>
<tr>
<td>Huaneng 中国华能集团</td>
<td>82.5%</td>
<td>82.5%</td>
<td>78.9%</td>
<td>77.0%</td>
</tr>
<tr>
<td>Datang 中国大唐集团</td>
<td>81.8%</td>
<td>81.5%</td>
<td>80.0%</td>
<td>76.4%</td>
</tr>
<tr>
<td>CEIC 国家能源投资集团</td>
<td>n.a.</td>
<td>62.8%</td>
<td>61.4%</td>
<td>60.8%</td>
</tr>
<tr>
<td>Average Central SOE</td>
<td>62.9%</td>
<td>62.9%</td>
<td>63.0%</td>
<td>61.6%</td>
</tr>
</tbody>
</table>

*Source: company filings and author’s analysis

Note: Leverage = Total Liabilities / Total Assets

**Grid Companies**

There are only two grid companies in China: State Grid (“SG”) and China Southern Grid (“CSG”), both of them are unlisted SOEs at the group level. State Grid ranked No. 2 in the 2019 Global Fortune 500 Company List with 917,717 employees, and China Southern Grid ranked No. 110 with 289,735 employees. “Size in itself is not evil, but it does give power to those who control it.”66 Before the 2015 reform initiatives, grid companies have the biggest market power along the value chain. They were the single buyer for any power generators. Regulators also need to rely on them to come up with specifics and carry out reform policies (Xu, 2017).

Return on equity has been relatively stable. ROE of SG and CSG swings between 3-6 percent from 2010 (Figure 34). Policy shifts can partially complain the swing, when pricing, tariff, or business model of grid companies are adjusted by

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66 Quote by Thurman Arnold
the NDRC. Market conditions, natural disasters, and the changing nature of their business mix probably play a role in explaining the rest.

Figure 34 Return on Equity of State Grid and China Southern Grid

This reasonable and healthy return profile of grid companies does not tell the whole story. Grid companies are not only in the T&D business. In fact, the traditional T&D business is only half of SG’s profits. In SG’s 2018 Social Responsibility Report, it committed to uplift its non-grid businesses to contribute more than 50 percent of SG’s total profits.

Over the years, State Grid has actively expanded in various financial segments. In 2010, SG consolidated all their financial business under one subsidiary, State Grid Yingda Group. Yingda has been one of the most comprehensive financial conglomerates in China, encompassing 10 companies in life insurance, P&C insurance, insurance brokerage, securities, banking, alternative asset management, and mutual fund. In addition, Yingda has investments in 23 financial institutions, including Huaxia Bank and Guangfa Bank. The financial business has a better return profile than industrial operations. In SG’s Development Strategy Guidelines issued in 2017, it planned to maintain a minimum of 15 percent ROE on its financial business segment.

In addition to expansion into the financial sector, SG also aggressively engaged in overseas expansion especially after the global financial crisis in 2008.
In a decade, SG has grown its overseas portfolio fast. By the end of 2018, SG’s total overseas assets reached US$65.5 billion, with investments in the Philippines, Brazil, Portugal, Australia, Greece, Italy, and Hong Kong. SG’s overseas expansion was never intended to bring electricity back to China, instead its objectives include: (1) to be globally credible so that it can become an international standard setter; (2) to build credentials to participate in other mature markets; and (3) to earn high returns and repatriate profits back. We don’t have specific return data of SG’s overseas investments, but in their investor presentation, they mentioned only one out of 11 overseas investments failed to meet the initial return target.

High returns for the non-grid businesses mean that the grid business’s profitability is much lower than what we see in ROE numbers for SG Group as a whole.

**Retailers**

One of the main objectives of the 2015 reform was to deregulate electricity sales in China. This reform policy of “let go two ends, grasp the middle” has shown a roadmap towards market competition at the retail end. Document No. 9 has indicated openness to private capital participating in retailing and electricity trading centers. In the following two years, more than 10,000 electricity retailers have been incorporated, out of which over 3,000 approved by electricity trading centers for trading.

The bread and butter business of retailers is to earn the spread between the price they charge small-scale end-users and the price they pay power generators and grid companies. There are three types of retailers other than the existing distribution companies by SG and CSG: (1) retailers owned by IPPs, (2) retailers owned by large scale end-users such as factories and refineries, and (3) unaffiliated retailers. Retailers fight for customers and market share with differentiation in price and services. Our interviewees pointed out that retailers owned by IPPs have the most competitive advantage because of information asymmetry.

The retail market is increasingly competitive, and as NDRC has lowered electricity prices, the profitability profile of the segment is increasingly

---

67 In Chinese known as “放开两头，管住中间”
challenging. Guangdong, one of the largest electricity markets, published an annual market report in 2018. The report mentioned that 20.3 percent of all retailers are operating at a loss. There is also a divergence between state-owned and private retailers. State-owned retailers, representing 49.2 percent of electricity usage in Guangdong, accounted only for 17.1 percent of the retailing earnings. Private retailers, on the other hand, had better profitability. With 30.5 percent of electricity usage representation, they accounted for 80.9 percent of the segment earnings.

**Past Reforms**

The electricity industry has gone through three phases of reform since the 1980s.

**Phase I: Towards Market Reforms**

Before the 1980s, China’s power industry was a highly controlled vertical integration. Lenin dictated the importance of the electricity industry in his statement “Communism is Soviet power plus the electrification of the whole country.” The Chinese government has made substantial investments in the sector, but the budget constrains in the 1980s forced the government to change the funding methods of large power generation and transmission projects. More autonomy was given to the local government along with the investment responsibilities. However, this limited change failed to solve the shortage problem. The government budget, both central and local, faced immense pressure to meet the increasing capital needs of the sector.

The government had to undertake the following two steps to reform the sector. First, in 1985, the “Provisional Regulations on Encouraging Fund-Raising for Power Construction and Introducing Multi-Rate Power Tariff” decentralized the central government’s sole investment authority. Local government, SOEs, private investors and even foreign investors were invited to build new power plants to expand the sector’s capacity to meet the surging demand. The policy allowed power generators to accelerate capital recovery and charge prices based on their

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68 The report is in Chinese, <广东电力市场 2018 年年度报告>
69 Vadirimir, Lenin (1920). Our Foreign and Domestic Position and Party Tasks. Moscow. Communism is Soviet power plus the electrification of the whole country, since industry cannot be developed without electrification.
costs to guarantee a competitive return. In 1995, China passed the first national electricity law, which solidified protection and recognition for new investors.

The results have been impressive. Broadened sources of investments pour into the sector to generate badly needed extra capacity. The central government was no longer the exclusive provider of power generation. The industry evolved into a dual system with state planning at the center and other investors as supplements. By the end of the 1990s, the non-central government power producers grew to account for 54 percent of the national total installed capacity (Zhang and Heller, 2004).

The power supply has dramatically increased, but it was still not enough. The surging demand from the industrialization process of the Chinese economy required a more dramatic and coordinated reform agenda to improve efficiency at all levels.

**Phase II: Separating Governmental and Business Roles and Introducing Competition**

As of the end of the 1990s, industrial SOEs were operating at continuing losses. The central government initiated the country-wide reform in 1997 to separate government administration from business operations. The second phase of electricity reforms started with the same initiative. In 1998, the Ministry of Electric Power Industry, which used to manage both the policy planning and the commercial operation of the sector, was abolished and replaced with the State Power Corporation of China (“SPCC”). The Ministry’s government functions were passed on to the newly established Electricity Department of the State Economic and Trade Commission (“SETC”).

In December 1996, the government established SPCC to take ownership of state-owned power generation assets and all of the high voltage power transmission grids and local electricity distribution networks. SPCC was responsible for the investment, development, construction, management, operation and ownership of

---

70 Annual added capacity to the system increased from 4-6 GW in the early 1980s to 10-12 GW by the end of the decade.

71 Hopewell built a BOT in China, one of the first in development countries.
power projects, the inter-connections of interprovincial and interregional electricity grids and the transmission of electricity across regions (Xu, 2017).

In March 1998, SETC was established to assume the governmental and administrative functions. The Electric Power Bureau was established within the SETC and given the responsibility of promoting reform policies and regulations, formulating development strategies, specifying technical requirements and industry practice and supervising the operation of the power industry.

Once the initial separation was completed, China started to conduct different experiments in search of a comprehensive reform plan. Six provinces (Liaoning, Jilin, Heilongjiang, Zhejiang, Shanghai, and Shandong) were selected to experiment with wholesale market competition, where a selected number of power producers participate in a limited competition that served a small fraction of market demand in each province. The result was clouded by the macroeconomic downturns after the 1997 Asian financial crisis. Serious electricity surplus crippled price levels, and the government had to cut all power producers’ generation quotas based on regional preferences and under-the-table arrangements.

The experiments in all six provinces were halted within two years for different reasons including suspected corruption and unfair treatment between state-owned and private-owned generators. Wholesale competition halted for another reason—the rise of provincial protectionism. The SPCC delegated more autonomy to provincial bureaus, who acted to protect and favor regional generators to preserve their local accords.

The conflict between central and provincial governments was highlighted by the dispute over the Ertan hydro station, known as the Ertan Waste Incident. In 1991, the World Bank loaned China US$380 million to construct the Ertan station in Sichuan province worthy of RMB 30 billion. Ertan was built with the help of many foreign countries, and financial support from both internal and external sources. The project was intended to alleviate the supply shortage in the Sichuan region, however, by the time the project was completed, the economic situation had changed. Ertan could not find enough demand for its installed capacity. From the first day of its operation, Ertan had to let a substantial amount of its capacity go

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72 In Chinese, 二滩弃水
waste, and therefore ran a significant financial loss. The SPCC’s Sichuan bureau was reported to discriminate against Ertan. The Sichuan grid company purchased electricity from its own power plants running at full capacity, but refused to buy from Ertan, citing that the price set by Ertan was much higher than the prevailing price of other power plants (Xu, 2017).

The dispute became a catalyst for future reforms. In December 2002, China announced the adoption of a different approach, which was similar to the global trend of electricity sector deregulation at the time. The goal was specified as “break monopoly, introduce competition, enhance efficiency, lower cost, improve pricing mechanism, better allocate resources, separate government from business, create open and orderly electricity market”. The approach aimed to replace central planning with market signaling. The central government abolished the SPCC at the end of 2002 and created seven state-owned power generation companies to take over SPCC’s generation and T&D assets. Huaneng, Datang, Guodian, Huadian, and China Power Investment Corp were the new power generators, and State Grid Corporation of China, and China Southern Power Grid split the T&D system. In addition, the State Electric Power Regulatory Commission was created as the independent industry regulator under the State Council. Pricing, however, would be supervised by the National Development and Reform Committee.

The second phase of reform achieved the separation of government and business and introduced multiple players in the power generation segment. The electricity industry experienced rapid expansion, with an average growth rate of 9.83 percent from 2002 to 2015. China became the world's largest power market. Despite the size expansion, market competition was limited because the pricing mechanism was still tightly controlled at both ends of the T&D segment. The politics between various entities, on the other hand, has become increasingly complicated.

Since the unbundling in 2002, reforms in the power sector were largely put on hold for more than a decade. Chen (2010) argues that the halting was a result of the

73 Stated in the Electric Power Sector Reform Plan (电力体制改革方案 5 号文), published in February 2002
74 State Grid would be the operator across northern China, and China Southern Grid would operate in three southern provinces (Guangxi, Yunnan and Guizhou).
power struggle between State Grid, NDRC, SERC, and five state-owned power generators, each with divisional interest and conflicting priorities. During that decade, power shortages and outage, corruption, and rising electricity prices frequently made it to the news headlines. Social discontent pressured the government to re-think its reform strategy going forward.

**Phase III: A Compromise**

In March 2015, the State Council issued the “Opinions on Furthering Reform of the Electricity Market”, known as Document No. 9. The main objective of the 2015 reform was to deregulate the retail sales end and allow better price coordination. The new reform policies in the supporting documents of Document No. 9 also aimed to address the following.

**Promoting the market-oriented pricing mechanism.**

First, the transaction price was expected to replace the existing on-grid price and would be determined by market supply and demand between power generators and large-scale end-users. This was regarded as an expansion of the Direct Purchase of Large Users policy (“DPLU”). DPLU indicated that a large user with high power consumption volume\(^{75}\) could negotiate a transaction price with generation plants, instead of accepting the government-set price. The electricity price for users therefore would consist of three parts: transaction price, T&D price, and government funds. The transaction price was supposed to be market-oriented, the T&D price would be determined by the NDRC, and the government funds determined and earned by the government. Second, for smaller customers, such as agricultural and residential users, who didn’t have access to the DPLU market, they were encouraged to purchase electricity from retailers through uniform trading centers.

**Establishing independent electricity trading centers and attracting private capital to the distribution segment.**

The trading centers, open to investments from private capital, were supposed to be independent of the grid companies. They would also be responsible for servicing the retail users.

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\(^{75}\) Usually, large users need to satisfy the annual electricity consumption of more than 100 million kWh, and the voltage level higher than 100 kV.
Promoting renewable energy utilization.

The Document called for enhancing the utilization of renewable energy at the provincial and trans-regional levels. Policies also steered the end-users to be in direct contact with renewable energy plants for demand-side coordination.

Repositioning the grid companies.

First, the business model of grid companies would be changed. Under the new pricing scheme, grid companies were supposed to only earn T&D price, which would be determined by the NDRC. Second, grid companies were expected to use enhanced information technologies to help end-users conduct demand-side management to improve energy efficiency.

The timing of the 2015 reform was deliberately chosen. Firstly, China ran a power surplus in supply around 2015, and coal price decreased by 30 percent in that year. As we will discuss in the next section, market reform is better pushed forward when the system is in surplus. Secondly, the Chairman of State Grid, Mr. Liu Zhenya was close to retirement age. The superpower of the state-owned grid companies has complicated the reform attempts before, a power vacuum at State Grid provided a window of opportunity. Chairmen of large central SOEs retire at age 63, and Liu Zhenya reached 63 in August 2015.

The 2015 reform was considered a moderate compromise. Even though the business model changed for grid companies, they have avoided overhaul to completely separate the transmission and the distribution segments. While transaction price is supposed to be market-oriented, but it is only market-oriented for large users; residential users might find the previous on-grid price lower than if they buy from retailers or trading centers (Zeng et al., 2016). Still, the authority of power system planning remains in the hands of local governments, in lack of a national power planning mechanism to coordinate regional distribution of demand (Figure 35). Though the 2015 reform brought up the importance of reforming the dispatching rule, how it would be implemented is not yet clear.

76 The initial intention of the NDRC was to unbundle State Grid by separating retailing services from T&D, however, the Document No. 9 only required State Grid to cooperate with local governments to provide equal access to competing retailers.
The effectiveness of the phase III policies is yet to be determined. But we can already start to see a couple of trends. First, profits of grid companies have trended down significantly as NDRC squeezed T&D price in order to lower electricity prices for industrial and retail users (Figure 36). Second, small power plants are shutting down. With a supply abundance in 2015 and 2016, and weak growth in demand for electricity due to macroeconomic situations, the transaction price has come down. As coal price has increased, many small power plants with a capacity below 300MW or operating life exceeding 20 years face a high risk of financial difficulties and shutdown. A broker report by UBS (2018) tracks the shutdown progress at the provincial level, and found that the actual shutdown had far exceeded the government target. In 2017, China closed 8.7GW of small-scale thermal plants, almost twice as much as its government target of 4.7GW.
Constraints

**Issuance Constraint: Trading Below Book**

SASAC stipulates that in order to prevent the loss in value of state-owned assets, all SOEs cannot transfer shares, either in primary or secondary markets, at a price below the company’s audited book value of the latest fiscal year\(^77\). In another word, no new issuance or divestment can happen if the company is trading below book value.

The following figure summarizes the trading situation of power companies. IPPs listed in Hong Kong have been trading below book value for an extended period of time (Figure 37). Datang (ticker: 991 HK) is currently trading at 0.59x P/B, Huaneng (ticker: 902 HK) at 0.69x, CR Power (ticker: 836 HK) at 0.68x, China Power International Development (ticker: 2380 HK) at 0.49x, Huadian (ticker: 1071 HK) at 0.61x, and Longyuan Power (ticker: 916 HK) at 0.69x.

\(^77\) According to 上市公司国有股权监督管理办法
IPPs are trading below book because the market is expecting supply issues and policy risk overhang will further erode power generators’ book value. This makes new issuance of stock infeasible under the SASAC rule of state assets preservation.

As for the grid companies, based on market judgment, it is challenging, if not impossible, for SG and CSG at the group level to list their shares above book value in the current market environment. Even though we do not have public information on SG and CSG’s financial breakdown, we can deduct from the overall financials to assess the possibility of a mixed-ownership reform to diversify their funding source. The conclusion is disappointing. The deduction goes as follows: If we assume that SG and CSG are priced at 1x book value, we can calculate their P/E ratio; then we can benchmark this deducted P/E number with prevailing P/E levels of other utility companies in the world. SG has a net asset of RMB1,701.7 billion, and a net profit of RMB56.5 billion in 2018. The deducted P/E ratio will be 30.1x. CSG has a net asset of RMB322.5 billion, and a net profit of RMB12.6 billion in
2018. The deducted P/E ratio will be 25.6x. The historical average P/E ratio of mature utility companies around the globe is around 12x – 18x. The SG and CSG valuation assuming 1x book value is unattractive to private capital especially if they two are likely to see further net income erosion and low ROE levels.

**Power Constraint: Unclear Regulation Coordination**

In his book Sinews of Power, Xu (2017) documents the complicated relationship between power sector companies and their regulators. SERC was created to serve as the independent regulator for the State Power Corporation, it was never granted the necessary authority to do so. Upon the unbundling of SPCC in 2002, the pricing power was placed under NDRC, not SERC. Approval power for power projects was also given to NDRC, instead of SERC. SERC urged that “the problem of allocation of responsibilities between SERC and other governmental subdivisions not only severely limits the capacity of SERC to regulate the electricity industry effectively, but also intensifies the functional overlaps and conflicts between government institutions.” But the government took no actions to address it.

SERC was handicapped in other ways. SERC was located in SGCC’s headquarters buildings, and its employees enjoyed the same benefits from SGCC as employees of its regulatory target. SERC staff dined at SGCC’s subsidized canteen, used SGCC’s facilities, and sometimes even asked SGCC’s employees for help when workload was uncommendable.

The unclear regulation coordination has caused confusion for grid companies to decide who to listen to, and who to pay attention to. SERC was abolished in 2013 and converted into the National Energy Administration (“NEA”). The NEA was placed under NDRC, which renders its independence as well as authority. According to my interviews with people working at State Grid, they only truly care about NDRC, because that’s the only government agencies with tremendous amount of power for pricing and market access. NEA to them is more of an annoying baby that needs to be pampered, while the NDRC is the real almighty calling shots.
Potential Solutions

Lessons from International Experiences

Before 1980, the electricity power industries almost everywhere on earth were organized and operated by state-owned entities or private-owned monopolies. The economies of scale were the focal point in the market design of vertical integration. Over the last three decades, electricity reform swept many parts of the world. While market configuration varies significantly among reform results (Table 12), and there is no international power sector reform model that fits China’s situation perfectly, there are some practices and learnings from other countries’ cases that China can benefit from.

Table 12 Electricity Sector Structure in OECD Countries After Reform

<table>
<thead>
<tr>
<th></th>
<th>Degree of Horizontal Integration</th>
<th>Vertical Integration</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Generation</td>
<td>Transmission</td>
</tr>
<tr>
<td>Australia</td>
<td>Mixed</td>
<td>High</td>
</tr>
<tr>
<td>Austria</td>
<td>Moderate</td>
<td>Moderate</td>
</tr>
<tr>
<td>Belgium</td>
<td>High</td>
<td>High</td>
</tr>
<tr>
<td>Canada</td>
<td>Moderate</td>
<td>Moderate</td>
</tr>
<tr>
<td>Denmark</td>
<td>Low</td>
<td>Moderate</td>
</tr>
<tr>
<td>Finland</td>
<td>Moderate/High</td>
<td>Moderate/High</td>
</tr>
<tr>
<td>France</td>
<td>High</td>
<td>High</td>
</tr>
<tr>
<td>Germany</td>
<td>Moderate</td>
<td>Moderate</td>
</tr>
<tr>
<td>Greece</td>
<td>High</td>
<td>High</td>
</tr>
<tr>
<td>Ireland</td>
<td>High</td>
<td>High</td>
</tr>
<tr>
<td>Italy</td>
<td>High</td>
<td>High</td>
</tr>
<tr>
<td>Japan</td>
<td>Moderate</td>
<td>Moderate</td>
</tr>
<tr>
<td>Netherlands</td>
<td>Moderate</td>
<td>High</td>
</tr>
<tr>
<td>New Zealand</td>
<td>Moderate</td>
<td>High</td>
</tr>
<tr>
<td>Norway</td>
<td>Low</td>
<td>High</td>
</tr>
<tr>
<td>Portugal</td>
<td>High</td>
<td>High</td>
</tr>
<tr>
<td>Spain</td>
<td>Moderate</td>
<td>High</td>
</tr>
<tr>
<td>Sweden</td>
<td>Moderate</td>
<td>High</td>
</tr>
<tr>
<td>Switzerland</td>
<td>Low</td>
<td>Moderate</td>
</tr>
<tr>
<td>Turkey</td>
<td>High</td>
<td>High</td>
</tr>
<tr>
<td>England</td>
<td>Moderate</td>
<td>High</td>
</tr>
<tr>
<td>United States</td>
<td>Low</td>
<td>Low</td>
</tr>
</tbody>
</table>

Source: IEA
### Reform Cases

Figure 38 summarizes the reform cases of UK, France, Japan, US California, US PJM, and Russia.

#### Figure 38 Comparison of Reform Cases

<table>
<thead>
<tr>
<th>Pre-reform Structure</th>
<th>UK</th>
<th>France</th>
<th>Japan</th>
<th>US California</th>
<th>US PJM</th>
</tr>
</thead>
<tbody>
<tr>
<td>State-owned vertically integrated</td>
<td>State-owned vertically integrated</td>
<td>Privately-owned vertically integrate</td>
<td>Vertically integrated investor and municipally owned utilities with right and obligation to serve</td>
<td>12 electricity companies, each vertically integrated</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Post-reform Structure</th>
<th>UK</th>
<th>France</th>
<th>Japan</th>
<th>US California</th>
<th>US PJM</th>
</tr>
</thead>
<tbody>
<tr>
<td>Three privately-owned segments: (1) national grid company (“NGC”); (2) regional distribution companies; (3) competing generators</td>
<td>Still largely dominated by EDF, the vertically integrated company controlled by the French government</td>
<td>Vertically integrated electricity companies separated by region.</td>
<td>Unbundling of generation from distribution</td>
<td>No mandatory unbundling, only 15 percent of total capacity for trading, PJM as an efficient operator but not owner of the grid</td>
<td></td>
</tr>
<tr>
<td>An electricity trading marketplace: compulsory power pool</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Reform Process</th>
<th>UK</th>
<th>France</th>
<th>Japan</th>
<th>US California</th>
<th>US PJM</th>
</tr>
</thead>
<tbody>
<tr>
<td>Privatization in the order of regional distribution companies (1990), NGC (1990, by distribution to the shareholders of regional distribution companies), and two generators (1991-1993.</td>
<td>The EU demanded electricity market liberalization in 2002, but France has been reluctant to privatize its state-owned nuclear power company EDF.</td>
<td>Incremental reform policies from 1996.</td>
<td>Reform policies in 1996: (1) establish electricity trading center (PX) and independent operator (ISO); (2) all electricity companies to hand over operation to ISO; (3) encourage electricity</td>
<td>Vertical consolidation reform policies: (1) separate account for generation, transmission, distribution and retailing, but no forced sale or unbundling; (2) PJM be the operator of the</td>
<td></td>
</tr>
</tbody>
</table>
Spin-off IPO of NGC.

Liberalization of the retail market: (1) direct purchase for 5,000 customers with demand over 1MW in 1990; (2) direct purchase for 50,000 customers with demand over 100kW in 1994; (3) all customers can participate in the power pool in 1999.

Under the pressure from EU, France agreed to create an electricity regulator, and to separate account for generation, transmission and distribution businesses.

No privatization of EDF in sight.

Increased competition in generation.

Intention to establish Power trading centers companies to exit generation; (4) separate generation, transmission and distribution within electricity companies; (5) lower electricity price by 10 percent in 1998, and 20 percent by 2002; (6) open up retail market for competition from 1998.

Electricity trading changed from power pool to NETA.

The reform resulted in huge power crisis starting from 2000

transmission system, not the owner of grid assets; (3) non-discriminatory access to grid; (4) electricity companies responsible for power reliability; (5) spot and futures market for risk management; (6) PJM provides settlement, hedging, allocation, and solving congestion

Takeaways

Power security and reliability are critical, reforms with missteps can have serious consequences, like the California dream turning into a nightmare. Here are some of the lessons learned and many issues that still remained to be debated. The key questions are (1) what makes an electricity market efficient and functional, and (2) what the opportunities and challenges are in the reform process. This list is not exhaustive nor is it in any particular order:

- **Electricity reform is highly risky and irreversible.** Once the unbundling or divestment process initiates, it is very difficult, if not impossible, to turn back. The cost of any mistake is high. The California experience surely suggests that market reform without caution can lead to disastrous outcomes.

### Box 5 The California Power Crisis

#### Electricity Reform in the United States

The U.S. electricity industry used to a regulated monopoly market, where investor-owned utilities (“IOUs”) had guaranteed exclusive rights to produce and sell electricity in a defined service territory. In 1978, the Public Utility Regulatory Policies Act of 1978 (“PURPA”) was introduced, and it established a cohort of independent generators for limited competition. In 1992, the Energy Policy Act of 1992 (“EPACT”) further required transmission companies to guarantee non-discriminatory access to the grid for all parties, opening up competition on the wholesale end. In 1996, orders issued by the Federal Energy Regulatory Commission (“FERC”) added on the requirements for information sharing, extending the deregulation to the retail level as well.

#### Electricity Restructuring Program in California

Before the restructuring, California’s electricity industry was dominated by three large IOUs. About 75 percent of Californians were customers of Pacific Gas Electric Company (“PG&E”), Southern California Edison Company (“SCE”), and San Diego Gas & Electric Company (“SDG&E”). Their prices and obligations were regulated by the California Public Utilities Commission (“CPUC”). The remaining 25 percent of the state’s electricity needs were met by publicly-owned municipal utility districts.

Following EPACT of 1992, industrial consumers were putting pressure on CPUC to evaluate the structure of the Californian system to lower electricity prices. Influenced by the structural changes that happened in Britain, the CPUC came to the conclusion that the state could create a competitive market in which suppliers were allowed to sell to customers
directly. In 1996, after years of debate, contemplation, and commenting, the CPUC issued a restructuring order, which included the following (Joskow, 2001).

- Unbundling of IOUs. The three large IOUs were required or encouraged to divest at least half of their fossil-fuel-powered generating plants.

- Retail “Customer Choice”. Customers could choose to buy power from their traditional utility or purchase it from other competitive electricity service providers (“ESPs”).

- Open Access. IOUs were required to provide open access to their T&D grid for both ends – the IPPs, the wholesalers, and ESPs.

- Wholesale Market Institutions. IOUs were directed to help create two new institutions for transmission and wholesale. The first was the California Independent System Operator (“CAISO”), which would operate the transmission networks, manage congestion, and provide ancillary services. The second was the California Power Exchange (“CALPX”), which would run the public wholesale markets for energy transactions.

- Market-based Pricing. To replace the cost basis pricing used by the CPUC before, CPUC has given wholesale marketers the authority to sell electricity at market-based rates determined in auctions.

- Transmission Charges. Transmission charges were composed of three types: access fees, congestions charges, and loss compensation.

**The Crisis**

The initial years of the restructuring went smoothly. Utility companies managed their costs under the price cap without significant operational disruptions. The wholesale prices were relatively stable since the new competitive PX market began operating in April 1998. But electricity demand in California grew much more quickly between 1996 and 2000 than had been anticipated. California added little new generating capacity for the latter half of the 1990s because of regulatory uncertainty clouding the restructuring debate.

In mid-May 2000, wholes prices began to rise above historical peaks. Many officials expected this rise to be short-term phenomenon because of rising demand in the summertime. However, wholesale prices did not fall as expected in autumn because unusually large amounts of generating capacity were out of service. The crisis was brought on by the “perfect storm” of hydropower shortages, natural gas shortages, emission controls, demand growth, plant outages, grid problems (HKS Case, 2001). All of these unanticipated events pushed wholesale prices to a new high in November.
Utilities were constrained by the price freeze, and their credit-worthiness evaporated quickly. In mid-January, PG&E and SCE were technically insolvent and they did not have enough cash to pay power generators. The PX ceased operation on January 31, 2001. Power generators refused to provide service unless they could collect payments from a trusted agency. The generation shortage exacerbated price soaring.

California was heading towards hundreds of hours of blackouts for the coming months and extremely elevated electricity prices. FERC finally adopted a price mitigation program that required generators’ bids to be capped at its marginal generating cost.

In June 2001, spot and forward prices eventually started to fall dramatically, back to normal.

