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Investigating the Political Economy of Automotive Industry Development in China: The Comparative Study between the Fuel Vehicles Industry and the Electric Vehicles Industry

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Abstract

The fuel vehicles (FV) industry and the electric vehicles (EV) industry are the two sub-sectors of the automotive industry, which are the economic pillar in many industrialised countries. In China, both of the two industries received massive state support through waves of industrial policies, but there are different developmental outcomes between them. This study will research why the EV industry is more successful than the FV industry in China from a political economy angle. Through a comparative study, it argues that successful industrial policies must both promote technological improvements to enhance productivity and also eliminate moral hazards issues derived from state support. Moreover, what was more important than industrial policies themselves is the development-enhancing political settlement, which can create economic benefits to different actors and incentivise them to fulfil the missions of industrial policies.

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List of Abbreviations

CAAM ----------China Association of Automobile Manufacturers

CCP ----------Chinese Communist Party

ECI ----------Economic Complexity Index

EVs ----------Electric Vehicles

FVs ----------Fuel Vehicles

GVCs ----------Global Value Chains

IP ----------Intellectual Property

ISI ----------Import Substitution Industrialisation

JVs ----------Joint Ventures

MC ----------Marginal Costs of Production

MIIT ----------Ministry of Industry and Information Technology of China

MITI ----------Ministry of International Trade and Industry of Japan

MOT ----------Ministry of Transport of China

MST ----------Ministry of Science and Technology of China

NDRC ----------National Development and Reform Commission of China

R&D ----------Research & Development

SOEs ----------State Owned Enterprises

TNCs ----------Transnational Corporations

TRIMs ----------The Agreement on Trade-Related Investment Measures

WTO ----------World Trade Organisation

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I. Introduction

In recent years, Chinese electric vehicles (EVs) have come under the spotlight of the global automotive industry. Domestically, from 2019 to 2022, the total production volume experienced exponential growth, which increased by 592% in only 4 years (CAAM, 2024, Lai, 2024). Just in August 2024, the market shares of EVs reached 51.1% (朱文婷, 2024). It was the first time that EVs became the majority in the Chinese automotive market. Internationally, taking advantage of EVs booming, China surpassed Japan and became the largest vehicle exporter in 2023 (Associated Press, 2024). In the same year, Chinese EVs accounted for 54% of global total EV stock (IEA, 2024). The two Chinese private EV firms, Build Your Dream (BYD) and Geely, were the largest and sixth largest EV manufacturers in the world by the end of 2023 (Daly, 2024). All of the data showed China has become a powerful player in the global EV industry.

However, the rise of the EV industry and China's economic miracles in the last three decades cannot overshadow China's relatively weak fuel vehicles (FV) industry. Unlike the EV industry, China does not have global competitive indigenous brands in FV industry (Ohara and Marukawa, 2011). Both the production and exports of Chinese FVs were largely contributed by joint ventures relying on western firms (Chen et al., 2021). For instance, in 2011, FVs produced by indigenous Chinese brands alone only accounted for 1.2% of total Chinese vehicle production (BBRA research, 2012).

The core technologies of FVs and EVs are the internal combustion engines and battery-powered electric motors. Both of them are highly complex and advanced technologies, which are difficult for the individual firms to develop on its own. In developing countries, it requires the state to implement industrial policies to stimulate learning, innovation, and application of technologies into the local content. In China, the industrial policies for the FV industry started from the 1980s, but their achievements are lower than expectations over thirty years. In contrast, the EV

industrial policies started in the mid-2000s. In less than twenty years, the EV industry had remarkable development. Both the FV and EV industries are sub-sectors of the automotive industry with state industrial policies support. Why are there different developmental outcomes between them? This question will be theoretically interesting, especially in the context of industrial development in developing countries.

First, automotive industry is a suitable lens for us to study industrial development. It is a technology-intensive sector with tight backward and forward linkages in the economy. Its development can trigger larger spillover effects over the whole economy, generating more nation-wide welfare gains (Liu, 2019). Most successful late industrialisers, such as Japan and Korea, selected the automotive industry as their pillar industry, which laid the cornerstone for their economic taking-off in the following decades. Today, in Japan, the automotive industry accounted for 13.9% of manufacturing GDP (ITA, 2024). lots of researches on late industrialisation compare the automotive industry in Japan/Korea to that in a developing country with weaker industrial capacity in Southeast Asia or Latin America. Through comparisons, they illustrated which factors contributed to fast industrial development and concluded their works in form of the policy implications for developing countries.

Second, China experienced multiple political and economic changes since the 1979 Reform and Opening-up. From the late 1970s to the 2010s, China's political system evolved from authoritarian communism to fragmented authoritarianism and to centralised state-led capitalism. From economic aspect, China's engines of development changed from state-owned enterprises (SOEs) to private firms. These political and economic changes, together with the contrasting performance between the two automotive sub-sectors, made the automotive industry in China an ideal field to research the political economy of industrial development through comparative case studies within the same country, which could reveal how political and economic factors interplay and affect industrial development.

By far, many researchers investigated the rise of China's EV industry. However, few studies have been done to investigate what made the EV industry more successful than the FV industry in China through the political economy approach. This study will fill this gap. The overarching research question in this study will be:

What economic and political factors can explain why the EV industry outperforms the FV industry in China?

By answering this question, this study aims to draw policy implications for the late industrialisation. In the following, Part II will establish the theoretical foundations for late industrialisation and the determinants of its success. Part III will discuss the methodology in this study. Part IV will research the policies and development of the FV and the EV industries in China. Based on Part IV, Part V will analyse how the state, bureaucrats, and firms engaged with each other to promote industrial development and investigate the political forces driving their interaction, based on the embedded autonomy theories, political settlement theories, and political coalition models discussed in Part II theoretical foundation. Part VI will have the conclusions and implications.

II. Theoretical Foundations

2.1 Conceptualising the Late Industrialisation

For backward countries, how can they catch up the early industrialised countries? This question is crucial for the postwar development studies. Many economists answered that the modernisation is the key for backward countries to fast development and prosperity. In 1954, Arthur Lewis explained the process of modernisation based on his dual-sector model. An economy is made by 2 sectors: a traditional low-productivity agricultural sector and a modern high-productivity industrial sector. The productivity growth can spark national economic development, which requires the transfer of surplus labour from the traditional low-productivity sector to the modern

high-productivity sector (Lewis, 1954, pp. 189 - 191). The dual sector model illustrated that productivity growth and labour transfer are the catalyst of catching up, which laid a foundation for the contemporary development studies.

In 1962, Alexander Gerschenkron phrased the catching-up process as late industrialisation. Drawing on the experiences of European late developers in the 19th century, he illustrated that the different domestic institutions in relatively backward countries resulted in the distinct characteristics of late industrialisation. First, the state was like a leader in navigating economic development. In the 1860s in Empire Russia, the state targeted several heavy industries and initiated a series of subsidies, credits, and taxation policies to encourage the investment in industrial materials and machine production to finance the industrialisation to cope with military pressure from western powers (Gerschenkron, 1962, pp. 19-20). Second, the state-controlled organisations and agencies, such as state-owned industrial banks, need to coordinate with the state to facilitate the growth of large industrial corporations. In Germany, the industrial banks not only had close cooperation with industrial corporations themselves to help them with financing, but also promoted infrastructure development to prepare for the upcoming fast industrial development. (Gerschenkron, 1962, pp. 13-16). Overall, Gerschenkron (1962) underscored that late industrialisation features with more state involvements in development planning, a larger scale of factories or firms, monopolistic industrial patterns, and technological acquisition from more advanced countries.

