

# A Comparative Study of Chinese and Foreign Automobile Industry Management Systems

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**Abstract:** China's automobile industry is currently experiencing significant growth at a time when the industries of developed countries and regions in Europe, the United States, and Japan have matured. As such, the automobile management system in China will play an increasingly important role in society and in the country's development as an automobile power. This study summarizes the problems with China's current system, compares it with those of developed countries, and, based on the results, proposes several solutions to the aforementioned problems. These include transforming the country's vehicle management system, developing the industry's legal framework, allowing market mechanisms to play a greater role, strengthening strategic guidance, and encouraging technological innovation.

**Keywords:** legalization; strategic guidance; market competition; management system

## 1 Introduction

Automobiles as consumer products play a vital role in the national economy, people's livelihoods, and socioeconomic development. In addition, the environments and conditions in which vehicles are used are complex (e.g., factors related to the driver, road infrastructure, other vehicles and pedestrians, and transportation management), leading to problems related to transport safety, environmental pollution, and energy consumption. The unique characteristics of automobiles mean that regulators must approach the topic from the perspective of public interest and should attempt to solve these problems through the strict management of automobiles.

China currently faces severe externalities related to transportation safety, air pollution, and energy supply. These externalities are the result of factors such as the increasing popularity of automobiles, a relative lag in the pace of social and industrial development, and supply-side problems caused by inadequate government management systems. The latter problems include an insufficient capacity for industrial innovation and persistent

illegal production practices. In contrast, countries and regions with developed automobile industries, such as Europe, the United States, and Japan, have mature management systems and healthy relationships between their automobile industries and societies. Therefore, the experiences of these countries can serve as a reference for China as it seeks to establish similar relationships and to become an automobile superpower.

## 2 Automobile industry management systems in developed countries

Developed countries have market-driven economies and emphasize market competition, allowing market mechanisms to dictate industrial development. These countries' governments rarely intervene in the market, and their stringent regulations of automobile products are guided by public interest and increasing the degree of competition at a strategic level. Economic, technological, and national differences mean these regulations vary between countries. However, there are also several commonalities, as discussed in the remainder of this section.

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## 2.1 Intensive management functions and clear departmental responsibilities

Developed countries adopt intensive management of automobiles and clearly distinguish between the responsibilities of each department. In addition, developed countries pay special attention to coordination in order to avoid multiple departments being responsible for the same management task, thereby improving management efficiency. In general, an organization is assigned to be the regulatory department for the automobile industry (e.g., the United States Department of Transportation (DoT) or Japan's Ministry of Land, Infrastructure, Transport and Tourism (MLIT)). These organizations are responsible for managing access to the automobile product market, as well as for related interim and ex-post oversight duties. Each department operates within its scope of responsibility in accordance with relevant laws and its authority, without overlapping in terms of functions or management. For example, the Japanese departments related to automobile management include the MLIT, the Ministry of the Environment, and the Ministry of Economy, Trade and Industry. The MLIT is responsible for approving vehicle types, vehicle registrations and inspections, and recalling faulty vehicles. The Ministry of the Environment and the MLIT cooperate to establish relevant environmental standards, which are executed by the MLIT. The Ministry of Economy, Trade and Industry is responsible for the recycling and re-use of vehicles.

## 2.2 Emphasis on legal system management and complete legal systems

Developed countries emphasize the use of laws to regulate the market, and establish laws that focus on public interests, such as safety, energy efficiency, and environmental protection. As a result, the legal system for vehicles covers the entire product life cycle, from market access, registration, annual inspections, and maintenance, to scrap recycling. For example, the United States has enacted several such vehicle-related laws, including the *National Traffic and Motor Vehicle Safety Act*, the *Clean Air Act*, and the *Motor Vehicle Information and Cost Savings Act* [1]. These laws stipulate clear regulations for vehicle safety and environmental protection standards for market access, corporate fuel consumption, vehicle registration, and maintenance. In addition, these laws constitute a complete technical and legal system related to vehicle safety, environmental protection, and energy efficiency. Similarly, Japan has enacted laws such as the *Road Traffic Act*, the *Air Pollution Control Act*, the *Energy Conservation Act*, the *Amendment Act on Reduction of Total Amount of Nitrogen Dioxide and Particulate Matters Originating from Automobiles in Designated Areas*, and the *End-of-life Vehicle Recycling Law*. As in the United States, these laws form a complete vehicle regulatory management system. Based on the experiences of the United States

