Understanding China

Xueyong Zhang

China's Railway Expansion in 40 Years of Economic Reform and Opening Up

Translated by Senlin Yu · Ruoyu Dai · Jiawen Huang

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Contents

Chapter 1
Introduction: Reform and Opening Up and the New Starting Point of Chinese Railways' Modernization

Focusing on the author's research objectives and the data collected, this book covers significant events in the construction and development of Chinese railways since the reform and opening-up period, rather than providing a chronological account of railway progress in China over the past four decades. The research examines various aspects of Chinese railways, including railway network planning, line construction, equipment manufacturing, operation and management, and even educational and health work, all in the context of reform and opening up, and delves into the milestones and transformations that have shaped the railway system in China.

Undoubtedly, the past 40 years since 1978 have witnessed the fastest progress of Chinese railways, as in many other fields. It is equally undeniable that such remarkable achievements are primarily attributable to the reform and opening up of Chinese railways. Through such a process, Chinese railways have established a new framework, implemented entirely new management and operational modes, and acquired world-class manufacturing technologies, leading to a revitalized system with a brand-new outlook. Therefore, this book centers on the genesis of Chinese railways and its twists and turns along the way.

We wish to convey an important view in this Introduction that the history of the railways over the past 40 years is not disconnected from the past. Among the various factors that have contributed to the current status of the railway system, we can clearly trace the influence from the policies of 1949, and even from the decisions of the Qing government to build railways in 1881. Over the nearly century-long period since 1881, diverse forces converged to forge the unique identity of Chinese railways, and their influence has persisted, albeit in varying intensities and manifestations, well into the post-1978 era. In other words, there are some "fundamental" elements that underpin the entire trajectory of Chinese railway development, necessitating our primary focus.

The Introduction will discuss three fundamental questions regarding the basic understanding of Chinese railway history: What constitutes "railway history"?

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What factors have shaped the history of Chinese railways? And how should the history of China's railways be narrated against the backdrop of reform and opening-up? For the first question, we will present our understanding through a review and evaluation of relevant literature. As for the second, we will analyze several major issues in railway history from specific perspectives and discuss how these issues continued to influence railway development during the reform and opening-up period. Finally, in response to the third question, we will provide the answer by outlining the fundamental structure of this book.

1.1 What Is "Railway History"?

Research on the history of Chinese railways has spanned over a century. As early as 1906, thirty years after railways were first introduced to China, three seminal works were successively published: *Essentials of China's Railways* by Wang Shengchun, *Compendium of China's Railways* by Liu Fu and Yi Zhenqian, and *A Comprehensive Analysis of the Current State of China's Railways* by Zeng Kunhua, marking the beginning of the studies on Chinese railway history. The following year, P.H. Kent, a British lawyer who worked in Tianjin for four decades, published *Railway Enterprise in China: An Account of Its Origin and Development*,[1] which remains a key reference for understanding the early history of Chinese railways. Over the century that followed, numerous works have been published focusing on different aspects and periods of Chinese railways. Surprisingly, however, none of these works discusses the methodology of railway history writing. While the concept of a railway might seem self-evident,[2] its history should not merely be a collective description of individual rail lines. Unfortunately, most railway history works approach the subject in such a manner, presenting railway history as a series of decision-making processes, construction timelines, and operational accounts for various railways. While this may seem sufficient to meet the general needs of readers, as it mirrors the public perception of railways, a considerable body of research goes beyond this, exploring the broader impacts of railways on economics, politics, society, the military, and even social mentality. In this context, railways become a significant yet vague background to social change, with their own development taking a back seat.

The author is of the opinion that railway history should neither be simplified as a history of railway lines' expansion nor generalized into the social history of railways. Rather, the true focus of railway history should be the railway system and its operations, which includes major subsystems such as planning and management,

[1] Kent, P. H. (1958). *Railway enterprise in China: An account of its origin and development* (Li Baohong et al., Trans.). Beijing: SDX Joint Publishing Company.

[2] Strictly speaking, the definition of the railway also requires careful identification and analysis. The definition of railway presented by Zhu Congbing in *Li Hongzhang and the Development of China's Railways* (Qunyan Press, 2006) is the most detailed exploration of this issue that the author has read.

technology research and development, track construction, industrial manufacturing, and dispatching and command, taking into account the unique characteristics of Chinese railways. Such a history also encompasses related subsystems like basic and professional education, railway health, and even public security and justice. As one of the most integrated and complex systems in modern transportation, our understanding of railways—how they operate and interact with other social systems, exhibit operational characteristics and patterns, and have evolved through different historical periods to their current state—remains limited. These questions can be broadly summarized into two categories: the internal operations of the railway system, and the bidirectional interaction between the railway system and the national and social needs.

Each mode of transportation has its own system and relies on its supporting infrastructure for operation, as automobiles depend on highways, ships need docks, and airplanes require airports. However, when it comes to the intricate connections within their respective systems, the railway undoubtedly differs from other modes of transportation. From a technical perspective, the wheel-rail (train and railway) interaction constitutes one of the three most fundamental issues[3] in railway technology. Moreover, the railway's system of dispatching and command is far more complex and specialized than those of other transportation modes. For example, traffic jams on roads are certainly annoying, but a transfer of similar situation on railways would be catastrophic. Though authorities in different regimes strived to maintain centralized and coordinated operations throughout the history of Chinese railways, the question of what consists of the ideal model has always been the subject of ongoing debates, usually on whether railways should prioritize public welfare or enterprise interests, whether operations should be centralized or open to competition, and whether the railway network should be separated from transportation services. Perhaps these debates will never have universally agreed-upon answers, but they drive the railway towards continuous improvement and progress.

From a different perspective, regardless of how obscure the railway system may be in the eyes of outsiders, the public has its own standards for evaluation: whether the railways can meet social demands. Simply put, what the railways contribute to society is their transport capacity. If railways can transport passengers and cargo to their destinations efficiently, the public will not be concerned about their internal operations. Nonetheless, railways in China often fail to meet such demands. During some periods, delays and cargo backlogs have almost become synonymous with railways. Public pressures have continuously driven railway progress, necessitating constant technological advances, management reforms, and service optimizations to meet public expectations.