**Figure 39 California Wholesale Prices ($MWh)**

![Graph showing California Wholesale Prices from Apr-98 to Jun-01](image)

*Source: Joskow, 2001*

- **Despite obvious advantages, the vertically monopolized model has a number of shortcomings.** Indeed, large companies could eliminate transaction costs by internalizing operations (Coase, 1937). Utility companies in general benefit society by cutting out the middleman, thus exemplify enormous economies of scale and scope, and offer significant cost savings (Michaels, 2005). However, the vertically integrated model is prone to over-investment in “gold-plating” projects with major cost overruns borne by customers or the government (Averch and Johnson, 1962). This was an issue in the 1980s in the US, where billions were invested in capital-intensive but loss-making nuclear power plants. Regulation at that time rewarded companies with a certain rate of return for their investment, therefore the cost-overruns were shifted to end-users.
• **Efficiency does not equal privatization, and vice versa.** Privately-owned but vertically integrated systems like the U.S. and Japan prior to their power reforms are not examples of efficiency. The key to enhancing efficiency is to unbundle generation, transmission, distribution, and retailing to diffuse vertically integrated market power. It is important to note that efficiency does not come without costs, unbundling requires to some extent the loss of cross-segment cost internalization. France, for example, has chosen to preserve its vertically integrated EDF because its reliance on nuclear makes bundling more attractive in the cost-benefit analysis. When it comes to the decision of whether the system or certain service components in the system should be privatized, one should assess the situation on an individual basis holistically, as market conditions, ideological conditions, and social welfare constraints all together shape the feasibility of the plan.

• **Price, if unmasked, can serve as an important informant for planning and coordination.** The biggest challenge of a regulated monopoly is that price signal becomes irrelevant, and the government can only be reactive in dealing with capacity balancing. Price distortion makes planning and coordination harder because of cross-subsidization among different segments. Energy allocation distortion, as a result of price distortion, results in factor inefficiency (Ouyang and Sun, 2014).

• **Retail market liberalization is better done in stages.** If we compare the retail market liberalization of U.S. California and U.S. PJM, price volatility is a key difference. Almost all electricity transactions in California were migrated to the spot markets instantly. PJM, by contrast, shifted its pricing mechanism to spot market in a more restrained way, where participants had two options of either bilateral contracting or bidding into the central dispatch system. A fully liberalized retail spot market is more vulnerable to market manipulation and price volatility because when supply is in deficit, one bid at a time determines the price for all customers. The CALPX average wholesale electricity price was volatile and escalating, resulting in a serious power outage in the 2000s. Better examples of retail market liberalization are the UK and Japan experiences, where the process was carried out in stages from large users only to full market participation.
- *Market reforms require good timing.* Reforms at times of insufficient capacity lead to higher prices and therefore social pressure to roll back. The best timing for reforms is when there is excess capacity, or a slowdown in demand growth.

- *Market reforms require continuous adaption.* Almost all electricity market reforms have experienced some problems at the outset. Policymakers must remain vigilant and be prepared to act quickly and decisively to fix problems when they surface. Market reforms require constant mid-course corrections, and they will be better executed if mitigation plans are in place to remedy serious public interest crisis.

**The Goals**

Joskow (2008) lists 11 conditions for a “textbook perfect” competitive market, which included:

- Privatization of state-owned electricity monopolies to create hard budget constraints and incentives for performance improvement;
- Vertical separation of competitive segments to guard against cross-subsidization;
- Horizontal restructuring of the generation segment to create an adequate number of competitors;
- The creation of voluntary public wholesale spot energy and operating reserve market institutions to support supply and demand balancing;
- The development of active “demand-side” institutions that help consumers manage market risk when there are variations in wholesale market prices;
- Efficient and non-discriminatory access to the transmission network by wholesale buyers and sellers;
- The creation of an independent grid operator who maintains reliability and manages transmission congestion
- The unbundling of retail tariffs to create transparency and limit cross-subsidization;
- The creation of independent regulatory agencies with good information and authority to enforce regulatory requirements;
- Clear transition mechanisms in place.
Most reforms in other countries have adopted or wish to adopt a variation of these themes. Judging by China’s past reforms along the lines of “separation of generation and grid, separation of core and non-core businesses, separation of transmission and distribution, and competitive on-grid market”, China has tried to reform its electric power sector using market-based policies.

Before we decide what would be the success criteria for China’s future reforms. It is important to be reminded of why further electricity reforms are imperative. First, the electricity price is driving investment decisions for industrial companies. Even though the price for residential electricity in China is below that of the United States, the price for industrial usage is higher. In 2018, the prices for ordinary industrial, heavy industrial, and residential in China were RMB0.7263, RMB0.5912, and RMB0.5331 per kWh. In the same year, the average prices for industrial, and residential in the United States were US$0.0692, and US$0.1287 per kWh. Second, fiscal sustainability is critical to supporting elevated levels of infrastructure investment to meet surging demand for energy coming from China’s 5-6 percent per year GDP growth. We need a financially inclusive system where social capital can participate and help lighten the burden of public finance. Third, there is still room for efficiency gains if prices are not distorted and can have signaling effects to balance supply and demand in real-time. Fourth, for environmental sustainability and air quality, China needs to shift away from coal-fire power generation and integrate renewable energy better on the grid system.

**Figure 40 Electricity Price Differential with the United States**

<table>
<thead>
<tr>
<th>(US$/kWh)</th>
<th>Industrial Price</th>
<th>Residential Price</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>U.S.</strong></td>
<td>0.0692</td>
<td>0.1287</td>
</tr>
<tr>
<td><strong>China</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ordinary industrial: 0.1068;</td>
<td></td>
<td>0.0784</td>
</tr>
<tr>
<td>Heavy industrial: 0.0869</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Difference</strong></td>
<td>Ordinary industrial: 54 percent higher than U.S.;</td>
<td>39 percent lower than U.S.</td>
</tr>
<tr>
<td>Heavy industrial: 26 percent higher than U.S.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

78 In Chinese, 厂网分开、主辅分离、输配分开、竞价上网
China’s future reforms need to build a functional, efficient, and sustainable electricity market. Future reforms shall strive to achieve:

- **Self-sustainability**: the market needs to attract new investment for infrastructure in an inclusive and sustainable way;
- **Operational and regulatory efficiency**: let price be the strong and unequivocal signal to supply and demand in real-time, and let the market forces enhance operational efficiency for transmission management and distribution sales;
- **Security and reliability**: electricity is crucial to people’s lives; a well-functioning market should be able to withstand shocks and survive;
- **Lower cost**: even though part of the price difference is explained by higher marginal fuel prices where China depends on coal and the U.S. on gas, the reform should aim to lower electricity costs for industrial usage to promote cost competitiveness of Chinese enterprises;
- **Shift to renewable**: policies should address the current bottleneck to promote the switch to renewable sources of power by creating incentives for grid companies to integrate excess renewable capacity.

**Roadmap of Proposed Future Electricity Reform**

Looking at the international experience, China’s electricity reforms have been heading in the right direction. Some might argue that the reform is too slow, and nothing fundamentally changed for over a decade from 2002 to 2015. I disagree with the criticism because the surging demand and constant shortage pressure of power put reforms on a peculiar footing. In power deficit environment, market reforms run the risk of instability. The government has been waiting for a window of opportunity to implement certain market reforms.

Some scholars argued that the government should further open up the power sector to social capital, citing the predominance of SOEs in the space. There is no hard hurdle for private or foreign capital to invest, however, the attractiveness of the sector’s profitability is putting off private capital’s interest. IPPs are trading
Reforms at the Commanding Heights

below book value, making them ineligible, by SASAC’s rule, to issue new shares to the market despite constant need for capital. Grid companies have a 3-4 percent ROE but grid business itself has a much lower return profile given half of grid companies’ profits come from their financial operations. Private capital, if allowed to invest in the grid infrastructure, will likely find the equity financing opportunity unappealing. Like what we are seeing in healthcare and railway transportation, the root cause is the distorted price signal. Without a pricing mechanism reform, any other measures of market reforms, be it mix-ownership or privatization, will just be barking on the wrong tree.

Future reforms on pricing mechanism need to be conducted in the following stages.

**Stage I: Solidify Initiatives of the 2015 Reform**

Firstly, the market-based pricing mechanism should continue to develop in the following ways:

- **Direct purchase for large users.** Larger users are encouraged to sign long-term contracts with generation companies directly. For generators, a long-term contract can guarantee them earning stability and provide them with incentives to lower operational costs. For large users, they benefit from lower-cost out of the bidding process.

- **The construction of a competitive retail market.** The retailers need to acquire customers based on their cost, services, and other bundling benefits to differentiate themselves. The retail users, small industrials or households, will gradually migrate to purchasing electricity from retailers who offer the best value proposition.

- **Non-discriminatory access to the grid.** A complete unbundling from distribution is a desired outcome for the retailing market. If provincial retailers owned by State Grid and China Southern Grid continue to exist, the government should establish transparent anti-monopoly rules to prevent access discrimination.

Secondly, the government needs to streamline the regulatory framework to spearhead the charge of further reforms. To date, China’s power industry is governed by three institutions: the NDRC, the NEA, and SASAC. Previously, we
have discussed the existing constrains of multiple agencies with conflicting agendas. The lack of institutional resources and the lack of a clear definition of regulatory power will likely render independence and effectiveness of the regulatory oversight.

Finally, initiatives of the 2015 reform are achieving promising results, where the retail market competition is benefitting the end customers with price cut and no power outage crisis during the transition period. If the reform assessment continues to be positive, the government should consider solidify it in the law amendment. Document No. 9 is a policy document without legal recourse. It has the risk of being overturned. Plus, some local governments claim that they are hesitated to implement certain policies in the Document No. 9, when these policies are in implicit conflict with or absent from the overarching Electricity Law (Pollitt et al., 2018).

**Stage II: Reform the Dispatch System**

China, unlike many other countries, is still operating under the “equal share” dispatch mode. The equal share dispatch rule assigns the number of operating hours to a plant in a year so that it recuperates its investment and operational costs during its economic life (Kahrl et al., 2013). Under this rule, the lower-cost generation plants will have the same, if not less, allotment of running hours in a year than higher-cost plants. A common practice used in other markets is dispatching based on merit, which dispatches electricity plants based on its operational costs. About 6 percent of coal used for power generation could have been reserved if China switched from equal share to merit-based (Pollitt, 2018).

China’s current dispatch system is a result of a period of serious electricity shortages before, when the government promised to provide enough operation time for generators to recover their investment cost and ramp up supply. However, this dispatch mode is often criticized for its low efficiency, energy waste, and environmental pollution. The debate about implementing merit-based dispatch rule in the Chinese power sector has been going on for over a decade, but the challenges to move away from the current equal share system are still prevalent.

A sudden shift to a merit-based dispatch system will cause financial losses to local generators, which hurt local government finances. According to a study by
Pollitt (2018), the break-even running time of the coal-fired power plants is about 5,500 hours per year, which is above the average running time of generators at all capacity levels. A merit-based dispatch system will further cut back thermal plants’ operation hours, making it even more difficult for generators to recover their investments. The power generation income is directly associated with a province’s fiscal income, which is a necessity for regional economic development as well as leadership’s career advancement. Most local governments are incentivized to keep the existing equal share mode, especially if they don’t have other power resources like wind, nuclear, or hydro.

The most efficient generators are large-scale SOEs under the supervision of central SASAC, which has little to do with local fiscal income apart from taxes. A merit-based dispatch system is likely to favor these large central SOEs, and force smaller local generators to close down. This means that the adoption of economic dispatch without compensation mechanisms will hurt many local government governments while benefiting the central government. The political economy of the market configuration should not be underestimated.

A dispatch reform without a pricing pass-through is simply an income transfer between different generators. In 2007, China launched a national campaign to increase the utilization of efficient and clean generators. In the *Measures for Energy Conservation Electricity Dispatch (Pilot)* issued by the State Council, the government selected five provinces to implement the Energy Conservation Dispatch (ECD), which dictates dispatching based on fuel efficiency and emission levels. Electricity prices and on-grid prices were still tightly controlled by the government. The new dispatch rule did not provide clear guidance on how generators should be compensated when the algorithm allocated less operation time to them. As a result, implementation of the ECD was halted in the experimental provinces and was never extended to the national level (Kahrl et al. 2016).

Therefore, a dispatch system reform has to come (1) after a market-based wholesale pricing mechanism is established, and (2) with a savings sharing mechanism to compensate local generators in order to gain political support.
Stage III: Allow Price Signal to Play a Major Role in Driving Efficiency

One of the potential risks of market reforms is social stability. If full cost pass-through is allowed in the system, a resource shock such as coal price surge will be passed on to end users. The central government is concerned about the social impact of rising electricity price, which include deterring economic activities of industrial enterprises and rattling social unease among citizens. The NDRC is tightly controlling the end-user price at this stage mainly for this reason. Under the current system, the gap between regulated price and market price comes from either the grid companies, IPPs or the government funds.

To let price play a decisive role in driving efficiency does not mean disregarding social stability concerns. I would propose a system where a shock in resource price will be passed from IPPs to the end users, but end users will be compensated in part by a government fund. This mechanism is similar to the idea of insurance where the end users are partially covered by the government. The end users will still face a co-payment of the increased cost. This way they still have a skin in the game to choose the most suitable generators. Generators, under this mechanism, will be sheltered from huge swings in earnings, thus maintain a healthy financial profile for future infrastructure investments. At the same time, they are incentivized to improve fuel efficiency, to lower operational cost, in order to fight for market share.
3. Railway Transportation

Chinese Railways (CR) has many contrasting faces. It is one of the largest railways in the world with supreme monopoly, yet it is heavily in debt and operating at a loss; it is the busiest railway, yet its inefficiency is at the center of criticism; it is the critical infrastructure that serves as the foundation of China’s socialist economy, yet it is constantly in shortage at times for freight and passenger traffic. CR is believed to be the “last piece of bone” for SOE reforms to chew on, and the “deepest water zone in reforms”.

Same as in healthcare and electricity, low returns, as a result of soft budget constrain and price regulation, are preventing private business and local governments to participate in railway investment, thus causing a shortage in railway traffic availability. Pure market-based reforms, such as outright privatization of the CR and deregulation of prices, would mean higher transportation costs for both business and especially railway passengers, who are mostly the less well-off bodies of the population compared to those who commute through air or car.

This section sets to consider the current situation of Chinese Railways, the past reforms and why they fell short to achieve the political objectives, and a menu of possible options for future reforms, keeping in mind both the dilemma and dual goals of efficiency and fairness.

Current Situation

The Network

As of 2018, China has 131,000 kilometers of railways, the second-longest network in the world. Its length has expanded rapidly over the past half century, from 21,810 kilometers in 1995 to 131,000 kilometers in 2018.

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79 Loss at the transportation segment of the business, excluding non-transport service segment
It is also among the busiest networks in the world. In 2018, the network delivered 3.375 billion passenger trips with 1,414.7 passenger-kilometers and carried 4.026 billion tonnes of freight with 2,882.1 billion cargo tonne-kilometers.
Figure 43 Freight Traffic of Chinese Railways

![Graph showing Freight Traffic of Chinese Railways from 2013 to 2018.](image)

Source: China Railway Statistics

As we can see in Table 13, although CR’s network has developed rapidly over the past four decades, in terms of quantity and quality, the network density in terms of density per capita and per km² is still low compared with that of other countries such as the United States, Japan, the United Kingdom, and even India. As a result, CR’s network is operating at a very high traffic capacity for passengers. Traffic units per route-km for China are 42.1 million, being more than 3 times that of Japan, and exceeds that of the United States, India, and the United Kingdom by an order of magnitude.

Table 13 Railway Comparison

<table>
<thead>
<tr>
<th></th>
<th>China</th>
<th>India</th>
<th>UK</th>
<th>USA</th>
<th>Japan</th>
</tr>
</thead>
<tbody>
<tr>
<td>Route-km</td>
<td>67,278</td>
<td>67,368</td>
<td>16,257</td>
<td>150,966</td>
<td>16,976</td>
</tr>
<tr>
<td>Route-km per 1,000 km²</td>
<td>7.0</td>
<td>20.5</td>
<td>66.7</td>
<td>15.4</td>
<td>44.9</td>
</tr>
<tr>
<td>Route-km per million population</td>
<td>48.3</td>
<td>49.8</td>
<td>244.5</td>
<td>461.4</td>
<td>134.2</td>
</tr>
<tr>
<td>Freight Tonnes-km (million)</td>
<td>2,146,466</td>
<td>620,175</td>
<td>12,512</td>
<td>2,445,132</td>
<td>21,265</td>
</tr>
<tr>
<td>Market share of freight (percent)</td>
<td>13.7%</td>
<td>~35%</td>
<td>12%</td>
<td>39.5%</td>
<td>5.2%</td>
</tr>
<tr>
<td>Passenger km (million)</td>
<td>685,213</td>
<td>1,149,835</td>
<td>2,900</td>
<td>10,660</td>
<td>197,254</td>
</tr>
<tr>
<td>Market share of passenger (percent)</td>
<td>41.0%</td>
<td>~10%</td>
<td>8.8%</td>
<td>0.8%</td>
<td>37.2%</td>
</tr>
<tr>
<td>Traffic units per route-km (million)</td>
<td>42.1</td>
<td>26.3</td>
<td>0.9</td>
<td>16.3</td>
<td>12.9</td>
</tr>
</tbody>
</table>

Source: World Bank, U.S. Department of Transportation, Office of Rail and Road of the United Kingdom

Notes: Traffic units = passenger-km plus freight tonne-km;
In China’s transportation system, the railway plays a critical role in passenger traffic, but it only accounts for 7.6 percent of overall freight tonnes and 13.7 percent of freight tonne-km (Figure 44). Even though logistics costs for railway is lower than that for expressways and air, railway is not the first choice for shippers. Railway’s percentage of overall transportation capacity in China is much lower than in other economies.

**Figure 44 China’s Transportation Segments**

Most trains in the network are for freight transportation (Figure 45). In freights, a relatively high proportion of its traffic is coal. As of 2017, coal alone accounts for 47 percent of all Chinese rail freight traffic (Figure 46).

**Figure 45 Number of Trains in the Rail Network**

![Pie chart showing the proportion of trains in the rail network.](image)

*Source: China Statistics Yearbook (2018)*

**Figure 46 Breakdown of Freight Traffic**

![Pie chart showing the breakdown of freight traffic by commodity.](image)

*Source: China Statistics Yearbook (2018)*
Operating Performance

Almost all rail operations are carried out by the China Railway Corporation ("CRC"), a state-owned enterprise created in March 2013 out of the Ministry of Railways. Unlike other central SOEs under the supervision of SASAC, CRC is 100 percent directly owned by the State Council.

Financial Performance

From annual reports and bond prospectus of CRC, we can see that CRC is currently operating at near accounting break-even point with a low return on equity. CRC’s business can be divided into two segments: transportation business (including passenger traffic, freight traffic, and railway construction) and non-transport businesses. Transportation business has been operating at a loss consistently, and the loss is made up of relatively healthy profit margins from non-transport businesses (Table 14). Why is the transportation business operating at a loss? Chinese railways have one of the lowest charges in both passenger and freight in our sample, with all charges order of magnitude less than that in other countries (Table 15).

Table 14 Financials of China Railway Corporation

<table>
<thead>
<tr>
<th>Return (%)</th>
<th>Asset turnovers (%)</th>
<th>2016</th>
<th>2017</th>
<th>2018</th>
<th>Average</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Return on equity (%)</td>
<td>0.00%</td>
<td>0.10%</td>
<td>0.10%</td>
<td>0.07%</td>
</tr>
<tr>
<td>Balance Sheet (RMB billion)</td>
<td>Total Asset</td>
<td>7,251.3</td>
<td>7,648.4</td>
<td>8,002.3</td>
<td>7,634.0</td>
</tr>
<tr>
<td></td>
<td>Total Liabilities</td>
<td>4,715.4</td>
<td>4,987.9</td>
<td>5,213.3</td>
<td>4,972.2</td>
</tr>
<tr>
<td>Revenue (RMB billion)</td>
<td>Total Revenue</td>
<td>907.4</td>
<td>1,015.4</td>
<td>1,095.5</td>
<td>1,006.1</td>
</tr>
<tr>
<td></td>
<td>Transportation</td>
<td>592.8</td>
<td>694.3</td>
<td>765.9</td>
<td>684.3</td>
</tr>
<tr>
<td></td>
<td>Passenger</td>
<td>281.7</td>
<td>319.7</td>
<td>357.0</td>
<td>319.5</td>
</tr>
<tr>
<td></td>
<td>Freight</td>
<td>257.5</td>
<td>316.0</td>
<td>352.2</td>
<td>308.6</td>
</tr>
<tr>
<td></td>
<td>Others</td>
<td>53.6</td>
<td>58.5</td>
<td>56.6</td>
<td>56.2</td>
</tr>
<tr>
<td></td>
<td>Non-transport</td>
<td>314.6</td>
<td>321.2</td>
<td>329.7</td>
<td>321.8</td>
</tr>
<tr>
<td>Cost (RMB billion)</td>
<td>Total Cost</td>
<td>872.4</td>
<td>958.5</td>
<td>1,035.2</td>
<td>955.4</td>
</tr>
<tr>
<td></td>
<td>Transportation</td>
<td>708.5</td>
<td>769.5</td>
<td>855.8</td>
<td>777.9</td>
</tr>
<tr>
<td></td>
<td>Before depreciation</td>
<td>585.6</td>
<td>633.5</td>
<td>680.4</td>
<td>633.2</td>
</tr>
<tr>
<td></td>
<td>Depreciation</td>
<td>122.8</td>
<td>136.1</td>
<td>175.4</td>
<td>144.8</td>
</tr>
</tbody>
</table>
There are two main indicators of labor productivity of railways: traffic unit per staff and train-km per staff (Wu and Nash, 2000). Traffic unit is the aggregate of passenger-km and freight tonne-km, and train-km is the unit of measure of distance which corresponds to the movement of a train over one kilometer. CR’s labor productivity in terms of traffic units per staff has improved significantly from 462,000 in 1980\(^{80}\) to 2,980,715 in 2017.\(^{81}\) However, train-km per staff shows a completely opposite picture. CR’s train-km per staff falls short from other countries. Wu and Nash identified this divergence in 2000 and argue that it reflects CR’s operational policy of using longer trains for passenger and heavier loads for freight, instead of running more trains and improving the frequency level due to the line capacity constraints. As of 2018, this divergence continues to hold.

\(^{80}\) Data from Wu and Nash (2000)
\(^{81}\) Passenger-km = 1,345 billion, freight tonne-km = 2,696 billion, staff number = 0.956 million
Table 16 Estimated Labor Productivity of Railways Among Different Countries

<table>
<thead>
<tr>
<th></th>
<th>Staff number (million)</th>
<th>Traffic unit per staff</th>
<th>Train-km per staff</th>
</tr>
</thead>
<tbody>
<tr>
<td>China</td>
<td>0.950</td>
<td>2,980,715</td>
<td>0.141</td>
</tr>
<tr>
<td>India</td>
<td>1.406</td>
<td>1,258,540</td>
<td>0.045</td>
</tr>
<tr>
<td>UK</td>
<td>0.037</td>
<td>416,541</td>
<td>0.432</td>
</tr>
<tr>
<td>USA</td>
<td>0.210</td>
<td>11,694,248</td>
<td>1.524</td>
</tr>
<tr>
<td>Japan</td>
<td>0.058</td>
<td>3,795,050</td>
<td>0.480</td>
</tr>
</tbody>
</table>

Source: Department for Transport of the UK, World Bank, U.S. Department of Transportation, Office of Railland Road of the United Kingdom (Transport Statistics Great Britain 2018: Modal Comparisons)

Note: Data of 2017

**Service Quality**

CR’s service quality has improved significantly over the past four decades, both in terms of traveling speed and waiting time for both freights and passengers. Wu and Nash record that in the 1990s, travelling speed of passenger trains was 49 km/h for passenger trains and 30.2 km/h for freight trains. Freight shippers usually must give 18 to 48 days advance notice to order a wagon and were permitted only 4 hours to load or unload, and passengers needed to wait more than 24 hours to get a hard bed ticket on congested lines. As of to date, China has the longest high-speed train network in the world. The average traveling speed of trains is about 70 km/h for passenger and 50 km/h for freight. With the development of the internet, passengers purchase tickets online. Freight shippers find it easier to request a wagon and are allowed more time to load and unload.

China’s railways, after a series of reforms and investments, have already improved its operating efficiency and traffic density on the existing network to world-leading levels. However, there is still prevalent capacity constraints in the system, which is one of the major reasons that railway transportation as a percentage of overall transportation is low compared to other transportation means such as highway and water.
Past Reforms

Phase I: Contract Responsibility System

In 1986, the Ministry of Railways piloted a contract responsibility system. The contract responsibility system would delegate operational power, including finance, wage, personnel, to bureau chiefs but required a certain level of asset values, profits, and economic returns. The system stipulated that 5 percent of railway revenues shall be repatriated to the Ministry of Finance, and all the remaining profits or losses would be borne by regional bureaus themselves (DRC, 2001).

Ding Guangeng was the minister, who pushed for the contract responsibility system to reform China’s railway system. In the end, he had to resign from his post, and waned with his career was the contract responsibility reform. Why had it failed to take off?

First and foremost, three catastrophic traffic accidents occurred within a month in January 1988. On January 7th, a train from Guangzhou to Xi’an was caught on fire in which 34 passengers died, 30 burned, and two cargos destroyed. Ten days later on January 17th, a passenger train from Harbin to Jilin collided head-on with another freight train in the Beiyinhe Station, causing 19 deaths, 76 injuries. One week later, on January 24th, a train from Kunming to Shanghai derailed, 88 people died, 62 severely injured, and 140 minorly injured. Ding had to take responsibility for the accidents and offered his resignation. Those accidents were not the results of the contract responsibility system reform. Catastrophic railway accidents were prevalent both before and after the reform initiation. Yet Ding’s resignation put a brake on the implementation of reform measures. Later on, the Ministry of Railways would consolidate power at the bureau levels back to central, in the name of safety concerns.

Secondly, the contract responsibility reform was objected by many bureau chiefs. The reform arranged bureau chiefs to be trained at Beijing Jiaotong University, and all needed to pass an exam after training to resume their posts. The responsibility system also required that managers who failed to achieve the

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82 In Chinese, 大包干
contract targets would be warned first and dismissed from their position if they continued to miss quotas. For bureau chiefs who were accustomed to job security, the contract responsibility system was a threat to their “golden bowl” jobs.

Other reasons include high inflation during 1986-90, a delay in fare adjustment, short-sighted behavior such as less incentive to invest in new lines, unrealistic quota set in contracts, a lack of positive incentive for individual managers to perform, and weak monitoring and supervision mechanism (Wu and Nash, 2000).

Phase II: Separation of Infrastructure from Operations

Externally, this is the key reform policy for the European rail network. Its success in Europe was highlighted by the fact that the separation allowed competing operators to share the same track and to offer particular services under franchise agreements.

Internally, in the early 2000s, the State Council established reform task forces under the direct leadership of Premier Zhu Rongji to reform monopolistic industries such as telecom, electricity, railways, and aviation.

Faced with a financial deficit in the rail sector, together with the dual pushes externally and internally, then minister Fu Zhenghuan came up with a comprehensive reform proposal *The Proposal for Railway System Reform*. With the help from the Development Research Center of the State Council (“DRC”), Fu submitted, revised, re-submitted the proposal back and forth for more than 30 times to the State Council, but his proposal still failed to secure the green light from top leadership.

In Fu’s proposal, DRC researchers noted that unlike other OECD countries, goals for rail reform in China are different. Four goals they identified were:

- Separation between government functions and enterprise management and between government functions and state asset management;
- Promotion of competition inside the rail sector itself;
- Creation of incentives for market-oriented investment;

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83 In Chinese, 网运分离
• The establishment of a sound, unified, impartial and highly efficient regulatory framework (DRC, 2001).

Specific reform measures included the following:

**Governance Reforms**

• Separation of government functions from enterprise management.
• Corporatization.
• Separation of social infrastructure and non-core businesses.
• Establishment of an independent rail regulation/supervision body.
• Revamping the state asset management system.
• Formulation of competition law and competition enforcement policy.
• Reformulation of the policy role of the Government.
• Separation of non-commercial from commercial operations and placing financial subsidy and compensation mechanisms on a sound basis.

**Pro-Competition Reforms**

• Promote intermodal competition by liberalizing private entry into motor and water, providing the necessary infrastructure for the use of private operators, etc.
• Promote competition within the rail sector by separating infrastructure construction and service operations and joint ownership

At the heart of Fu’s proposal lied the belief that efficiency can only be improved in the private hands, that “the only way out for the railway industry is to break through monopoly, allow competition, transform the administrative system and management mechanisms, and cultivate market-oriented entities”.

Before drafting the proposal, the Ministry of Railways had already initiated pilot the economic responsibility contract program with the management of Liuzhou, Nanchang, Hohhot and Kunming railway bureau. In the next year, the program was expanded to the entire railway network. Meanwhile, four railway bureaus had set up separate legal entities to provide passenger transport services. In addition, enterprises and activities that are not directly related to transportation services have begun to be stripped from the Ministry of Railways.
These reforms were stalled because top leadership considered the separation plus contract responsibility pilot a failure. Regional bureaus experienced huge losses following the pilot program. Zhenzhou bureau, for example, which was one of the most profitable bureaus before the pilot, suffered an RMB70 million loss in one year. A retired bureau official recalled in an interview that after the separation, the transportation scheduling power was still concentrated at the Ministry of Railways. The Chinese railway system was operating at full capacity, which means at peak times like the Chinese New Year, the Ministry of Railways might order regional bureaus to shoulder more passenger traffic services at a loss.