The works of Lewis and Gerschenkron have been influencing the study of late industrialisation for decades. Meanwhile, another group of scholars explored some other features of late industrialisation. They argued that the development of late developers in the 20th century is more complex and unpredictable than the European late industrialisers. “The economies of developing countries are conditioned by the development and expansion of developed countries” (Dos Santos, 1970, pp. 231). The colonial legacies and the unequal world capitalism system made developing countries

integrate into the global economy in a disadvantaged way. Amin (1976) discussed that in low-productivity developing countries, the exportation of low-priced products and importation of capital-intensive high-priced products caused the declining terms of trade, which deepened their wealth drain and obstructed their development.

Though there are debates among different groups, they both contributed to the conceptualisation of late industrialisation. To conclude, relatively backward countries need to develop high-productivity and high-return industrial sectors to modernise and mitigate the adverse effects from the unfavourable integration into the global economy. In this process, the state, the bureaucrats (such as the state-owned industrial banks), and the firms (large firms supported by industrial banks & states) need to keep close distance and coordinate with each other to deliver better developmental outcomes.

2.2 The Political & Economic Factors Behind Successful Late Industrialisation

Since the 1970s, the extraordinary economic performance of several originally backward countries has amazed the world, including both the high-income East Asian Tigers and a few fast-growing African states after independence. Another question emerged: why did successful late industrialisation take place only in these countries rather than the rest of the massive developing world?

Neoclassical economists answered this question by highlighting the market supporting policies. They believe that the complexity of markets and industries, as well as the failure of the Import Substitution Industrialisation in Latin America, denied the governments' abilities to choose the "industrial winners" and allocate the resources (Juhasz et al., 2023). The best channel to industrial development and productivity growth is to ensure the well-functioning of the market. The World Bank report (1993), *The East Asian Miracle,* illustrated that it was the benign economic policies that prepared East Asian for economic taking-off, including investments on human capital,

property rights protection, macroeconomic stability, and export-promotion strategies under the liberal trade framework. In contrast, in China, the government's exporting licenses and tariffs in the late 1990s and early 2000s had tremendous distortion effects and reduced the manufacturing productivity by around 40%, which were gradually solved by trade liberalisation reform after the WTO accession (Khandelwal et al., 2013, pp. 2169).

These neoclassical economists praised the great roles of the market and highlighted that the inability of the state and the bureaucrats is the cause of poor economic performance. However, such an explanation received lots of criticism. It ignored the global economic order and the roles played by the state in both East Asian developmental states and the European late industrialisers. On a deeper layer, it failed to explain why the coordination among the state, bureaucrats, and firms was effective in promoting industrial development in successful developmental states, but ineffective in Latin America under ISI and China in the 1990s. Therefore, some developmental theorists tried to combine politics and economics to uncover the determinants of effective coordination among states, bureaucrats, and firms. They argued that throughout history, the market allocation mechanism alone has never enabled backward countries to catch up. What distinguished successful late industrialisers from the unsuccessful others are the political factors that can effectively make market actors and the bureaucrats interact with each other in accordance with long-run national interests of industrial development.

2.2.1 Embedded Autonomy

Peter Evans (1995) illustrated that the rational Weberian bureaucracy with embedded autonomy situates at the centre of successful late industrialisation. In terms of embeddedness, the bureaucrats should be the indispensable part of the dense social network, leading them to negotiate developmental objectives, policies, and possible actions with business elites to serve the goal of economic transformation and industrialisation (Campbell and Evans, 1998, pp. 103-104). Meanwhile, in terms of

autonomy, the elite bureaucratic system must work for the national economy independently from the controls of strong rent-seeking groups (Evans, 1995, pp. 48). The presence of embedded autonomous enables some developing countries to transform into fast-growing developmental states. In Japan, the Ministry of International Trade and Industry (MITI), the pilot agency for planning economic development, demonstrates the embedded autonomous bureaucratic system behind the postwar economic miracle. The bureaucrats in MITI graduated from top universities in Japan, treated their work in MITI as a crucial part of their career objectives and worked coherently under the national economic goals and bureaucratic rules (Johnson, 1982; Evans, 1995). Rather than supporting the firms that only served their private economic interests, these bureaucrats supported several industries whose growth can bring the maximised economic dividends for the whole country, which made them more autonomous (Johnson, 1982). Meanwhile, bureaucrats in MITI stayed embedded through the social network originated from top universities in Japan. In the targeted industries, empowered by the social network, bureaucrats and capitalists from domestic firms cooperate with each other to tailor development strategies and industrial policies for advancing the industrialisation (Evans, 1995, pp. 49; Okimoto, 1991).

2.2.2 The Political Settlements & Political Coalitions

In complementing the embedded autonomy theory, some developmentalist scholars placed the bureaucrats into a broader political climate of interests & power distributions for more comprehensive analysis. The political settlement framework by Mushtaq Khan can explain how the state and bureaucrats interacted with firms to promote industrial upgrading in East Asia. The political settlement refers to the distribution of organisational & bargaining powers across society, under which more powerful groups can block or distort institutions or policies if they hurt their interests (Khan et al., 2000, pp. 4; Khan, 2018, pp. 649). In South Korea, the state gave rents to the firms in forms of subsidies, which can reduce the marginal costs of production (MC), and also withdrew subsidies if the firms did not perform well (Khan, 2023). The Korean ruling elites, rather than the firms, were the most powerful actors, so the firms

cannot distort the policies and have no alternative but to sustain productivity growth to get the rents, which then propelled the industrial upgrading (Khan, 2015). Similar to Khan's political settlement theory, Whitfield and Buur introduced a triangular model, shown in Chart 1, to illustrate the political coalitions behind successful industrial policies. The interconnected interests among ruling elites, bureaucrats and capitalist firms bring them into this political coalitions, in which each actor can create economic rents or benefits for the other two.

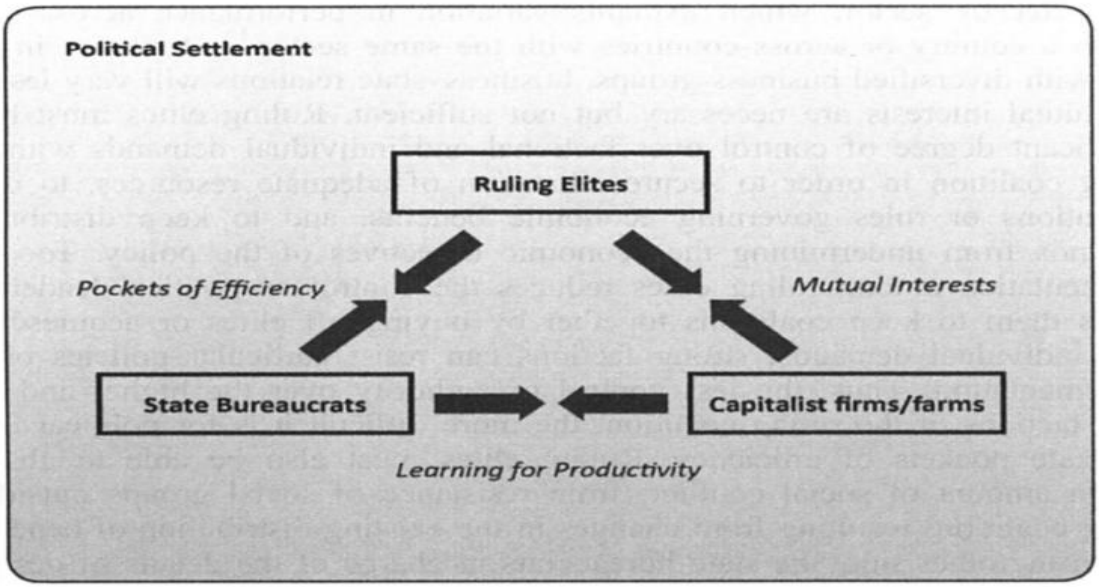

Chart 1: The Political Coalitions (Whitfield and Buur, 2014).