In 1949, when the People's Republic of China (PRC) was founded, the government took over from its predecessor a railway network spanning nearly 30,000 kilometers (with an operating mileage of 21,810 kilometers), and this inheritance was

[3] The other two are the pantograph-contact line interaction and the fluid-solid interaction (aerodynamics), but only emerged as necessary and important with the development of electric railways and high-speed rail systems.

by no means terrible in the context of constant wars. Over the next 30 years, Chinese railways demonstrated remarkable growth and efficiency: the length of the main lines expanded from 29,119 kilometers in 1957 (with an operating mileage of 26,708 kilometers) to 58,686 kilometers in 1980 (with an operating mileage of 49,940 kilometers), marking an approximately 100% increase (with the operating mileage up by 87%); the number of locomotives grew from 4251 to 10,278; the number of passenger trains rose from 8566 to 16,157; the number of freight trains increased from 90,249 to 266,376; the volume of passenger traffic surged from 312.62 million to 912.46 million; and freight jumped from 274.21 million tons to 1085.84 million tons.[4] The railways managed to play a "pivotal role" even during the tumultuous decade of the "Cultural Revolution" (1966–1976). Among the achievements from 1965 to 1976, China "completed 5,669 kilometers of main lines, 3,577 kilometers of branch lines, and 1,697 kilometers of double track lines. By the end of 1976, the operating mileage reached 46,262 kilometers, including 7,285 kilometers of double-track sections; the Nanjing Yangtze River Bridge was completed, and the electrification of the Baocheng Railway (Baoji-Chengdu) was achieved; the SS1 Electric Main Line Locomotive and the Dongfeng 4 Diesel Locomotive were successfully developed".[5]

Problems arise when we compare the growth of railways with that of the national economy. From 1965 to 1976, national gross industrial and agricultural output value increased by 133.5%, while railway freight only grew by 69.8%.[6] According to relevant statistics, "Our national economy, from the early days after the founding of PRC to the early 1980s, as reflected in railway passenger traffic and freight, saw a 9.9-fold increase in railway freight from 99.83 million tons in 1950 to 1,085.84 million tons in 1980; and a 4.8-fold increase in passenger traffic from 156.81 million in 1950 to 912.46 million in 1980. During the same period, the railway mileage only increased by 1.25 times, the number of locomotives by 1.4 times, passenger trains by 2.2 times, and freight trains by 3.8 times. In the 1980s, compared with data in the early 1950s, the freight railway counts per passenger-kilometer decreased by 50%, and the number of freights per million ton-kilometer decreased by 66.4%".[7] In other words, the core issue of railway reform in China does not lie in the achievement of railway construction but in the extent to which they can meet the national social demands, which is essentially a relationship between transportation capacity and traffic volume, and the evaluation shall be correlative and dynamic.

The focus of this book is on the internal operation of the railway system and its interplay with national and social demands against the historical backdrop of China's reform and opening up. Specifically, it delves into why reforms in China's railway industry were necessary, how these reforms were carried out, what

[4] Xu Zenglin. (1999). *Fifty years of the railroads of the People's Republic of China (1949–1999)* (p. 374). Beijing: China Railway Publishing House.

[5] Miao Qiulin. (1994). *China railway* (p. 59). Beijing: China Railway Publishing House.

[6] Ibid.: 60.

[7] Wang Zhizhong, & Wei Liyin. (2001). *Research on China's railway reform and development (1978–1998)* (p. 19). Beijing: Contemporary China Publishing House.

difficulties occurred during the process, and how they were tackled. Furthermore, the book explores the formulation and development of a Chinese railway modernization model that integrates government leadership with market mechanisms.

From a macro to micro perspective, the issues can be categorized into three hierarchical levels:

Firstly, we need to consider the relationship between the railway industry and the society in China, which is exemplified in the relationship between rail transportation technology and social demand for this technology. To understand it within the context of the reform involves clarifying the precise positioning of railway reform within the historical context of the comprehensive reform. Similar to reforms in other industries, railway reform embodies the traits of comprehensive reform, yet also possesses distinct characteristics that set it apart. In certain aspects, it has been pioneering and leading in the comprehensive reform efforts; in others, it may be trailing behind. As history researchers, we need to identify which aspects are leading the way and which are lagging behind. More importantly, we should delve into how such particularities arose and what implications and values they offer for us to correctly understand China's reform, the monumental historical event.

Secondly, we need to consider the relationship between "the Railway Man"[8] and railway reform. As is the case in all industries in China, reform is progressively implemented through the active engagement and initiative of practitioners across various sections, all under the leadership of the Communist Party of China (CPC). Each individual is both a practitioner of reform within their industry and a beneficiary of reforms in others, acting as both an agent and, in a sense, a recipient. Thus, there exists a set of apparent internal contradictions. On the one hand, over the past 40 years, all Chinese people firmly believed that "reform and opening up are the source of vitality for the development of contemporary China, the important magic weapon for our Party and the people to catch up with the pace of the times, and the only way to uphold and develop socialism with Chinese characteristics".[9]

On the other hand, in different periods and under diversified conditions, different industries have varying understandings of reform, which may even be detrimental to the short-term interests of some industries. Therefore, "it is crucial to have new plans and measures. We should have a strong problem-oriented consciousness, focus on major issues, identify crucial points to find answers, and strive to address a series of prominent contradictions and problems in the development of China".[10] The railway industry is no exception. The process of railway reform reflects how the Railway Man understands and perceives railway reform, and how they comprehend railways and reform, thereby influencing or changing the way the public perceive

[8] The "Railway Man" reflects the self-identity of railway practitioners, and to some extent, it reflects the high degree of systematicity of the railway industry. Although there are also expressions like "Oilman", they seem to be less used in transportation industries such as highway and shipping sectors, as a matter of experience.

[9] Xi Jinping. (2012, December 13). Speech on inspection work in Guangdong. *People's Daily*.

[10] Xi Jinping. (2013, November 14). Speech at the symposium with non-CPC personages held by CPC Central Committee. *People's Daily*.

railways. Ultimately, the Railway Man is a typical representative of industries within the overall reform. The successful experience of the past 40 years demonstrates that this is an ideological issue that should be addressed and resolved during the reform.