and Japan, South Korea has enacted a series of laws to serve as a basis for automobile product oversight, including the *Motor Vehicle Management Act*, the *Clean Air Conservation Act*, the *Noise and Vibration Control Act*, and the *Wastes Control Act*.

## 2.3 Strict regulation of automobile product market access and increasing emphasis on post-market-access oversight

In developed countries, automobile regulatory authorities establish technical laws covering vehicle safety, energy efficiency, and environmental protection, and use these laws to manage access to the automotive product markets [2]. Market-access management typically involves three stages, the first being ex-ante management. In this stage, vehicles are approved by type or undergo a self-certification process, which guarantees that automobile products designed and manufactured by companies conform to relevant laws and regulations. The second stage is interim management, which focuses on the oversight of production compliance and guarantees that all products meet legal requirements. The third stage is ex-post management, which addresses product defects that were not detected during the first two stages, and may include a company having to recall products and eliminate defects. Furthermore, governments impose severe penalties on companies when defective products result in damage. For example, a company may be required to pay compensation or a fine, or may even face legal action [1].

## 2.4 Strong strategic guidance and industrial competitiveness

Developed countries implement medium- and long-term development strategies in response to environmental and energy pressure and international competition [3]. For example, the United States has promulgated a series of strategic plans, including the Strategy for American Innovation, the Intelligent Transportation System (ITS) Strategy, the Advanced Manufacturing Partnership (AMP) Plan, and the New Energy for America plan. These policies identify the need to reduce vehicle fuel consumption rates, encourage the development of new-energy vehicles (NEVs), accelerate the development of the Internet of Vehicles (IoV) and autonomous driving technologies, and improve the competitiveness of the automobile industry. Similarly, in response to trends such as energy and environmental constraints, urban congestion, population growth and population aging, and changes in consumer values, Japan implemented the *2014 Automobile Industry Strategy*. This plan aims to accelerate the development of new automobiles (e.g., electric vehicles), develop a global automobile industry, and promote technological innovation. These medium- and long-term development strategies emphasize macro-level guidance, characterized by a clear division of labor between governments and corporations, minimal government intervention, and a focus on environmental protection and coordination projects. These strategies require the voluntary

cooperation of industry organizations and corporations. For example, when Germany implemented its *National Electromobility Development Plan*, many government departments jointly established a national electric-vehicle platform. This included creating supporting projects to serve as guides to the plan, while strictly following a principle of technological neutrality. Within this framework, organizations plan research topics and apply for platform projects under the guidance of these supporting projects.

## 2.5 Emphasis on technological innovation and the application and popularization of new technologies

Innovation is the core driver of progress in the automobile industry, and developed countries strongly emphasize the leading and supportive role of innovation [4]. The governments of these countries guide and incentivize innovation by focusing on key generic and cutting-edge technologies, respecting the dominant innovative status of companies, and coordinating government departments, corporations, higher education, and other organizations. Specifically, these governments adopt four types of guidance and incentive methods. The first method involves planning documents that provide a high level of strategic guidance for technological progress in the automobile industry. For example, the US government's ITS Strategy focuses on achieving autonomous driving and mobile Internet capabilities in vehicles. To achieve this, it has surveyed more than 280 groups, including the federal government, state governments, research organizations, industrial organizations, automobile manufacturers, and trade corporations. This strategy is implemented in five-year cycles that clearly stipulate the development goals and necessary development projects for each period and stage. The second method involves increasing R&D investment in automotive technologies, establishing R&D and service platforms for generic technologies, and accelerating the development and deployment of advanced automotive technologies. For example, the European Automobile Manufacturer Association's European Council for Automotive R&D (EUCAR) platform encourages the governments of EU member nations to contribute EUR 100 million annually. The organization includes the European Commission and relevant industries, suppliers, and research bodies, which jointly promote the development of common rail fuel injection technology, X-by-wire technology, and generic electric motor structure technology. The third method uses fiscal and taxation strategies, R&D, and testing to actively promote the popularization of technologies such as new energy and autonomous driving. With regard to new energy, Japan has published the *Next Generation Automobile Strategy* (mainly new-energy vehicles), Germany has implemented an electric vehicle purchasing subsidy policy (the *Electric Vehicle Sales Promotion Policy (Environmental Protection Subsidy)*), and the United Kingdom has invested GBP 246 million in battery R&D and production. With regard to au-