In Chart 2, the industrial policies from the ruling elites can provide firms with better infrastructure, financial subsidies, and industrial protection, which decreases their MC. Overtime, the growth of firms can increase the benefits to the ruling elites. Firms can contribute to more competitive industrial sectors, higher export revenues, and more foreign exchange gains, constituting the preconditions for ruling elites to have higher financing and gain more domestic political support (Whitfield and Buur, 2014, pp. 129). For the bureaucrats, in exchange of more support from ruling elites and financing from the firms, they need to mediate political resistance and divisions within the ruling coalitions & interest groups, and also to implement the industrial policies to support the targeted firms and sectors based on their professional industrial knowledge (Whitfield and Buur, 2014; pp. 130). The rents created from the political coalition not only bridge

state, bureaucrats and firms together, but also guided firms to develop in the way corresponding to the national development interests.

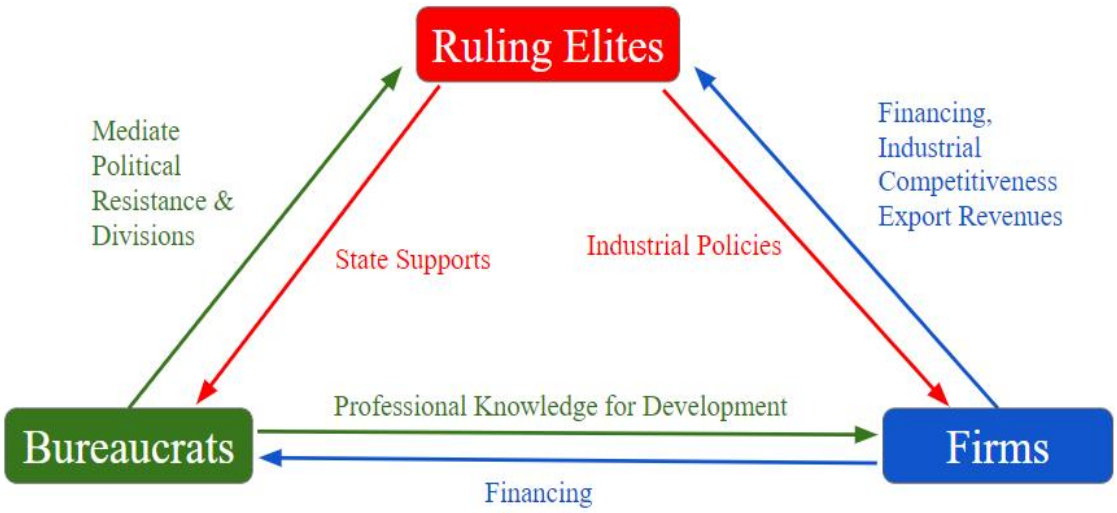

Chart 2: The Interconnecting Rents in the Political Coalition (Edited by the author based on Whitfield and Buur, 2014)

2.2.3 Foreign Firms & Global Economic Institutions

The embedded autonomy and political coalitions explain what sustains the effective involvement of the state, firms, and bureaucrats. However, there were critics on this theory. Whitfield and Buur (2014) believed that as long as firms can closely engage with the other two actors within the political coalitions, it does not matter whether they are domestic private enterprises, State-owned Enterprises (SOEs), or foreign firms. Nevertheless, Lee (2021) argued that the reliance on foreign firms is a main reason explaining why the automotive industry is less developed in Southeast Asia compared with South Korea. The establishment of the WTO in the late 1990s solidified the global production network, with most developing countries sticking to the lower-end of Global Value Chains (GVCs) (Thun, 2004). Thus, the reliance on foreign firms transform developing countries into providers of low value-added intermediate products, which made their catching up process more difficult. Actually, these critics are still part of political settlement because, in these developing countries, foreign firms are powerful players that create large rents for domestic rent-seeking groups and distort the institutions. It will be elaborated in Part V when analysing China.

III. Methodology

3.1 Research Questions, Case Selection, and Methodology

This study is a desk-based research. It will apply qualitative literature-based research methods with some descriptive data, drawing evidence from academic journals, books, industrial association reports, government policy briefs, and international organisations databases. Through a comparative case study between 2 sectors within one country, it aims to answer why the EV industry outperforms the FV industry in China. For the FV industry, it will select the time interval from the 1980s to the 2000s. For the EV industry, it will be from the 2000s to the present. The 1980s was the time when China started the Reform & Opening-up and initiated the first few industrial policies targeting the automotive industry. From the 2000s, during the 10th Five-Year Plan, the state announced the plans to largely support the development of the EV industry, which marks the gradual shift of state focus from the FV to EV industry (www.gov.cn. 2006).

Based on the overarching research question in Part I, Part IV and Part V will research the following 3 sub-questions:

1. What are the policies for the FV and EV industries and whether they are effective?
2. How did the state, bureaucrats, and firms interact with each other under these policies?
3. What are the political settlements and political coalitions behind the interactions?

Part IV will assess the effectiveness of industrial policies with a more economic-centric approach. It will evaluate industrial policies from 2 dimensions, one around its effectiveness in promoting technological development and the other around its effectiveness in restricting the number of subsidised firms, which would be explained in Section 4.1. These two dimensions rest on the works that attempted to theorise the industrial policies in East Asian developmental states, especially *Asia's Next Giant* by Amsden on the Korean industrial miracle. Part V will combine economic and political

approaches. It will apply the embedded autonomy theory by Peter Evans, the political coalition theory by Whitfield & Buur, and the Political Settlement Framework by Mushtaq Khan to analyse how political factors can affect the implementation of industrial policies and create development-promoting institutions. Finally, to avoid confusion, the term “rents” throughout this study refers to any kinds of benefits that different actors can receive, no matter they are good for development or not.

3.2 Limitations

Undeniably, this research has its defects. First, the two dimensions of industrial policies are more like a descriptive framework based on other countries’ experiences rather than a normative theory. The policymakers in Asian developmental states designed them to achieve economies of scale, but there might also be other ways to achieve that than the two discussed. Second, due to the relatively late emergence of the EV industry, the time intervals for the 2 cases are different. From the 2000s to 2020s, the development of technologies in other industries may also help the EV industry, which was absent in the development of the FV industry. It could cause biases. Moreover, the state’s actions, the bureaucrats’ behaviours, and firms’ decisions are hard to quantify. Therefore, in this study, we can only use limited descriptive statistics as our quantitative evidence. The absence of quantitative regression analysis could undermine the causality between our qualitative evidence and the developmental outcomes.