As President Xi Jinping has pointed out, "The process of emancipating minds is also one of unifying thoughts. Only by doing so can we maximize the consensus on the reform and develop a cohesive force to move the reform forward".[11] In fact, as Chinese society develops and the comprehensive reform proceeds, new situations and problems will surely arise during reform. Ultimately, these issues boil down to the relationship between "emancipating minds" and "unifying thoughts". Deep reflection on the reform process of the railway industry, a typical industry, also allows us to explore the lessons and experiences needed for future reforms.

Thirdly, we need to consider the fundamental reason and method for the railway reform. China's remarkable achievements in reform are fundamentally attributed to the right leadership of CPC. What lessons can the railway industry, as a specific sector, learn from its own reform process? The railway system is gigantic and complex. In terms of the result, the current achievements are comprehensive and holistic, but when we go back to specific historical periods, they vary. As researchers in history, we should clarify the detailed process of railway reform, which means exploring how breakthroughs were made at different stages and in the face of different problems, and what effects these measures have ultimately generated. More specifically, as for the basic sectors of the railway system, which sector played the vital role in driving the reform forward in different periods? Was it technology that led the way, management that inspired innovation, or operations that radically changed the overall picture? Which direction should China's railway reform proceed?

1.2 Various Factors Shaping the Form of China's Railway

When China's railway system embarked on the path of reform and opening up, both insiders and outsiders enumerated various shortcomings of the railway system and primarily attributed them on the planned economic system, the target of reform. Like other fields, this judgment contains some truth. However, many difficulties encountered during the reform indicated that merely blaming the planned economic system was not tenable. This does not mean that the planned economic system is suitable for the railway industry, rather, it suggests that many problems in the railway industry appear to stem from the planned economy but are attributable to other factors. The reality is that some problems need to be traced back even further, to the very inception of China's railway. Identifying these factors will provide a deeper understanding of China's railway during the period of reform and opening up. At least three aspects need to be highlighted: the emotional significance of the railway

[11] Ibid.

to the nation, the perception of the railway's "closedness", and the understanding of the fundamental attributes of China's railway.

Railways are generally viewed as a symbol of the Industrial Revolution worldwide, and so it is in China. However, according to the Chinese government and people, railways have a special significance beyond their general role in economic and social development. They are tied to the sentiment of national self-strengthening. The existence of railways is one thing, but who controls them is another more important matter. Since their inception in Britain in 1825, railways spread rapidly in mainland Europe and other parts of the world. Only in China did the debate over whether to build railways go through three rounds of discussions, with participation from both the government and the public. One of the focal points was the perceived infringement on Chinese sovereignty by foreign-built railways. The nationalist sentiment surrounding sovereignty even influenced the development of railways throughout the late Qing Dynasty, fermenting into the violent Railway Protection Movement in 1911, which contributed to the fall of the Qing Dynasty. On the other hand, railway construction can also become a symbol of national pride: Zhan Tian you gained great fame for his role in the construction of the Beijing-Zhangjiakou Railway,cwith many overlooking the difficulties and setbacks he faced as a young student sent by the Qing Government to study in the United States. The historical echoes of national sentiment were so profound that even in the 1980s, there were advocates who argued that the Beijing-Zhangjiakou Railway should be considered the first railway in China.[12] Similarly in 1949, while the PRC government was stabilizing its control, the first immediately went to the construction of the Chengdu-Chongqing Railway, largely to showcase the strength of the new regime and its focus on the people's interests. The successful operation of the railway in 1952 indeed produced the intended effect, greatly enhancing public trust and support for the new government.[13]

Excavating and highlighting the significance of railways used to be the main storyline of railway history. The renowned work of Mi Rucheng, a great historian of railways, is entitled *Imperialism and China's Railway*, and his *Materials on the History of Modern Railways in China* and *Materials on the History of Railways in the Republic of China*, which have benefited a lot of researchers, are also based on the right of way as the main narrative line in the collection and editing of materials. As the focus of modern Chinese historical research has shifted, attention to railway rights has gradually waned. It is normal for academics to follow the trends of its time, but the focus of earlier research persists in the study of the subject. This sentiment can even be seen in the high-speed railway technology innovation route of the 1990s. At that time, it was a consensus within the Ministry of Railways (hereinafter

[12] Fang Ju. (2006). *History of Chinese railway* (pp. 17–24). Beijing: Beijing Jiaotong University Publishing House. This discussion also reflects different views on whether the Tangxu Railway or the Wusong Railway is China's first railway, similarly showing the influence of national sentiment on railways.

[13] Tian Yongxiu. (2016). Chengdu-Chongqing railway opened to traffic and public recognition. *Journal of Southwest Jiaotong University (Social Science)*, (6), 7–13.

referred to as MOR) to build high-speed railways, but opinions diverged on how to acquire high-speed rail technology, especially high-speed railway technology. Initially, the decision was to self-develop the technology, out of concern of the containment on technology from its origin country. In 2004, when the decision shifted to upgrading technology through "introduction, digestion, absorption, and re-innovation", widespread debate was sparked, embodying the influence of early railway history on later decisions.

1.2.1 Closedness in the Railway System

Railways are commonly referred to by the public as the "Iron Big Brother".[14] This term not only affirms the importance of the railways but also contains a hint of irony regarding their closed-loop management and indifference to public demands. Many commentators believe that this closed-loop management originated from the management system after 1949. During the era of the planned economy, the offices of various ministries were often called "courtyards", a term that vividly illustrated the closedness of this economy system. Regarding the "Courtyard of MOR", those who were within once recalled,

> From the south of the MOR Office Building at No. 10 Fuxing Road, Haidian District to the north of Lianhuachi Road lies the Yangfangdian residential area of MOR, which covers the entire area on the east and west sides of the North Beehive Road.