Conceptually, there are three drawbacks of the separation approach (Pittman, 2002). First, is the potential increase in transaction costs. The cost of maintenance in the UK after the separation of infrastructure and operation had increased by 50 percent, and the cost of upgrades had increased by 150 percent. Second, is the problem of sequential monopoly, which might increase the monopoly price on final products. Third, is a complex operating agreement between track owners and train operators that lacked legal clarity and enforcement capability.

**Phase III: Market-Oriented Reforms Under One Network**

After Fu’s separation proposal got shelved, new minister Liu Zhijun took the reform onto a completely opposite direction. Liu believed that the biggest challenge of China’s railway system is its capacity constraints. In his “Great Leap” reform decade, the Ministry of Railways would put on a huge amount of debt to fund railway track and high-speed train constructions. Liu would re-consolidate all previously delegated regional power back to the central Ministry, and manage funds, personnel, investments, scheduling, maintains, and operation centrally under one network. Fueled by leverage, the railway system experienced the fastest growth in terms of assets, capacity, and revenue in this period; train speed was upgraded at a leaping pace; and infrastructure upgrades were carried out systematically.

Liu’s consolidated control did bring efficiency to railway reforms, it also brewed rent-seeking and corruption. On 23 July 2011, two high-speed trains collided in the suburbs of Wenzhou. 40 people were killed, and 192 were injured. This serious traffic disaster led to a series of investigations, one of which exposed
minister Liu Zhijun to allegedly taking over RMB800 million in kickbacks connected with contracts for high-speed rail expansion.

Following Liu’s downfall, from 2013 to date, the government has initiated a new round of reforms. This time, the reforms were carried out in links with each other as a package proposal. The specific measures are as follows.

**Political System Reform**

The Wenzhou accident rekindled the long-awaiting urge to separate government functions and enterprise management. In 2013, the Ministry of Railways was dissected into National Railway Administration and China Railway Corporation. In 2017, the National Railway Administration was corporatized and started to report to the Ministry of Transportation. In 2019, China Railway Corporation was reorganized as China State Railway Group Co., Ltd under China’s Corporate Law, instead of industrial enterprise owned by the whole people.

**Investment and Funding Reform**

To diversify funding sources for the upgrade construction of the railway system, the NDRC established Railway Development Fund. The fund is structured similarly to a close-ended investment fund where social capital serves as a preferred limited partner. Social capital can expect to earn a steady stream of cash flow as returns, without direct participation in the construction, operation, and management of the railway system. The fund has a tenure of 15 years, with China Railway Corporation as the general partner. The fund is expected to raise RMB400-600 billion in two years, and the ratio of fiscal expenditures and social capital is expected to be between 1:2 to 1:3.

**Pricing Reform**

The goal of pricing reform is to allow freight charges to float according to market demand, and to allow passenger fares to have tiered price discrimination. For freight, NDRC allowed the operator to determine charges for full container, less than container, metals and 12 other transportation categories. For other freight charges, the operator can float the price upward to up to 15 percent. For passenger, China Railway Corporation raised the price for some first-class seats on high-speed trains by 30 percent. However, the pricing reform for passengers is dealt with extra caution, and its scope is limited to high-speed trains on some specific lines.
After the reorganization and corporation of China Railway Corporation, it is clear to see the central government’s push for the securitization of railway assets. Mixed ownership at the group level might be challenging given low/negative profitability, however, some specific lines might have promising return levels to attract outside investors. For example, Beijing-Shanghai High-Speed Rail is turning to be profitable and has initiated an IPO application in 2019.

**Constraints**

**The Features Constraint: Characteristics of The Railway Network**

Constrains of reforms stem from different characteristics of the rail network. A clear understanding of the characteristics below would also help us judge and eliminate some options put on the reform menu.

**Natural Monopoly**

Rail network is usually a natural monopoly. William Baumol (1997) coins the current definition of a natural monopoly as “an industry in which multi-firm production is more costly than production by a monopoly”. In other words, one firm is a natural monopoly if it can produce the market output at a lower cost than could two or more firms. In industries whose business model is based on network
infrastructures like the railroad, electricity grid, and gas network, are usually natural monopoly because of the economies of scale.

The literature on regulation for natural monopoly focuses mostly on identifying potential market failures and avoiding market power abuse by monopolistic enterprises. The arguments for regulation in the case of natural monopoly revolve around the fact that monopolies make society suffer a deadweight loss, as indicated as the shaded area in Figure 48. Other considerations include (1) inefficient price signals because prices will be set higher than marginal cost; (2) inefficient costs of production because the incumbent monopoly may engage in heavily investing in sunk costs to deter entry and protect its monopoly position; (3) product quality and dynamic inefficiencies due to lack of incentive to adopt new technology; and (4) political economy considerations (Joskow, 2006).

However, this is not to say all of natural monopolies should be regulated. In the end, it comes down to the cost-benefit analysis of such regulations. Luger (2008) identifies three circumstances under which regulation is unnecessary or even harmful: first, if market entry is free and instantaneously possible market pressures will eliminate monopoly power; second, regulation harms society if the cost of regulation is higher than the benefits; third, if it removes incentives for firms to innovate on the perspective of becoming a monopoly.

**Figure 48 Natural Monopoly and Deadweight Loss to Society**

Chinese railways fall into the third circumstance. The problem with China’s rail network as a natural monopoly is not a lack of regulation, but too much
regulation. There is no excessive return in the system, prices are kept low, the shortage is constant, and the monopolistic body is operating at a loss. As an illustration in Figure 48, price is regulated by the government at point Pc, where price equals marginal cost and consumer surplus is maximized. But the natural monopoly would be operating at a loss because the price is set below the long-term average cost line. Therefore, for the supply to be sustained at Qc, government subsidies in various forms need to be in place for the only operator to stay in business. At the same time, because of the implicit and explicit subsidies, new entries might be deterred if they do not have access to the same sets of subsidies. As a result, the suppressed price keeps competitors from entering, and the incumbent loses incentives to become profitable.

Club Goods

Goods can be classified according to two attributes: (1) whether they are excludable, namely if its supplier can prevent people who do not pay for it from consuming it; and (2) whether they are rival in consumption, namely if the same unit of the good cannot be consumed by more than one person at the same time (Ostrom and Ostrom, 1977). Figure 49 categorizes four different types of goods based on these two attributes.

Figure 49 Four Different Types of Goods

<table>
<thead>
<tr>
<th>Excludability</th>
<th>Rivalry in Consumption</th>
</tr>
</thead>
<tbody>
<tr>
<td>High</td>
<td>High</td>
</tr>
<tr>
<td></td>
<td>Private Goods</td>
</tr>
<tr>
<td>Low</td>
<td>Low</td>
</tr>
<tr>
<td></td>
<td>Club Goods</td>
</tr>
<tr>
<td></td>
<td>Common Resources</td>
</tr>
<tr>
<td></td>
<td>Public Goods</td>
</tr>
</tbody>
</table>

In most of the natural monopolies, goods and services provided are considered club goods because they are excludable and non-rivalrous. Club goods are also called artificially scarce goods because the quantity supplied is lower than the quantity in efficiency. Efficiency requires the producers to price goods at marginal
cost, which is lower than the average cost to break even. The economic theory of clubs represents an attempt to explain the under-supply equilibrium of a public goods provision (Buchanan, 1965; Oakland, 1972).

Club goods are not in Pareto equilibrium because congestion will arise as club size increases. Congestion costs can range from time loss on crowded highways, a reduction in aesthetic value in national parks, or in our case a lack of capacity in railways. Oakland (1972) argues that the optimality conditions for public goods for which congestion costs exist call for the rationing of the good among individuals through user charges.

**Externality**

The benefits and costs of railways are multi-dimensional. NDRC (2011) provides a quantitative framework to assess railway projects in China, covering construction costs of the projects, operation and maintenance costs of transport services, direct user benefits (mainly cost and time savings), transport safety impacts, congestion and overcrowding effects, exhaust emissions, and strategic environmental and sustainability analysis. This cost-benefit analysis, however, does not capture all the regional impacts. In addition, major infrastructure projects have impacts on labor productivity, employment, industrial growth and regional development. For policymakers, such externalities upon the regional economy and welfare are significant factors in planning and decision-making (World Bank 2014).

For passengers, a World Bank (2014) report assesses the regional economic impact of high-speed trains in the following three dimensions: (1) the effects of transport-induced agglomeration upon business productivity. The improvement in business productivity is very substantial especially in second-tier and third-tier cities, amounting to nearly 1 percent of municipal GDP per year; (2) employment effects. Evidence on job impacts are less clear, but service industries can afford to offer customers more accessible and higher quality services as the business-related travelers surge; (3) tourism effects. Tourist trips have been increasing rapidly to major attraction sites, but faster transportation might also reduce nights spend at the sites. Other scholars have collaborated similar findings, especially on railways’ impact on economic development (Zhang et al, 2014).
For freight, international experience points to substantial economic benefits of transportation infrastructure. Donaldson (2018)’s analysis focuses on the building of India’s railroad system from 1870 to 1930, and the dramatic expansion of the railroad network in America from 1870 to 1890. Donaldson contended that economic gains from transportation infrastructure can be substantial, because railroad reduced trade costs, increased shipment of goods, and generated other spillover benefits outweighing construction costs. But the true economic impact may not be known until years after a project is completed.

Aggregating all these externalities, both central and local governments will have a different return profile than private investors for railways. Regional economic benefits justify on-going railway subsidies by the state, but such regional impacts are not in private investments’ calculation for returns.

*Capital Intensive*

Railways are capital intensive. But it is easy to ignore exactly how intensive they can be. All infrastructures are capital intensive, but their scale can be orders of magnitude different.

I worked on the Hong Kong IPO of China Tower. China Tower was established on July 15, 2014, with three state-owned telecom companies (China Mobile, China Unicom, and China Telecom) as its shareholders. The idea was to separate telecom services with infrastructure construction and let the tower business go to capital markets for funding in the future. Three telecom shareholders sold all their tower assets to China Tower and signed long-term lease contracts with China Tower at market prices. By the time of China Tower’s Global Offering, its most recent net asset was RMB127.9 billion (as of March 31, 2018). The IPO was priced at the bottom of the price range, at HKD1.26 per share, valuating the company at 1.08x pro-forma price-to-book ratio.

China Tower IPO was a tough one because the size of the offering was large, connected party transactions were messy, and the profitability of the company had only just turned positive. Available funds on the market found the US$7 billion IPO size too large to swallow.
If China Railway Corporation were to do an IPO at the bottom 1.0x price-to-book valuation, offering only 5 percent of new shares, the IPO size would be USD144 billion, 8 times of the largest IPO size in the world’s history.

Privatization of China Railways Corporation, or even mixed-ownership at the group level, is merely not feasible, even after it starts to generate positive returns. Discussing privatization without considering who would be able to come up with the funds is just illusionary.

**The Competition Constraint: Competitiveness Among All Transportation Means**

Even though there is no internal competition, the railway system as a whole faces competition from other transportation means. This external competition determines how much room railways have to raise fares.

Over the past three decades, in freight transportation particularly, railway has lost a hefty chunk of market share to highway. Railway’s share of China’s freight volume-km shrank dramatically from about 36.0 percent to 13.7 percent between 1995 and 2017. By contrast, the market share of highway freight jumped from 13.1 percent to 33.8 percent during the same period. One reason is the surge of white goods faster than dark goods. While the volume of dark goods has remained a steady growth in the past decades, white goods has expanded much faster. The majority share of new white goods transportation is in highways rather than in railways.

Considerations in deciding freight transportation methods include costs, speed, and availability/flexibility.

- **Costs:** Railway has a sizable cost advantage compared to highways.
  
  Surveys and empirical studies showed that costs for highways in the range of RMB0.53 – 0.68 per tonne-km. We can also estimate the cost of railway logistics using total highway transportation costs divided by total freight tonne-km on highways. Highway logistics are estimated to account

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84 SASAC has a rule that no SOE can sell shares at a price below 1.0x price-to-book ratio.
83 General Motors’ IPO in 2010 was $18bn in size.
86 Data from National Statistics Yearbook
87 Dark goods are used to describe coal and other raw materials; white goods are anything other than dark goods, including food, merchandises, etc.
for 56 percent of total logistics costs to society, and 57 percent of highway logistics are for transportation.\(^{89}\) NDRC reported that total logistics costs to society were RMB13,354 billion in 2018. Total freight tonne-km of highways was 6,677 billion. Therefore, highway transportation cost per tonne-km is RMB0.64. After rounds of price increase for railway freight fares, the most recent fare hike in 2014 puts average costs of railway transportation at RMB0.1451 per tonne-km.

- **Speed.** *Railway transportation has similar transit speed as highways, but the turnaround time is much longer, thus average speed is disadvantaged.*
  
  Average speed is estimated to be the average distance divided by average turnaround time, which includes transit time, stop time, loading and unloading time for each transportation service. According to Bain & Co (2017)’s survey, the transit speed of major highways is nearly 50-60 kilometers per hour on the road. The average distance for highway transportation was 181 kilometers in 2017, which means for an average transport, the service can be performed within a day. Even if we make a generous assumption of loading and unloading time, say 2 hours, the average speed of highway transportation is 20-30 kilometers per hour. As for railways, even though transit speed of railways can reach 50-80 kilometers per hour on main lines, turnaround is much slower for rails than highways. The average distance of railway freight transportation was 731 kilometers in 2017.\(^{90}\) Railway’s wagon turnaround time is 4.35 days as of 2017.\(^{91}\) Therefore, the average railway speed is 7 kilometers per hour

- **Availability/Flexibility.** *Highway transportation is much more accessible and flexible.* Anecdotally, China’s rail freight services have been notorious for their complicated application procedures and a lack of availabilities.\(^{92}\) Empirical evidence is hard to find, but the corruption cases to obtain railway freight quota can indirectly attest to the shortage. The most recent high-profile case is the bribery case of former minister of railways Liu Zhijun. Ding Yuxin, a Shanxi businesswoman, was accused of giving more

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\(^{89}\) According to internal report of HuoLaLa, one of the market leaders in highway transportation for freights.

\(^{90}\) Number from China Statistics Yearbook of 2018

\(^{91}\) Number from CEIC

\(^{92}\) See South China Morning Post’s opinion piece on January 10, 2014, which discussed freight rate hike by China Railway Corp.
than RMB49 million in bribes to Liu between 2004 and 2011 partly to obtain quotas for her company. Apart from application complications, less than container shipment usually needs to wait for the container to be filled before departure, which can take days with no predictability. For white goods in particular, speed and punctuality are critical in market competitiveness. Railways cannot compete with highways in these aspects.

Figure 50 Average Speed (km/h) of Traffic on Major Highways

<table>
<thead>
<tr>
<th>Route</th>
<th>Length (km)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Guangzhou - Beijing</td>
<td>2,318</td>
</tr>
<tr>
<td>Harbin - Beijing</td>
<td>1,273</td>
</tr>
<tr>
<td>Xi'an - Beijing</td>
<td>1,226</td>
</tr>
<tr>
<td>Changsha - Shanghai</td>
<td>1,203</td>
</tr>
<tr>
<td>Chengdu - Wuhan</td>
<td>1,195</td>
</tr>
<tr>
<td>Wuhan - Chongqing</td>
<td>951</td>
</tr>
<tr>
<td>Shanghai - Wuhan</td>
<td>869</td>
</tr>
<tr>
<td>Guangzhou - Shanghai</td>
<td>1,426</td>
</tr>
<tr>
<td>Beijing - Shanghai</td>
<td>1,375</td>
</tr>
</tbody>
</table>

Source: Bain

The picture for rails in passenger service is brighter than freight. For passenger services, rail fares, of either ordinary or high-speed trains, are on average cheaper than that of aviation and highways. According to a broker report (CICC, 2018), the fare rate for ordinary passenger transportation is RMB0.21 per person per kilometers, lower than RMB0.78 per person per kilometers for airplanes and RMB0.28 per person per kilometers for cars (Figure 51).

In addition to its cost advantage, railways are considered more punctual, more comfortable, more reliable and more hassle-free at security checks. Especially with the utilization of high-speed trains, transportation time has been shortened in par with total time spent if traveling by air.
The Break-even Constrain: Attractiveness for Social Capital

Private firms will only supply goods and services if they expect to at least recover the costs of providing these goods and services. The costs include both direct costs, depreciation, fixed asset investments, and opportunity costs of capital. If the regulation sets prices lower than the overall costs of investment, private firms will not voluntarily supply the services, and private investors will not find the opportunity attractive. Supply and demand will not clear and low prices will lead to shortages in the system.

This is what is causing the lack of interest from private equity investments into the railway industry in China. China Railways Corporation’s transport business is a negative ROE segment, and the overall net profitability of the firm even after expanding the non-transport segment with healthy margins is close to zero.

To make railway construction and operation attractive for private investors, the rail system should target at least 3-5 percent in return, in par with Chinese long-term treasury yields. Return comes from either an increase in revenue and/or a reduction in cost. On the revenue side, as the rail system is operating at almost full capacity, revenue increase relies on price hikes on the transport segment or a further expansion of the non-transport segment with healthy margins. On the costs
side, wage accounts for a majority of variable costs for rails, the reduction in cost points to fewer employees and higher labor productivity.

**The Political Constraint: Social Welfare and Political Feasibility**

Price hike in commanding heights industries is always a politically controversial topic due to both ideological conservation and fairness considerations.

Rail, like healthcare, electricity, water, and other resources, in a socialist economy is considered a governmental service, which should not be used to make a profit. Every time there was a price hike, waves of criticism and cries to question whether the action would be anti-socialism surfaced. For example, in 2013, when asked about the recent price adjustment in railway at the National People’s Congress, representative Wang Mengshu expressed the following with passion.  

“If railways are in the hands of capitalists, our socialist revolution would be meaningless. The stable price for railway transport has been crucial and irreplaceable to the development and stability of Chinese society...were capitalists to take control of our railways, more than 10 million employees and their families would be ruthless exploited, with no human rights and dignity left....Privatizing of Chinese railways is a part of American grand strategy to contain China!”

Indeed, rail price is heavily subsidized by the government, and is distortedly cheaper than other transportation means, and that’s what is preventing railway companies to turn profitable so that more social capital can be attracted to expand the already congested system. These are the logical reasons to argue for a price hike. However, ordinary people, especially with the leadership of a couple of die-hard socialist strong-heads, care less about logic for the big picture, but much more about how the price adjustment is going to impact their own lives, and how the gesture is indicating a contradiction of the Party’s vow to be for the people instead of making money from the people.

One way to smooth the criticism is carrying out price adjustment at small incremental a time. Pacing helps to smooth the additional cost to people’s lives at a rate they don’t notice. However, pacing with silence might not be enough. News

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93 News report can be found on [http://www.hongqi.tv/xywch/2013-03-11/3980.html]
reporting, online discussions will eventually cite total price hike over an extended period of time, and people are going to feel the cost of their tickets or their food price has gone up two times over a couple of years.

The narrative is key, and communication strategy is absolutely critical, were any price adjustment to be carried out going forward.

Another reason that drastic price hike can be politically difficult is that it stands in contrast with social welfare. The market-based price hike will hurt the less-well-offs more evidently than it will do to the wealthy. A majority of the passengers on rails are choosing rails because they are the cheapest option, and they cannot afford to purchase an air ticket. Out of the 1.4 billion population in China, there are still nearly 1.0 billion who have never been on an airplane. For those who are working away from home, in bigger cities or industrial regions, a round-trip railway ticket to go back home for Chinese New Year can be a big fracture of his or her annual savings. If price hike is carried out across the board, these workers might not be able to afford going home once a year, an already sympathetic situation for their families.

In addition to passenger transportation, if freight transportation becomes more costly, the chain effects might also raise price for coal, then electricity, for grains, then food, for fertilizers, construction materials, and many other necessaries.

On the other hand, for the rich, none of these costs will be material to alter their lifestyles or standard of living. The pain out of pure market reforms will be felt and borne mainly by the less-well-offs, a concept that is socially unjustified from a welfare point of view.

Potential Solutions

Reforming a national railway, let alone the size of Chinese Railways, is a great challenge for most countries. The World Bank presents in its conference that “railways are one of the most difficult economic sectors to reform. It is extremely unusual that railway and government have the vision to understand clearly the future transport needs of the economy and develop a reform program in advance to meet those needs. In most countries, rail reform is done too late, and it is done in a
costly and fragmented way: the economy gets bad rail service and it pays too much for it.” (World Bank, 2005)

China Railways’ characteristics provide us with helpful guidance toward finding the right set of solutions for different segments in the rail business. Constrains discussed above can help us eliminate some options on the menu because they are either financially infeasible or politically suicidal. Figure 52 puts up the menu for summary.

**Figure 52 Menu of Options for Railway Reforms**

<table>
<thead>
<tr>
<th>Options</th>
<th>Feasibility</th>
<th>Reasons</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ownership Reform of CRC Group</td>
<td>☐</td>
<td>The deal, even the slightest mixed-ownership reform, would be very challenging for the market to absorb at above 1.0x P/B</td>
</tr>
<tr>
<td>Universal Price Hike</td>
<td>☐</td>
<td>Political suicide that might lead to social unrest</td>
</tr>
<tr>
<td>Encourage Social Capital to Invest</td>
<td>☐</td>
<td>Social capital shies away from investing in railways because the current industry cannot meet sustainable return requirement</td>
</tr>
<tr>
<td>Price Differentiation</td>
<td>☐</td>
<td>The natural monopolistic nature calls for price differentiation</td>
</tr>
<tr>
<td>Securitizing Individual Lines</td>
<td>☐</td>
<td>Synergy with coal companies, as well as feasibility on capital markets for individual line IPO</td>
</tr>
<tr>
<td>Introducing Internal Competition</td>
<td>☐</td>
<td>Corporate governance reforms and capital markets allocation aimed to improve incentives for performance</td>
</tr>
</tbody>
</table>

Here I propose the following package, as illustrated in Figure 53. It is important to stress the wholeness and the sequence of the package. First, none of the solutions should be taken and judged in isolation, because particular considerations are given to the linkage of different segments. For example, the solutions for passenger services and freight services should be different because they face very different constraints and problems. But they are connected in terms of public
confidence, sharing capacity, and investment sources. Second, the sequence is staged to building momentum, win support both internally and externally, and ensure a smooth implementation of the plan.

Figure 53 Potential Solution Package in Sequence

**Step 1: Turn Financially Sustainable**

Negative returns are at the root of a lack of investment interest from social capital and even local government, it is also the reason that China Railways Corporation’s balance sheet is made up of an almost unbearable amount of debts. Railways have to turn profitable to be operationally and financially sustainable.

**How Much is Enough?**

To turn CRC into a positive profit territory, many parameters can change. While on the cost side, it is less politically feasible to reduce labor force and less space left to squeeze from negotiating better deals with suppliers, the revenue side has more room for maneuvering. It is important to assess how much price adjustment and capacity expansion will be enough to deliver a 5 percent return on equity, slightly higher than long-term treasury yield. For a utility company to steadily deliver 5 percent ROE with moderate growth, the equity story will be attractive enough for investors who are searching for defensive yield.
The illustrative model below shows that even if we make conservative assumptions, a price adjustment of 8 percent per year for freight and 5 percent per year for passengers, should help CRC as a whole achieve our pre-set ROE target in 3 to 4 years (Figure 54).

We made the following assumptions:

- Operation capacity to growth at 8 percent, the same as the growth rate of newly constructed rail lines
- Non-transport business to grow at 5 percent, in line with previous growth in the segment
- Gross margin for the non-transport business remains the same as 2018
- Costs of transportation (before depreciation) grow at the same rate of capacity expansion
- PP&E and net asset to grow at 8 percent, in line with the aggregate growth rate in the past couple of years
- Depreciation as a percentage of PP&E remains steady
- Construction fund deduction in profit remains the same as 2018
- 15 percent tax rate for profits before tax

**Figure 54 Illustrative Model of CRC Financials with Price Adjustment**

<table>
<thead>
<tr>
<th></th>
<th>2018</th>
<th>2019</th>
<th>2020</th>
<th>2021</th>
<th>2022</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Capacity</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Freight tonnes-km (billion)</td>
<td>2,882.1</td>
<td>3,112.7</td>
<td>3,361.7</td>
<td>3,630.6</td>
<td>3,921.1</td>
</tr>
<tr>
<td>Growth %</td>
<td>8%</td>
<td>8%</td>
<td>8%</td>
<td>8%</td>
<td>8%</td>
</tr>
<tr>
<td>Passenger kilometers (billion)</td>
<td>1,414.7</td>
<td>1,527.9</td>
<td>1,650.1</td>
<td>1,782.1</td>
<td>1,924.7</td>
</tr>
<tr>
<td>Growth %</td>
<td>8%</td>
<td>8%</td>
<td>8%</td>
<td>8%</td>
<td>8%</td>
</tr>
<tr>
<td><strong>Price Change</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Freight</td>
<td>8%</td>
<td>8%</td>
<td>8%</td>
<td>8%</td>
<td>8%</td>
</tr>
<tr>
<td>Passenger</td>
<td>5%</td>
<td>5%</td>
<td>5%</td>
<td>5%</td>
<td>5%</td>
</tr>
<tr>
<td>Non-transport</td>
<td>5%</td>
<td>5%</td>
<td>5%</td>
<td>5%</td>
<td>5%</td>
</tr>
</tbody>
</table>
### Balance Sheet

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Growth %</td>
<td>8%</td>
<td>8%</td>
<td>8%</td>
<td>8%</td>
<td>8%</td>
</tr>
<tr>
<td>Net asset (RMB billion)</td>
<td>2,789.0</td>
<td>3,012.1</td>
<td>3,253.0</td>
<td>3,513.3</td>
<td>3,794.3</td>
</tr>
<tr>
<td>Growth %</td>
<td>8%</td>
<td>8%</td>
<td>8%</td>
<td>8%</td>
<td>8%</td>
</tr>
</tbody>
</table>

### Total Revenue

<table>
<thead>
<tr>
<th>Transportation</th>
<th>2012</th>
<th>2013</th>
<th>2014</th>
<th>2015</th>
<th>2016</th>
</tr>
</thead>
<tbody>
<tr>
<td>Passenger</td>
<td>357.0</td>
<td>404.8</td>
<td>459.1</td>
<td>520.6</td>
<td>590.4</td>
</tr>
<tr>
<td>Freight</td>
<td>352.2</td>
<td>410.8</td>
<td>479.2</td>
<td>558.9</td>
<td>651.9</td>
</tr>
<tr>
<td>Others</td>
<td>56.6</td>
<td>56.6</td>
<td>56.6</td>
<td>56.6</td>
<td>56.6</td>
</tr>
<tr>
<td>Non-transport</td>
<td>329.7</td>
<td>346.2</td>
<td>363.5</td>
<td>381.7</td>
<td>400.8</td>
</tr>
<tr>
<td>Total</td>
<td>1095.6</td>
<td>1218.4</td>
<td>1358.3</td>
<td>1517.8</td>
<td>1699.6</td>
</tr>
</tbody>
</table>

### Total Cost

<table>
<thead>
<tr>
<th>Transportation</th>
<th>2012</th>
<th>2013</th>
<th>2014</th>
<th>2015</th>
<th>2016</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cost before depreciation</td>
<td>680.4</td>
<td>734.8</td>
<td>793.6</td>
<td>857.1</td>
<td>925.7</td>
</tr>
<tr>
<td>Depreciation</td>
<td>175.4</td>
<td>189.4</td>
<td>204.6</td>
<td>220.9</td>
<td>238.6</td>
</tr>
</tbody>
</table>

### Return

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Construction Fund</td>
<td>-40.8</td>
<td>-40.8</td>
<td>-40.8</td>
<td>-40.8</td>
<td>-40.8</td>
</tr>
<tr>
<td>Tax</td>
<td>15.8</td>
<td>9.7</td>
<td>18.2</td>
<td>28.7</td>
<td>41.5</td>
</tr>
<tr>
<td>Net Income</td>
<td>2.0</td>
<td>55.2</td>
<td>103.3</td>
<td>162.5</td>
<td>235.0</td>
</tr>
<tr>
<td>Return on Equity</td>
<td>0.07%</td>
<td>1.83%</td>
<td>3.18%</td>
<td>4.63%</td>
<td>6.19%</td>
</tr>
</tbody>
</table>

Over 4 years, a total price increase of 36 percent for freight, and 22 percent for passengers, given the assumption that there is no productivity or efficiency improvement, should be enough to restore profitability of the entire company to a level attractive to equity investors, be it from local government, social capital, or others.

The price increase will not be an extra disadvantage for railways from a cost perspective. As we have described in constraint analysis above, freight fare for
railways is only one quarter to one-third of that for its main competitor—highways. Logistics operators are increasingly opting to use highways because of availability, flexibility and quicker turnaround. The transmitting effects, from price increases to profitability restoration then finally to more sustainable expansion of rail capacity, can help with these pain points that railways suffer now.

Price adjustments proposed here are meant to be for the system as a whole, but they do not mean that within the segment all the subcategories of services will have the same share of the hikes. Keeping in mind the social welfare concerns and political feasibility concerns in mind, we need to dive deeper into how exactly the price hikes should be divided up.

**Differentiation for Passenger Services**

From both perspectives of social welfare and political feasibility, price hike shall not be borne uniformly, especially when the trend of rising grassroot populism is sweeping the globe. People in specific demographics or specific segments of the wealth spectrum have the highest elasticity in emotion in response to policy shifts. For example, moderate price increases can fuel mass and disruptive demonstrations, which later evolve into violent protests and fatal confrontation.