IV. Case Studies: Policies and Development of Chinese Automotive Industry

4.1 Core Constituents of Effective Industrial Policies

Among late developers, different countries may follow different models of development. Japan and South Korea relied on large domestic private corporations, Zaibatsus and Chaebols, each of which ran diversified businesses and had close

relationships with governments (Amsden, 1994). In contrast, the main driver of economic taking-off in Taiwan is the small and medium enterprises (Wade, 1990). In spite of the pathway divergence, productivity growth is the cornerstone for industrial development, which was discussed in the Lewis dual-sector model. What can ignite productivity growth? According to the Solow-Swan model, when the output is experiencing diminishing returns, it is the technological improvement that enhances the productivity, shifts the output curve outward and promotes economic development. Therefore, promoting technological growth is central to industrial policies, especially for heavy industries. Looking back into the 20th century, we can find successful industrial policies in late industrialisers usually included 2 dimensions:

1. Subsidize a certain number of firms to help them acquire high-end technologies and apply the technologies into new products.
2. Restrict other firms in the market from getting the benefits above.

(Amsden, 1989)

Regarding the first dimension, the state needs to provide firms with financial subsidies, technical supports, and market protection from foreign competitions, given the firms are incapable to compete with their counterparts in advanced industrialised countries at early stages of development. These state benefits can not only encourage firms to invest more in learning advanced foreign technologies, but also create more market spaces for them to apply the technologies and strengthen the technological improvements.

What is equally important is the second dimension. Failing to restrict other firms from receiving the benefits will lead to moral hazards issues and policies failures. If all the firms could receive the state benefits, they would have fewer motives to develop technologies to stay competitive, which confines the national industrial development and causes government resources misallocation (Zhao et al., 2019). The state must monitor and discipline the firms to ensure only the well-performing firms could get

state support. The failure of ISI in Latin America and success of the export-oriented industrialisation in East Asia reflected the impacts of the restriction, with the latter case requiring the exporting firms to maintain productivity growth as conditions of receiving state support (Gereffi and Wyman, 1990). In addition, as a result of effective restriction, a fewer number of firms producing at the larger scale is more likely to induce economies of scale, because the production can be more profitable only if firms cross the minimum efficient scale. In developing countries, an oligopolistic pattern of production is a more efficient way to translate technological acquisition into higher profits and productivity (Huang, 2002). The oligopolistic pattern is reflected not only in Asian Tigers, but also in European catching-up countries in the 19th century discussed in Section 2.1.

These 2 dimensions are the entry points for us to investigate the rationales and impacts of both the FV and EV industry policies in China. We need to investigate how Chinese policies attempted to achieve the two dimensions and whether they worked.

4.2 Policies and Development of the FV industry from 1980s to 2010s

China's automotive industry development started in the 1950s. Mao's regime perceived the automotive industry as part of the national security, since more military trucks and SUVs can enhance war mobility (Yuan and Broggi, 2023). In 1953, with USSR support, China established its first automobile corporation, the First Automobile Works (FAW) (Xinhua News, 2023). In the 1960s, the deteriorating China-USSR relationship forced many provinces to build their own auto plants to realise the provincial self-reliance in face of increasing war risks (Eun and Lee, 2002). Under the planning economy, all of the automotive firms in China were SOEs. This pattern lasted all the way to the post-reform era. However, during Maoist era, the economic isolation and domestic political turmoil hindered technological acquisition and productivity growth. In 1984, the total number of vehicles manufactured was only around 5000 (Xue et al., 2024). Like other industries, the FVs industry experienced the first spring after Deng's

Reform and Opening-up. From the 1980s to 2000s, one kind of player dominated the Chinese FV industry: the Joint Ventures (JVs) between Chinese SOEs and foreign auto firms.

In 1979, the Chinese government introduced the Law of Joint Venture Using Chinese and Foreign Investment, which regulated that foreign firms cannot have shareholdings over 50 percent in order to get entry permission to the Chinese market (Salem, 1981). Under this law, foreign automotive firms had to find local partners and form into JVs to enter the Chinese market. The central government designed this law based on the first dimension of industrial policy in Section 4.1, the technological improvements. At that time, China's industrial capacity in the automotive sector was far lagged behind the world average level. It, combined with the poor infrastructure and insufficient R&D capital, denied the possibilities of self-innovation. The partnership between domestic firms and top-tier foreign firms through JVs was an important channel to acquire technologies from developed countries, as workers flows and training workshops in JVs can generate knowledge sharing and technological transfers (Ohara et al., 2011). Under this background, Beijing Automotive Works and Chrysler Corporation from the US jointly established the first automotive JVs in China, Beijing Jeep (Young and Tan, 2001). Few years following it, some other famous JVs were established, such as SAIC Volkswagen and FAW Volkswagen.

In 1986, the state nominated the automotive industry as a priority industry for national development (www.gov.cn, 1986). In the following two decades, multiple industrial policies followed to promote industrial expansion and upgrading. Among them, the 1987 Industrial Policy is the most significant one. It was the first "Picking Winners" industrial policy in China, which aimed to restrict the number of state supported firms (the second dimension of industrial policies). It selected a certain number of National Champions firms, summarised as "Three Giant SOEs and Three Smaller JVs (三大三小)", which included all the JVs owned by the three giant SOEs (FAW, SAW and SAIC) and the other three smaller SOEs-foreign JVs (Beijing Jeep, Tianjin Xiali and

Guangzhou Honda) (CAAM, 2018). Most national-level industrial policies in the 1990s and 2000s were based on the framework of 1987 Industrial Policy.

In 1994, The Outline of The State Industrial Policy listed two main tasks for the auto industry:

1. Mitigate the industrial fragmentation across the country and increase the production concentration around the selected firms.
2. Urge the "national champions" to learn and absorb new technologies from foreign partners and gradually enhance the indigenous product development capacity.

(Lo and Wu, 2014; 姜智文, 2019)

In 2001, the WTO accession further liberalised the market and trade of China, which was reflected in The 2004 New Automotive Industrial Policy. It removed a number of local content rules, reduced entry barriers, and enhanced intellectual properties (IP) protection in automotive industry due to the requirements of the TRIMs agreement under the WTO (Oliver et al, 2009). Accordingly, more foreign automobile firms entered Chinese market and formed into JVs with Chinese SOEs, leading to soaring vehicle production and a higher variety of vehicle products (Global Times, 2021). From 2004 to 2009, the total vehicle production doubled from 5 millions to 10 millions in only 5 years (CEIC, 2023).

However, although a more liberal market environment brought more foreign firms, more technological spillovers and more vehicle productions, the technological improvements of Chinese domestic SOEs were not significant. Internationally, the vehicle exports from China were stagnating in the 2000s, showing the limited market competitiveness of Chinese vehicles (McCaleb, 2016). Domestically, while relying on their foreign partners, large SOEs actually gained little from technological transfers and knowledge spillovers (Lee, 2021). For small firms, they had few living spaces without foreign partnership, given that JVs accounted for 90% of vehicle production (Baker and Hyvonen, 2011). FV industry policies failed to transform China into a

strong player in global FV industry by the 2000s. To understand this failure, we need to figure out how the policies implementations deviated from the expected two goals based on the two dimensions in section 4.1.