Starting from the northernmost MOR building, a series of brick-and-wood structures were built and gradually extended southward. This expansion ultimately led to a super-large compound with neither walls nor gates. Today, most of the eastern and southern sections have now been allocated to various subordinate organizations of MOR, leaving less than one-tenth of the original area as "the courtyard" in the northwest corner. At that time, Bus Route No. 21 had in total six stops, and three of them were at Huichengmen, Yangfangdian, and North Beehive within the compound. To facilitate the lives of the employees and their families, MOR built a kindergarten, a primary school, and a middle school for railway workers' children. It also established a railway hospital, a cultural center, a boiler room, a barber shop, public baths, and other facilities. In addition, the Ministry provided premises for a variety of services, including public security, banking, postal services, grain and oil, catering, coal, vegetables, sideline products, general merchandise, bookstores, photography, Chinese and Western medicine stores, bicycle repair, and waste material recycling. Together, these enterprises collaborated to develop and support the residential area.[15]

[14] Railway in Chinese is "铁路", which can be literally translated as Iron Road. The nickname of Chinese Railway uses Iron to homophonize the first character of Iron Road, which does not necessarily indicate that the Chinese railway is cold, hard and stiff.

[15] (2013, March 23). The little rascals of MOR courtyard. *Beijing Evening*.

This memory naturally evokes thoughts of the planned economy system. However, in terms of railways, the closed-loop management actually dates back even further, to the very early days of its establishment. Building a railway demands for mature technology, enormous funding, and qualified engineers. These requirements cannot be met merely through strong emotions. Instead, it requires immense patience, strong organizational abilities, and scientific management methods. As railways gradually expanded and became transportation networks, the complexity of the railway system increased. When we talk about the railway system, we mean that building the railway is just one aspect—albeit an important one—besides which it includes locomotive and vehicle manufacturing, power supply systems, and effective scheduling and command. However, this is not sufficient,as early railways primarily connected modern large cities but inevitably passed through relatively underdeveloped areas, including remote and impoverished regions. Therefore, at various stations along the route, MOR had to build schools, hospitals, and other living facilities for its employees to ensure a minimal standard of sustainable living. The often-criticized practice of enterprises running social welfare services actually has its origins in the railway sector. This is not an attempt to defend the railways, but rather to highlight the complexity of the issue. In the first half of the twentieth century, the drawbacks of the railway system were not conspicuous under the backdrop of overall industrial lag. Even for a long time after 1949, such practices remained prevalent. As the national industrial system continued to develop and improve, the railways became a "weak link" in the national economy. When this system was forced to adjust its operational methods, its immense historical momentum made reforms extremely difficult.

1.2.2 Basic Attributes of China's Railway System

The "integration of government and business functions" is a typical feature of China's railways. Its essence is "the high degree of integration between government functions and enterprise functions, where the government is essentially the enterprise. The government exercises unified direct control over the enterprises it owns, including micro-management".[16] This characteristic is both historical and realistic at that time in China, which is closely related to the economic and social development of the country.

For a long time, MOR of the People's Republic of China was the governing body under the State Council responsible to oversee national railway affairs, which unified and managed all operational and management tasks of the national railway. In the early 1980s, its functions mainly included four aspects: (1) Administrative management, which primarily involves the management of long-term planning,

[16] Wang Zhizhong, & Wei Liying. (2001). *Research on China's railway reform and development (1978–1998)* (p. 2). Beijing: Contemporary China Publishing House.

development strategies, industry policies, network layout, regulations, design specifications, and technical standards for national railways; (2) Enterprise operation and management, which primarily involves unified management of transportation, infrastructure, industry, materials, and international trade of the national railways; (3) Social management, mainly on education, healthcare, housing, pension, environmental protection, cultural and sports activities, publishing, and newspapers; and (4) National public power, which encompasses the function of public security and jurisdiction.[17] While enterprise operation and management functions are designated for an enterprise, administrative management, social management and public power functions are beyond the scope of what an enterprise can undertake. By 1980, the total number of railway employees had reached 2.6 million, effectively forming a large, comprehensive, and closed social system. The Ministry had put in place production facilities and supportive organizations, providing jobs for the adult children of the employees, placating the parents, pumping up their income, and thus promoting social order. Until 1989, "a total of over 860,000 adult children of the employees have been placed in jobs",[18] evidencing that the railway system operated as a de facto "society within a society".

This phenomenon is closely related to the operation pattern of Chinese Railways, which is characterized by a highly centralized dispatching command at its core, coordinated actions among transportation departments as its basis, and semi-military approach to order execution as the guarantee of the former two.[19] "For decades, due to the adherence to such a pattern, high efficiency was achieved in railway transportation; national transportation plan was completed and pivotal goods transportation missions were accomplished, despite strained railway capacity; different subordinate administrations and interfaces prioritized the central tasks and missions and ensured that local interests align with the general targets; workers were trained to maintain a high level of discipline to secure a smooth flow of railway".[20]

Chinese railways serve both commercial purposes and public interests, and as a matter of fact, the latter plays a more significant role. Some scholars believe that Chinese railways are entirely a public enterprise.[21] This is true because Chinese

[17] Ibid.

[18] Department of Personnel and Labor Relations. (1989). Recognizing the situation, strengthening reform, and advancing the railway collective economy to a new stage. In the Editorial Committee of *Selected essays on railway reform* (Ed.), *selected essays on railway reform* (p. 66). Beijing: China Railway Publishing House.

[19] This characteristic of the railway was summarized from the written instruction by the Central Committee of CPC on the leading party ground of MOR's *Report on Establishing Political Department and Reforming Management System in Railway System*. The instruction emphasized that "Railway is the main artery of national economy, a highly centralized enterprise with semi-militaristic nature" and "All authorities should be centralized at MOR".

[20] Lv Yinhua. (1994). *China's railways advance in reform* (51). Beijing: China Railway Publishing House.