In France, the yellow vests movement is initiated by a 23 percent price hike in diesel prices and a 15 percent price increase in petrol in 2018, with taxed on both petrol and diesel increasing at the same time. The movement, started with majorly truck drivers, quickly attracted millions of participants spanning the whole political spectrum. Protestors blocked roads with constructing barricades, clashed violently with police, smashed store windows, set cars and buildings on fire, all to express their frustration that a disproportionate burden of government’s tax reforms was falling on the working classes. In Chile in October 2019, the President declared a state of emergency as protests torched dozens of buses, buildings and destroyed the city’s metro stations. The unrest started mainly by students against the hike in metro ticket prices, which increased from 800 pesos to 830 pesos ($1.13 to $1.17) by 4 percent for peak-hour travel. For a country with 22,874 dollars GDP per
Reforms at the Commanding Heights

$0.04 subway fare hike seemed trivial, but this trivial increase brought out rage and unleash that no policymakers anticipated.

Price adjustment, especially for prices directly paid by the population, needs to be smoothed. More than smoothing, it should also be differentiated amongst different customer segments. The natural tendency of an unregulated natural monopolist, assuming it is profit-maximizing, is to price discriminate (Posner, 1999). Because of economies of scale, and because a natural monopolist’s marginal cost is lower than his average total cost, he should design a rate schedule that enables the poorer consumer to purchase at a price closer to the marginal cost than the wealthier consumer is charged. This kind of price discrimination serves in favor of the less affluent and against the more affluent consumers. Posner further argued that under conditions of natural monopoly, price discrimination “may be the only feasible method of pricing consistent with an efficient allocation of resources.”

Therefore, a price hike for passenger services should be smooth and differentiated, with little increase for less affluent consumers and more for more well-off riders. However, mapping out individual demand curve or differentiating through wealth levels is impractical. Specific strategies of differentiation require detailed customer profiling. For example, one possibility is to differentiate by high-speed and conventional rails. Figure 55 shows the income distribution of passengers on high-speed and conventional rails varies, with income on conventional trains being about 65-75 percent of that on the high-speed rail services (World Bank, 2016). High-speed rail fares are low compared to other transportation means and compared to those in other countries, pointing to a possibility to raise price on high-speed while keeping conventional rail price unchanged.

Even within high-speed, price adjustment can be further differentiated based on its speed of 200-250 kph or 300-350 kph. The World Bank survey mapped out different levels of cost coverage to the traffic volumes needed to achieve coverage, and the orange dots showed the actual 2016 traffic densities for sixteen 250 kph projects and fifteen 350 kph projects. Most of the 200-250 kph lines are below the dark blue line, showing that they cannot even cover the operating and maintenance

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94 According to the World Bank, GDP per capita adjusted by purchasing power parity (PPP), in 2018
costs. The situation with 300-350 kph lines is more promising, where all of the lines can cover basic operating costs and almost half of them can earn a positive profit after interest.

Figure 55 Income Distribution and Monthly Income of Rail Passengers, 2015

Source: World Bank, CRC

Figure 56 Breakeven Passenger Density at Opening

Source: World Bank
Note: kph = km/h; O&M = operating and maintenance; pkm = passenger-kilometers.
One thing to caution is the cost-plus reform that the government is piloting. In 2015 and 2016, the National Development and Reform Commission liberalized the fares on new railway passenger lines financed by private capital or wholly owned by China Railway Corporation, allowing fares to be independently adjusted based on a uniform method of cost recognition. Cost-plus regulation in general raises difficulties. Berg and Tschirhart (1988) point out that because operators can pass along prices to customers as costs increase, they would have less incentive to control costs. Worse, they might even have an incentive to generate higher costs by retaining inefficient employment, paying out higher benefits, or undertaking excessive corporate expenditures. Another hypothesized incentive for firms is to operate with too much capital, known as the Averch-Johnson effect. Even though empirical findings regarding this hypothesis are mixed, the model highlighted the vulnerabilities of cost-plus regulation in general.

Were the cost-plus regulation to continue, mechanisms to curb costs should also be in place in parallel to ensure operators do not abuse cost accounting rules.

*Differentiation for Freight Services*

Similar to passenger service, a price adjustment for freight service is needed to restore financial sustainability of the railway system. Freight is more complicated than passenger because it has a transmitting effect through an intermediate level of goods and services provided. Elasticity and implications of the freight goods along the value chain are important to the differentiation strategies. For instance, price increase for freight services will raise transportation costs for coal miners or agricultural producers, who will choose a combination of absorbing the rising cost by themselves or passing along it to the downstream such as electricity generator or agricultural distributors.

What are critical to determine elasticity is market competitiveness and efficiency of the downstream industries. Theoretically, electricity generation and transmission are in an oligopolistic or monopolistic state in China now, thus a rise in coal transportation will be transmitted along the value chain, resulting in a highly elastic rise in electricity price for all households and business production. Agricultural or other manufacturing industries paint a rather different picture.

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Downstream in these areas, like food or manufacturing goods distribution either by the producers themselves (maybe through online platforms like JD.com, Alibaba) or distributors (such as supermarkets, Suning stores), have much more competitive markets. Of course, more empirical studies are needed to affirm this hypothesis. If proven, the logical solution for freight service fare differentiation is to have non-coal products share a bigger portion of the price hike than coal.

**Risk Management: Control and Communication Strategy**

Any price adjustment is risky by nature from a political point of view, no matter how carefully designed. Like what we have seen in France, Chile, and many other countries, a rising tide of grassroots populism is prevailing. Against this background, any caution of populist unrest in response to price adjustment is not an over-statement.

Facts are less important. Price adjustment can be portraited as an exploitative way for the state to make money from its citizens. It can incite a sense of unfairness when living costs or traveling costs are rising to the extent that people cannot afford. These claims might lack logical or factual foundations, because for example China’s railways are not exploitative at all, and the government is heavily subsidizing in a fiscally unsustainable way.

Ideological implications will be questioned. Chinese society will always be haunted by the question of whether we are the socialist or capitalist economy. Scholars, commentators, representatives, or even conservative officials might swing the ideology sword to block the capitalist hydra. They have a specific interpretation of socialism, right or not, whether because they believe in it or because they need it as a tool to serve some vested interest.

Controlling the narrative is therefore essential to the successful implementation of future reforms. The public needs to be educated on the basis of price adjustment, namely, to restore sustainability in railway construction to solve the shortage or congestion problems travelers or logistic operators face.

But the public will not read this report, nor will they care about the logic, numbers, data, or evidence. Instead, they need stories, stories that can trigger emotional understanding. A story of ordinary railway worker working hard with a modest salary, a story of a private investor who has lost money in financing
railways, a story of fruit farmer who cannot get freight transportation quota to ship his products before they rot, a story of a man who is able to make it to his mother’s bedside before she passes away because of high-speed trains made available. These are true and moving stories that I heard during my field research. These are stories that can reach the heart of the public and cater to people’s emotion of sympathy.

In politics, perceptions dictate behavior, and realities sometimes weight less than beliefs, passions, and obsessions. A wholistic and carefully curated communication strategy, centered around shaping people’s perception, is of paramount importance to risk management, to ensure successful implementation of such reforms.

**Step II: Securitize Individual Lines**

We have already criticized the solution suggesting privatization or mix-ownership reform at the China Railway Corporation’s group level, because its sheer size would make any issuance or transfer too large to swallow for the market. The same problem is true if mix-ownership reform is tried at the regional bureau level. To ensure feasibility given general market conditions, mix-ownership reforms will be suitable for individual lines, one after another pacing through a period of time.

**Reorganization and Corporation**

As the first step of any mix-ownership reform, individual lines, especially those with better financial performance and operational efficiency, shall be incorporated as individual legal entities under China Railway Corporation and its regional bureaus.

The reorganization would also require independent auditing, internal control, and separate financials for at least two to three years before tapping capital markets, either primary or secondary.

**Co-investments from Coal Miners for Dedicated Coal Transportation Lines**

Half of freight rail capacity is reserved for coal, and until capacity is freed from dark goods, we can see few lines dedicated to logistics. The mixture of dark goods and white goods is part of the reasons for the long turnover time. We propose a pilot to have dedicated coal lines with co-investment from coal miners.
One case in point is China Shenhua Energy Co. Ltd’s railway network. Shenhua Group is the largest state-owned coal-based mining and energy company. Its business includes China’s largest coal production, sizeable power generation, and importantly its own network of railways. Shenhua’s railway network consists of 6 lines with a total operating length of approximately 2,155 kilometers. Its Shenshuo and Shuohang Rail Lines together form one of the two primary dedicated eastbound coal freight rail lines in China. As of 2018, Shenhua completed 280 billion tonne-kilometers of turnover volume on self-owned railways, growing at a steady rate.

Shenhua’s railway network has been a competitive advantage for its coal business. Shenhua’s 2005 IPO prospectus stated “the national rail system is the primary supplier of long-distance coal transportation for many coal producers. Despite the PRC government’s efforts to increase rail capacity, China’s national rail system has been unable to fully satisfy the need for coal production. With energy demand rising, the shortage of coal transportation capacity has become a key bottleneck in the PRC energy sector. Coal producers who have secured reliable and sufficient access to rail and port transportation capacity therefore enjoy a significant competitive advantage. While the PRC government has adopted a medium- to long-term investment plan to expand the capacity of the national rail system, the inadequacy of coal transportation capacity on the national rail system is expected to continue for the foreseeable future.”

As a result, unit economics for the rail business has been extraordinary and stable, in direct contrast to it of the national system. From Figure 57, it is obvious that Shenhua’s rail segment has a very healthy margin of operation with an incredibly stable earning profile.
Figure 57 Shenhua Rail Segment’s Key Financials and Unit Economic Figures

<table>
<thead>
<tr>
<th></th>
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<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Revenue</td>
<td>Rmb m</td>
<td>17,526</td>
<td>19,558</td>
<td>21,306</td>
<td>22,926</td>
<td>25,006</td>
<td>29,969</td>
<td>30,626</td>
<td>27,232</td>
<td>33,530</td>
<td>37,586</td>
<td>8.8%</td>
</tr>
<tr>
<td>Gross profit</td>
<td>Rmb m</td>
<td>8,451</td>
<td>9,596</td>
<td>10,433</td>
<td>11,024</td>
<td>11,427</td>
<td>14,867</td>
<td>15,884</td>
<td>12,637</td>
<td>16,180</td>
<td>18,954</td>
<td>9.4%</td>
</tr>
<tr>
<td>EBIT</td>
<td>Rmb m</td>
<td>7,758</td>
<td>8,801</td>
<td>9,690</td>
<td>9,896</td>
<td>10,283</td>
<td>13,590</td>
<td>14,298</td>
<td>10,070</td>
<td>15,000</td>
<td>17,675</td>
<td>9.6%</td>
</tr>
<tr>
<td>EBITDA</td>
<td>Rmb m</td>
<td>9,533</td>
<td>10,592</td>
<td>11,721</td>
<td>12,004</td>
<td>12,650</td>
<td>16,151</td>
<td>17,558</td>
<td>13,957</td>
<td>19,635</td>
<td>22,533</td>
<td>10.0%</td>
</tr>
<tr>
<td>FCFF</td>
<td>Rmb m</td>
<td>5,093</td>
<td>4,550</td>
<td>4,373</td>
<td>-2,286</td>
<td>-14,115</td>
<td>-6,518</td>
<td>-886</td>
<td>4,911</td>
<td>12,066</td>
<td>12,730</td>
<td>10.7%</td>
</tr>
<tr>
<td>Capex</td>
<td>Rmb m</td>
<td>-2,501</td>
<td>-3,842</td>
<td>-4,926</td>
<td>-11,816</td>
<td>-24,194</td>
<td>-19,271</td>
<td>-14,869</td>
<td>-6,529</td>
<td>-3,819</td>
<td>-5,384</td>
<td>8.9%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Margin</th>
<th>Mean</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Gross</td>
<td>48%</td>
<td>49%</td>
</tr>
<tr>
<td>- EBIT</td>
<td>44%</td>
<td>45%</td>
</tr>
<tr>
<td>- EBITDA</td>
<td>54%</td>
<td>54%</td>
</tr>
<tr>
<td>- FCFF</td>
<td>29%</td>
<td>23%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Unit economics</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
<th>2011</th>
<th>2012</th>
<th>2013</th>
<th>2014</th>
<th>2015</th>
<th>2016</th>
<th>2017</th>
<th>08-17 CAGR</th>
<th>13-17 CAGR</th>
</tr>
</thead>
<tbody>
<tr>
<td>ASP</td>
<td>Rmb/t km</td>
<td>0.1158</td>
<td>0.1093</td>
<td>0.1109</td>
<td>0.1081</td>
<td>0.1105</td>
<td>0.1143</td>
<td>0.1137</td>
<td>0.1128</td>
<td>0.1236</td>
<td>0.1238</td>
<td>0.7%</td>
</tr>
<tr>
<td>Unit cash cost</td>
<td>Rmb/t km</td>
<td>-0.0645</td>
<td>-0.0601</td>
<td>-0.0605</td>
<td>-0.0614</td>
<td>-0.0651</td>
<td>-0.0624</td>
<td>-0.0606</td>
<td>-0.0711</td>
<td>-0.0683</td>
<td>-0.0656</td>
<td>0.2%</td>
</tr>
<tr>
<td>Unit EBIT margin</td>
<td>Rmb/t km</td>
<td>0.0512</td>
<td>0.0492</td>
<td>0.0504</td>
<td>0.0467</td>
<td>0.0455</td>
<td>0.0518</td>
<td>0.0531</td>
<td>0.0417</td>
<td>0.0553</td>
<td>0.0582</td>
<td>1.4%</td>
</tr>
<tr>
<td>Unit EBITDA</td>
<td>Rmb/t km</td>
<td>0.063</td>
<td>0.0592</td>
<td>0.061</td>
<td>0.0566</td>
<td>0.0559</td>
<td>0.0616</td>
<td>0.0652</td>
<td>0.0578</td>
<td>0.0724</td>
<td>0.0742</td>
<td>1.8%</td>
</tr>
<tr>
<td>Unit FCFF</td>
<td>Rmb/t km</td>
<td>0.0336</td>
<td>0.0254</td>
<td>0.0228</td>
<td>-0.0108</td>
<td>-0.0624</td>
<td>-0.0248</td>
<td>-0.0033</td>
<td>0.0203</td>
<td>0.0445</td>
<td>0.0419</td>
<td>2.5%</td>
</tr>
</tbody>
</table>

Source: company filings
Dedicated coal freight lines also mean that Shenhua’s cost of operation can be exceedingly stable, its punctuality to deliver to customers can be counted on more than its competitors, and its cross-value-chain margin as a whole can be higher than other pure coal miners (Figure 58 and Figure 59).

**Figure 58 Shenhua’s Operating and Cash Costs**

![Shenhua’s Operating and Cash Costs](image)

*Source: Company filings*

**Figure 59 Shenhua’s Net Income Margins Compared to Industry**

![Shenhua’s Net Income Margins Compared to Industry](image)

*Source: WIND*

*Note: Net income margin = net income from core business / sales from core business; industry players include all companies under the category coal mining (煤炭采选业) in WIND database.*
Shenhua’s prediction of inadequate capacity still holds today, even though it is to a lesser extent than 2005. Current rail capacity to Northern ports, taking coal from three key producing provinces to ports where coal is further shipped to southern coastal and inland consumption centers, of around 1.2 billion tonne per annum (“tpa”) is barely enough to meet existing coal transportation demand. The existing capacity consists of Mengji Line’s 200 million tpa, Daqin’s 450 million tpa, Shenshuo/Shenhung Line’s 350 million tpa, and Shanxi Mid-South Line’s 200 million tpa (Figure 60). Even though coal consumption is unlikely to grow substantially, but even the expected 0.7 percent annual growth will strain existing capacity. A fifth backbone rail, the North-South Mengji Line is now in operation and is expected to alleviate some pressure when it opens up shipment route directly to Southern inlands (Figure 61). However, Menghua only has 200 million tpa of capacity, still not enough to make up of the Southern deficit as supply shrinks.

Figure 60 Existing Bohai Rim Rail Capacity

Source: UBS broker report

96 Daqin Line is a public listed company, number from management discussion in public documents.
Thus, there are still financially attractive investment opportunities for coal miners to consider investing in rail capacity expansion. One or more coal miners, private or state-owned, can form a consortium together with the government funding to build dedicated freight lines for coal transportation. The shareholders shall enjoy absolute advantages in price and/or availability when transporting their own coal, while the line can also provide services to external entities should it has extra capacity.

One should note that the nature of this configuration will make co-invested lines hard to be securitized again on the secondary capital markets. This non-market pricing mechanism and heavy connected-party transactions might render dedicated lines ineligible for IPO in the future.
Strategic Investment and IPO of Individual Lines

As we have discussed in the previous section, securitization of the group is practical given China Railway Corporation’s sheer size. The same is true even for regional bureaus. A feasible alternative is to perform mixed-ownership reform at the individual line level. If the price adjustment is successful, and profitability of individual lines can be restored to around 5 percent dividend yield, equity participation can be attractive enough for private capital to chip in.

As multiple capital market cases have shown before, before the public offering, companies benefit from having a pre-IPO strategic investment round, to diversify its shareholder base, test water and set market price, strengthen internal control through the board, attract public attention, and cornerstone the issuance. Similarly, individual rail lines can consider raising a round of primary investment before going public directly, to familiarize themselves with capital market rules.

Likely investors who will be interested in the issuance are the following:

- Insurance companies and pension funds: they have long duration liabilities that need long-duration stable-cash-flow investment returns to match.
- Sovereign wealth fund: they look for sizable deals that are uncorrelated with the rest of their allocation portfolio.
- Mutual funds: they look for defensive stocks that will be less impacted by market cycles.
- Trust companies or other wealth managers: similar to mutual funds, their cost of funding is around 3 percent for short-term money management.
- Finance companies of other SOEs: some SOEs have very strong cash flow and are looking to manage their cash in a yield-searching way.

After the pre-IPO round, individual lines can start their preparation for IPO. Other considerations such as listing venue (Shanghai stock exchange v.s. Hong Kong stock exchange), listing window, legal construction (H-share v.s. domestic) should be assessed at the time.

97 Almost all large size IPOs such as China Post, China Tower, Sinopec Marketing are preceded by a pre-IPO round of financing
98 This is the general market condition for 2019, market situation might change in the future
Step III: Introduce Competition

Conceptually, private capital investment and capital market oversight are conducive, if not necessary, ingredients for better corporate governance. In return, better corporate governance elevates performance of firms. The relationship between corporate governance and transparency is apparent, and corporate governance at its core involves the monitoring of the corporation’s performance and setting out a reward and punishment mechanism to better align interest (Gilson, 2000). Capital market streamlines standard to evaluate managers’ performance and brings onboard diligent oversight by investors and the board on corporate conducts such as investment decisions, cost budget, and expansion plans.

Institutional investors can help alleviate agency problems, which include: (1) engaging in dialogue with management with a mutual understanding of the goals; (2) evaluating overall governance disclosures and monitoring performance related to shareholder values; (3) raising questions and requesting information when it comes to financial decisions. Although these actions might not prevent managers from making certain decisions given that institutional investors will only have a minority stake, the oversight can at least exercise power in pushing managers to do better preparation.

Corporate Governance

Empirical evidence evaluating corporate governance and financial performance are mixed in other regions. On the one hand, scholars argued that there is no strong correlation. For example, Black et al. (2006) evaluated 515 firms in Korea and found that corporate governance has a positive influence on firm value, yet it is less likely to predict higher firm profitability. On the other hand, evidence is pointing to direct association. Drobetz et al. (2004) assessed 91 firm data in Germany and concluded that corporate governance is positively associated with firm value and stock return; With the data from 357 firms in Thailand, Alba et al. (1998) proposed that firms with higher ownership concentration and weaker corporate governance have lower profitability. Another study by Agarwal and Knocher (1996) studied 800 Forbes firms and found presence of non-executive directors to be negatively linked with firm value, and the relationship between insider ownership and firm value to be inconclusive.
But empirical evidence in China is more promising. Yang (2013) used 676 Chinese listed company’s panel data from 1997 to 2007, and found the following: (1) the relationship between state ownership and firm performance is a reverse U shape; (2) shareholding by institutional investors is positively associated with company’s financial performance; (3) no statistical significance in the relationship between non-executive board member and firm performance. Yang’s conclusion means that for companies like China Railways which are 100 percent owned now, lower state ownership and higher institutional investor holdings can potentially be associated with better company performance.

Corporate governance reforms after the securitization of individual lines can include the following:

- Disclosure and monitoring: to enhance transparency;
- Decision-making process: to curb irrational investment decisions;
- Internal controls: over financial reporting, auditing, hiring practices, and legal compliance;
- Employee stock ownership plan: to better align interest between managers and shareholders. Decisions about (1) specific methods, be it restricted shares, options, or stock purchase plans, (2) scope, (3) lockup period, (4) vesting schedule can be made when the time comes according to the market practice and universal rules about state-own asset management.

**Internal Competition**

By internal competition, I refer to the competition amongst different lines to obtain better resources to expand. Two levels of competition will be present. First, competition between managers for career advancement and financial rewards. Of all the listed and unlisted lines, the management team of each line is evaluated on the absolute performance level as well as in comparison with its peers. Management performance is also evaluated based on how well they execute and deliver budget goals. Second, competition between companies for financial resources to expand. Well-run firms with stable profitability and better corporate governance will have better market access for future fundraising. The Ministry of Transportation will continue to make overall plans for railway development, but
the decision to inject one line into certain listed entity can depend on that listed company’s ability to raise money from the market.
4. Telecommunication

Telecom reforms in China have not only helped establish and develop the largest and fastest-growing telecom market in the world, but they have been successful at achieving other political goals. The study of telecom reforms is critical, because it provides us with a model that other network sectors can learn from.

Similar to other network sectors, the telecom industry has a quasi natural monopoly with network effects. But unlike other commanding height industries such as electricity or rail, telecom is even more ideologically sensitive. The telecom network carries intelligence and information, which are critical for national security and ideology propaganda. The telecom network is essential to the communication apparatus. Therefore, the liberation efforts for telecom have been stricter to limit nonstate or foreign involvement. All three telecom operators are state-controlled. Foreigners are not permitted to control network operations. Private participation is limited to portfolio investment through minority stock ownership with limited managerial influence.

But a tighter control from the state does not mean significant deadweight loss for customers. The government has sliced up the monopoly and created internal competition. As we will see in the following section, competition between three operators has brought better services and cheaper prices, but it also resulted in duplicated infrastructure investment and worsening financial profiles.

It is interesting to observe, that China was able to finance the explosive expansion of network infrastructure without either liberalizing or privatizing the telecom sector. The government has also maintained control over access and contents for ideologic purposes, free from foreign involvement. China successfully introduced fierce competition among operators, even when all of them are state-controlled. The state-intervened or state-introduced competition did not come naturally, the uneven path of China’s telecom reforms centers around the political economy of institutional struggles (Zhang, 2002; Wu, 2008).
Yet, with growth plateauing, the telecom industry is confronted with new challenges that past model of success cannot overcome.

**Current Situation**

**Satisfying Achievements**

The Chinese telecommunications industry has enjoyed a remarkable period of growth under the unique model of state-managed duopolistic competition. In sharp contrast to the 1980s when land lines were scarce and mobile phones were first introduced, currently China is the largest telecommunications market with a phone popularization rate of 126 per 100 persons.\(^99\) In the 1980s, mobile phones were inaccessible to ordinary families. A handset used to cost around RMB20,000, plus an extra fee of RMB6,000 for telecom network services. The average salary at the time was no more than RMB100. Nowadays, China’s telecommunications industry has achieved adequate infrastructure investment, coverage penetration, technology upgrade in speed, and competitive pricing.

**Rapid Investment and Rising Penetration**

Over the past decades, the development of mobile businesses has been supported by sustained investments in telecommunications infrastructure. According to the National Bureau of Statistics, the capacity of mobile telephone exchanges has expanded from 0.5 million subscribers in 1990 to 2.6 billion subscribers in 2018. Base stations for mobile telephones have increased from 0.3 million in 2005 to 6.7 million in 2018. The length of optical cable lines was 1.2 million kilometers in 2000, and that number has grown to be 43.2 million kilometers in 2018.

With regard to subscriber penetration, China’s total subscription (including fixed and mobile) reached 1.79 billion in 2019, representing 128.0 phone subscriptions per 100 inhabitants. Most of the growth in penetration comes from mobile phones, while fixed-line subscription has been in decline since the mid-2000s (Figure 62). Compared with OECD countries, even though China’s fixed-line

\(^{99}\) Popularization rate of telephones includes fixed-line and mobile
penetration is lower than all OECD countries, the mobile popularization is in-line with the average number of developed countries (Figure 63).

Table 17 The Expansion of China’s Telecommunications Capacity

<table>
<thead>
<tr>
<th>Year</th>
<th>Capacity of Mobile Telephone Exchanges (million subscribers)</th>
<th>Base Stations of Mobile Telephones (million)</th>
<th>Length of Optical Cable (million km)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2000</td>
<td>139.9</td>
<td>-</td>
<td>1.2</td>
</tr>
<tr>
<td>2005</td>
<td>482.4</td>
<td>0.3</td>
<td>4.1</td>
</tr>
<tr>
<td>2010</td>
<td>1,502.6</td>
<td>1.4</td>
<td>10.0</td>
</tr>
<tr>
<td>2015</td>
<td>2,181.5</td>
<td>4.7</td>
<td>24.9</td>
</tr>
<tr>
<td>2018</td>
<td>2,594.5</td>
<td>6.7</td>
<td>43.2</td>
</tr>
<tr>
<td>CAGR</td>
<td>17.6%</td>
<td>27.6%</td>
<td>22.0%</td>
</tr>
</tbody>
</table>

Source: National Bureau of Statistics

Figure 62 Historical Fixed-Line and Mobile Penetration in China


Figure 63 Penetration of China Compared with OECD Countries in 2019, Subscription per 100 inhabitants

Upgraded Internet Access and Speed

As of the first half of 2019, 61.2% of China’s population are internet users, making China the largest internet usage country in the world (Figure 64).

Figure 64 Top Countries with Internet Users, 2018

In terms of internet speed, China’s fixed broadband has achieved satisfying results. More than 85 percent of the 449 million fixed broadband subscriptions enjoyed a speed above 100Mbps. Fixed broadband internet speed in China on average is higher than most OECD countries (Figure 65). On the mobile front, a recent report by Ookla in December 2019 evaluated the mobile internet speed globally. China ranked 5th globally with a download speed of 67.7Mbps.

Source: Mary Meeker’s Internet Trends Report 2019

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Data from MIIT Telecommunications Industry Statistic Report 2019
Moving to Competitive Pricing

As it stands today, China’s mobile data pricing under the 4G network is slightly more expensive than the world’s average. Cable.co.uk gathered 6,313 mobile data plans in 230 countries in 2018 and calculated the average cost of 1GB data. Figure 66 shows that China’s average cost of $9.89 per GB is more expensive than most European and Latin American countries, but less expensive than that of Asia and North America. A World Bank report in 2019 collaborates this number, pointing out that China’s mobile prices as a share of GNI per capital is 0.6 percent, compared to 1.7 percent for that of Brazil, 1.8 percent for India, 1.2 percent for South Korea, 1.0 percent for Japan, 3.2 percent for Asia, and 0.8 percent for the United States.

But as the world upgrades to the 5G network, China’s three telecom operators are determined to price their data package more competitive than the rest of the world. The 5G packages offered by China Mobile, China Telecom, and China Unicom range from RMB128 to RMB599 per month. The cheapest package at
RMB128, offered by China Mobile, will include 30 GB of data and 500 minutes of call time. In comparison, the lowest price for South Korea’s 5G package is 55,000 won (c. RMB325) per month which includes 8-9 GB of data, and the U.S. operator AT&T charges US$75 (c. RMB525) a month for its low band 5G Unlimited Extra Plan.¹⁰¹

**Figure 66 Price of Mobile Internet Worldwide, 2019**

![Map showing mobile internet prices worldwide, 2019](source: cable.co.uk)

### Challenging Outlooks

The past achievements of the telecommunications industry are indeed non-insignificant, but they cannot guarantee a healthy development in the future. In fact, many of the growth drivers in the past are vanishing as the market matures. Past rapid growth is founded on a very low base. As the penetration plateauing and business demand saturating, China’s telecom industry is confronted with a lower growth profile. The central government’s intervention created a more balanced competition and therefore stimulated significant efficiency improvement, but the managed competition will likely lead to declining profitability, especially as Capex needs a surge in light of new technology upgrading. The telecom industry is

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¹⁰¹ Information for South Korea from websites of SK Telecom, KT, and LG U+; information for the U.S. from the website of AT&T
predominately state-owned and state-financed, the upcoming financing needs for 5G networks and future infrastructure construction will continue to levy strains on companies’ balance sheets and governments’ fiscal resources.

The challenges of telecommunications are not unique to China. As a BCG report (2020) points out: “Telecom companies lack the global scale of the digital giants in rolling out new services, an area where operators have lost revenue over the past two decades. They face daunting network investments and a lack of financial flexibility due to a debt-laden capital structure and sky-high dividend commitments.”

**Lower Growth**

The growth rate of customer subscription and penetration slows, contributing to a slower growth in revenues. Even though the volume of telecommunications business has been growing significantly over the past decade, revenue growth is much less impressive. The average revenue growth of the past five years was only 2.7%, compared with 10.6% in the 2000s. The lower, if not negative, growth in revenues will be the new normal of the telecommunications industry.