First, beyond the state policies, we need to analyse whether the Chinese SOEs can indeed receive technological transfers from their foreign partners based on the global economic order. Since the 1970s, the soaring labour costs in developed countries drove many Global North based firms to transfer their labour-intensive production plants into lower income developing countries, which gave rise to the Global Value Chains (GVCs) (Hung, 2009). In the 1990s, the rapid growing IT & transportation technologies, the prevalence of neoliberalism and the formation of WTO further strengthened the functions and influences of GVCs, connecting firms from different countries all together. The smile curve in Chart 3 shows how the GVCs work.

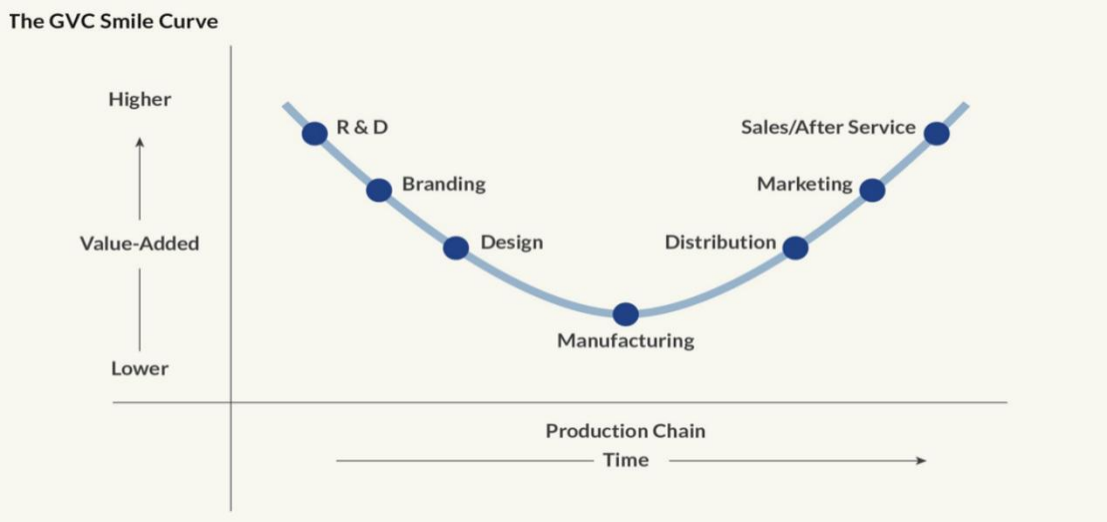

Chart 3: The GVCs Smile Curve (Mudambi, 2008)

Along the curve, firms in developed countries specialise in higher value-added activities distributed at the two ends of the curve, such as R&D, while most of developing countries specialise in low value-added manufacturing activities (Baldwin and Ito, 2021). The FV industry was not an exception. In the 1990s, given the large cheap labour pool and domestic market with huge potentials, many global auto firms were eager to establish their plants in China to assemble cheap vehicles and sell them in the Chinese market. For them, forming into JVs with Chinese SOEs is not merely

the way to fulfill the state requirements but, more importantly, the means to find the local production bases for low value-added assembling, which reduced their production costs (Oliver et al., 2009). However, due to the weak capacity of firms and deficiency of skilled labour in China, many foreign auto firms found it unnecessary and too costly to guide their Chinese partner firms to learn advanced technologies and carry higher value-added tasks, which trapped Chinese SOEs into low value-added activities (Chang, 2009). Furthermore, foreign firms in China were very careful on their IP protection. It was their monopolies on R&D activities, which they invested heavily in their home countries, that empowered them to reap tremendous profits from surplus of labour in developing countries (Sell, 2010). However, the counterfeits, created by the imitations of Chinese firms, can challenge their monopolies and reduce their prospect profits, which undermined their willingness to expose high-end technologies to Chinese firms (Maskus, 2014).

Second, we need to ask whether there were effective mechanisms of restricting the number of firms receiving the state benefits. The state must have strong power to monitor & discipline the supported firms and exclude poor-performing firms from the state benefits to encourage domestic firms to absorb advanced technologies from foreign firms. However, in the 1986 and 1994 industrial policies, the state had not yet developed systematic disciplining and punishing mechanisms for selected SOEs-Foreign JVs (邵京宁, 2004). In 2004, the New Automotive Industrial Policy added 2 requirements for the JVs:

1. For any new FVs investment project, the total project portfolio shall not be less than 2 billion CNY, of which the self-owned fund shall not be less than 800 million CNY.
2. For any new FVs investment project, the firms must also establish the R&D centre and the investment in it shall not be less than 500 million CNY.

(www.gov.cn, 2005)

The new requirements tried to increase the criteria of state support and to enhance the SOEs competitiveness. However, it did not make any real impact, because the strength

of global leading foreign firms can enable the JVs to reach this criterion easily without much Chinese SOEs' efforts. Those Chinese SOEs, instead, could still receive the state benefits while relying on foreign partner firms even if they did not upgrade their technological capacities and productivity, causing severe moral hazard issues (Thun, 2004, pp. 460). Furthermore, the lack of coordination between the state and local governments also lowered the effectiveness of the state industrial policies. From the 1980s to the 2000s, many local governments spent much effort developing their local small SOEs, rather than following the state instructions (Montinola et al., 1995). There were various ways for local governments to evade the state requirements. For instance, even if the state prohibited the supports to automotive firms other than the selected national champions from 1986, the local governments were able to dismantle their local FV firms into firms in other sectors, such as combustion engine firms or tire firms, and then offer them massive benefits (Ma, 1997). However, not different from the SOEs discussed above, local auto firms received very limited technological transfers and encountered developmental bottlenecks as well. From the 1980s to the 2000s, there was a sharp increase only in the number of auto firms in China, not the productivity nor profits of Chinese auto firms. The production share of the three largest auto firms in China were only 35.6% in 1997, almost insignificant compared with 72.8% in 1975 Japan and 97.9% in 1986 South Korea, which means Chinese FV production was highly fragmented across many smaller firms without economies of scale (Huang, 2002, pp. 545).

4.3 Policies and Development of the EV Industry From the 2000s to the Present

China's EV industry started to develop in the early 2000s, when the government selected the EV industry as a priority development area to enhance innovation and technological breakthroughs in the Outline of the 10th Five Year Plan (2001-2005) (www.gov.cn, 2002). This state decision came from 2 driving forces:

1. The need for enhancing industrial competitiveness

2. The urgency of the green transition

(Yang, 2023).

Regarding the industrial competitiveness, Chinese policymakers realised it was too difficult to catch up the global leading countries in the FV industry so that they had to find a new “fast track” to promote industrial upgrading in the automotive industry. Meanwhile, the rising oil energy constraints and worsening of air pollution in large Chinese cities urged the country to make higher use of green energies (Du et al., 2019).