[21] Tu Yourui. (1994). Common issues confronting railways of the world and features of railways in China. In Zhao Guoqian (Ed.), *Object lesson and assessment* (p. 6). Beijing: China Railway

railways perform massive non-profitable missions related to government, national defense, social services, and economic development, usually not the responsibility of an ordinary state-owned enterprise. Therefore, profit is not the first consideration in the operation of Chinese railways. For example, "railway haulage in China is 0.5 cents per ton-kilometer in comparison with India's 1.66 cents, the second lowest throughout Asia. In Europe and the USA, railway haulage is 5 times, 6 times, 8 times, and 10 times that of China, and even reached 16 times in West Germany".[22] Compared to other transportation industries, railway haulage is 1/11 of highway and 1/60 of civil aviation.[23] Low-cost haulage leads to reduced economic benefits. According to statistics in 1982, the rate of profit and tax (pre-tax rate of return) on funds in Chinese heavy industry is 16.77% while it is only 9.3% in the railway industry, higher than the rate of 2.21% in coal industry but is far lower than that of 59.1% in oil and other industries such as metallurgy, power, chemistry and construction.[24] Up to the early 1980s, salary of railway workers only accounted for 18% of the total income of railway transportation, compared to 50% in Japan and the USA, 65% in India, 113% in Austria, and 127% in the Federal Republic of Germany.[25] Chinese railways neither have the pressure and need for profiting, nor the worry of investment and debt. Within the traditional system, the funds needed by Chinese railways were all allocated by the government, and the materials needed were provided under a mandatory plan, typically in sufficient supply. In this sense, Chinese railways was more like a functional department of the government, rather than an enterprise.

The management of Chinese railways was marked by a centralized system that depended on mandatory administrative orders and planning. Specifically, the authority of pricing haulage, adjusting tax rates and applying for loans and credit in the railway rested with the central government, and so it was with that of planning for railway development, formulating industrial policy and making major investment decision, leaving MOR with limited governmental function. Within the railway industry, all authority involving personnel, funds, materials, production, supply and sales was centralized, including making investment decisions, planning for production and business operations, setting product prices, purchasing materials, disposing of production facilities, establishing organizational structures, appointing and dismissing officers, hiring employees, allocating income, etc. As a result, railway enterprises were feeble in taking on any operational responsibility.

Publishing House.

[22] Ibid.: 3.

[23] Lv Yinhua. (1994). *China's railways advance in reform* (22). Beijing: China Railway Publishing House.

[24] Hu Guangrong. (1985). Countermeasures on increasing economic benefit of railways, In China Academy of Railway Sciences (Ed.), *Study on the strategies of railway development* (internal information, p. 204).

[25] Tu Yourui. (1994). Common issues confronting railways of the world and features of railways in China. In Zhao Guoqian (Ed.), *Object lesson and assessment* (p. 3). Beijing: China Railway Publishing House.

This feature fitted perfectly with the macroeconomic system of this country, especially prior to the reform and opening up. Then, Chinese railways was fully self-sufficient and could independently accomplish missions assigned through administrative orders by the country. The absence of market undermined its economic value.

1.3 Structure of This Book

Now that we are going to discuss what has happened to Chinese railways since the reform and opening up, focusing on what kind of reform and opening Chinese railways have been going through. With the basic understanding of Chinese railway history mentioned previously, we do not intend to regard it as linear — such a history would never exist. At any time, reform is not based on momentary impulse—though it constitutes the initial drive—nor is it like a meticulous craftsman who is always trying to perfect his work. The purpose of reform is to find a way out of difficulties, sometimes even crises. As the path ahead is unclear, a successful reform usually ventures out prudently, rather than following a detailed map. The progressiveness of reform does not indicate that consensus on reforms is easily obtained. While Deng Xiaoping's phrase "crossing the river by feeling the stones" has transformed the prudence into a guiding methodology, the initiation and progression of reform demands great courage. This is further illustrated by some other quotes from Deng, such as "we should dare to experiment and break a new path" and "blaze a new trial".

Just like the twists and turns in the history of railways for almost a hundred years, the forty-year development of Chinese railways has not always been smooth since the reform and opening up, and even encountered unprecedented setbacks. Some of the difficulties stemmed from the general situation of the reform, while others from the path chosen and measures adopted in the reform itself. In consideration of these two aspects, this book has divided the progress of Chinese railways' reform and opening up into four stages: initial stage, proactive change, marketization, and comprehensive promotion.

1.3.1 Initial Stage (1978–1985)

As a preliminary experiment of reform in China, the overhaul of Chinese railways in 1975 marked the historical beginning of the reform. In the early stage of the reform and opening up, the contradiction was intensified between railway capacity and the social and national demands. Subsequently, Chinese railways became a severely vulnerability of national economy. On the one hand, the railway industry passively implemented a series of policies formulated by the country to reform state-owned enterprises. On the other, it had to advance with exploratory efforts

under the constraints of the economic system. However, due to misjudgments regarding the characteristics of Chinese railways, the historical development stages and primary operational contradictions, the sector's accelerated development failed to keep pace with even faster-growing demands. This growing disparity ultimately compelled the implementation of the next phase "Contract Responsibility System" reform as an institutional response.

1.3.2 Proactive Change (1986–1991)

In the mid-1980s, Chinese railways became the bottleneck of the national economy instead of a previous role as a vulnerability. Other than the fast-growing economic demand, another important factor contributing to the heavy burden of Chinese railways was some reforms in national infrastructure, the most principal one was the grant-to-loan conversion policy implemented in 1984. In order to find a solution, MOR proposed the Contract Responsibility System, hoping to search for more development opportunities. However, railway policies centered on "tapping the potential and expanding capacity" proved to be improvident. The pattern of "Self-Sustaining Approach to Building New Railways" was unable to raise funds for the quick development of the railway. Under the Contract Responsibility System, the contract could be concluded on time but failed to bring the railway into the fast track of development. The bottleneck effect continued to worsen.

1.3.3 Marketization (1992–2003)

In other fields, railway reform has been market-oriented since the reform and opening up. Only after Deng Xiaoping's South Tour Speeches and the 14th CPC National Congress in 1992 did China formally establish its goal of developing a socialist market economy system. As a result, MOR also determined the market-oriented direction of railway reform, and issued *Opinions on Several Issues Concerning the Implementation of the Decision of the Third Plenary Session of the 14th CPC Central Committee and Strengthening the Reform of Railways* (the "Thirty Items for Railway Reform"), which outlined the fundamental concepts, overall goals and basic principles for the reform.