**Figure 67 Growth Rate of China’s Telecom Business Volume and Revenues**

*Source: MIIT Telecommunications Industry Statistic Reports*
Declining Profitability

Two factors put downward pressure on telecom companies’ profitability. First, the price competition between three operators is still prevalent, combined with the central government’s request to lower prices for voice and data services. On the keynote stage of the 2018 Mobile World Congress in Shanghai, China Telecom’s President Mr. Liu Aili warned that an unchecked price war between operators could severely damage the industry. In addition, the State Council requested three operators to reduce mobile data prices by at least 30% to support its commitment to speed upgrade and tariff reduction since 2015.

Second, the disruptive technology innovation requires replacement of old network infrastructure, and therefore a surge in financing costs and depreciation for these projects. China first launched 2G in the early 1990s, 3G in October 2009, 4G in December 2013, and 5G to be expected in June 2020. Every turnover of networks requires new investment in equipment, lines, exchanges, stations, and other infrastructures. For example, during the rollout period of the 4G networks, China Mobile’s depreciation expenses have grown at a CAGR of 7.0 percent from 2014 to 2018, while its overall operating expenses were only growing at a CAGR of 4.1 percent.

As a result, the profitability of the three operators, evaluated in terms of EBITDA margin and net profit margin, has been in decline.

Figure 68 Declining Profitability of the Three Operators

Source: Company filings
Upcoming Capex Need

There will be significant capex demand in the telecommunications industry for the years to come. All three operators have vowed to invest heavily in 5G network infrastructure from 2019 onwards. Earnest & Young estimates China’s 5G capex demand will amount to a total of RMB1.5 trillion. One of the biggest challenges for the industry is to find sustainable avenues to finance these capex requirements.

The capex needs to grow significantly with the upgrade of network generations. Annual capex investment during the 2G era for the telecommunications industry was RMB243.8 billion.\(^{102}\) Annual investment during the 3G era amounted to RMB343.6 billion.\(^{103}\) This number has grown to RMB415.9 billion during the 4G era,\(^{104}\) and will likely reach more than RMB500 billion annually during the construction phase of 5G networks.

As I will demonstrate in the following section, financing channels in the telecommunications industry are limited. Firstly, foreign participation has only been possible at the capital level previously. But the current unimpressive trading levels, especially of China Telecom and China Unicom on the Hong Kong stock market, are making it impossible for any offshore private placement to happen. Secondly, domestic private companies’ enthusiasm, in providing capital and technology in exchange for markets and customers, can be dampened by the recent mixed-ownership reform by China Unicom. Thirdly, ideology around telecommunications still play a significant role in the decision to open up the industry. As the state’s nerve network, the telecommunications industry is perceived as the core to maintaining national security and political stability.

Past Reforms

Telecommunication reforms have mirrored the process in several other commanding heights sectors, namely following the order of dismantling monopolies, regulatory restructuring, and allowing private or foreign participation

\(^{102}\) Average number between 2005-2008, data from MIIT.
\(^{103}\) Average number between 2009-2012, data from MIIT.
\(^{104}\) Average number between 2013-2016, data from MIIT.
Reforms at the Commanding Heights

at a strictly controlled scaled and only in designated parts of the value chain. What is unique about telecom reforms compared to others is how effective the state-intervened competition has been.

**Phase I: The First Attempt to Break Up the Monopoly**

Before 1993, all oversight and business functions of telecommunications were lumped together in one institution: Ministry of Posts and Telecommunications (“MPT”), which was established in 1973 after the Cultural Revolution. In the late 1980s and early 1990s, the separation of government functions and business activities was rampant in many industries such as rail and electricity. But the separation in telecommunications came later than others. In 1993, with the explosive demand for telecommunications services including the internet and skyrocketing waiting list for household phone lines, the State Council intervened to open up competition from the monopolistic situation.

The first step was to allow service providers in nine sub-service categories, including radio paging, the 800 MHz trunk telephone service, the 450 MHz radio mobile communications service, domestic VSAT service, telephone information service; computer information service; electronic mail (e-mail); electronic data interchange (EDI); and videotext and any other telecommunication service approved by the regulator (Liang & Zhang, 2001).

The second step of the initial reform process was to allow a new strong-enough competitor in basic service areas. Outside of MPT, the central government permitted a new entity to be set up by the Ministry of Electronic Industry (“MEI”). China Unicom was established in 1994 as a joint venture with backing from the MEI and 13 other state-owned enterprises.

The third step was to separate government functions of the MPT from its business operations. One of MPT’s bureaus, the Directorate General of Telecommunications, was separated and registered as a corporation called China P&T Directorate General of Telecommunications, also known as China Telecom. Despite the official separation, the business activities of telecommunications services were still carried out by provincial and municipal bureaus of the MPT. The MPT acted as both the regulator and the operator, giving China Telecom an insurmountable competitive advantage over China Unicom. China Telecom
inherited most network business, personnel, and funding from the MPT, and it controlled the only public Fixed Telephone Network (FTN) in China. China Telecom refused to offer interconnection on reasonable terms, making it impossible for Unicom to compete for years (Wu, 2008; Yan & Pitt, 1999). By the end of 1997, China Unicom’s market share in the mobile phone service was less than 2%.

In MPT’s reluctant response to the central government’s demand for reforms, it pledged to maintain strong control over the telecommunications infrastructure and to safeguard against any foreign influence. The promulgation of the ‘‘Provisional Measures for the Administration of Examination and Approval of Deregulated Telecommunications Operations’’ (MPT Doc. No. 675 (1993)) in November 1993 explicitly barred foreign investors from operating or even participating in the operation of telecommunications services in the country (Loo, 2004).

**Phase II: Breaking Up the Monopoly, Again**

The surging demand in the Information Age for telecommunications services was incompatible with China Telecom’s dominance in market share and under-investment in technological advancement. Chinese citizens, who earned $800 a year on average, had to pay $3 per minute for calls to North America and $375 for installation fees. High prices have made phone calls and access to internet unaffordable, leaving China behind the global information revolution in the 1990s.

In 1999, when a proposal for informatization landed on Premier Zhu Rongji’s desk, he forcefully jotted his instruction in the document’s margins: “now we must support competition, to promote the development of telecommunications in China.”

But this proposal to separate the MPT and China Telecom was blocked by MPT Minister Wu Jichuan. Mr. Wu outmaneuvered his critics to protect his political status as China Telecom became China’s second-largest taxpayer, only behind the state tobacco company.

In light of the regulatory capture by the incumbent regulator and operator combined, the State Council had to make a compromise. In April 1998, a new ministry, the Ministry of Information Industry (“MII”), was established from a
merger of the MPT and the MEI. This giant was headed, of no surprise, by Mr. Wu. Wu led a leadership team of six, including two former MPT vice ministers and three former MEI vice ministers.

After the formation of the MII, the regulator’s commitment to protecting China Telecom did not dwindle. The State Council, led by Premier Zhu Rongji, had to intervene again. Zhu’s motivation was two-fold. He was a steady believer in reforms, having utilized iron-fist methods to solve fundamental and structural problems in China’s economy. Complaints were accumulating, about high installation fees, high rates for international calls, long waiting lists for telephone installation, and poor customer service (Caijing, 1998). In addition, China was at the critical stage of bargaining to enter the World Trade Organization. The WTO’s accession negotiations lingered around two things: an independent regulatory body for the telecommunications industry, and access to the market by foreigners.

Under instruction by the State Council, the newly established MII submitted two proposals in 1998 on how to break up the monopoly of China Telecom. One was to divide China Telecom vertically along business lines. The other was horizontal break up along geographic lines. Theoretically, the advantage of vertical separation is that it prevents cross-subsidizing between profitable and non-profitable categories of service, and therefore limits the competitive advantage of the incumbent. The disadvantage of vertical separation is the potential loss of efficiency and economies of scope (Crandal et al., 2009). Before China’s restructuring, there were a number of international case studies for the authorities to look to in making decisions (Table 18).

The MII was more in favor of a vertical separation of China Telecom, partly because it would preserve the highest possible value if China Telecom were to go public on stock exchanges. Other advisors such as the Peking University Professor Zhou Qiren, also advocated strongly for what he called “multiple network competition” (Zhou, 1998). Zhou was inspired by the merger of AT&T and Tele-Communications Inc. He argued that China could learn from how AT&T used TCI’s cable network to break the monopoly of local phone companies. China Telecom was too strong in its own space, and the wait for Unicom to build enough

\[105\text{ In Chinese, 数网竞争}\]
infrastructure to compete would be too long. Zhou proposed allowing the Internet and cable television networks to enter into the telecommunications space and utilize their existing network to compete with China Telecom.

Table 18 Forms of Structural Separation in Telecommunications Before 2000s

<table>
<thead>
<tr>
<th>Country</th>
<th>Forms</th>
<th>Descriptions</th>
</tr>
</thead>
<tbody>
<tr>
<td>U.S.</td>
<td>Vertical + Horizontal</td>
<td>AT&amp;T was first broken into long distance and local services, then its local services was further divided along geographic lines</td>
</tr>
<tr>
<td>Japan</td>
<td>Vertical + Horizontal</td>
<td>NTT went through accounting separation between different units (wireline vs. operation). Then a couple of years later, the government required both vertical separation (long distance and local) and horizontal separation (east and west). But all the divided unit still remained under one holding company</td>
</tr>
<tr>
<td>Canada</td>
<td>Vertical + Horizontal</td>
<td>Both separation of long distance from local and separation by region</td>
</tr>
<tr>
<td>Argentina</td>
<td>Horizontal</td>
<td>Split between north and south</td>
</tr>
<tr>
<td>Brazil</td>
<td>Horizontal</td>
<td>Split by several regions</td>
</tr>
</tbody>
</table>

After rounds of debates, meetings, consultation sessions that involved the MII, China Telecom, Unicom, academia, and the State Council Informatization Office, on February 14, 1999, the State Council formally announced the reorganization plan. China Telecom was divided into four companies, each responsible for fixed telephone, mobile communications, wireless paging, and satellite communications. These four companies operating along product lines were respectively called China Telecom, China Mobile, Guoxin, and China Satellite. In addition to the monopoly break up, two other network operators obtained the license to compete in the space: China Netcom Corporations, and China Railway Telecom.

106 In 1999, the State Council established a leading group for national information work. The State Council Informatization Office works for the leading group. The leading group was chaired by Zhu Rongji, and other members included Hu Jintao, Wu Jichuan, Zeng Peiyan, and Ding Guanggen. The head of the Informatization Office was Mr. Liu He, who later became the Vice Premier of China in Xi Jinping’s administration.
China Railway Telecom, also known as the Railcom, had the most extensive communications network after China Telecom. They had provided communication services to its railway offices as well as other carriers such as Jitong and Unicom. After obtaining the license to enter the commercial space, Railcom posted a significant challenge to China Telecom with regard to service prices. Railcom marketed its service package with installation fees significantly lower than the rates of China Telecom. Wu (2008) hypothesized that Railcom’s competitive advantage was diminished after the MII intentionally canceled installation fees nationwide.

China Netcom was established in 1999 with the backing of the Ministry of Railways and the State Administration of Radio, Film and Television (“SARFT”). It started as a wholesaler for wire-line telecommunications services. Its main product was Internet Protocol services performed on a new broadband Internet backbone. Netcom attracted a number of foreign investors, including NewsCorp and Goldman Sachs.

Despite the breakup and the introduction of new players, the competitive landscape was not fundamentally different for China Telecom’s monopolistic market position. Initially, data communications services including the Internet, have not yet yielded sustained profitability. Voice services, especially mobile services, continued to be the most profitable business. As a result, two spin-off units of the old China Telecom—China Telecom and China Mobile—were more and more profitable, while the rest of operators coping with low profitability.

In light of the still uneven competition landscape, the State Council urged for another split of China Telecom horizontally. In 2002, China Telecom was divided into a northern and a southern company. The southern company would inherit 70 percent of the network’s assets. The northern company, with the remaining 30 percent of old China Telecom’s optical fiber network, would merge with Netcom and Jitong.

**Phase III: Oligopolistic Consolidation and the Three Kingdoms**

The new market structure did diminish China Telecom’s dominance, but serious imbalance in competitive landscape continued to exist. China Mobile, the split-off vehicle for the profitable business—mobile services—beneffited
significantly. As shown in Figure 69, China Mobile’s profits as a percentage of the whole industry rose from 51.3 percent in 2003, to 65.9 percent in 2007. Other operators see moderate growth in revenues, while China Mobile enjoyed a 125 percent of growth in the topline.

Figure 69 Revenues and Profits of Telecom Operators in 2003 and 2007


China Mobile’s ascent to prominence was accompanied by its intentional strategy to influence regulation by arbitrating between agencies. In the early 2000s, the regulatory structure of China’s telecommunications industry changed. The regulatory functions of the MII were split between the MII as the micro-level regulator, the SASAC as the state asset manager, and the NDRC as the price supervisor. Among these three agencies, incentives and priorities were different.

SASAC’s top priority is to preserve and grow state assets and profitability. There were many rounds of price and product differentiation between China Mobile, China Telecom, and China Unicom, using tactics like predatory pricing, aggressive undercutting, and product bounding (Shi, 2007). The price war has driven services fees much lower than the government’s price schemes, and inevitably driving profitability of the operators to the ground. To prevent over-competition and price war between major telecom operators, the SASAC ordered a re-shuffling of corporate executives. In November 2004, Former CEO of China Unicom Wang Jianzhou became China Mobile’s CEO; the former China Telecom
CEO Chang Xiaobing was rotated to become China Unicom’s chairman. Former China Mobile’s CEO Wang Xiaochu was appointed as the general manager of China Telecom. The job rotation ultimately calmed down the competition and brought the price war to a pause.

Unlike the SASAC who had an incentive to see less competition and more consolidation, the other two regulatory agencies held an opposite stance. The NDRC, whose mission was to control price and encourage industrial upgrading, took specific steps to discipline service prices, especially as complaints about high calling charges were mounting. The MII had a long affiliation with China Telecom. China Telecom was trapped in the PHS market, which was severely impacted by the rate reduction campaigns by China Mobile and China Unicom. China Telecom appealed to the MII and the central government in 2006 and 2007. Subsequently, the MII in 2006 issued a criticizing document about China Mobile’s monopolistic practices and predatory pricing. In 2007, the MII and NDRC released specific policies to regulate price packages.

At the backdrop of this intense and uneven competition, the third turning point in China’s telecommunications reform history emerged with the need for 3G licensing. China Netcom was merged into China Unicom, which retained its GSM business but transferred its CDMA operations to China Telecom. China Satellite was merged into China Telecom. China Railcom was merged into China Mobile. By the end of 2008, the Chinese telecommunications industry was consolidated into three large operators—China Unicom, China Mobile, and China Telecom.

The rebalancing of market power for the three kingdoms of telecommunications was facilitated with the granting of 3G technical standards. China Unicom was awarded WCDMA, the most widely used global standard. China Telecom was assigned with CDMA2000. China Mobile, the market dominant at the time, was granted TD-SCDMA, the least mature technology.

With the consolidation and rebalancing, China’s telecom industry entered a new era after 2008, but the results of industry competitiveness were mixed. On the positive side, the market share of mobile services as well as 3G services became

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107 MII no. 408 “Notice on the Requirements of China Mobile Communications Corporation to Strengthen Management and Consciously Inspect and Correct the Unauthorized Acts of Operation”.
more balanced. As we can see in Figure 70, China Mobile has yield market share to the other two competitors. But financial positions did not reflect the changes in market share. China Mobile enjoyed a pretax profit margin above 30%, while China Unicom and China Telecom were burdened with fixed-line operations and had a pretax profit margin at a single digit (Table 19). China Mobile, from a financial perspective, has sustained its dominant position. Its revenues accounted for more than 50 percent of the whole industry, and its profits accounted for more than 80 percent of all.

**Figure 70 Market Share of China Mobile, China Unicom, and China Telecom**

![Market Share Chart](chart.png)

*Source: Company filings, MIIT*
Reforms at the Commanding Heights

Table 19 Revenues and Pre-tax Profit Margin of Three Operators After 2008

<table>
<thead>
<tr>
<th></th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
<th>2011</th>
<th>2012</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Revenues (RMB million)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>China Mobile</td>
<td>411,810</td>
<td>452,103</td>
<td>485,231</td>
<td>527,999</td>
<td>560,413</td>
</tr>
<tr>
<td>China Unicom</td>
<td>159,792</td>
<td>153,945</td>
<td>171,370</td>
<td>209,167</td>
<td>248,926</td>
</tr>
<tr>
<td>China Telecom</td>
<td>186,529</td>
<td>209,370</td>
<td>219,897</td>
<td>245,068</td>
<td>283,073</td>
</tr>
<tr>
<td><strong>Pretax Profit Margin (%)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>China Mobile</td>
<td>36.3%</td>
<td>34.0%</td>
<td>32.8%</td>
<td>31.6%</td>
<td>30.6%</td>
</tr>
<tr>
<td>China Unicom</td>
<td>2.5%</td>
<td>8.0%</td>
<td>2.7%</td>
<td>2.7%</td>
<td>3.8%</td>
</tr>
<tr>
<td>China Telecom</td>
<td>0.1%</td>
<td>9.2%</td>
<td>9.2%</td>
<td>9.0%</td>
<td>7.0%</td>
</tr>
</tbody>
</table>

*Source: Company filings*

To avoid the duplicate building of telecommunications infrastructure, to facilitate network sharing, and to allow private capital to participate without the influence of operations, the central government established China Tower Corporation Limited. In 2015, China Tower raised equity contributions from three operators and China Reform. China Mobile, China Unicom and China Telecom accounted for 38.0 percent, 28.1 percent, 27.9 percent of China Tower’s shares outstanding respectively. The cash consideration was then advanced to acquire all telecommunications towers and related assets from the three operators. Subsequently, China Tower entered into a series of long-term business agreements with the three operators to provide tower services for both phone and wireless businesses. China Tower was expected to help China Unicom and China Telecom, whose financial positions were less equipped for the rollout of 4G coverage.

In July 2018, China Tower floated its US$6.9 billion IPO on the Hong Kong Stock Exchange. Many private or foreign capital participated as cornerstone investors: Chinese investment firm Hillhouse committed US$400 million, followed by U.S. fund Och-Ziff Capital’s US$300 million, and Darsana’s US$175 million. Other private cornerstone investors include Alibaba’s Taobao and Invus Public Equities.
Constraints

The Issuance Constraint: Trading Below Book and Unsatisfying Returns

Similar to some other commanding height industries that we examine in this book, China’s telecommunications sector is also trading near or below book value in the offshore market at the moment. The gap is especially significant for China Unicom and China Telecom, which suffer from smaller market share, declining topline revenues, and unprecedented squeeze in margins. The trading level makes it impossible for operators to raise equity capital.

Figure 71 Trading Level (P/B Ratio) of China’s Three Telecom Operators

Out of all three operators, China Unicom is the only one that has an onshore listing vehicle on China’s A-share market. China Unicom’s A-share listing entity (ticker: 600050 SH) is not exactly the same company as China Unicom’s Hong Kong-listed vehicle (ticker: 762 HK). The A-share entity is a holding company for the parent group’s stake in the Hong Kong-listed red chip vehicle. While the Hong Kong entity has been trading near or below SASAC’s minimum requirement for any private placement of equity issuance, Unicom-A has held up a valuation that can warrant an equity raise.
And that was what the government did. In 2017, the Chinese government pushed through a major ownership reform to raise capital, to introduce collaborating shareholders, and improve corporate governance for China Unicom (Box 6). Though the first year after the mixed-ownership reform was carried out, Unicom’s financial and operating statistics seemed to have an uptick, the steam has yet to prove sustainable. As we approach the third year of the ownership reform, investors are seeing the share price of China Unicom sliding below that when they entered the investment at RMB6.83 per share.

Box 6 The Mixed Ownership Reform of China Unicom-A

In August 2017, China Unicom-A, a subsidiary of China Unicom Group announced sale of shares, representing 35.2 percent of the company’s stake pro forma at a price of RMB6.83 per share, to 14 strategic investors. In addition, China Unicom also granted key employees with 848 million restrictive shares of Unicom-A at a price of RMB3.79 per share. Total consideration of the deal was about RMB78 billion, which would be used for the optimization of 4G, development of 5G, and the development of innovative businesses.

Figure 72 Shareholding Structure Prior to and After the Mixed-Ownership Reform

Source: China Unicom investor presentation
**Strategic Investors**

14 strategic investors in the deal can be classified into four categories: (1) large internet companies such as Tencent, Baidu, JD.com, Alibaba, and Suning; (2) leading companies in industry verticals such as Didi, Yongyou, Eastone; (3) SOEs such as China Life and CRRC Corp; and (4) specialized funds such as Qianhai FOF and China Structural Reform Fund.

The plan was the leverage the resources of these strategic investors to create synergies with Unicom’s primary business, especially in areas such as cloud computing, big data, Internet of Things (IoT), artificial intelligence (AI), home internet services, digital contents, retail systems, electronic payment, internet finance and so on.

As a result of the share sale, the shareholding of China Unicom Group would decrease from 62.7% to 36.7%. Strategic investors would hold the following share percentage: China Life 10.22%, Tencent 5.18%, Baidu 3.30%, JD.com 2.36%, Alibaba 2.04%, Suning Commerce Group 1.88%, Kuang-Chi 1.88%, Huaihai Ark 1.88%, Aegon-Industrial Fund 0.33%, and China Structural Reform Fund 6.11%.

The mixed-ownership reform expanded Unicom-A’s board of directors from 7 to 13 directors. Among the 8 non-independent directors of the new board, 3 was appointed by China Unicom Group. The rest 5 non-independent directors would be appointed by strategic investors like China Life and tech giants.

**Employee Restrictive Shares**

In the transaction, Unicom-A granted 7,550 employees with 848 million restrictive shares at about half of the price of the last trading day (RMB3.79 per share). Employees would finance the share purchase themselves. The restrictive shares had a vesting schedule and corresponding requirements as follows:

**Table 20 Vesting Schedule and Requirements of Unicom-A Restrictive Shares**

<table>
<thead>
<tr>
<th>Timing</th>
<th>Amount</th>
<th>Requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td>First Vesting</td>
<td>24-36 months after granting</td>
<td>40% (1) 2018 revenues grow no less than 4.4% compared to 2017, and higher than industry average compared to 2017; (2) 2018 profits grow no less than 65.4% compared to 2017, and higher than industry’s 75th quartile compared to 2017; (3) 2018 return on net assets is no lower than 2.0%</td>
</tr>
<tr>
<td>Second Vesting</td>
<td>36-48 months after granting</td>
<td>30% (4) 2019 revenues grow no less than 11.7% compared to 2017, and higher than industry average compared to 2018; (5) 2019 profits grow no less than 224.8% compared to 2017, and higher than industry’s 75th quartile compared to 2018; (6) 2019 return on net assets is no lower than 3.9%</td>
</tr>
<tr>
<td>Third Vesting</td>
<td>48-60 months after granting</td>
<td>30% (7) 2020 revenues grow no less than 20.9% compared to 2017, and higher than industry average compared to 2019; (8) 2020 profits grow no less than 378.2% compared to 2017, and higher than industry’s 75th quartile compared to 2019; (9) 2020 return on net assets is no lower than 5.4%</td>
</tr>
</tbody>
</table>
Source: China Unicom-A company filings

In addition to the company’s financial requirements, individual employees were required to meet annual individual evaluation rating requirements for vesting.

State Capital Dilution

Indeed, China Unicom Group’s holding in Unicom-A decreased to 36.7%, but the company still remained under the control of state-owned capital. China Unicom Group would still be the largest shareholder of the listco, with more than 33% of the stake. The 33% threshold is important because the company’s Article of Association stipulates that many corporate decisions such as the approval of a merger or sale, and significant investments would require at least two-thirds of the shareholders’ vote. This means that China Unicom Group still has a blocking stake in every major corporate decision going forward. Besides, when combined with those held by friendly fellow state capital such as China Life and China Structural Reform Fund, shares under state control remained above 50%. This arrangement is a safe compromise to obtain the most backing for the transaction.

Exemption from the Securities Regulation

The Unicom mixed-ownership reform was in fact a violation of China’s securities regulation. In February 2017, the China Securities Regulatory Commission (CSRC) issued a notice on Implementing Rules for the Non-Public Offering of Shares of Listed Companies. The new regulation required that equity issuance through private placement by a listed company cannot exceed 20% of the company’s total shares outstanding. The Unicom deal, if passed, would obviously breach this requirement as the newly issued shares would amount to 42.6% of the company’s existing shares outstanding.

Days after the official announcement of the placement plan, CSRC declared that “after going through the relevant legal procedures with the National Development and Reform Commission (NDRC) and other departments, the CSRC will treat the private placement in China Unicom’s ownership reform as an exceptional case.”

Performance of Unicom-A After the Ownership Reform

China Unicom has undertaken a number of initiatives to boost sales, improve efficiency, and cut costs. These measures included forming JVs with strategic investors to attract new business, cooperating with investors who are in the vertical application category to build in Unicom services in their businesses, downsizing the workforce, shifting sales efforts from

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108 Some strategic investors participated through the investment funds. For example, Yongyou, Didi, and Eastone participated through Huaihai Ark; CRRC Capital participated through China Structural Reform Fund
offline to online to lower sales and administrative costs, lowering end-user subsidies, and capping salary pools.

From the operational perspective, Unicom did see an uptick in user numbers especially for its mobile businesses right after the ownership reform in 2018, yet the user growth slowed in 2019. Financial statistics on the topline have not yet reflected the new user growth, an industry-wide challenge as we have illustrated before. The bottom-line profit numbers have registered moderate growth, but they fall short of the management forecast as laid out in the vesting schedule of the restrictive share scheme.

### Table 21 Performance After the Unicom-A Ownership Reform

<table>
<thead>
<tr>
<th></th>
<th>Mobile Users (mn)</th>
<th>Fixed Broadband Users (mn)</th>
<th>Fixed Line Users (mn)</th>
<th>Revenues (RMB bn)</th>
<th>Net Profit (RMB mn)</th>
<th>Return on Net Assets (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1H2017</td>
<td>269.4</td>
<td>76.9</td>
<td>63.3</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>2H2017</td>
<td>284.2</td>
<td>76.5</td>
<td>60.0</td>
<td>274.8</td>
<td>425.8</td>
<td>1.13%</td>
</tr>
<tr>
<td>1H2018</td>
<td>302.0</td>
<td>78.9</td>
<td>57.9</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>2H2018</td>
<td>315.0</td>
<td>80.9</td>
<td>55.9</td>
<td>290.9</td>
<td>408.1</td>
<td>2.86%</td>
</tr>
<tr>
<td>1H2019</td>
<td>324.4</td>
<td>83.4</td>
<td>54.3</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>2H2019</td>
<td>318.5</td>
<td>83.5</td>
<td>54.2</td>
<td>290.5</td>
<td>498.2</td>
<td>3.45%</td>
</tr>
<tr>
<td>CAGR per annum</td>
<td>6.9%</td>
<td>3.3%</td>
<td>-6.0%</td>
<td>2.8%</td>
<td>8.2%</td>
<td>-</td>
</tr>
</tbody>
</table>

*Source: China Unicom-A company filings*

The share price performance of Unicom-A has reflected the mixed results we see in the operational and financial statistics. The speculation and expectation of the ownership reform have fueled the surge in share price since September 2016 till the closing of the transaction in 2017. But Unicom-A has trended down to a level below the placement price.

### Figure 73 Share Price Performance of Unicom-A

*Source: Bloomberg*
The Political Constraint: Foreign Control and Customer Price

The calculation in policymakers’ mind is not just about the total national costs and benefits, but the distribution and balance of them among existing coalitions and the public. Therefore, domestic constraints are absolutely critical to consider.

The possibility of foreign control or operational participation in China’s telecommunications industry is low. It is low not only because of the common reasons cited by many developing countries, but because the past struggles between the Chinese government, market demand, and foreign investors have closed the window of possibility for at least a foreseeable future.

Globerman (1995) identifies several arguments for host countries to place restrictions on foreign ownership of telecommunications carriers. Sovereignty-related reasons include the intention to preserve domestic monopoly and the worry of national security. Economic reasons for ownership restriction are that governments wishing domestic owners can agree to promote social objectives given high economic rent they receive from telecommunications services.

The most cited reason, apart from national security concerns, from officials against foreign ownership in China’s telecommunications is that the government was counting on the telecommunications company to even out the development efforts through cross-subsidies between their profitable and unprofitable regions. While foreign investors would be after profit and unwilling to support service build-out in poorer areas of China, the state-owned or state-influenced corporations would follow orders (Wu, 2008).

The Chinese government’s resistance to foreign ownership started in the 1990s despite statements from analysts suggesting that China cannot sustain its enormous demand for capital without foreign help. In 1993, the State Council issued Regulation 55 spelled out an explicit ban on foreign direct investment in telecommunications: “Foreign businesses are not allowed to run or participate in the telecommunications service in China. The public network, private networks, wireless, and cable telecommunication service should not be operated by groups, enterprises, or individuals outside the state. Companies with foreign investment or joint ventures should not run this business and should not use any means or any methods to get financial resources from foreigners.” Even though, the FDI ban was
loosened by the MPT in the following years to allow restrictive utilization of foreign capital, but the ban on equity ownership or operational participation stayed intact.

One of the early shots foreign investors had at cracking the defense was a financing model developed by Unicom in 1995 in face of limited capital for expansion. The model was called the “Chinese-Chinese-Foreign” (CCF) arrangement. In this 3-way management contract, Unicom would form a joint venture with foreign investors. Then Unicom would grant the joint venture a network supply contract which included equipment leasing, royalties, consulting, and engineering fees. Foreign investors supplied the joint venture with capital and operation, and in return, they received “equity-like” retained earnings from the joint venture. Over the years, Unicom formed 46 CCF ventures, which provided approximately US$1.4 billion capital since 1995.