The WTO accession in 2001 and The 2004 New Automotive Industrial Policy both promoted the trend of liberalisation. Therefore, unlike the FV industry, the state did not enact industrial policies targeting “foreign partnerships” or “national champions” for the EV industry. Instead, state-guided experimenting, in the form of pilot projects and pilot cities, was important to the EV industry. It was because the EV industry faced an additional obstacle at early stages of development: the low consumers’ acceptance. For Chinese families, EVs were something novel in the 2000s. Shifting people’s preferences from FVs to EVs was not a simple process. In such a context, the state stood out to promote technological improvements and also increase consumers’ acceptance. It first initiated EV pilot projects in several selected cities, planning to diffuse the pilot projects to the whole country. In 2008, the Beijing Olympics game was a window to start the experiment. During the event, Beijing municipal government, under state guidance, increased the use of electric buses for the transportation of athletes and reporters (You, 2023). It was like a state-sponsored advertisement for EVs, kicking off a series of pilot projects in the rest of the country. In 2009, the state started the “10 cities, 1000 vehicles” project, setting the goal to have 1000 electric buses in the next 3 years in the 10 selected cities (Jin and He, 2020). From 2010 to 2017, the coverage of pilot projects increased robustly, from 10 cities to 88 cities and from only public used EVs to all the EVs (Tian et al., 2024). In the pilot cities, local government coordinated with central government ministries to establish pubic funded R&D centres and accelerate the development of the infrastructure specific to the EV industry, such

as charging facilities (Wang and Mah, 2021). The pilot projects informed consumers of the government's strong support for EVs. The R&D centres and infrastructure gave EV firms the positive signal for the upcoming expansion of the industry, encouraging them to venture and invest more on related technologies. It paved the way for fulfilling the first dimension of industrial policies in Section 4.1.

What was even more important than R&D centres & infrastructure were the subsidies and taxation policies for the EV industry from 2010. It was these policies that brought the high noon of Chinese EV industry, making it more successful than the FV industry. In June 2010, the central government issued the Announcement on the Pilot Subsidies for EVs in Private Sectors (Wu et al., 2021, pp. 3). This announcement provided guidance for the central government ministries (include MIIT, MOT, MST, and NDRC) and the local governments in the pilot projects regarding how to support the EV industry. On the whole, it has 6 bullet points:

1. The local governments need to grant financial subsidies to EV firms, after which EV firms are required to sell EVs at subsidised prices to all the consumers.
2. The local governments not only need to develop infrastructure for the EV industry, but also regularly repurchase the used batteries as part of further subsidies.
3. The local governments must have an annual target for the total number of EVs in their cities / provinces.
4. The amount of subsidies offered to firms depends on the power battery pack energy of each EV they produce. For EVs satisfied with the battery energy criteria, the local government subsidise them 3000 CNY per kilowatt hour, maximum 60,000 CNY for each EV.
5. The local government needs to audit each EV firm regularly. The uncompetitive EV firms will face penalty fares to compensate for the subsidies received before.
6. The local government needs to issue monthly and yearly financial and development reports of the local EV industry and submit them to MOF. The MOF will determine the amount of subsidies given to the local government in the next phase after rigid

reviewing.
(www.gov.cn, 2010).

This policy announcement incorporated both subsidies and performance monitoring. The latter one was absent in the FV policies. From 2010 to 2020, the state added some amendments to them to strengthen the monitoring & disciplining mechanisms. For instance, the 2016 amendment increased the criteria for receiving the subsidies by introducing strict requirements on the safety and durability of EV batteries and excluding EV firms with more road accident records from the subsidies plans (MIIT, 2020). In 2017, the state issued the Medium and Long-Term Development Plan for the Automotive Industry in China, which guided EV firms to accelerate indigenous innovations and apply them to overseas markets through the Belt and Road Initiative (MIIT, 2017). In the same year, the state also introduced the dual-credit policy, comprising of:

1. The Corporate Average Fuel Consumption (CAFC) credits: measured using national standard fuel consumption minus each firm's actual fuel consumption.
2. The New Energy Vehicle (NEV) credits: measured using each firms' actual yearly EV production volume minus the national standard for expected EV production volumes of each firm.

(Li et al., 2020, pp. 4; www.gov.cn, 2017).

Under this policy, the credit deficit firms must buy credits from credit surplus firms. Having negative credits over a year will result in the cancellation of their market licenses (MIIT, 2023).

From the perspective of consumers, subsidised prices of EVs, fewer emissions, and higher safety standards constituted their incentives to replace FVs with EVs for family uses, overcoming the obstacle of limited consumer acceptance (Lin and Wu, 2018). On the level of automotive industry, these EV policies mitigated the industrial problems

rooted in the FV industry: the lack of technological acquisition and restriction measures.

At the global scale, the EV industry did not experience large-scale booming until the 2010s (Matulka, 2014). For China, this industry in the 2000s was like a blank page. The main market incumbents in the FV industry, SOEs-foreign JVs, did not have obvious advantages in the EV industry. Therefore, any firm that developed competitiveness in the EV industry would be able to capture larger market shares and reap more profits (Lauer and Liefner, 2019). In order to compete for more subsidies, both indigenous private firms and SOEs-foreign JVs need to actively acquire advanced technologies, innovate on themselves, and also create new products in order to reduce emissions, upgrade their battery functions, and enhance the safety to reach the subsidies criteria. Firms failing to do so would not survive in the market for long after subsidies cancellation. It was from this point that several indigenous private firms stood out, such as BYD and NIO. Unlike SOEs that had long reliance on foreign firms and government supports, indigenous private firms managed to import key battery technologies and vehicle components by themselves under the trend of market liberalisation (Tian et al., 2024). They were also active in seeking cooperation with the local governments and universities to establish innovation centres for technological development. In Guangdong province, BYD established partnerships with several universities' science & engineering departments, through which, it recruited top graduates into their innovation centre to upgrade their EV products (Shou and Li, 2024). Many other private EV firms also had similar development models as BYD. In a few years, they built up their technological capacity and gained products competitiveness, empowering them to not only squeeze JVs' dominance in Chinese market, but also conquer overseas market.

V. Discussions & Analysis from the Political Economy Angle

In Part IV, we discussed the policies and development of the FV and EV industry in China with a more economic-centric approach. In the EV industry, faster technological improvement, reduced moral hazards and the rise of dynamic indigenous private firms under market liberalisation all together advanced the fulfillment of the two industrial policies objectives in Section 4.1, making it more successful than the FV industry. However, if this is our only conclusion, this study is merely a repetition of what thousands of neoliberalism supporters had underscored: the importance of liberalised market and private sectors. Today, many countries are developing their private sectors and liberalising their markets, but only some of them have attained fast industrial development. Why is that? In addition, why did firms and bureaucrats in local government comply with the state instructions in EV industry, but not FV industry? To gain deeper insights towards the state policies, bureaucrats' behaviours and firms' decisions, we need to conduct further political analysis, bearing 2 questions in mind:

1. Who held the power and how it impacted others?
2. Who can get the rent from what?

5.1 Fragmented Authoritarianism Behind the FV Industry

From 1980s to 2000s, fragmented authoritarianism was the feature of Chinese political system. Despite the authoritarianism on the central level of CCP, the powers and administration on the local level were very fragmented (Lieberthal and Lampton, 1992, pp.1-51). Each group had their own interests and held the bargaining powers. The cadre system and SOEs can elaborate it.