During this period, the reform was pursued with great intensity. Throughout this process, reform measures were taken step by step, including restructuring the railway management system, optimizing the operating mechanism, establishing a modern enterprise system, revitalizing the railway investment system, and developing diversified railway operations, thus effectively facilitating the construction of China's railways. In addition to the development momentum from the market-oriented reform, the substantial increase in construction investment, coupled with the abandonment of the "tapping the potential and expanding capacity" strategy,

was another key factor contributing to the rapid progress of the railways. Of course, all these factors are interrelated. It is through the preceding decade of reforms that China accumulated significant experience and technological expertise in railway construction, enabling the country to effectively utilize these new investments, fulfill the tasks assigned by the government, and lay a solid foundation for overcoming the "bottleneck" in the development of railways.

1.3.4 Comprehensive Promotion (2004–2018)

Following a series of reform measures aimed at addressing, alleviating and overcoming the "bottleneck", and after accumulating technological resources, talent and management expertise over nearly 30 years, Chinese railways had then reached a stage where it was fundamentally capable of resolving the "bottleneck" problem. In 2004, the first railway industry planning document in the history of PRC, the *Medium and Long-term Railway Network Plan* was implemented, marking the beginning of a new era of systematic, large-scale railway construction. In 2008, as the pace of industrialization, urbanization, marketization, and internationalization accelerated, the Plan underwent its first adjustment, ushering in a period of rapid progress for China's railways. In 2016, in response to new challenges, the Plan was revised. Under the guidance of the Plan, the overall capacity of "China's High-Speed Rail Network" and the quality of passenger and freight transportation services had been improved. To meet the new requirements for a modern transportation system with Chinese characteristics and the modernization of railways, the comprehensive reform of railways in various fields such as the management system, technological innovation, investment and financing, and safety production also entered a critical period. In this process, out of reflection on speed and safety, we adopted the way of "slow thinking" on the "high-speed" development of railways, which helped China's railway technology, management and operation mature, enabling the railways to achieve a "two steps forward, one step back" progress through a process of reflection and adjustment.

In 2013, MOR was dissolved. Why wasn't that year the start of a new stage? Undoubtedly, the dissolution was a major event in the development of China's railway sector, and the question of whether and when to dissolve it had also been a long-standing political and social hotspot since 1998. For a while, the dissolution of MOR was viewed as a sign of the "last mile" problem to separate government and business functions. But when the dissolution actually happened, it caused a little stir. In retrospect, a series of reform and opening-up measures led by MOR had long paved the way for its eventual dissolution. Therefore, 2013 was not an end, but rather a turning point. Various reform measures had already been planned and promoted, and the development of China's railways before and after 2013 showed continuity rather than disruption.

The above four stages correspond to Chaps. 2 through 5 of this book. In addition, there are two important issues that cannot be fully covered by any single stage,

which we have chosen to describe in two additional chapters, namely the emergence and development of China's high-speed railways (HSR) and the export of China's railway technology.

In the 1990s, the Chinese government put forward a proposal to develop the high-speed railway, and repeatedly demonstrated its necessity and feasibility. The technological renovation of the Guangzhou-Shenzhen Railway, along with the completion of the Qinhuangdao-Shenyang Passenger Dedicated Line and Beijing-Tianjin Intercity Railway, marked China's mastery of the high-speed railway construction technology, and the completion of the Beijing-Shanghai High-speed Railway signified the maturity of the high-speed railway technical system. By the end of 2019, China's high-speed rail operating mileage exceeded 35,000 kilometers, accounting for about 70% of the global high-speed rail network. China's HSR has profoundly transformed Chinese society.

In March 2013, MOR was dissolved and replaced by the National Railway Administration affiliated to the Ministry of Transport, and China Railway Corporation, a state-owned enterprise directly under the State Council. Since 1998, the dissolution of MOR had been a hot topic at every National People's Congress. Although ministries with similar functions, such as those overseeing textiles, coal, metallurgy, and machinery, were abolished, MOR was exempted and avoided the institutional reform in 2003 and 2008. Nevertheless, it could not remain entirely unaffected. In the context of reform, institutions formerly under MOR, including those in higher education, engineering construction, and vehicle manufacturing, were gradually spun off, followed by the railway police, procuratorates, and courts. Finally, the reform crossed a threshold.

Half a year later, then-Premier Li Keqiang embarked on vigorously promoting China's HSR during his visit to Thailand. Premier Li characterized China's HSR as "technologically advanced, safe, reliable, and highly cost-effective". Following this, the promotion of China's HSR became a staple of Premier Li's subsequent overseas visits. Shortly after Premier Li's speech, President Xi Jinping proposed the Belt and Road Initiative, with HSR serving as a fundamental pillar of the initiative. Consequently, the media hailed HSR as a "National Symbol". Domestically, HSR lines were constructed in remote and underdeveloped provinces such as Guizhou, Yunnan, Xinjiang, and Gansu.

"Going Global" emerged as one of the central topics deserving attention in the latest development of China's railway sector. From a broad perspective, the history of China's railway technology spreading overseas dates back a long time, with the earliest chapters written through railway assistance projects in regions like North Korea, Vietnam, and East Africa. During this period, most overseas railway projects undertaken by China were driven by political considerations, and the country's railway sector lagged significantly behind developed nations in terms of construction technology and machinery supply. Nonetheless, these early foreign aid railway projects honed domestic enterprises and accumulated invaluable experience for China's subsequent "going global" endeavors.

Since the reform and opening up, China's railway construction capabilities have undergone a remarkable transformation, equipping the country with the prowess to

compete on par with the world's leading railway nations. This transformation has been evident in numerous overseas railway projects, accompanied by a notable surge in the export capabilities of railway equipment. Following the rapid advance of China's HSR technology, Chinese enterprises have ventured into the global high-speed rail market. The Ankara-Istanbul High-Speed Railway in Turkey marks the first overseas high-speed rail project implemented by Chinese enterprises, while the Jakarta-Bandung High-Speed Railway in Indonesia represents the first step for China's high-speed railway industry to "go global" with its entire industrial chain and all essential components.