The MPT was initially in support of the CCF model. But starting in 1997, the wind started to shift. Wu (2008) assigns two reasons to the change in attitude: “a highly successful IPO by China Telecom in 1997, and the acceleration of China’s WTO accession talks toward their conclusion”. The China Telecom IPO has given authorities the confidence to attract foreign capital without yielding management control for other telecom operators like Unicom as well. Unicom needed to clear these CCF contracts to pave the way for their IPO on the Hong Kong Stock Exchange. The WTO discussion, on the other hand, rendered the usefulness of these sneaky arrangements if China agreed to open up the telecom industry to foreign participation altogether. Other scholars like Mueller and Lovelock (2000) use a game theory model to map out the vested interest and their motives. They conclude that the FDI ban is a coalition between the state and China Telecom. The MPT and central government had a strong incentive to protect China Telecom from foreign competition in exchange for China Telecom’s commitment to achieving national development objectives. Opening to foreign investment in

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109 As documented by Wu (2008), the MPT Minister Wu Jichuan said that foreign companies could invest in telecommunications projects but only under the precondition that they will not hold equities or be involved in the operation or management of telecommunications business.
Unicom might threaten the special role of China Telecom, which is the favored son in the family.

Starting in 1999, Unicom was ordered to unwind most of these CCF contracts. For the contracts that were still in the process of termination, revenues paused to flow to the joint ventures.

China did agree to a number of relaxations of the FDI ban in the WTO accession agreement in November 1999. These relaxations would be carried out in stages regarding foreign ownership in value-added services, basic telecom mobile services, and basic telecom fixed-band services. After the WTO accession, a number of foreign firms did invest in China. For example, Hong Kong’s PCCW did a cross-holding transaction with Netcom, Spain’s Telefonica invested in Netcom, foreign investors chipped in China Mobile’s IPOs. But the conflicting guidance from different ministries and the SASAC has clouded the path to control with too much uncertainty.

Even though the government has incentives to protect state-owned incumbents from foreign competition, its interests are not identical to these of operators. The state has interests in structural reform to stimulate internal competition and to improve efficiency. It is also constrained by the public’s expectation of prices and service quality.

As we see in the history of the industry’s development, in the early stage, the state intervened on multiple occasions to propel internal competition. Since 2015, the State Council has been the consistent advocate of “higher internet speed, lower fees”.110 Following Premier Li Keqiang’s initial request for the telecom carriers to cut prices and improve services on May 13, China Mobile announced it would reduce mobile data prices by 35 percent or more by the end of 2015. China Unicom announced an intention to reduce prices by at least 20 percent, and China Telecom followed suit with a promise to cut prices by 30 percent. But those quick vows backfired only months after, when the three state-owned operators failed to carry out any concrete steps to achieve the goals. They offered a discount on conditions that few users could meet; they have put forward cheaper “night traffic” plans when most users wouldn’t need them at night with home WIFI access.

110 In Chinese, 提速降费
In light of the resistance, Li Keqiang put “higher internet speed, lower fees” in the Report on the Work of the Government ever since. In the 2017 Report, he urged all operators to drop domestic long-distance fees and roaming charges by the end of the year. In the 2018 Report, he vowed to lower mobile service fees by at least 30 percent, and significantly lower broadband service rates. In 2019, he said: “This year, average broadband service rates for small and medium enterprises will be lowered by another 15 percent, and average rates for mobile internet services will be further cut by more than 20 percent. Cellphone subscribers nationwide will be able to keep their numbers while switching carriers, and cellphone packages will be regulated to achieve solid fee cuts for all consumers to see.”

Li Keqiang’s persistence wins the internal power struggle. Operators did significantly lower prices, cancel fees and increase speed. According to the MIIT, by 2019, average data fees have declined by 90% compared to that in 2015. Mobile internet speed has nearly quadrupled since 2015, and fixed broadband internet speed has almost doubled\(^{111}\). Even though the user number has grown substantially with the help of lower fees and higher speed, the government’s push has been cutting into the bones of the three operators in dragging down their revenue growth and profitability.

**The Regulatory Constraint: Division of Government Power**

The current regulatory framework of the telecommunications industry is divided between three agencies under the coordination of the State Council: the MIIT is responsible for overall industrial policies; the NDRC is responsible for pricing and approvals for investment projects; and the SASAC is responsible for the management of the three telecom operators.

Each agency has its own priorities, and sometimes they come in conflict. The MIIT wants to create a competitive environment to expand internet and broadband access, to successfully upgrade the country’s coverage to 5G networks, to lower prices, to improve the industry’s service quality and innovation. The NDRC caps the interconnection rates and therefore is caught up in the frequent conflict over interconnection. The SASAC, on the other hand, wouldn’t want price to decline so fast that it hurts the profitability and balance sheet of individual operators. Any

\(^{111}\) Data from SPEEDTEST
proposal for future reforms needs to take into consideration the division of government power, and the potential resistance.

**Potential Solutions**

**The Goals**

China’s past reforms have already achieved some great targets, but there are still areas of shortfall that future reforms should focus on addressing. These areas of improvement include:

- *Level the Competitive Landscape*: the current competitive landscape is advantageous to the leading players if no intervention is exercised. To maintain a satisfying level of competition, the government needs to level the field so the ones with unprofitable burdens of the past can continue to put pressure on the market leader. Other methods to introduce competition should also be considered;

- *Restore Financial Health and Expand Financing Channels*: operators’ slower revenue growth and declining profit numbers have dampened their valuation, making it impossible for them to raise extra capital. Restructuring is needed to restore health to their balance sheet;

- *Sustain Investment in 5G (and Future Generation) Infrastructure*: the growth and development of the telecommunications industry rely on sustained investment in infrastructure, faster and faster for each generation of a network upgrade. The industry also needs to be barred from over competition and replicated infrastructure building;

- *Improve Service Quality and Maintain Competitive Pricing*: the government policies need to continue delivering to the public better services such as higher internet speed, as well as lower telecommunications prices. The lower cost of telecommunications is also critical to business operations, especially for small-and-medium-size companies.

- *Drive Innovation*: the industry as a whole needs to improve on its innovative initiatives, in terms of both technology for products and services, and market players’ business models.
The process of industry reforms is extremely complex with multiple facets. Scott Wallsten (2002) finds that sequence does matter in telecommunications reforms. He uses empirical evidence to show that establishing an independent and trustworthy regulatory authority before privatizing the telecom firms is conducive to increasing telephone penetration, investment, and subscriptions, as well as to increase the price investors are willing to pay for the target firms. Even though the discussion of reforms in China is drastically different from that two decades ago, the lesson to stage and sequence reform effort is still valid in today’s context, especially when the low-hanging fruit is already picked up.

The reform can come in the following packages with pros and cons.

The first package is a replay of the previous monopoly breakup. The current competitive landscape, where China Mobile is dominant in all the profitable segments of the industry, poses a significant challenge to any potential structural reforms. To level the playing field, the government could divide China Mobile into two companies geographically. The breakup would help with maintaining pressure on pricing and service qualities for all operators, but it suffers from a number of shortfalls. First, the breakup itself can be complicated by reactions from the capital market. China Mobile is a listed company with foreign minority shareholders. Even though with the majority shares in the hands of SASAC the breakup transaction can be executed, the capital market can view the deal as value destruction for China Mobile. Unlike the previous monopoly breakup, where the breakup had promised potential for growth as a result of enhanced competition, the breakup of China Mobile in the current environment is simply dividing the already-shrinking cake. Second, SASAC would oppose this proposal as the total value of state assets can decline as a result of the capital market frustration. Third, the breakup cannot help with the industry-wide problem of duplicated construction and high capex expenses that are dragging down earning profiles for all three operators. Fourth, the breakup does nothing to expand the financing capacity for the future development of the industry.

The second option is to use the 5G licensing as a window of opportunity to boost the competitiveness of China Unicom and China Telecom. By assigning different spectrum for 5G coverage to three operators, the government can choose
to leave the underdogs with the most lucrative piece. But similar to the first option, this strategy will exacerbate rather than alleviate the burden of 5G infrastructure construction for the industry. Also, the initial intention to lift up China Unicom and China Telecom might be undermined by the fact that they are ill-capitalized to develop 5G infrastructure as quickly as China Mobile. This division will hamper the overall development of China’s 5G industry.

The third, and the most promising strategy, is to separate infrastructure from operation. Even though China Tower has separated a portion of three operators’ internet infrastructure assets, it is small in size compared to other main infrastructure in telecommunications. The separation entails the following advantages. The operators can all benefit from sharing the infrastructure by avoiding duplicate construction. But the benefit is not evenly spread. China Telecom and China Unicom, who are in a weaker financial footing, will enjoy the added benefit from a competition perspective. Besides, the separation makes it easier to attract outside capital. The government could leverage China Tower’s existing platform to acquire the remaining infrastructure assets other than the internet-related ones. China Tower is trading at around 1.5x P/B ratio, making it easier to price an equity follow-on deal above SASAC’s minimum requirement.

For the separation to work, all operators should share the same spectrum on the 5G coverage. After the separation, operators can start to focus on improving their service quality and product differentiation. The elimination of infrastructure advantages/disadvantages would propel operators to actively reach out to innovative companies for business cooperation. Private businesses in the downstream application areas would have the opportunity to form joint ventures with operators to provide differentiated products to the public.

**Figure 74 Menu of Options for the Telecommunications Reform**

<table>
<thead>
<tr>
<th>Goals</th>
<th>Breakup China Mobile</th>
<th>Differentiated Licensing</th>
<th>Infrastructure Separation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Level the Competitive Landscape</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Restore Financial Health and Expand Financing Channels</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Let me expand on the third option. There are three major components in this process:

**Action I: Shifting Infrastructure from Operators to China Tower**

All three operators should (1) sell their existing 4G infrastructure assets to China Tower, and (2) agree to lease from China Tower rather than building their own network. Together with the asset shift, headcounts and other related cost centers should move to China Tower.

Financing of the separation can be conducted through a combination of asset injection and equity issuance. For the previous-generation telecom infrastructures, the government can request the injection in exchange with shares in China Tower. To prevent triggering reverse takeover or major acquisition thresholds by the Hong Kong Stock Exchange, the injection should be conducted in stages over the course of years. The transfer of assets can also be financed by cash proceeds from China Tower’s follow-on equity issuance to the public shareholders. China Tower has a demonstrated track record, though short in duration yet, to bring reasonable returns to investors. Its follow-on issuance should be appealing to external investors especially like life insurance companies and sovereign wealth funds in search of stable business models.

NDRC needs to be in close monitoring of the pricing mechanism between China Tower and the operators. One of the most important lessons from the international experience of telecom reforms, is that a transparent process to determine pricing is crucial to success. A transparent process should involve consultation with stakeholders at all stages of policymaking. The experience of the United Kingdom’s telecom reform has been particularly revealing in this regard. A broad range of stakeholders can provide valuable insights when they are raising their concerns. Eventually, the policy decision should be based on a detailed
analysis of different perspectives, and it should be communicated with all the parties consulted before.

As for the potential resistance force, China Mobile might see this arrangement as curtailing their competitive advantage in the mobile segment. But China Mobile would benefit from moving significant size of infrastructure assets off their balance sheet, and therefore, improve profitability by turning into an asset-light business model.

**Action II: Opening Up Service Cooperation with Private Sector Players**

Digitization has posed a serious challenge to the telecom industry’s core business. But it is not just a threat; it offers an opportunity for telecom companies to reconnect with their customers. Innovation, especially in the B2C market, is not a SOE’s strongest suit. Telecom companies can adopt a digitization strategy that fully leverage the institutional agility of the private sector.

- **Pursue Adjacencies with Market Leading Private Companies:** the operators could consider partnering with incumbent market leaders in the adjacent businesses such as financial services, IoT, cloud, IT services, online reading, O2O business, digital payments, music streaming, online education, digital health, and video conferencing. Three operators could form joint ventures with corresponding private companies in different sub-segments. For example, telecom operators could partner up with iQiyi, to provide high-speed streaming services for iQiyi’s live shows.

- **Build Essential Digital Talent and Capabilities:** telecom companies could establish a new unit focusing on new and digital service businesses. The digital talent team should be lean and agile when called upon to respond to fresh technological demands. They should also have the capacity to conduct experiments and iteration with the end-users at an early stage of product development.
The Holy Grail of Reforms

Finance is different.

It distinguishes itself from other commanding height sectors in the deep-water zone, for two reasons. First, contrary to the theme of state subsidizing, the financial system is structured as a repressive machine, at the expense of public’s savings. The government has been subsidizing the healthcare cost, transportation cost, electricity cost, and telecommunications cost, out of the fiscal pocket and the profit pie of state-owned institutions. But financial policies have worked in the opposite direction. The state has maintained a healthy interest rate margin for banks. As a result, the general population only gets a pale return on their extremely limited avenues of investment. Private participation is not limited by self-interested market forces like in other sectors, but by strict rules on licensing and regulation.

Second, the success or failure of its reformatory development has far greater consequences than that of any particular industry. The financial system is the blood vein of the whole economy. If market failures at other commanding height sectors are like a solid tumor that could still potentially be cured by surgery, the failure in the financial system is leukemia that permeates the entire body. On the other hand, if the financial market is well developed in support of China’s economic transition, other sectors will benefit. In fact, reforms proposed in the previous sections hinge on a stable financial environment and a more developed capital market. That is why the reform in the financial sector is the holy grail of all reforms.

China’s financial sector development has been closely entangled with the country’s economic growth miracle for the past four decades. The financial reforms, especially after the 1997 Asia financial crisis, have been carried out gradually and steadily towards a more market-oriented direction. The government
has made a great process. Past reforms are critical to support economic growth and financial stability, and they have facilitated the balance of international payments.

Nevertheless, China’s financial system remains government-dominated, evidenced by a considerable presence of state-owned financial institutions; financial policies remain repressive as the government still maintains control over interest rates; and capital allocation remains sub-optimal to support the new growth demand of China’s economic upgrading.

Why hasn’t China’s repressive financial system derailed the country’s macroeconomic development? Huang and Wang (2017) explain the dual effects of the McKinnon effect and the Stiglitz effect (McKinnon 1973, Stiglitz 1994). “The McKinnon effect is generally negative, as financial repression hinders both financial efficiency and financial development, while the Stiglitz effect is mainly positive as repressive financial policies could help effectively convert saving into investment and support financial stability. Both effects exist in all economies, but their relative importance varies.” They argued that the state dominance in the financial sector, both in terms of policies as well as market participants, is instrumental to the Stiglitz effect outweighing the McKinnon effect during the early stage of China’s development when the entire market and regulatory framework were underdeveloped. However, recently they found that repressive financial policies have begun to hurt China’s economic potential as it began to shift to a more service-based and technology-driven economy.

Despite its differences, the financial sector has one thing in common with other sectors—price distortion and the sub-optimal allocation of resources. The wrong market signals lead to the misallocation of capital and elevated levels of financial risk, which makes future reforms difficult if the government wants to strike a balance between social stability and market efficiency.

**Past Reforms**

**Monetary Policy**

People’s Bank of China (“PBoC”) was established in 1948, but it was never a central bank until 1984, 6 years after the Third Plenum of the Eleventh National Congress of the Communist Party. At the beginning of 1984, the original PBoC
relinquished its commercial functions to a newly established bank called the Industrial and Commercial Bank of China (“ICBC”) and became a proper central bank. The legitimacy of PBoC was granted not until 1995 when the National People’s Congress passed the *Law of the People’s Republic of China on the People’s Bank of China*. The Law defined PBoC’s role and power in formulating and implementing the country’s monetary policy, as an independent agency from the Ministry of Finance and local governments.

Before the mid-1980s, the government did not have a specific monetary policy framework. In line with the overarching theme of gradual reform in China, the monetary policy framework shifted from the direct management of credit scale from 1984-1997 to the indirect management of money and credit starting from 1998. 1998 marked the transition because credit quota was abolished and the PBoC started to withdraw from direct interventions in commercial banks’ operation. Over time, the supervision functions for banking, security and insurance industries were separated out from the PBoC. Monetary policy reforms went through the following phases.

**Phase I: 1984-1996**

In 1986, *The PRC Regulations for the Administration of Banks* was published. It first defined the task of financial institutions as the “developing the economy, stabilizing the currency and promoting socioeconomic performance.” The wording later evolved to be a dual mandate of “stabilizing currency and facilitating economic growth”.

The first phase of monetary policies was mainly characterized as fighting inflation. Despite the explicit target, the central bank at the time lacked the necessary tools to conduct proper monetary policies, it relied heavily on administrative measures to control financial institutions. These measures proved to be ineffective. The rapid credit expansion in the late 1980s, stemmed from the rising demand for economic development, led to daunting inflation problems, in the 1985-1989 and 1992-1995 period (Figure 75). Inflation reached 18 percent in 1989 and 24 percent in 1994. PBoC used total credit and cash issuance as the tool to control inflation. Specifically, it regulated the money supply by enforcing credit quotas.
The administrative measures have become increasingly ineffective because of the rapid growth of non-state financial institutions and direct financing channels, all of which were outside of PBoC’s administrative jurisdiction (Huang et al., 2010). In 1994, PBoC started to narrow the scope of credit quotas and initiated open market operations on the foreign exchange market. In 1996, PBoC officially shifted its policy to include base money as a key intermediate monetary policy target and lowered the importance of cash issued. A monetary base plan trial was implemented in 1997 with positive results. Therefore, in 1998, PBoC abolished credit quotas for state-owned commercial banks and focused on measures of money supply such as M0, M1 and M2 to regulate credit.

Instrument wise, PBoC expanded its toolkit from only the credit quotas to a full range of policy tools. The de-coupling of PBoC and commercial banks started with the policy of “linking the loan volumes to its total deposits”, which separated the central bank from directly providing funds to commercial banks. Central bank credit was created to inject base money into the economy and allow some autonomy in credit allocation by commercial banks. Yi (2009) estimates that 70 percent of the annual base money was injected into the market through central bank credit between 1986-1994.
Phase II: 1996-2002

After the 1997 Asia Financial Crisis, deflation and economic slowdown were haunting China. PBoC continued its switch from direct intervention to using more indirect policy instruments to smooth economic cycles. These instruments include open market operations, reserve requirement ratios, and rediscount to influence lending activities of the banking sector (Sun, 2015).

- **Open Market Operations (“OMO”):** OMO was first launched in 1996 where the central bank buys and sells securities to regulate liquidity in the financial system. It was briefly suspended in 1997 until its resume in response to the Asian financial crisis in 1998. In 2000, PBoC conducted its first reverse repo operation to sterilize excess liquidity as a result of foreign trade recovery. In 2002, PBoC purchased bonds on the markets for the first time. Ever since, OMO has become a major and regular tool to stabilize short-term liquidity volatility.

- **Reserve Requirement (“RR”):** PBoC adjusts reserve requirement ratio, a portion of reserve held at the central bank, to influence credit multiplying capacity of financial institutions. In 1998, PBoC conducted major reform of the RR regime so that the previous required reserve account and the excess reserve account could be integrated into one. PBoC has been using RRR on a regular basis to regulate market liquidity.

- **Rediscount:** Since 1995, PBoC has been providing financing to commercial banks by purchasing their discounted and undue bills asset. Rediscounting has been used more often in China than other markets to (1) provide financing to meet commercial banks’ temporary demand for liquidity, and (2) regulate base money and credit structure by adjusting the rediscount rate and choice of rediscount bills. In 1998, PBoC de-pegged the rediscount rate from the central bank lending rate.

During this period, PBoC increased its use of adjusting interest rates as a tool to balance the economy (Huang et al., 2010). Chibor was established in 1996 together with a unified inter-bank lending market. In 1997, PBoC liberalized the repo rates and cash bond rates on the interbank bond market. In 1998, PBoC lifted control over the issuance rate of policy financial bonds and treasury bonds on the
interbank market. In 1999, a public bidding system determined the issuance rate for Treasury bonds on the interbank market for the first time.

Interest liberalization in China is carried out following the order of “foreign currency rates before local currency rates, lending rates before deposit rates, and long term, large quantity credit rates before short term, small quantity credit rates.” This framework is established as a result of oceans of literature on the liberalization process and the case studies of liberalization in some countries, some led to success, and other disastrous failures.

For lending rates, the first step to liberalize lending rates went back to 1987, when PBoC allowed commercial banks to float lending rates upward to a maximum of 20 percent. In 2000, PBoC liberalized lending rates for foreign currency loans. On the deposit front, the process is carried out much more slowly. Even though PBoC liberalized deposit rates for large deposits in 2000, other liberalization has been put on hold until today.

**Phase III: 2002-now**

As the basic infrastructure of markets, trading, and rates were established, PBoC has continued to expand its monetary toolkit. Apart from tools that regulate market liquidity in general, PBoC started to develop a range of policy tools, including central bank lending, central bank bills, and window guidance, for targeted objectives to promote growth or contain risk in specific areas of the economy.

- **Central Bank Lending**: central bank lending refers to loans from PBoC to commercial banks and other financial institutions. This tool helps regulate money supply both in terms of size and price. It has been an important monetary policy tool to adjust monetary base, to provide liquidity to troubled financial institutions for financial stability concerns, and to promote funding for certain areas such as rural, agriculture, and small-and-medium enterprises (SMEs).

- **Standing Lending Facility (“SLF”)**: SLF was launched in 2013 to meet long-term liquidity demand of financial institutions. Most of the SLF maturities are between one to three months. Financial institutions pledge collaterals to PBoC for the loan drawdown. Eligible collaterals include
highly rated bonds and high-quality assets. PBoC influence monetary base by setting interest rates, as well as by adjusting the range of admissible collaterals. PBoC uses SLF lending rates to guide short-term policy rates.

- **Short-term Liquidity Operation (“SLO”):** SLO was also launched in 2013 as a supplement to OMO. SLO was repurchase operations with maturities up to seven days. PBoC conducts the repurchase operation based on a bidding process, similar to OMO operations.

- **Medium-term Lending Facility (“MLF”):** Launched in 2014, MLF provides medium-term base money to commercial banks and policy banks. Similar to SLF, collaterals are required for MLF loans. Eligible collaterals include government bonds, central bank bills, policy financial bonds, high-grade debenture bonds, and other high-quality credit assets. PBoC uses MLF lending rates to guide medium-term policy rate.

- **Pledged Supplementary Lending (“PSL”):** Also launched in 2014, PSL provides lower-cost and longer-term financing to development institutions for their efforts in renovating shantytowns. PSL also requires collaterals for lending, similar to MLF.

- **Central Bank Bills Issuance:** Starting from 2002, PBoC has used central bank bills, issued to financial institutions, to sterilize liquidity from the increase in its foreign reserves. BIS (2019) found this liquidity draining instrument to be effective in (1) increasing the supply of short-term high-quality assets, (2) establishing the short end of the risk-free yield curve, and (3) broadening the development of China’s money markets. PBoC suspended the issuance in 2013, due to the reversal of foreign exchange inflows. But it restarted direct issuance in 2018, when PBoC established regular issuance mechanism in Hong Kong to offshore market participants. PBoC vowed to promote the use of central bank bills in the future on a more regular basis.  

- **Central Bank Bills Swap (“CBS”):** An innovation in 2019, CBS aims to support commercial banks’ perpetual bond sales. Primary dealers on the open market can swap perpetual bonds issued by certain qualified banks.

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112 An article was published by PBoC’s monetary policy department on October 14, 2019, claiming that central bank bills is a tool fitted for China’s particular economic situation. [央票据是适合中国国情的货币政策工具](http://www.bjnews.com.cn/finance/2019/10/14/635933.html)
with central bank bills. CBS does not increase monetary base directly, but it makes perpetual bond sales more appealing to investors because after swapping they can use central bank bills as collateral to gain liquidity from MLF or other central bank lending facilities. CBS helps banks issue perpetual bonds to meet the capital adequacy requirement from BASEL III.

- **Window Guidance**: Forward guidance in the U.S. has been a key tool in the unconventional monetary policy mix since the Great Recession. The FOMC increasingly has used explicit forward guidance to apply downward pressure on long-term interest rates. However, window guidance in China is different. Window guidance in China is more of an exchange between the central bank and commercial banks to encourage or prohibit certain lending activities. For example, when the government worries about real estate bubbles, PBoC would use window guidance to discourage loan flows to developers. Window guidance is used less often now as commercial banks are public listed companies with a broader range of shareholder interest.

During this period, interest liberalization has been rolled out with great caution. In 2003, interest rate floors for small amount foreign currency deposits were scrapped. In 2004, interest rates for small amount deposits were completely liberalized. Deposit rates liberalization has been put on hold until now, even though floors have been abolished, PBoC retained ceilings at 1.2 times the base deposit rates. For the lending rates, since 2003, PBoC has been expanding the band of lending rates as well as expanding the range of liberalized institutions. In 2013, PBoC announced lifting all restrictions on lending rates for financial institutions. In addition, in 2007, PBoC set up Shanghai Interbank Offered Rate (“Shibor”) to replace Chibor.\(^{113}\)

Interest rates in China are operating in a dual-track system. On the one hand, Shibor is anchored for money market operations, which better reflect liquidity condition on the market; on the other, the lending rate is pegged to PBoC-set benchmark rate. The dual tracks have been hampering the central bank’s wish to lower corporate financing costs because the transmission mechanism of benchmark

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\(^{113}\) Chibor is calculated based on the real interest rate of inter-bank financing trade, while Shibor is the average all banks’ quotations
rates is less market-oriented. In 2019, PBoC announced the expanded use of Loan Prime Rate (“LPR”) as the major anchoring rate for commercial loans. The new LPR will come from the quotation from 18 contributing banks on the 20th of every month. Banks submit quotations based on their bidding in open market operations. The new LPR has expanded tenure from only one-year rate to include also five-year and beyond. The merge of two interest rate tracks makes PBoC’s indirect intervention through OMOs to trickle down to economic activities more easily.

The Banking Sector

The banking sector reforms can be described as “through hell and high water”. China’s banking industry, mostly dominated by the Big Four at the time, had been instrumental to SOE financing. But it also had accumulated huge risk during the economic transition phase of China in the 1990s. After the Asian financial crisis, they were deemed to be technically bankrupted (Lardy, 1998). In 1998, the government rescued the Big Four by injecting RMB270 billion from the special treasury bonds to supplement their capital.

In 1999, the government established four assets management companies (AMCs)\textsuperscript{114} to take over the non-performing assets in the Big Four. The Big Four transferred RMB1.4 trillion non-performing assets to the four AMCs. The transfer did not immediately or fundamentally solve the NPL problem confronting China’s banking sector. NPL in the banking sector continued to be higher than 10 percent until 2005 (Figure 76). Within the banking sector, a divergence also appeared. While the average NPL ratio between 1995 to 2007 for joint-stock commercial banks was 3.95 percent, the same ratio was as high as 12.90 percent for the Big Four (Huang, 2010).

The government realized that peeling off bad loans was not enough to address the rooted problem of inefficiency and risk mispricing. What the banking sector lacked was a comprehensive system, the corporate governance structure, and management expertise. All banks are encouraged to attract strategic investors, both domestic and foreign, and prepare for reorganization and later ownership reforms.

\textsuperscript{114} China Cinda Asset Management Corporation, China Huarong Asset Management Corporation, China Orient Asset Management Corporation and China Great Wall Asset Management Corporation were established in charge of taking over and disposing the non-performing assets from CCB, ICBC, BOC and ABC, respectively
Guo Shuqing, then chairman of China Construction Bank, explained in an interview, that Chinese banks needed to find foreign strategic investors because (1) no domestic entity, be it China Life or China Petro, had enough capital to deploy given the size of the banking sector; (2) foreign strategic investors could provide insightful expertise to improve management and operational skills of the banks; and (3) the investment of sophisticated foreign investors would serve as a validated rubber stamp for the banks’ future IPO.\textsuperscript{115} My interview with a staff member on the strategic investor task force at CCB told me, what the foreign investors brought was far more than mere capital, they provided staff training and risk management framework that are instrumental to Chinese banks’ development. Many banks have attracted meaningful foreign investment between 1996 to 2007.

The introduction of foreign strategic investors was not without controversy. Critics argued that the selling of shares to foreigners was under-valued, and the pricing was too low. But neither the valuation comparison with international deal experience, nor the later improvement of China’s banking system, collaborates with the critiques. First, the valuation of the primary round was 1.22x, 1.15x, and 1.17x Price-to-book for ICBC, CCB, and BOC respectively (Table 22). This valuation is in line with the historical transaction multiples in the global banking space. Especially considering the NPL situation facing China’s banks before the investment. The valuation, from a market perspective, was rather generous.

\textsuperscript{115} <http://bank.hexun.com/2005-06-22/102051667.html>
Second, the critics looked at how much return foreign investors gained from their investment, but it would be impossible to know what the outcome without such investment would be.