Since the mid 1980s, CCP conducted multiple rounds of internal reforms under the instructions of Premier Zhu Rongji to shrink the size of the government, in order to improve the government functioning efficiency and sustain governance legitimacy especially after decades of stagnation in the communist era (Brødsgaard, 2016, pp.40). The reforms contained 3 noteworthy aspects:

1. “In terms of the political hierarchy, while the business groups (SOEs) stayed on the vice-ministerial ranks, the government ministerial branches that used to manage the SOEs were downgraded and incorporated into State Economic and Trade Commissions” (Brødsgaard, 2016, pp.41-42). Therefore, central government’s controls on the SOEs diminished.
2. After the government fiscal reform in the 1980s, local government started to hold the rights to collect tax revenues from local SOEs and kept a significant portion in their pockets, rather than just levied tax and transferred all the revenues to the central government (Wong, 1991, pp. 699-706).
3. The reforms did not overturn the fact that SOEs themselves had always been a crucial part of Chinese political system since Maoist era. The senior managers of SOEs were treated as government officials, who could be relocated by the CCP to government administration branches as part of the cadre rotation scheme (Zeng, 2017).

For the FV industry, this pattern generated side effects. It was hard to ensure the embedded autonomy of the bureaucrats responsible for policies implementations. The power decentralisation and increased autonomy of SOEs enhanced the powers held by local governments and SOEs, raising their possibility to disobey the central government’s instructions in seeking their own rents. For instance, mentioned in section 4.2, local governments would like to develop their local FV SOEs rather than follow the state strategy of “Three Giant SOEs and Three Smaller JVs”. That’s because local government could gather more tax from local SOEs as a main source of their incomes after the fiscal reform. Moreover, the cadre rotations from SOEs to government branches strengthened the private networking between SOEs and bureaucrats. The local bureaucrats could be close friends with SOEs managers (Bai et al, 2014). In absence of strong central power, local governments could give financial supports to those SOEs with private linkage to them, no matter they developed their productivity or not, which increased corruption in the cronyism form (Lin et al., 2020). This rent-seeking behaviour eliminated bureaucrats’ embedded autonomy. Because of the power decentralisation, the state had less capacity to discipline and punish the

SOEs even if their behaviours distorted the policy incentives and retarded the national industrial development.

The local rent-seeking issue was not the whole story. In section 2.2 and 4.2, we discussed how the global economic order and reliance on foreign firms could also affect the developmental outcomes. Concerning China, foreign firms were reluctant to transfer the advanced technologies to Chinese partner firms, since foreign firms even held more powers than the SOEs and local governments. In the 1980s and 1990s, due to the poor economic development and limited technological capacity, China's only bargaining power in front of foreign firms was its large market (Naughton, 2007; Chang, 2009). It was the state that held this power and enacted the 1979 JVs law for technological transfer. In contrast, developed countries based foreign firms mastered all the core technologies for automobile production. Their willingness to invest in China and share technologies could determine the fate of China's FV industry, thereby holding more powers in China. As a result, after the mid-1980s decentralisation reform, neither SOEs nor local bureaucrats had the capacity to monitor and enforce foreign firms to transfer the technologies. However, both Chinese SOEs and foreign firms can still get the rents without significant technological transfers. Foreign firms reduced their production costs and gained higher market shares in China. For Chinese SOEs, although their own tasks were low value-added, they could still share high revenues with foreign firms through selling foreign technologies made FVs, thanks to the nature of JVs.

Therefore, the political factor behind the ineffectiveness of the FV industry policies is that they did not take political settlements or the distribution of powers into account. From the 1980s to early 2000s, the state did not have the absolute power superiority in the FV industry. Shown in Chart 4, even if it introduced the JVs laws and "Three Giant Three Small", SOEs and foreign firms were still able to distort the formal institutions for their own rents, leading to different outcomes than expected. In such a case, the state's role was confined to offering guidance to industrial development, without

efficient enforcement measures.

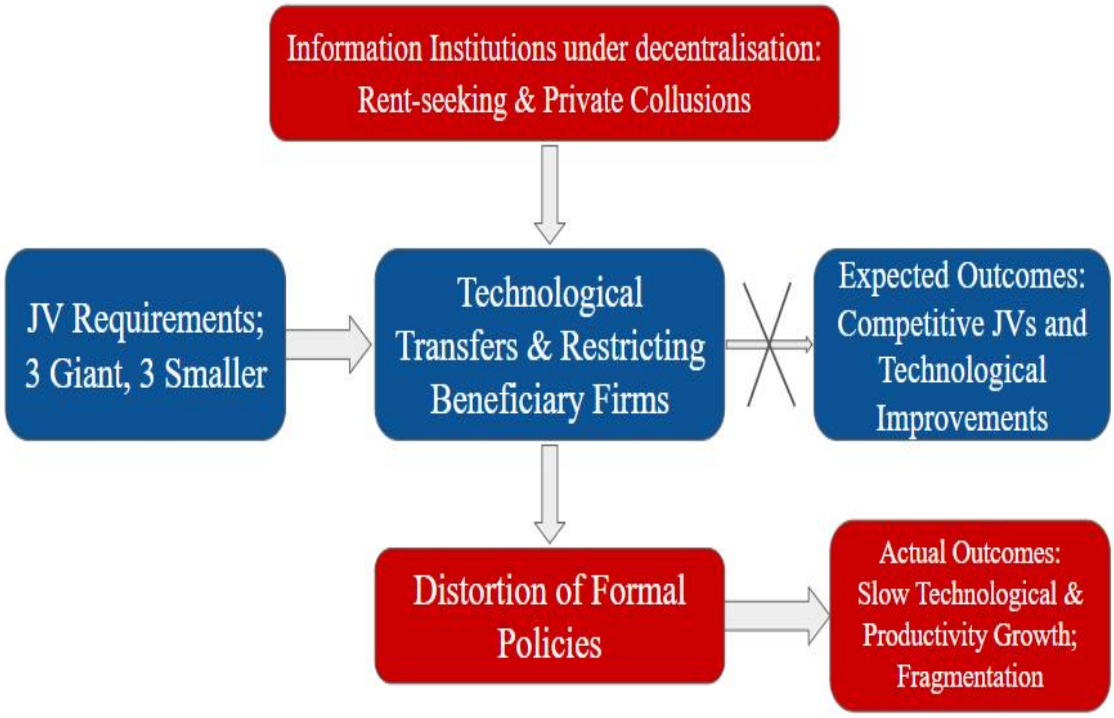

Chart 4: Informal Institutions and Policy Outcomes (Build by the author based on Khan et al., 2013)

Meanwhile, apart from the state, the other three actors, local bureaucrats, SOEs and foreign firms had the interconnected interests with each other that stabilised this development-constraining political settlement. As shown in Chart 5, Local bureaucrats can offer policy benefits to local SOEs with private linkages to them. As local SOEs grew and established JVs with foreign firms, those SOEs could not merely earn higher market profits for themselves, but also create more tax revenues for local bureaucrats. The FV plants build by foreign firms in JVs can also promote local economic development. This relationship would lead to more private deals between local bureaucrats and the FV firms. For foreign firms, apparently, they got the rents through market entry permissions (from local bureaucrats) and lower production costs (from SOEs).