tonomous driving technology, the United States has published the *Automated Driving Systems 2.0: A Vision for Safety* and the *Self Drive Act*. Japan has stated that it will relax laws and regulations that restrict driverless vehicles, while the UK government has stated that it will remove laws that restrict self-driving vehicles. The fourth method emphasizes the protection of intellectual property rights. Developed countries have established complete systems to protect such rights, which promotes innovation and protects the interests of innovators.

## 2.6 A fair and open competitive market environment

Market mechanisms are at the heart of automobile market oversight in developed countries. By preserving competition, these countries rarely need to implement measures that protect or support automobile companies. This is evident in several aspects of the environment. First, there is complete openness. Externally, developed countries typically implement a policy of "pre-access national treatment plus negative list," which places no restrictions on foreign investment in automobile manufacturing. Internally, the automobile markets are open to all market actors. As such, government market-access management requires only that the automotive products produced by these companies meet relevant technical regulations. Second, the stance of developed countries is encouragement of competition. Governments strive to establish unified markets, eliminate local protection, and promote the free trade of automobile products. At the same time, these governments implement strict anti-monopoly legislation to guarantee that market actors can compete under fair conditions and to maintain market order, thereby protecting the legal rights of consumers.

## 3 Comparing Chinese and foreign automobile industry management systems

### 3.1 Unique characteristics of China's automobile industry management system

China's automobile industry management system is quite different to those of developed countries and regions and has several unique features.

First, management functions related to automobiles are distributed among seven government departments: the Ministry of Industry and Information Technology; the National Development and Reform Commission; the Ministry of Public Security; the Ministry of Environment and Ecology; the General Administration of Quality Supervision, Inspection and Quarantine; the Ministry of Transport; and the Ministry of Commerce. Furthermore, the delineation of management functions between departments is relatively vague, and there is insufficient communication and coordination between departments, resulting in a weak system.

Second, China lacks specific laws that regulate automobiles.

Existing laws related to automobiles do not explicitly cover energy efficiency (especially with regard to manufacturing), and instead are extremely general. It has long been the case that government departments manage the automobile industry based on government policy documents and primarily use administrative methods to penalize firms that violate laws and regulations. As such, China lacks penalty measures based on laws and regulations.

Third, China uses mandatory national standards rather than technological regulations. Standards and regulations are very different concepts, because technological regulations have no legal status. In terms of their qualities, standards are voluntary, whereas regulations are compulsory. In terms of content, standards are typically only technological requirements, rather than management requirements.

Fourth, China's government departments view project investment management and the market access of automobile producers as important methods of industrial management. The government has established thresholds for firms wanting to enter the automobile industry based on scales, capabilities, and systems, and has restricted the entry of other firms and capital. This has resulted in vehicle production credentials becoming a valuable resource in China. Owing to incomplete laws and regulations, existing firms that lag the market have no way of withdrawing from the market. As a result, "zombie companies" rely on the sale of "shell resources" to generate a profit.