Table 22: Foreign Investment in China’s Banking Sector, 1996-2007

<table>
<thead>
<tr>
<th>Chinese banks</th>
<th>Timing</th>
<th>Foreign Investor</th>
<th>Investment Amount</th>
<th>Shareholding</th>
</tr>
</thead>
<tbody>
<tr>
<td>Everbright Bank</td>
<td>1996.1</td>
<td>Asian Development Bank</td>
<td>US$19 million</td>
<td>3.29%</td>
</tr>
<tr>
<td>Bank of Shanghai</td>
<td>1999.12</td>
<td>IFC</td>
<td>US$55.1 million</td>
<td>7%</td>
</tr>
<tr>
<td></td>
<td>2001.12</td>
<td>HSBC</td>
<td>US$63 million</td>
<td>8%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Shanghai Commercial Bank</td>
<td>US$23.6 million</td>
<td>3%</td>
</tr>
<tr>
<td>Nanjing Commercial Bank</td>
<td>2001.11</td>
<td>IFC</td>
<td>US$27 million</td>
<td>15%</td>
</tr>
<tr>
<td>Shanghai Pudong Development Bank</td>
<td>2002.12</td>
<td>Citi</td>
<td>US$67 million</td>
<td>4.62%</td>
</tr>
<tr>
<td>Industrial Bank</td>
<td>2003.12</td>
<td>Hang Seng Bank</td>
<td>RMB1.725 billion</td>
<td>15.98%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>GIC</td>
<td>RMB540 million</td>
<td>5%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>IFC</td>
<td>RMB432 million</td>
<td>4%</td>
</tr>
<tr>
<td>Bank of Communication</td>
<td>2004.8</td>
<td>HSBC</td>
<td>RMB1.75 billion</td>
<td>19.9%</td>
</tr>
<tr>
<td>Xi’an Commercial Bank</td>
<td>2004.1</td>
<td>IFC</td>
<td></td>
<td>2.5%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Scotiabank</td>
<td></td>
<td>12.4%</td>
</tr>
<tr>
<td>Jinan Commercial Bank</td>
<td>2004.11</td>
<td>CommBank</td>
<td></td>
<td>11%</td>
</tr>
<tr>
<td>Minsheng Bank</td>
<td>2004.11</td>
<td>IFC</td>
<td></td>
<td>1.08%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Temasek</td>
<td></td>
<td>4.55%</td>
</tr>
<tr>
<td>Shenzhen Development Bank</td>
<td>2004.12</td>
<td>Newbridge Capital</td>
<td>~RMB1.5 billion</td>
<td>17.89%</td>
</tr>
<tr>
<td>Bank of Beijing</td>
<td>2005.3</td>
<td>ING</td>
<td>RMB1.78 billion</td>
<td>19.90%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Deutsche Bank</td>
<td></td>
<td>5%</td>
</tr>
<tr>
<td>Hangzhou Commercial Bank</td>
<td>2005.4</td>
<td>CommBank</td>
<td>AUD100 million</td>
<td>19.90%</td>
</tr>
<tr>
<td>Harbin Commercial Bank</td>
<td>2005.4</td>
<td>IFC</td>
<td></td>
<td></td>
</tr>
<tr>
<td>China Construction Bank</td>
<td>2005.6</td>
<td>Bank of America</td>
<td>US$2.5 billion</td>
<td>9.1%</td>
</tr>
<tr>
<td></td>
<td>2005.7</td>
<td>Temasek</td>
<td>US$1.4 billion</td>
<td>5.1%</td>
</tr>
<tr>
<td>Nanchong Commercial Bank</td>
<td>2005.7</td>
<td>Deutsche Investitions</td>
<td>Euro3 million</td>
<td>10%</td>
</tr>
</tbody>
</table>
After attracting investment in the primary market, banks were encouraged to list their shares on public markets in order to raise capital. In 2006, Bank of China became the first listed Big Four banks both on domestic (Shanghai) and overseas (Hong Kong) markets. Then ICBC, CCB and ABC followed the trend and became listed companies in 2006, 2007, and 2010. Joint-stock commercial banks and city commercial banks followed suit, until 2019, 33 banks are listed.

Chinese banks are large in size, but it may be premature to claim that they are as strong as their international peers. By the time this paper is written, most of the listed banks have been trading below book value for an extended period of time (Figure 77). Some city commercial banks are trading as low as 0.4x P/B, suggesting that the market is assigning a much higher NPL ratio than the banks report.
Figure 77 Historical Trading Level (P/B Ratio) of Banks

Source: Bloomberg

I worked on the Hong Kong listing of Postal Savings Bank of China ("PSBC") during 2016-2017. One of the biggest challenges of the project was to convince the market that PSBC was worthy of a valuation above 1.0x P/B while all the Big Four banks were trading at 0.7-0.8x levels. The highlights of PSBC were its network of 40,000 branches and a wide base of rural deposits and a low level of non-performing loans. These were valid advantages compared to other large commercial banks, but they were not enough to persuade US$8.1 billion buy-in. To anchor the deal, investment banks and PSBC itself counted on industrial investors who were willing to step in as cornerstone investors. Cornerstone investments reduce the supply of shares, thus allowing the remaining shares to be pushed to a higher price. Six cornerstone investors, mostly state-owned enterprises, subscribed about 75 percent of the planned issuance. The deal was priced near the low end of
the indicative range at 1.04x P/B. After its debut, PSBC has traded downward to converge with its commercial bank peers (Figure 77).

**Capital Markets**

**Stock Market**

The first stock issued on the secondary market was Feile Audio Equipment in 1984. In the early 1980s, SOEs began to experiment with shareholding reform and to issue shares to insiders and the public. These shares were more like bonds rather than stocks, because they were normally issued at par with guaranteed principle and fixed dividend. In 1986, Shenyang Trust & Investment Corporation started to provide brokerage service for stock and bond trading, and loans with enterprise bonds as collateral. In response to the public enthusiasm for trading, the government established Shanghai Stock Exchange (SHSE) and Shenzhen Stock Exchange (SZSE) in 1990 and 1991 respectively, right after some pilot programs on securities transfer and distribution.

**Figure 78 China’s First Underwritten Stock Issuance**

Stocks in the initial stage of the secondary market paid dividends more generous than bank deposits. People all across the country swamped to buy stocks. Due to the shortage of subscription forms, the government limited every person to purchase up to one stock warrant based on his or her identity card. Retail investors
borrowed identity cards from the countryside and waited in long lines to purchase stock warrants. On August 10, 1992, when the Shenzhen government issued the IPO lottery table, retail investors were furious as they suspected the stock warrants had been illegally distributed. Violent protests followed. This incident, known as the 8.10 Incident, shook the whole country and triggered the government’s decision to establish a regulatory body to supervise the activities of the stock markets. China Securities Regulatory Commission (“CSRC”) was established in November 1992.

The stock market development has been extraordinary. The number of listed companies increased from 10 in 1990 to more than 3,600 in 2019. The total stock market capitalization reached RMB53.6 trillion (c. US$7.6 trillion) at the end of June 2019.

Despite rapid development, there is still potential for China’s stock market to grow. The ratio of the total market value of listed companies to GDP is an important indicator of the degree of financial deepening. This ratio was 48.3 percent for China at the end of 2018, far below the 148.5 percent in the United States and the world average of 93.0 percent (Figure 79).

Figure 79 Ratio of Total Market Value of Listed Companies to GDP

Source: WIND
The stock market has been evolving from a two-board system into a multi-level system (Figure 80).

- **New Third Board.** The third-tier market ("Equity Transfer System") was established in 2001 to deal with the earliest listed trading companies on STAQ system and NET system and delisted companies, which are known as the "Old Third Board". In 2006, unlisted joint-stock companies in Science and Technology Park entered the agency transfer system for share quotation transfer, then the market was rebranded as the "New Third Board".

- **GEM Board.** On October 30, 2009, the growth enterprise board (GEM) was opened with the first batch of 28 stocks listed for trading. GEM was mainly established for high-tech industries.

- **Sci-Tech Innovation Board.** The science and technology innovation board was opened on June 13, 2019, and the first batch of 25 stocks was listed on July 22. Enterprises that have not made profits or have accumulated losses that have not been covered are allowed to be listed.

Figure 80 China’s Multilevel Stock Market

Note: Along the direction of the arrow, listing requirements are looser, investors face bigger risk, and adequacy requirements become higher
The essential reform in the stock market is regarding the IPO method. The government has been holding a firm grip on stock issuance. At the beginning, stock issuance followed a quota system, where the central government would determine the total size of issuance while the local governments recommended companies for listing. After 10 years, in March 2000, CSRC adopted a new policy of verification and approval. Under the new regime, securities firms acting as the lead underwriter would take the responsibility to verify information, enforce disclosure, and recommend listing to the Issue Review Committee of CSRC. The CSRC would have the final power to determine whether and when to list recommended companies. The verification and approval system is blamed for (1) distorting the pricing of IPOs, (2) sterilizing liquidity from money circulation because it requires clients’ fund to be frozen for an extended period of time, and (3) causing the long waiting line for companies to be listed and have necessary access to capital for corporate development. As a result, CSRC conducted pilot experiments of new IPO method and pricing on the newly established Sci-Tech Innovation Board in 2019. The Sci-Tech Innovation Board uses a registration-based IPO system, where CSRC and SHSE will conduct a formality review of the application without substantively assessing the value of the shares or profits for investors. The registration-based IPO system is expected to significantly streamline and expedite the review procedure. The pricing cap on new issuance is lifted, allowing the market to price a stock based on its merit. Following the pilot at Sci-Tech Innovation Board, CSRC is looking to expand the registration-based system to Shenzhen’s ChiNext board.\footnote{Task forces has been prepared for ChiNext’s Registration-Based IPO Reform. <https://www.caixinglobal.com/2019-10-21/task-forces-prepare-for-chinex ts-registration-based-ipo-reform-101473808.html>}

**Bond Market**

China’s bond market has gone through twists and turns from it first resumed the issuance of treasury bonds in 1981. In 1988, The Ministry of Finance experimented with the circulation and transfer of Treasury bonds in 61 cities over bank counters. In 1992, SHSE and SZSE debuted treasury bond trading. Bonds were traded both on the OTC market and on exchanges. The treasury bonds on the OTC market were all bearer physical bonds instead of book-entry bonds, making their custody and settlement burdensome. Therefore, in the early years of the co-
existence, the exchange market overshadowed the OTC market, and became the dominant mode of bond trading.

In 1993, treasury bond futures were piloted on the SHSE. In 1994, the trading aggregate reached RMB2.8 trillion in the Treasury bond futures market. Then the 327 Incident happened.

Box 7 The 327 Incident

The 327 bond was a three-year bond issued by the Chinese government in 1992, due in June 1995, which promised to pay RMB132 at maturity for a par value of RMB100. In early 1995, China was faced with severe inflation at 22 percent, and the rumors began to circulate that the Ministry of Finance would compensate holders of government bonds by paying RMB148 at maturity for every 327 bond. Many investors swamped the treasury bond futures market to take a bullish or bearish position about the rumor, and Wanguo Securities was one of many.

On February 23, 1995, the Ministry of Finance announced that it would pay RMB148.50. At that time, Wanguo Securities was holding a large short position on the Bond. As the market opened on the morning of February 23, buyers bullish about the 327 Treasury bond, led by the China Economic Development Trust and Investment Co., pushed the price from the previous night's closing price of RMB148.21 to 148.50 by buying 800,000 lots.

In the afternoon, the price reached 151.98. When Liaoguo Securities, one of the allies of Wanguo Securities, suddenly changed sides and started to buy, the price rose by 3.77. A rise of RMB1.00 would cost Wanguo Securities more than RMB1 billion. In the last minutes before the market closed, sellers led by Wanguo Securities started to fight back. They first lowered the price from 151.30 to 150 by selling 500,000 lots. Then, they kept pounding the price with lots of hundreds of thousands, and eventually brought the price down to 148.

Finally, they threw a selling bomb and dragged the price down to 147.40 with a massive sales order of 7.3 million lots. In accordance with the provisions of the Shanghai Stock Exchange, a lot in the Treasury bond futures trading represents the number of contracts of underlying Treasury bonds worth CNY 20,000 in face value. A sales order of 7.3 million lots represents CNY 146 billion, but all of the 327 Treasury bonds issued are only worth CNY 24 billion.

After the market closed that evening, the Shanghai Stock Exchange released an emergency announcement that all 327 Treasury bond transactions after 16:22:13 were deemed invalid. Accordingly, the adjusted Treasury bond futures trading amount was RMB540 billion, and the closing price of 327 Treasury bond futures was the price of the last valid transaction at
The Holy Grail of Reforms

RMB151.30. At that closing price, Wanguo Securities would incur an RMB6 billion loss. The next day, there was a run on Wanguo Securities.

Three months later, the Treasury bond futures market was closed.

The low liquidity of the exchange market and the need for a relatively independent bond market apart from the stock market have propelled the establishment of the interbank bond market. In 1997, in order to cool off the overheating stock market, PBoC ordered commercial banks to withdraw from the exchange bond market. This opportunity has created an interbank market for China’s OTC bond trading. Ever since, PBoC had expanded the participant base of the market to include commercial banks, insurance companies, securities companies, and other non-bank financials. Trading volume in the interbank market exceeded that of the exchange market for the first time in 2003. To date, the interbank market dominates China’s bond market (Table 24).

Table 24 Interbank and Exchange Markets in Spot and Repo Transactions

<table>
<thead>
<tr>
<th>At December 31, 2018</th>
<th>Spot transaction</th>
<th>Repo transaction</th>
<th>In total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Total amount (RMB billion)</td>
<td>Proportion (percent)</td>
<td>Total amount (RMB billion)</td>
</tr>
<tr>
<td>Inter-bank bonds market</td>
<td>148,129.0</td>
<td>98.9</td>
<td>722,361.1</td>
</tr>
<tr>
<td>Exchange-traded bonds market</td>
<td>1,657.0</td>
<td>1.1</td>
<td>229,415.1</td>
</tr>
<tr>
<td>In total</td>
<td>149,786.1</td>
<td>100.0</td>
<td>951,776.2</td>
</tr>
</tbody>
</table>

Source: WIND

Now China’s bond market is made of four different segments: interbank, exchange, inter-institution quotation system, and OTC. The comparison of these four is summarized as follows.
Similar to the stock market, China’s bond market has grown fast to become the world’s second-largest bond market only after the United States. By the end of Q3 2019, China’s bond market reached RMB90.7 trillion (c. US$12.8 trillion), surpassing Japan.
Despite its fast growth, the interbank market still suffers from some areas of weakness. First, market liquidity is low. Since the participants of the interbank bond market are mostly financial institutions who usually buy and hold securities to maturity. Second, the problem of artificially high domestic rating is prominent. Of all the rated bonds in the interbank market, more than 95 percent are rated AAA or AA, and only 0.11 percent receive a rating of BBB+ or lower. Third, it lacks the infrastructure to hedge interest risk and credit risk. Derivatives such as treasury bond futures, interest rate swaps, and credit default swaps are either non-established or lack market depth to be effective. Fourth, it heavily relies on government credit and investors lack the pricing capability for nongovernment credit risk. Most of the bonds traded in the market are treasury bonds and policy financial bonds based on sovereign credit. The market is unfamiliar with pricing nongovernment credit.

**Exchange Rate and Capital Account**

China’s foreign exchange regime has undergone gradual but significant changes from the official rate only, to the dual-track of official and market rates, and then to a managed floating mechanism based on demand and supply.

Since the opening up reform in 1978, foreign exchange has become increasingly salient to China’s interaction with the global markets. In the early
1980s, the exchanged rate was determined by the government in the foreign exchange business commenced by Bank of China.

Between 1985 and 1993, a dual-track of exchange rates emerged. In 1985, the first foreign exchange trading center was first established in Shenzhen Special Economic Zone to handle foreign trade transactions. Following Shenzhen, many local governments also established foreign exchange trading centers. All these trading centers will have their own market-based retention rates, coexisting with the official foreign exchange rate.

In 1994, China decided to unify different exchange rates at 18 trading centers by creating a managed floating exchange rate in a newly established interbank foreign exchange market. The government also devalued the official rate and merged it with the unified market rate. Since then, China’s foreign exchange market was in the new chapter of a managed floating and single rate regime, which has been de facto pegged to the US dollar. The initial RMB to dollar rate was 8.7.

At the height of the Asia financial crisis in 1997, the pressure for devaluation was enormous for RMB to reflect the affected economic fundamentals of China. However, China fought to maintain stability of its currency, and kept the exchange rate at around 8.3 with its floating range narrowed.

In 2005, the PBoC announced that China was changing its US-dollar pegging policy to a regime based on supply and demand with reference to a basket of currencies. Every trading day, the government will announce a fixed rate before the start of trading as the midpoint of the band. Initially, the RMB/USD rate was allowed to fluctuate in a daily band of +/-0.3 percent around the fix; and RMB to other currencies were allowed with a wider band of +/-1.5 percent.

The band has been expanded since 2005. The trading band for RMB/USD was widened to +/-0.5 percent in 2007, to +/-1 percent in 2012, and +/-2 percent in 2014. The trading band for non-US dollar currencies was also expanded to +/-3 percent.

From 2005 to 2014, RMB has been riding a steady escalator of appreciation. Real effective exchange rate appreciated by around 50 percent to the US dollar during this decade (Figure 82). The managed appreciation reflected the authority’s view that based on a DSGE model of estimation, the RMB equilibrium exchange
rate called for an appreciation due to the effects of labor productivity, money supply growth, and the consumption in foreign countries (Sun, 2015).

**Figure 82 Real Effective Exchange Rate of RMB/USD**

![Real Effective Exchange Rate of RMB/USD](source: Bloomberg)

The government has a heavy hand in the foreign exchange market because it believes in the following explicit advantages of a stable exchange rate. First, stable exchange rates reduce planning uncertainty and help import and export enterprises focus on their operational upgrading. Second, stable exchange rates may encourage overseas institutions to invest in RMB assets or hold RMB. Third, the economic growth model transition and the internationalization of RMB would require a stable FX environment to avoid disturbance.

But the market sentiment of the direction of RMB/USD rate turned in 2014 and 2015. Partly due to the large correction in the Chinese stock market in 2015, and partly because of a sharp decline in import demand, and partly due to the beginning rate hike by the Federal Reserve, capital outflows have accelerated, and RMB/USD started to depreciate. In light of the unexpected turn and the speed of the trend, the PBoC intervened through open market operations to stabilize the exchange rate in conjunction with capital control. FX reserves at State Administration of Foreign Exchange (“SAFE”) fell by 13.3 percent in 2015 from RMB3.84 trillion before the depreciation episode began.

The government has made efforts to shift away from a fixed peg to dollar, based on the understanding that the arrival of the first turning point of the Lewis
Turning Point might trigger the Balassa-Samuelson effect. The Balassa-Samuelson effect illustrates that an increase in wages in the tradable goods sector will lead to higher wages in the non-tradable (namely service) sector of the economy (Balassa, 1964; Samuelson, 1964). The Balassa-Samuelson effect did not take place in China’s initial stage of opening-up reforms. One possible explanation is the large quantities of surplus labor resources in China’s rural regions entering the tradable sectors. However, as China has reached the Lewis Turning Point, when the surplus labor resources in rural areas are gradually decreasing, and the marginal products of capitalists and non-capitalists are bound to converge. The immediate implication is the inflationary pressure in the future. As the rise of productivity in the tradable sectors continues, it may lead to a rise in prices of agricultural products, and structural inflation as a result. To date, China is pegging its currency to the CFETS basket of currencies. The basket link allows China to manage trade competitiveness against a broader range of trade counterparts.

Financial liberalization in the FX market has been carried out in a gradual way. China realized the current account convertibility in 1996. But capital account convertibility is still a target to be achieved. Scholars argued that the capital control policies are becoming less effective, and the liberalization of capital account convertibility will not bear significant market risks. These views are not yet enough to move China towards full liberalization of the FX market. In other words, China still needs to wait for a window of opportunity to push for the final step of FX liberalization.

Reasons deterring currency floating include (1) a fear of the negative impact of appreciated currency on export, (2) the repayment pressure if there is a high share of foreign currency liabilities (Calvo and Reinhart, 2002), and (3) significant capital outflow risk pertaining RMB-denominated savings seeking to invest overseas. Das (2019) warns in the IMF report that “if households and corporates move money abroad suddenly and are reluctant to lend or invest in renminbi, this could trigger funding shocks for banks and nonbanks, and possibly fire sales and large-scale redemptions of short-term investments, such as wealth management products. This could lead to credit risk being abruptly repriced and restricted, adding to corporate stress. The equity market would also likely come under strong downward pressure.”
Current Challenges and Constraints

Financial Repression

The biggest challenge or criticism of China’s financial system is its financial repression. The financial repression theory from McKinnon (1973) and Shaw (1973)’s work argues that a repressed financial sector reduces the cost to the government of sterilized intervention and restricted competition. Deposit rates are set at administratively low levels below market equilibrium. In such a system, savings and investments are discouraged due to a lower rate of return compared to a competitive market, financial intermediaries are not operating at their full capacity, and credit allocation is not efficient.

Numerous studies attest to the negative influence of financial repression on economic growth. For example, Fry (1978, 1980, 1981) provides a theoretical linkage between real interest rate, savings, and economic growth in a wide range of countries. Gupta (1984) collaborates the positive relationship between aggregate savings and the real interest rate in Pakistan, the Philippines, Sri Lanka and Thailand, but the same relationship does not hold in the rest of the countries. Roubini and Sala-i-Martin (1992) present both theoretical and empirical evidence to demonstrate how financial repression is associated with higher inflation rates, higher base money per capital, and weaker economic growth. Building on their previous research, Roubini and Sala-i-Martin (1995) conclude, “Financial repression reduces the efficiency of the financial sector, increases the costs of intermediation, reduces the amount of investment, and reduces the growth rate of the economy”. Pagano (1993) also finds that policies such as interest rate controls and reserve requirements largely hinder financial intermediation and undermine the financial market’s function of efficient resource allocation. In a more recent examination of financial repression, Lardy (2008) argues that continued manipulation of interest rates imposes detrimental risks to the Chinese financial system, deters progress towards a robust capital market, and hinders China’s long-term economic growth. Gelb (1989), King and Levine (1993), De Gregorio (1992), and Fry (1995) all identify a negative relationship between financial repression and long-term economic growth.
Despite a large number of theoretical and empirical studies that portrait the negative link, however, other researchers have challenged this conclusion. Dornbusch and Reynoso (1989) argue that the promotion of economic growth is indeed hindered by deficit finance, but not necessarily by the broad practices resulting from financial repression. Arestis and Demetriades (1999) point out that the financial liberalization hypothesis is based on a set of unsound assumptions including perfect competition and complete information. Stiglitz (2000) even attributes the increasing frequency of financial crises during the past decades to the increasing financial liberalization in the developing countries, arguing financial liberalization is like “putting a race car engine into an old car and setting off without checking the tires or training the driver”.

In China, the relationship between financial repression and economic growth is still unclear due to mixed evidence. China has one of the most repressive financial systems, yet it has also enjoyed the strongest growth in the past several decades. Li (2001) argues that financial repression has helped China maintain financial stability, which is critical for economic reforms. However, Lardy (2008) estimates that financial repression, which he defines as the negative return on deposits, costs Chinese households about 4 percent of GDP. Wu (2015) estimates that policy distortions in financial markets caused aggregate total factor productivity (TFP) loss of 19.2 percent.

In more recent studies, scholars reconciled these two opposing views by proposing the idea of a double-edged sword. Huang and Wang (2011) use both time series and provincial panel data, they find that while repressive financial policies have helped economic growth in China during the first two decades in reform periods, the impact turned negative in the 2000s. Similarly, Huang et al. (2010) argue that financial repression has been instrumental to China’s economic development in the past, but as the economy develops to a stage, repressive policies can impose a significant cost on the economy in terms of economic efficiency and GDP growth. Xu and Gui (2013, 2014) argued that on the one hand, credit misallocation and state ownership in the financial system hinder economic growth by damaging economic efficiency; on the other hand, interest rate controls have contributed to economic growth by lowering the cost of capital for the entire
corporate sector, and exchange rate distortion promotes economic growth by stimulating exports.

**Under-development of Capital Markets**

China’s financial industry has made tremendous efforts in establishing and improving market infrastructure. As we discussed, noticeable progress has been made in forming an increasingly competitive multi-level capital market. This serves as a good starting point of financial liberation and a more efficient allocation of capital in the economy. There is, nevertheless, still a long way to go for the market structure to be improved.

First, despite rapid growth in market size, liquidity and depth of China’s financial markets remain relatively low. For example, China’s onshore FX market has a turnover data lower than other countries with de jure floating currencies (BSI Triennial Central Bank Survey, 2016). The volume of transactions is concentrated at large state-owned banks in a small range on a daily basis, pointing to a lack of depth. The same liquidity feature is obvious in the interbank bond market where major market participants tend to hold securities to maturity rather than trading for profit.

**Figure 83 FX Turnover in Floating Currency Countries**

![Average Daily FX Turnover (%)](image)

*Source: BIS Triennial Central Bank Survey 2016*

Second, the early-stage investors are handicapped by professional sophistication as well as a particular fundraising mechanism, making it hard for innovative early stage companies to get funding. Bond market, stock market, even
bank loans are for companies above a certain scale. The quality funding market for innovation at the earliest stage is severely lacking. Even though from a number perspective, early-stage venture capital funds are very high, they are structurally dispositioned to finance long-term innovation. Unlike venture capital funds in the U.S. and other developed markets, VCs in China rely heavily on local governments in the form of government-guided funds for fundraising. Indeed, some top VC funds such as Sequoia China and IDG have a more diversified channel of funding such as foreign investors, sovereign wealth funds, and university endowment overseas, most other VC funds have only two sources of funding: governments and high-net-worth individuals. The fund structure is designed to be relatively short term. The common fund tenor is 3+2, meaning that the LPs are expecting to reap cash returns within 3 years, and that 3-year period of exit can be extended by 2 years with LP approval. The short-term nature of these fund structures forces VC funds to avoid innovation at the earliest stage. During my interviews with a renowned VC, they told me that they only look at startups with revenue above RMB10 million. Take innovative drug development as an example, CFDA has a faster approval timeline than FDA in the United States, but the process and standards are largely similar. The process takes around 8-10 years for drugs and 5-7 years for medical devices to generate revenue. Therefore, the VC fund structure prevents them from investing in standalone proprietary innovation.

**Figure 84 Drug Discovery and Development Timeline**

![Drug Discovery and Development Timeline](source: cancerprogressreport.org)
Third, direct financing subdued. Indirect financing, namely bank loans has come down as a percentage of aggregate financing to the real economy from 2002 to 2013. But its dominance has returned to a pre-reform level in spite of announced efforts to develop direct financing channels. RMB bank loans’ share in aggregate social financing flows surged to 81 percent in 2018 and has been elevated at 70-80 percent band for an extended period after 2014 (Table 26). Compared to other countries in the world, China’s direct financing is low (Figure 85).

Table 26 The Breakdown of Aggregate Social Financing to the Real Economy

<table>
<thead>
<tr>
<th>Year</th>
<th>RMB Bank Loan</th>
<th>Foreign Currency Bank Loan</th>
<th>Corporate Bond</th>
<th>Equity Financing</th>
<th>Trust</th>
<th>Others</th>
</tr>
</thead>
<tbody>
<tr>
<td>2002</td>
<td>92%</td>
<td>4%</td>
<td>2%</td>
<td>3%</td>
<td>0%</td>
<td>0%</td>
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<tr>
<td>2003</td>
<td>81%</td>
<td>7%</td>
<td>1%</td>
<td>2%</td>
<td>0%</td>
<td>9%</td>
</tr>
<tr>
<td>2004</td>
<td>79%</td>
<td>5%</td>
<td>2%</td>
<td>2%</td>
<td>0%</td>
<td>12%</td>
</tr>
<tr>
<td>2005</td>
<td>78%</td>
<td>5%</td>
<td>7%</td>
<td>1%</td>
<td>0%</td>
<td>9%</td>
</tr>
<tr>
<td>2006</td>
<td>74%</td>
<td>3%</td>
<td>5%</td>
<td>4%</td>
<td>2%</td>
<td>12%</td>
</tr>
<tr>
<td>2007</td>
<td>61%</td>
<td>6%</td>
<td>4%</td>
<td>7%</td>
<td>3%</td>
<td>19%</td>
</tr>
<tr>
<td>2008</td>
<td>70%</td>
<td>3%</td>
<td>8%</td>
<td>5%</td>
<td>5%</td>
<td>10%</td>
</tr>
<tr>
<td>2009</td>
<td>69%</td>
<td>7%</td>
<td>9%</td>
<td>2%</td>
<td>3%</td>
<td>10%</td>
</tr>
<tr>
<td>2010</td>
<td>57%</td>
<td>3%</td>
<td>8%</td>
<td>4%</td>
<td>3%</td>
<td>25%</td>
</tr>
<tr>
<td>2011</td>
<td>58%</td>
<td>4%</td>
<td>11%</td>
<td>2%</td>
<td>2%</td>
<td>22%</td>
</tr>
<tr>
<td>2012</td>
<td>52%</td>
<td>6%</td>
<td>14%</td>
<td>2%</td>
<td>8%</td>
<td>18%</td>
</tr>
<tr>
<td>2013</td>
<td>51%</td>
<td>3%</td>
<td>10%</td>
<td>1%</td>
<td>11%</td>
<td>23%</td>
</tr>
<tr>
<td>2014</td>
<td>61%</td>
<td>-4%</td>
<td>19%</td>
<td>5%</td>
<td>0%</td>
<td>7%</td>
</tr>
<tr>
<td>2015</td>
<td>73%</td>
<td>-3%</td>
<td>17%</td>
<td>5%</td>
<td>0%</td>
<td>2%</td>
</tr>
<tr>
<td>2016</td>
<td>70%</td>
<td>3%</td>
<td>15%</td>
<td>5%</td>
<td>0%</td>
<td>10%</td>
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<tr>
<td>2017</td>
<td>71%</td>
<td>0%</td>
<td>2%</td>
<td>5%</td>
<td>0%</td>
<td>10%</td>
</tr>
<tr>
<td>2018</td>
<td>81%</td>
<td>-2%</td>
<td>13%</td>
<td>2%</td>
<td>-4%</td>
<td>10%</td>
</tr>
<tr>
<td>2019.01-10</td>
<td>74%</td>
<td>0%</td>
<td>13%</td>
<td>1%</td>
<td>-1%</td>
<td>12%</td>
</tr>
</tbody>
</table>

Source: PBoC

Figure 85 Direct Financing Share in Economy in 2017

Financial Stability

The challenges of financial stability come from both sides: financial liberation and financial repression. Financial liberation experiences in other countries indicate an extensive risk of financial crisis. A lack of liberation and the continuing financial repression force savings to flow to nonbanks for higher returns. These nonbanks, including trust schemes, peer-to-peer lending, and even cryptocurrency pertain to high risk inherently due to a lack of oversight and the fraudulent environment.