The proposal of the Belt and Road Initiative has ushered in new development opportunities for Chinese railways. Given the current imbalance in sea and land transportation across Eurasia, railway construction holds paramount importance in the steady progress of the Belt and Road Initiative. While Chinese railways currently face certain challenges in their "going global" endeavors, they are poised to play a pivotal role in the future connectivity of infrastructure projects jointly performed by Belt and Road Initiative partner countries. Furthermore, they will exert a profound influence on fostering shared development and prosperity worldwide.

Lastly, it is always difficult and even risky to describe the events that are currently unfolding from a historical perspective. Yet, considering that these texts will also become usable material for future studies of railway history gives us the courage to engage with this subject.

Chapter 2
Initial Stage: Attempt to Eliminate "Weak Links" (1978–1985)

"The relationship between Chinese railways and Chinese society mirrors the interplay between rail transportation technology and the public's demand for such technology".[1] The primary thread in the development of Chinese railways revolves around the ongoing contradiction and its subsequent resolution between national and social needs and rail transportation capacity. Since the reform and opening up, the fundamental approach to addressing this contradiction has been railway reform—a theme that has dominated Chinese railway history over the past 40 years. Consequently, the issue can be divided into two sub-issues: on the one hand, how national and public needs for railways manifest, and in what forms; on the other, how the railway system continuously responds to these needs while adjusting and developing itself? Thus, the crux of railway reform is not merely the achievements in construction (whose development, from a statistical perspective, is growing at a satisfying speed). Rather, it centers on the extent to which the railways can meet national and public needs, specifically, the relationship between the required transportation volume and the capacity provided by railways. Thus, evaluating railway reforms necessitates a framework that is inherently comparative and adaptable.

Since 1975, over a relatively long period, the prevailing view of the country and the general public on the railway was that "the railway is a weak link in the national economy",[2] meaning that its transportation capacity was far from meeting the demand. Clearly, striking a balance between the two was the central task of railway

[1] Zhang Xueyong. (2018). External influences and internal rationale: The reform and opening up history of China's Railways in the perspective of a century of changes. *Journal of Southwest JiaoTong University (Social Sciences)*, (6), 1–8.

[2] Decisions of the Central Committee of CPC on improving railway work ([1975] ZF. No. 9). In the Research Office of the Party History, Party Building, and Political Work of the National Defense University of the Chinese People's Liberation Army (Ed.), *Cultural Revolution Research Materials* (Volume II) (internal information, p. 248). The expression "prominent weak links" is used in *Document No.9*.

X. Zhang, *China's Railway Expansion in 40 Years of Economic Reform and Opening Up*, Understanding China,
https://doi.org/10.1007/978-981-95-0333-9_2

reform during that period. Nevertheless, we should note that after approximately a decade of exploration, around 1990, the railway failed to resolve its awkward position as the "weak link" and instead, its problem became even more severe, ultimately turning into a bottleneck for national economic progress.[3]

In 1992, Deng Xiaoping's South Tour Speeches marked the real acceleration of railway reform in China. Prior to this, the history of railways was characterized by continuous exploration, adjustment, and experimentation. Distinctly, this period can be divided into two stages based on the extent of reform efforts. Marked by the introduction of the Contract Responsibility System[4] in 1986, the Railway Man started proactive reforms and sought changes. Before this, although MOR issued a series of reform documents and made numerous attempts, these efforts, though integral to the reform process, largely entailed the implementation of macro and general reform measures from the Party Committee and the Central Government within the railway system. In other words, the railway industry's unique characteristics, and the proactive and creative spirit of railway reformers were not yet prominent. Thus, the years from 1978 to 1985 constituted the first historical stage of railway reform in China over the past 40 years, characterized by exploration through the restructure of Chinese Railways.

2.1 Pilot Reforms: Restructure of Chinese Railways in 1975

As is widely recognized, the Third Plenary Session of the 11th Central Committee of the Chinese Communist Party (CPC), held in December 1978, marked China's entering a new era of reform and opening up. Additionally, such landmark events acquire their unique historical significance within the grand historical context. This means that when we shift our focus to the history of reforms within specific industries, the overarching historical context often obscures the richness and distinctiveness of the history itself, making it difficult for us to grasp the details. Indeed, the reforms in various industries in China are by no means progressing uniformly, but rather differ from one another. So, where does the history of railway reform in China begin? This is where our discussion should start.

[3] Zhu Rongji. (1994). Speech at the national conference of leaders in the railway sector. In Zhao Guoqing (Ed.), *Challenges and Solutions* (p. 3). Beijing: China Railway Publishing House.

[4] Detailed discussion is provided in Chap. 2 of this book.

2.1.1 Identifying the Historical Foundations of Chinese Railway Reform

In the few existing studies on railway reform, 1978 is routinely regarded as the starting point. For instance, *Fifty Years of the Railroads of People's Republic of China (1949–1999)* states: "In December 1978, the CPC Central Committee convened the Third Plenary Session of the 11th Central Committee, making a strategic decision to shift the focus of the Party's work to socialist modernization and putting forward the requirement to address the imbalance in the national economy. This marked a significant turning point since the founding of PRC and the beginning of railway work moving from stagnation to progress".[5] While this view is not incorrect, it may not be entirely convincing, for if railway reform indeed was in step with the overall reforms, why did the railway industry lag far behind the pace of national and social development for a considerable period of time? In fact, China's reform began with great difficulty. The entire social landscape did not immediately transform after the central government's call. On the contrary, it was only after repeated trials and explorations that the process of reform was truly accelerated.

The railway industry was no exception. Examining the period around 1978, it is difficult to simply conclude that the railway industry exhibited signs of rapid change. Much of the railway operations continued to rely on established practices, although reform steps were gradually taken.

In the field of railway reform, three events are considered as significant starting points: the pilot program in May 1979 at the Shanghai Railway Administration Rolling Stock Depot to expand enterprise autonomy in operational management, the establishment of the Office for Economic System Reform under MOR in November 1980, and the publication of *Opinions of MOR on Railway Reforms* in 1985 in light of the documents issued at the Third Plenary Session of the 12th Central Committee. Notably, all three events occurred after 1978.

Which of these, or which one of them, can be deemed the definitive starting point of railway reform?