Fifth, the management of market access is subject to several government regulatory measures, such as the *Announcement of Road Power-Driven Vehicle Manufacturing Enterprises and Products*, mandatory certification of motor vehicles and safety components, transparency of information related to products' environmental impacts, and management of road transport vehicle fuel consumption standards. These measures are managed by a variety of departments, including the Ministry of Industry and Information Technology, the General Administration of Quality Supervision, Inspection and Quarantine, the Ministry of Ecology and Environment, and the Ministry of Transport.

Sixth, China attaches excessive importance to the regulatory and guiding role of industrial policy and strategic planning. China has published two versions of its automobile industry policies and many short-term and mid- to long-term automobile industry plans, in which it is relatively clear that government decisions replace market choices. These characteristics are evident in the government's choice to support specific technological pathways, products, and companies, without a long-term continuous development strategy.

Seventh, in addition to its substantial financial investment, China has implemented several policies to support technological innovation. However, it has long been the case that the fiscal resources allocated across departments, channels, and recipients for technological innovation have been insufficient to support key generic and cutting-edge technologies. In addition, different

types of innovators apply for support through different channels, which exhibit insufficient cooperation. Furthermore, China needs to strengthen its protection of intellectual property rights and cultivate a society that respects innovation.

Eighth, China has tended to view the automobile industry as weak and, thus, has adopted primarily supportive and protective policies for the industry. Typical examples include subsidies and restrictions on competition (e.g., restricting the ratios of foreign capital, strict production sites and limited market access, a high degree of tariff protection, restricted technological pathways, and supporting companies and products that meet certain conditions) aimed at guiding the development of the industry. To a large extent, this has led to disorder and insufficient competition in China's automobile industry.

### 3.2 A Comparison of Chinese and foreign automobile industry management systems

Here, the automobile industry management systems of developed countries are used as benchmarks for the comparison with China's system (Table 1). A significant difference between China's system and a benchmark indicates an area that can be improved and optimized.

### 3.3 Problems with China's automobile industry management system

The comparison with the automobile industry management systems of developed countries highlights eight problems with the system in China.

First, there are too many departments responsible for managing the automobile industry. This results in a lack of coordination between departments and overlaps in terms of management content.

Second, China's legal system is not yet fully established, particularly with regard to the production stage of the product life cycle. As a result, departments are limited in their ability to enforce oversight, leading to repeated legal and regulatory violations in China's automobile industry (e.g., fraudulent data, illegal modifications, certification reselling, etc.).

Third, China uses compulsory standards rather than technological regulations. Furthermore, because compulsory standards lack management documents, they must be implemented through administrative documents.

Fourth, there are significant overlaps between departments in terms of management content related to product market access. In addition, this content overemphasizes ex-ante reviews and underemphasizes interim and ex-post oversight.

Fifth, China overemphasizes policy support, overlooking the positive role of market mechanisms in industrial development.

Sixth, China's strategic planning content is excessively detailed. As a result, the government intervenes frequently on a

**Table 1.** Comparing the automobile industry management systems of China and developed countries.

Classification		Developed countries	China
Management system	Management department	One department, in general	Scattered across seven government departments
	Relationship between departments	Clear responsibilities, emphasis on coordination	Little communication between departments
Legal system	Specialized laws	Yes	No
	Legal coverage	The entire product life cycle	Lacking in some stages, especially production
	Establishment of relevant laws	Clearly established	Generalized
	Penalty measures	Primarily economic and criminal penalties	Primarily administrative penalties
Technological regulation system		Yes, with legal efficacy	No
Product market access	Management system	Unified market-access management system	Includes management of four standards: public announcements; CCC automobile certifications; motor vehicle environmental impact information transparency; commercial vehicle fuel consumption
	Management department	In general, concentrated in one or two government departments	Concentrated in four government departments
	Oversight of production conformity	Effective oversight measures and strict legal penalty measures	Insufficient oversight methods and limited penalty measures
Company market access		No	Investment project approval; company market access reviewed by the National Development and Reform Commission and the investment management departments of provincial governments; Ministry of Industry and Information Technology
Market competition		Competition encouraged, and fewer protective and supportive measures	Competition restricted, to a degree, generally using supportive and protectionist policies
Strategic guidance		Emphasis on macro-level guidance, with governments rarely intervening on a micro level	Insufficient macro-level guidance; frequent micro-level government interventions
Technological innovation		Innovation is guided by strategic plans, increasing technological investment, and improving the protection of intellectual property rights; emphasis on key generic technologies and forward-looking technologies, strengthening the status of firms as innovators, and promoting official, industrial, academic, and research organization integration	Clear strategic plans, but insufficient cooperation; comprehensive measures, including funding support for technological innovation, but a lack of coordination and cooperation between supportive policies; insufficient coordination and cooperation between governments, associations, and corporate organizations
Management efficacy		These countries are automotive superpowers and have a leading status in the global automobile industry in terms of resource allocation	Large and weak automobile industry, with problems that include a weak capacity for technological innovation, lagging development of independent brands, and industrial disorder