Financial liberalization can lead to financial instability or a full-blown crisis. In the late 1980s and early 1990s, financial liberalization became a common prescription of policies sponsored by international financial organizations such as the IMF and the World Bank, known as the “Washington Consensus”. Unfortunately, Washington Consensus policies have yielded disappointing results in countries without the necessary institutional capacity of prudential regulation and market infrastructures. Arestis et al (2003) find that financial instability has been popular after the implementation of financial liberalization policies in Venezuela, Mexico, Ecuador, Thailand, Russia, Columbia, Indonesia, Kenya, Korea, Brazil, and others. In response to the disappointing results and social unrest, McKinnon (1993) adds the need for sequencing in implementing liberalization. Fiscal balance, price stability, domestic capital markets, and international capital account should be freed in sequence. Mishkin (2001) stresses that prudential regulation needs to be in place before any financial deepening. In a literature review by Loizos (2018), most empirical studies find a positive relationship between financial liberalization and financial instability or the onset of a banking crisis. Most studies pointed to the institutional underdevelopment and distorted incentives of market participants as the root cause of such instability.

The risk of financial liberation is not an excuse for non-actions. Continuous financial repression can also accumulate risk in the system by making unregulated nonbank sectors attractive for capital. A case in point is an online peer-to-peer lending vehicle named Ezubao. Founded in July 2014, Ezubao grew quickly to attract about RMB50 billion (c. US$7.6 billion) from more than 900,000 investors. Ezubao promised a return on investment between 9 percent and 14.6 percent, much higher than other investment opportunities in China. To attract validation, Ezubao
sponsored the online broadcasts of the National People’s Congress and ran advertisements on the main evening CCTV news bulletin. The company unexpectedly ceased trading in December 2015, when local authorities started to scrutinize its operations. In February 2016, the scheme closed down and 21 involved officials were arrested. In the investigation, regulators found that 95 percent of the investments were fake, and the major expenditures of the lending platform were for bribery. Ezubao has become the largest Ponzi scheme in China’s history. Other examples of high-risk nonbank investment opportunities include peer-to-peer lending, universal life insurance and financial trust products, all of which have made it to the news headlines when they triggered financial instability.

Potential Solutions

The Bond Market

Diversify market participants in the OTC market to include nonfinancial enterprises, individuals through bond funds.

Currently, individuals purchase treasury bond directly at government issuance, and hold it to maturity as a fixed-income financial asset. If they can participate in the OTC market by purchasing bond fund or a bond ETF product, they will obtain a higher return than interests from banks and enough better liquidity than treasury bond certificates. The bond fund shall allow investors to buy and sell given reasonable early notice, and it should be marked to market on a daily basis. Large funds can benefit from the economies of scale and lower transaction costs for individual investors. Bond funds can be largely divided into two types: passive management and active management. Passive bond funds are indexed to benchmarks, and active funds engage in trading. The development of bond funds can be conducive to attracting funds from individual savings and nonfinancial enterprises to the bond market, instead of to banks. Also, active funds are helping to improve the liquidity of the bond market. The enhanced liquidity and market participation can help better reflect the market rate for the benchmark yield of lending on the yield curve.
Further the internationalization of China’s bond market.

The low or negative interest rate environment across the globe makes China’s bond market more attractive than ever. For example, the 10-year Treasury bond spread between China and the United States are near record highs (Figure 86). However, foreign participation is still very low in China’s bond market. By the end of June 2019, foreign institutions and individuals held RMB2.0 trillion bonds, accounting for only 3.25 percent of the total market\(^\text{117}\). Most of the bonds held by foreign investors are government-issued, while credit bonds account for only about 10 percent of their holdings\(^\text{118}\). A number of factors lead to this. First, the bond market regulation such as disclosure and investor protection are yet to be further developed. Second, there is a lack of internationally trusted rating agency in China’s bond market. Third, the administration, registration, and custody of bonds are segregated, leading to complicated transaction process and noticeable transaction costs. Fourth, liquidity and depth of the market is thin, and there lacks an efficient market maker mechanism. Lastly, and most importantly, investors are concerned about FX risks. The following strategies can be considered:

- Improve the treasury bond balance administration system, the public auction mechanism for issuance, and other market designs;
- Improve the regulation and lawmaking on disclosure, investor protection, and ratings;
- Reconcile the interbank and exchange market, and establish a centrally managed uniform custody and settlement system;
- Further develop the market infrastructure such as cross-border payment, by expanding the coverage of CIPS and integrating CIPS with FX and bond markets;
- Encourage foreign markets to accept RMB bonds as legitimate collateral for overseas transactions.
- Perform roadshow and reverse roadshows for international investors to better understand how they can participate in China’s bond market.

\(^\text{117}\) Data from WIND
\(^\text{118}\) According to my interviews with securities company management
Figure 86 10-Year Treasury Spread Between China and the U.S.

Source: Bloomberg

Figure 87 Bond Holding in Interbank Bond Market by Foreign Investors

Source: WIND
Develop the high yield market.

One of the most important funding sources for early-stage and innovative companies in developed markets is the high yield market. However, the domestic high-yield debt market in China is not well defined. Rating scales in the Chinese market are not comparable to those of international standards and they are inflated, making it hard for investors to distinguish credit quality within the same rating category. ABS and REITs markets are just in their infant stages. There is still a long way to go for China to develop its own high yield market. The following aspects are critical to the development of such a market:

- Encourage the adoption of the adequate covenants package, which contains protective clauses such as financial covenants and protection mechanisms;
- Make explicit requirements about ongoing disclosure for high yield issuers, such as financial statements, material events, and credit status;
- Establish a mechanism for orderly liquidation in the events of bankruptcy to protect investors’ interest.

The Stock Market

Promote the market-based reforms in the stock market

The current pilot program of the new Sci-Tech board is showing promising results. With the right timing, similar issuance procedures and pricing freedom should be extended to the existing main boards. Market-based reforms shall proceed with caution. Close monitoring of the market reaction and media commentary, together with active and clear communication can help avoid irrational herding behaviors and huge swings in prices. The details of market-based reforms include but are not limited to:

- Adapt the current IPO issuance method on the main board to be registration based;
- Relax the timespan of frozen funds for IPO subscription;
- Relax the regulation of secondary follow-on issuance to allow listed companies more flexibility in equity raising;
- Establish a mechanism for funds or institutional investors to be the largest shareholders of certain companies. Currently they are disqualified to be the
real control person（实际控制人），thus eliminating their option to exit buyout transactions through the A-share market;

- Reduce administrative intervention and establish a market-based mechanism for crisis management

*Enhance the penalizing mechanism for fraud and other wrongdoing in the securities market, but not class action suits*

One of the biggest challenges of the current stock market is for regulators and minority shareholders to uncover financial and operational fraud. The information asymmetry can be lightened by (1) enhancing penalty consequences, (2) improving enforcement, and (3) class action suits. My interviews with legal experts in the SEC shed a shadow on class action suits as an option. The U.S. market is flooded with class action suits with almost all M&A transactions facing the threat of class action suits before they are actually filed. Lawyers draft up class action suits to extort listed companies in many cases when they know they don’t actually have a case. Companies settle not because they have committed any wrongdoing, but because they cannot afford uncertainty and reputational damage in transactions. As a result, class action suits become more of a transaction cost than a correction mechanism. The adoption of class action procedures in China’s market is even more tricky. A significant portion of listed companies on the stock market are SOEs. The allowance of class action might lead to media attention of conflict between the government asset owners and citizens represented by their lawyers. The dismissal of the class action suits can be interpreted as unfair or unlawful even if the suit does not have legal grounds.

**The FX Market**

*Develop a more liquid and active FX market.*

In the long term, as capital flow management is gradually loosened, a more liquid FX market can attract diversified investors in the price discovery process. To do so, the following actions would help:

- Allow sufficient two-way exchange rate movement, and avoid one-directional sentiment to deter speculative capital flows;
- Improve active communication strategies with the market, and publish policy communications simultaneously in English;
• Encourage participation in the onshore FX market by various types of institutions

Clarify FX intervention mechanism and enhance transparency

Transparency of FX intervention help guide market expectation and enhance efficiency. Information about FX intervention should be announced after monetary authorities have taken action. Relevant information includes:

• Reasons for intervention
• Source of funding
• Intervention methods and counterparties
• Intervention amount
• Gains/losses of the intervention
• Ongoing monitoring of the intervention results

The Monetary Policy

Continue the decades-long push towards indirect management

PBoC has achieved a significant shift from outright administrative intervention to a more market-based mechanism for base money regulation. The further push toward indirect management requires PBoC to help facilitate the price discovery process for benchmark rates.

• Improve monetary policy transparency via active communication;
• Strengthen forecast capability of liquidity in the banking sector
• Cultivate efficient bond market as a precondition for indirect monetary policy operation of PBoC;
• Enhance institutional capacity in regulation, interest rate intervention, corporate governance, diversifying monetary policy toolkit and risk management;
• Wait for the window of opportunity to lift deposit rate cap, one of the preconditions for liberalization is PBoC’s ability to influence market interest rate through OMOs and other market-based measures;
• Devise preventative market-based mechanism for global financial risk spillovers;
Develop the twin-peak framework of macroprudential and monetary regulation

The creation and implementation of a macroprudential framework with independent counter-cyclical objectives can serve as an important complement to monetary policies. The complementary nature will arise in the long term because the objectives of financial stability and economic growth are intertwined, and one cannot be achieved without the other. In the short term though, careful integration and coordination are required for macroprudential and monetary policies to avoid clashing. While monetary policies can address the economic cycles in general, targeted macroprudential measures are typically more efficient at addressing the root cause of financial imbalances.

- Understand the transmission mechanism of macroprudential and monetary policies in the financial market, and their interactions;
- Consolidate institutional power for macroprudential policies amongst agencies, for example, the administrative regulation responsibility of financially important institutions shall be shifted from CBIRC to PBoC;
Conclusion

Background and The Problem

The center pillar of a socialist society and the body of communist power is its state-controlled political economy. State economy can be instrumental to organize labor and coordinate capital investment in the early stage of development, but it inevitably falls into the growth trap when the whole society starts to experience shortage in certain areas. In that case, the old development model ceases to be effective, and social pressure becomes paramount, a socialist economy is therefore forced to reform.

Unlike the rest of socialist economies, including the Soviet Union and other east European countries, China has undertaken a different approach to reform its state sector. While almost all the privatization attempts, with various pace and formats, to reform its economy in other socialist countries have fallen short, China’s gradual and market-based reforms in the past four decades have been an exception to such underachievement so far.

China’s approach is less of SOE privatization, but mostly fostering a healthy environment for private business to thrive in selected industries. The concept of liberalizing part of the economy was not new. Lenin coined the phrase “commanding heights” in 1922 at a party convention. He called for the liberalization of the service sectors but demanded tight state control over industries essential to the economy like power generation, transportation, money production, natural resources, and upstream manufacturing.

This divergence of liberalization and control is vividly evidenced in the market landscape we see in China today. In industries in the downstream of the value chain such as retail, real estate, and manufacturing, markets are fully competitive and private dominated. For industries within the circle of commanding heights,
such as utilities, telecom, transport, energy, finance, and basic services such as healthcare, the state dominance prevails.

The low-hanging fruit has already been picked, what is left on the state economy reform agenda are the difficult ones specifically in the “commanding heights” industries. How could China continue to reform its state economy?

This paper aims to answer the following research questions:

- Why is it imperative to push forward reforms in commanding heights industries?
- Why is it difficult to reform the commanding heights industries? What is the key theme of distortion and misallocation? What are the obstacles and constraints?
- With the constraints and trade-offs in mind, what are the package of proposals for future reforms?

Findings

The government is taking on a significant and burgeoning fiscal burden to invest in commanding heights industries to meet citizen’s growing demand. The government is heavily subsidizing citizen’s healthcare costs, transportation costs, electricity bills, and other infrastructure utilization.

But this model is both financially unsustainable and systematically deficient. Investments in commanding heights industries coming dominantly from the state are growingly insufficient to keep up with the rising need for capacity and quality.

Full-scale privatization is precarious given the current market and political circumstances. Firstly, the past experience of state economy privatization in other socialist economies highlights significant execution risk that could ultimately lead to social turmoil and economic collapse. Secondly, commanding heights markets are distorted and unprofitable as they stand. Privatization and price liberation could lead to material price hikes to restore profitability and ensure a reasonable return for private investors. Finally, the ideological hurdle could polarize authorities internally, resulting in confusing or even conflicting policies.
Partial privatization, namely encouraging the participation of private capital alongside state investment, cannot be fruitful without solving the fundamental problem of market distortion. Social capital is encouraged to invest, but the market mechanism makes it challenging, if not unprofitable, for private capital to enter and shoulder the cost of development with the government. First, mixed-ownership reforms in these industries are challenging because the target enterprises are all trading below book value. Second, if private investment does not enjoy the same level of subsidies available to public enterprises, it would be impossible for them to compete and set prices to ensure an adequate level of returns.

The fundamental problem in the commanding heights industries is the market distortion as a result of price control and subsidies. Prices are kept artificially low and subsidies make up the losses incurred by state-owned actors. The soft budget constrain solidifies their monopolistic market position because these industries are unprofitable for private capital to enter.

But to relax price control and to lower subsidies are not so straightforward. Here comes the dilemma. Market-based reforms such as price hikes run the risk of affecting the less well-off bodies of the population the most. Market reform 2.0 faces the upmost challenge in striking a balance between market liberalization and social welfare, between unsustainable fiscal burden and unfulfilled promise to citizens, and between economic efficiency and social stability.

Past reforms in China have exhibited four unique features that future reforms can learn from: (1) the central theme of building a market system where market plays a divisive role in resource allocation; (2) the important characteristics of gradualism so that reforms are meticulously carried out in stages; (3) the adoption of a dual-track strategy to incentivize new elements to grow and develop which in turn push for changes in the old components; and (4) the critical steps of piloting before any policy is diffused widely.

The new sets of solutions call for imagination, creativity, iteration, and experiment to tackle these challenges. Reforms in the deep-water zone should be treated with utmost caution, like walking on a thin line with abyss on either side.
Recommendations

The goals of the recommended reforms are to (1) restore the rate of return to ensure an adequate level of investment in these capital-intensive industries, (2) a price for sustainable investment, and (3) a mechanism to alleviate social welfare concerns in market reforms.

Healthcare

**Strategy I: Consolidate Leadership in Payment**

Leadership of healthcare financing needs to be unified. This means that NHSA, Ministry of Finance, and their corresponding agencies at local levels need to have a unified taskforce and agree-upon coordination mechanism.

**Strategy II: Shift from Subsidies to Insurance**

- **Action 1**: the reduced subsidies should be aggregated as a lump sum payment injection to the social insurance funds under NHSA
- **Action 2**: NHSA can increase guidance prices for medical services. Hospitals, both private and public, can benefit on the revenue side
• **Action 3**: NHSA should serve as the main payer, if not the single player, and continue to use its bargaining power to drive down costs.

**Strategy III: Create Equal Opportunities for Qualified Private and Public Hospitals**

The government shall implement policies to level playing grounds for private hospitals in terms of SHI insurance reimbursement.

**Strategy IV: Strengthen Regulatory Evaluation and Enforcement to Minimize Risks of Bad Apple**

- **Action 1**: Use the single/dominating payer system to nudge for good behavior.
- **Action 2**: Enhance regulations to prevent and punish bad behavior.

**Strategy V: Integrated Information System Between Public and Private Institutions**

It is critical to have an integrated information system across all institutions where important disease information can be shared.
Electricity Power

Stage I: Solidify Initiatives of the 2015 Reform

- **Direct purchase for large users.** Larger users are encouraged to sign long-term contract with generation companies directly.

- **The construction of a competitive retail market.** The retailers need to acquire customers based on its cost, services, and other bundling benefits to differentiate themselves.

- **Non-discriminatory access to grid.** A complete unbundling from distribution is a desired outcome for the retailing market.

- **Streamline the regulatory framework.** The lack of institutional resources and the lack of a clear definition of regulatory power will likely render independence and effectiveness of the regulatory oversight.

Stage II: Reform the Dispatch System

China’s current dispatch system is a result of a period of serious electricity shortages before, but it is criticized for its low efficiency, energy waste, and environmental pollution.

A sudden shift to a merit-based dispatch system will cause financial losses to local generators, which hurt local government finances. The most efficient generators are large-scale SOEs under the supervision of central SASAC, which has little to do with local fiscal income apart from taxes. A merit-based dispatch system is likely to favor these large central SOEs, and force smaller local generators to close down.

Therefore, a dispatch reform without pricing pass-through is simply an income transfer between different generators. A dispatch system reform has to come (1) after a market-based wholesale pricing mechanism is established, and (2) with a savings sharing mechanism to compensate local generators in order to gain political support.

Stage III: Allow Price Signal to Play a Major Role in Driving Efficiency

To let price play a decisive role in driving efficiency does not mean disregarding social stability concerns. I would propose a system where a shock in resource price will be passed from IPPs to the end users, but end users will be compensated in part by a government fund. This mechanism is similar to the idea
of insurance where the end users are partially covered by the government. The end users will still face a co-payment of the increased cost. This way they still have skin in the game to choose the most suitable generators. Generators, under this mechanism, will be sheltered from huge swings in earnings, thus maintain a healthy financial profile for future infrastructure investments. At the same time, they are incentivized to improve fuel efficiency, to lower operational costs, in order to fight for market share.

### Railway Transportation

<table>
<thead>
<tr>
<th>Options</th>
<th>Feasibility</th>
<th>Reasons</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ownership Reform of CRC Group</td>
<td>☐</td>
<td>The deal, even the slightest mixed-ownership reform, would be very challenging for the market to absorb at above 1.0x P/B</td>
</tr>
<tr>
<td>Universal Price Hike</td>
<td>☐</td>
<td>Political suicide that might lead to social unrest</td>
</tr>
<tr>
<td>Encourage Social Capital to Invest</td>
<td>☐</td>
<td>Social capital shies away from investing in railways because the current industry cannot meet sustainable return requirement</td>
</tr>
<tr>
<td>Price Differentiation</td>
<td>☐</td>
<td>The natural monopolistic nature calls for price differentiation</td>
</tr>
<tr>
<td>Securitizing Individual Lines</td>
<td>☐</td>
<td>Synergy with coal companies, as well as feasibility on capital markets for individual line IPO</td>
</tr>
<tr>
<td>Introducing Internal Competition</td>
<td>☐</td>
<td>Corporate governance reforms and capital markets allocation aimed to improve incentives for performance</td>
</tr>
</tbody>
</table>
**Stage I: Turn Financially Sustainable**

- Even if we make conservative assumptions, a price adjustment of 8 percent per year for freight and 5 percent per year for passengers, should help CRC as a whole achieve the pre-set ROE target in 3 to 4 years.
- **Price Hike Differentiation for Passenger Services.** Raise price for first-class seats and for 200-250kph high speed lines
- **Price Hike Differentiation for Freight Services.** Raise transportation price for downstream agricultural or manufacturing industries while keeping cost for coal transportation unchanged
- **Communication Strategy:** Narrative is key

**Stage II: Securitize Individual Lines**

- **Reorganization and Corporation**
- **Co-investments from Coal Miners for Dedicated Lines.** Dedicated lines can free up rail capacity for other freight services, and at the same time they enhance margin and integration for coal miners
- **Listing of Individual Lines:** Pre-IPO round and IPO

**Stage III: Introduce Competition**

- **Corporate Governance:** disclosure, internal controls, and employee stock ownership plans
- **Internal Competition:** Competition for political advancement and financial resources to expand
**Telecommunications**

**Action I: Shifting Infrastructure from Operators to China Tower**

- All three operators should (1) sell their existing 4G infrastructure assets to China Tower, and (2) agree to lease from China Tower rather than building their own network. Together with the asset shift, headcounts and other related cost centers should move to China Tower.

- *Financing of the separation can be conducted through a combination of asset injection and equity issuance.* For the previous-generation telecom infrastructures, the government can request the injection in exchange with shares in China Tower. To prevent triggering reverse takeover or major acquisition thresholds by Hong Kong Stock Exchange, the injection should be conducted in stages over the course of years. The transfer of assets can also be financed by cash proceeds from China Tower’s follow-on equity issuance to the public shareholders.

- *NDRC needs to be in close monitoring of the pricing mechanism between China Tower and the operators.* A transparent process to determine pricing is crucial to success. A transparent process should involve consultation with stakeholders at all stages of policy making. The policy decision should be based on a detailed analysis of different perspectives, and it should be communicated with all the parties consulted before.

**Action II: Opening Up Service Cooperation with Private Sector Players**

- *Pursue Adjacencies with Market Leading Private Companies:* the operators could consider partnering with incumbent market leaders in the adjacent businesses such as financial services, IoT, cloud, IT services, online reading, O2O business, digital payments, music streaming, online education, digital health, and video conferencing.

- *Build Essential Digital Talent and Capabilities:* telecom companies could establish a new unit focusing on new and digital service business.
Finance

Bond Market

- *Diversify market participants in the OTC market* to include nonfinancial enterprises, individuals through bond funds.
- *Further the internationalization of China’s bond market.*
  - Improve the treasury bond balance administration system, the public auction mechanism for issuance, and other market designs;
  - Improve the regulation and lawmaking on disclosure, investor protection, and ratings;
  - Reconcile the interbank and exchange market, and establish a centrally managed uniform custody and settlement system;
  - Further develop the market infrastructure such as cross-border payment, by expanding the coverage of CIPS and integrating CIPS with FX and bond markets;
  - Encourage foreign markets to accept RMB bonds as legitimate collateral for overseas transactions.
  - Perform roadshow and reverse roadshows for international investors to better understand how they can participate in China’s bond market.

- *Develop the high yield market.*
  - Encourage the adoption of the adequate covenants package, which contains protective clauses such as financial covenants and protection mechanisms;
  - Make explicit requirements about ongoing disclosure for high yield issuers, such as financial statements, material events, and credit status;
  - Establish mechanism for orderly liquidation in the events of bankruptcy to protect investors’ interest.

Stock Market

- *Promote the market-based reforms in the stock market*
  - Adapt the current IPO issuance method on the main board to be registration based;
  - Relax the timespan of frozen funds for IPO subscription;
o Relax the regulation of secondary follow-on issuance to allow listed companies more flexibility in equity raising;
o Establish mechanism for funds or institutional investors to be the largest shareholders of certain companies. Currently they are disqualified to be the real control person, thus eliminating their option to exit buyout transactions through the A share market;
o Reduce administrative intervention and establish market-based mechanism for crisis management
  • Enhance the penalizing mechanism for fraud and other wrongdoing in the securities market, but not class action suits.

FX Market
• Develop a more liquid and active FX market.
o Allow sufficient two-way exchange rate movement, and avoid one-directional sentiment to deter speculative capital flows;
o Improve active communication strategies with the market, and publish policy communications simultaneously in English;
o Encourage participation in the onshore FX market by various types of institutions
  • Clarify FX intervention mechanism and enhance transparency.

Monetary Policy
• Continue the decades-long push towards indirect management.
o Improve monetary policy transparency via active communication;
o Strengthen forecast capability of liquidity in the banking sector
o Cultivate efficient bond market as a precondition for indirect monetary policy operation of PBoC;
o Enhance institutional capacity in regulation, interest rate intervention, corporate governance, diversifying monetary policy toolkit and risk management;
o Wait for the window of opportunity to lift deposit rate cap, one of the preconditions for liberalization is PBoC’s ability to influence market interest rate through OMOs and other market-based measures;
o Devise preventative market-based mechanism for global financial risk spillovers.
• **Develop the twin-peak framework of macroprudential and monetary regulation.**
  o Understand the transmission mechanism of macroprudential and monetary policies in the financial market, and their interactions;
  o Consolidate institutional power for macroprudential policies amongst agencies, for example, the administrative regulation responsibility of financially important institutions shall be shifted from CBIRC to PBoC.
Postlude

“Every reform movement has a lunatic fringe.”
- Theodore Roosevelt

Reform is a catchy phrase that lingers in the news all the time, but the really impactful ones are few. Timing of the reform is critical. For any large and complicated institution, the inertia to keep the status quo is a strong force that cannot be ignored. It is unlikely any radical change can be enacted unless that institution has its back against the wall. The same goes for past reforms in China.

Deng Xiaoping was able to win enough support, or to tame the strongest opposition internally because China in the late 1970s was facing serious drought, famine, and all sorts of shortage in the economy. The Soviet model struggled to even feed the Chinese people.

In the early 1990s, Deng Xiaoping doubled down on development by rectifying the importance of the market economy in the face of heated debate about whether the market will set China on the road to socialism or capitalism. During his 1992 Southern tour, Deng stripped away the ideological hyperbole by declaring that

Setbacks have befallen socialism in some countries and regions and may appear a diminishing force. However, the experiences we gain, and the lessons learned will propel the development of socialism in more healthy directions. Do not think Marxism is going to disappear, become redundant, or is designed for failure. It is no such thing!

The incident preceding Deng’s Southern tour was the fallout of Tiananmen. The event of June 1989 was a product of economic instability and loss of price control, fueled by radical public emotion. In response to the actions taken during
Tiananmen, the international community completely shut out China, and the economy was heading to a more challenging territory than before.

Before the Fourteenth Party Congress in October 1992, no side had decisively dominated the internal debate. On the one side, central planners such as Chen Yun, believed rapid economic growth was inherently politically destabilizing. On the other, Deng led the charge insisting that GDP growth was the fundamental means of ameliorating the potential risk of social discontent. Deng’s pre-emptive attack on the Southern tour was the turning point of the internal struggle.

Zhu Rongji was indeed a steel-willed technocrat. He once said: “even if a minefield or the abyss should lie before me, I will march straight ahead without looking back”. His reform policies, to radically change the SOEs and to revolutionize the way state-owned banks conduct their business, happened at the backdrop of increasing SOEs losses, Asian financial crisis, and bank insolvency.

Reforms are like guerrilla wars. They are waged by the few but dependent on the support of the mass. Only in extreme crisis, does real opportunity of change breed. Human beings do not usually change because it is the right thing to do, they change because they have to.

Now is probably not the crisis time yet. But if or when in the future, unsustainable fiscal promises in the commanding heights find it challenging to be fulfilled in light of deteriorating revenue streams and exhausted existing policy tools, I hope this paper can offer an alternative design.

At the heart of each of the sectors examined in this paper is a former monopoly that is divided into smaller enterprises. However, these smaller enterprises remain giants in the sector compared with private companies that may have entered. The giants often represent the commercial interests of various government ministries, all of which must arrive at some consensus for any major policy reform to go forward. These bureaucracies compete to achieve policies that are most advantageous for themselves and the industries they represent. However, nonstate forces are continually changing the context in which these bureaucratic negotiations take place; they are the forces that push forward the reform cycle. Markets expand, innovative services arise, and consumers become more demanding. Policy reform, often in the case of network industries appearing in the
form of increased government regulation, is required to meet the demands of the new context. If this does not happen, failures follow power shortages occur, phone calls fail to connect, bank lending dries up, and planes fall out of the sky. Those familiar with life in China in the last twenty-five years will recognize all these travails. These highly regulated industries differ from others, such as manufacturing, wherein a liberalized market the hand of government is nearly invisible

When reforms fall short of expectations or fail to meet the rising demands of the citizens, pundits often blame regulatory capture. Observers claim that reforms are hard to move forward because vested interest within the regulatory bodies effectively navigate the system to prevent fundamental changes in the status quo. This pessimism is not unique in the current age. The same rhetoric has been raised by critics since the beginning of China’s reforms.

Capture perhaps did have played a significant role in delaying, distorting, or undercutting many reformatory processes throughout our time. But China’s past reforms, at the highest level or in respective industries, have also given us hope. Indeed, all reforms might appear to be imperfect or incomplete, as they are tasked with overcoming multiple constraints and achieving conflicting goals. However, China’s political and economic system has overcome many challenges which at the time seemed insurmountable. Be it the monopolistic ministries, or the powerful SOEs, good reforms sometimes did prevail in spite of various special interests.

Carpenter and Moss (2014) sharply point out in their book about regulatory capture, that “All too frequently, moreover, casual claims of capture are associated with demands that the regulatory policy or agency in question be not merely reformed but abandoned. Observers of regulation are often quicker to yelp about the evils of capture than to think hard about how it might be prevented or mitigated, short of wholesale deregulation.”

The same goes for China’s reforms. What the history of reforms implies is that when some ingredients are aligned in place, the system is capable of bringing out necessary changes. The same goes for China’s reforms. What the history of reforms imply is that when some ingredients are aligned in place, the system is capable of bringing out necessary changes.


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