Firstly, in terms of chronological order, the pilot program at the Shanghai Railway Administration Rolling Stock Depot in May 1979 was the earliest trial in the railway system.[6] However, neither its scale nor impact was sufficient to be historically significant. Even in the *Chronicle of Shanghai Railways* compiled by the Administration itself, it is briefly mentioned with just a single sentence, "Shanghai Railway took the lead in 1979 by initiating reforms and corporate reorganization efforts such as expanding enterprise management authority and the lump-sum contracting of the progressive increase of the profits (the profit-sharing arrangements)" and it was not included in the *Memorabilia* for that year.

[5] Xu Zenglin. (1999). *Fifty years of the railroads of the People's Republic of China (1949–1999)* (p. 135). Beijing: China Railway Publishing House.

[6] Compilation Committee of the *Chronicle of Shanghai railways.* (1999). *Chronicle of Shanghai railways.* Shanghai: Shanghai Academy of Social Sciences Press.

Secondly, from the perspective of organizational management, the establishment of the Office for Economic System Reform under MOR on November 6, 1980, was the earliest body tasked with overseeing and coordinating reform within the railway system.[7] The Office was led by Deng Cunlun, then Deputy Minister of Railways, with Deputy Leaders including Geng Zhenlin and Liao Shiquan, then Deputy Ministers, and Ye Keming, then Director of the Ministry's Finance Bureau. Despite the high ranks of the officials and institutional functions, this early reform, conducted under the decrees of the central government and aligned with the broader state-owned enterprise reforms, lacked the distinctive and proactive features specific to the railway industry. In this regard, it cannot be considered the definitive starting point for railway reform.[8]

Lastly, from the perspective of industry-specific characteristics, the *Opinions of MOR on Railway Reforms*[9] on January 1, 1985, in line with the principle proclaimed at the Third Plenary Session of the 12th Central Committee, represented a genuine reform initiative tailored to the railway industry. The Contract Responsibility System implemented the following year was the Ministry's first comprehensive reform package. While this plan embodied the railway industry's initiative to change, it was unlikely to be the starting point of railway reform given that it lagged behind the national reform efforts by six or seven years.

Thus, none of the three events mentioned can be considered the historical starting point of railway reform. Then, where does the real beginning of railway reform lie?

Expanding the scope of research, we can see that the basic work of the railway industry from 1978 to 1985, regardless of its scale, should be considered part of the 40-year history of railway reform and opening up. It is important to identify the guiding principles that truly influenced the railway industry during this period and the central documents that best reflect such principles. As a result, it becomes evident that the railway industry maintained a certain level of stability and continuity for a long time. In fact, while the rest of the country was still reeling from the upheavals of the "Cultural Revolution", the railway industry was among the first to stabilize and adjust itself. Conversely, despite the nationwide surge of reform experiments, the railway industry struggled to find its path. Therefore, this book argues that the starting point of railway reform should be traced back even earlier, specifically to the issue of the 1975 Central Committee document *Decisions of the Central Committee of CPC on Improving Railway Work*, commonly known as *Document No. 9*.

The reasons for this will be explained as follows.

[7] Notice on the establishment of an office responsible for reform of economic system. Archived in Southwest Jiaotong University, No. 801-0-2(14).

[8] For a detailed discussion, refer to the following sections.

[9] Opinions of MOR on railway reforms. Archived in Southwest Jiaotong University, T-7.

2.1.2 *The Content and Impact of* Document No. 9

In 1975, with support from Mao Zedong and Zhou Enlai, Deng Xiaoping was officially appointed as director of the CPC Central Committee and began to lead the comprehensive rectification of the national economy.[10] On January 28, Deng summoned Wan Li, the newly appointed Minister of Railways, and gave instructions to relevant officers of MOR to draft a plan for railway rectification. After discussions on February 6 and February 11, Deng demanded that the plan be completed by February 25, the day of the National Industrial Secretaries' Conference. He stressed the urgent need for a concentrated overhaul of the railways, advocating for a military-style management approach, and verbally presented the key points of *Document No. 9*.[11]

In his speech on March 5, 1975, Deng stated, "There is a major agenda that the whole Party should focus on. What is this major agenda? The Government Work Reports of the First Session of the Third National People's Congress (NPC) and the First Session of the Fourth NPC both outlined a two-step plan for developing our national economy: the first is to build an independent and relatively complete industrial and economic system by 1980; the second is to build China into a socialist powerhouse with modern agriculture, industry, national defense, and science and technology by the end of the 20th century, which gives us twenty-five years from now. The entire party and nation should strive to achieve this great goal. This is the major agenda".[12] So, how can we boost the national economy? Deng emphasized, "The analysis shows that the current weak link is the railways. If the problems with railway transportation are not resolved, the operation will be disrupted, and the entire plan will fall through. Therefore, the central government is determined to address this issue".[13] Thus, the railways became the breakthrough for comprehensive rectification, marking the beginning of the reform process.

Document No. 9 can be viewed from two perspectives. Firstly, the railway industry served as the "vanguard" in the comprehensive rectification. As early as March 5, 1975, at the National Industrial Secretaries' Conference, Deng Xiaoping pointed out that "the experience gained from resolving railway issues would be helpful to other industrial sectors".[14] Consequently, the experience of rectification in the Xuzhou Railway Sub-administration, led by Wan Li, then Minister of Railways, was quickly promoted across various industrial departments. In late March and

[10] Literature Research Office of the CPC Central Committee. (1997). *The Chronology of Zhou Enlai (1949–1976) Volume II* (pp. 693–694). Beijing: Central Literature Publishing House.

[11] For details of the last two meetings, refer to: An Interview with Tie Ying (on May 25, 1994) and Wang Zhen's speech at the National Conference of Leading Officers in the Railway Sector on March 28, 1975. Cheng Zhongyuan et al. (2009). *Prelude: Deng Xiaoping and the rectification move in 1975* (p. 35). Shijiazhuang: Hebei People's Publishing House.

[12] Literature Research Office of the CPC Central Committee. (1994). *Selected works of Deng Xiaoping* (Volume II) (p. 4). Beijing: People's Publishing House.

[13] Ibid.: 5.

[14] Ibid: 7.