micro level, but offers little in the way of guidance on a macro level.

Seventh, the funding of scientific research is fragmented, with insufficient investment in R&D related to key generic and forward-looking technologies. For a variety of reasons, including institutional and mechanism factors, many firms have insufficient endogenous power and capacity for innovation.

Eighth, although firms' market access plays an important and positive role, it also causes production qualifications to become a scarce and valuable resource. This protects firms that lag behind

the market, but that possess production qualifications, while also restricting access for new market entrants. In addition, firms that lag behind have no way of exiting the market, which interrupts the process of "survival of the fittest."

#### 4 Recommendations for optimizing China's automobile industry management system

An important objective of China's comprehensive reforms is to modernize the national administrative systems and capabili-

ties. Based on the results of this study, it would appear that this applies equally to automobile industry management. As such, the following recommendations are proposed.

First, the automobile industry management functions of relevant government departments need to be integrated. In addition, reforms of the major departments are required, clearly defining one department as the automobile management authority. This will strengthen its status as the leader of vehicle management, with other relevant departments providing coordination and support within the scope of their responsibilities. Each department's management responsibilities should be defined clearly. This will enable departments to exercise control and manage those areas they are responsible for, without interfering in activities beyond the scope of their duties.

Second, the legal and regulatory system needs to be improved in order to manage and control vehicle safety, the industry's environmental impact, and energy efficiency in a manner that protects the public's interests. China should learn from the automobile market-access management systems of developed countries to establish relevant legal and technological regulatory systems. In doing so, it should significantly strengthen its interim and ex-post oversight and eliminate automobile investment project management and market access systems for automobile manufacturers. This will enable a shift in oversight orientation from "firm management" to "product management." Most importantly, research should be conducted on establishing a *Road Vehicles Act*, including the oversight required for each stage of the vehicle life cycle and top-level legislative planning.

Third, market mechanisms need to be employed to promote industrial competition. For example, this can be achieved by removing restrictions on the ratio of foreign investment in complete vehicle manufacturers, forcing independent brands to implement internal reforms, and accelerating the transformation and upgrade process. Local protection should also be removed and efforts should be made to establish a unified national market. In addition, anti-monopoly guidelines are required. Thus, a complete policy and regulatory system should be established that

includes anti-monopoly oversight mechanisms and an open and competitive automobile trading and after-market system.

Fourth, the government should provide strategic guidance for the automobile industry. In addition, the government should propose long-term strategic focal points, important reform tasks, and policy orientations for the automobile industry. Furthermore, when establishing and executing strategic plans, micro-level interventions must be reduced and governments, corporations, and industrial organizations should be motivated to cooperate with each other.

Fifth, China should use market mechanisms to drive technological innovation in the automobile industry and let the market dictate technological R&D, path selection, factor pricing, and the allocation of resources. This will require significantly less government intervention. Innovation policies should focus on supporting R&D related to key generic, fundamental, and forward-looking technologies, such as low-carbon technology, information technology, and smart technology. In addition, R&D funding should be allocated according to the principle of supporting the strong and should take advantage of the power of joint policy coordination. Finally, China's legal, policy, and systemic protection of intellectual property rights should be upgraded and strictly enforced.

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