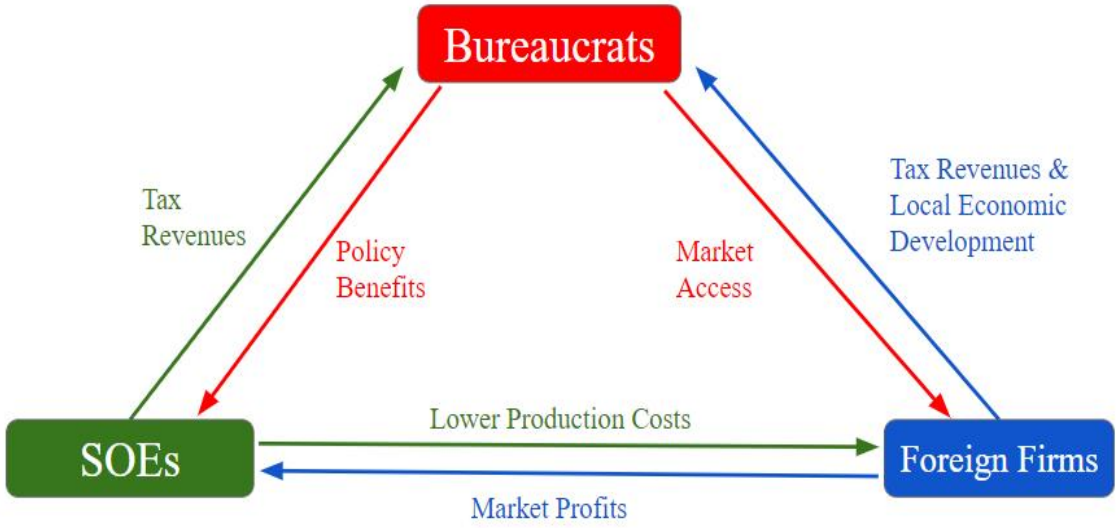

Chart 5: The Interconnecting Rents in the Political Coalition in the FV Industry (Build by the author based on Whitfield and Buur, 2014)

The 3 actors engaged with each other to get their own rents, all of which had the capacity to evade from the state control. This relationship can increase the inflows of foreign firms and contribute to local economic growth in the short-run, but in terms of the development of FV industry, it limited the technological transfers and constrained the industrial upgrading from the 1980s to 2000s.

5.2 Power Centralisation Behind the EV Industry

Fragmented authoritarianism and decentralisation of political system caused distortions of the FV industry policies. Towards the success of EV industry policies, we need to link the industrial development to the political changes. According to Khan (2018), changes on political settlement are usually not radical, which are instead accompanied by economic development, institutional changes or even political instability. It was also true for China in the late 2000s.

First, despite China's high GDP growth for two decades, the industrial upgrading attained was not very remarkable by the late 2000s. China's Economic Complexity

Index (EIC), the index calculating the average knowledge and technology intensity of industries in an economy, only ranked 40th globally in 2005, lower than other major middle-income countries, such as Mexico (25th), Russia (28th) and Brasil (31st) (oec.world, 2024). The inability to develop the higher value-added parts in the industries posed China to the risk of Middle-Income Trap. If China could not establish technology/knowledge-intensive industries as new impetus of growth, the dividends from the cheap labour pool, which was China's advantage in the previous two decades, will be diluted in the next decade, due to the rising labour costs brought by the GDP per capita growth (Sumner, 2021). Facilitating industrial upgrading was a top priority for China in the late 2000s. Second, the prevailing corruption and cronyism under the decentralisation was troubling China. From 1990 to 2008, corrupted government officials in China had stolen more than 120 billion CNY in total and transferred them to western countries (BBC, 2011). Only in 2007, more than 10 percent of government spending were corrupted (Pei, 2007). Worsen even, the environmental pollution was also a great challenge. As the result of fast economic growth, China surpassed the US and became the world largest carbon emitter in 2007 (Lacey, 2013). Since that time, the high concentration of PM2.5 in the air was killing around one million people each year, through inducing lung cancer and heart stroke (The Guardian, 2015).

Slow industrial upgrading, prevailing corruption and severe environmental pollution exerted great pressure on China. The state had to take actions to solve these issues for the healthier functioning of the economy. It was very difficult to finish these tricky and urgent tasks under fragmented authoritarianism. However, different from democratic regimes, the essence of Chinese political system was still authoritarianism in spite of the local fragmentation, meaning that it was possible for the state to redistribute the power and centralise the leadership if it is required for development (Tjia, 2023). In 2012, it was president Xi Jinping that played this role and made the necessary changes. After coming into power during the 18th National People's Congress meeting, Xi followed a "political strongman model" which was similar to the Maoist era. "He re-institutionalised the democratic centralism with unified CCP leadership, under

which the state power was concentrated on the hands of several senior CCP leaders" (Tsang and Cheung, 2021, pp. 228-229). Towards the people, Xi strengthened the CCP centric nationalism, convincing people that only CCP can guide China to revive and prosper (Xi, 2018). Towards the government officials, he underscored the bureaucrats' loyalty to CCP as the main principle of Marx-Leninist with Chinese characteristics (Tsang and Cheung, 2021, pp. 227). Moreover, since 2012, CCP under Xi's leadership was committed to anti-corruption. It conducted stricter auditing on the officials with wider business linkages and cooperated with some foreign governments to arrest corrupting officials fled overseas (Tran, 2016).

Xi's actions tightened the linkages between local bureaucrats and central government and also deterred government officials with corruption propensity. It shifted the power distribution and political settlement so that the central government became more powerful actor. Doner (2005), when investigating the Korean miracle, argued that the state need to deliver benefits to people to ensure the stability of its governance model and mitigate the systemic vulnerability. Similarly, Xi's government also needed to promote industrial upgrading and environmental protection to ensure the endurance of his strongman model. The EV industry, which already had some foundations laid by the previous regime, is a channel to finish the both two tasks. Therefore, the central government enforced stricter implementation of 2010 Announcement on subsidies and designed several amendments to enhance the monitoring and restrict the benefits coverage to improve the policies effectiveness (the second dimension of industrial policies). Under this circumstance, the EVs firms found it less feasible to collude with local governments & bureaucrats to distort the policies and get subsidies while staying uncompetitive. The only choice left to them is to increase their technological strength and productivity to introduce more EV products that meet all the policy requirements on safety, durability and energy efficiencies.

Looking back into the political settlement, we can find the political changes in the 2010s created a political coalition that was more favourable to industrial development.

This new coalition is made of 3 actors, the state with more centralised controls and active involvements, the local bureaucrats taking charge of policies implementations and the firms. In the EV industry, because of the loosening JVs requirements and vanishing advantages of JVs, firms here refer to all kinds of firms producing EVs. Within the coalition, there are still interconnected interests among all the 3 actors. As shown in Chart 6, under EV policies, the state is the main sources of finance to local bureaucrats, as the MOF calculated the funds delivered to the local governments based on their EV industry reports. When receiving the funds, local bureaucrats need to support the political centralisation and implement the EV industry policies, which is like an exchange between the state and local bureaucrats. There is also a similar relationship between the state and the EV firms. The huge benefits that EV firms can get are from the development guidance and a brand new market opened by the state. Previous, in the FV industry, a lot of auto firms had few living spaces. After the state EV pilot projects, they were guided to develop EV and gain new market shares. For the state, it is the EV firms that fulfilled the goal of industrial upgrading and green transition. On the policy implementation level, local bureaucrats can provide EV firms with infrastructure, R&D support, and subsidies. In exchange, the firms need to contribute more to local EV industry.

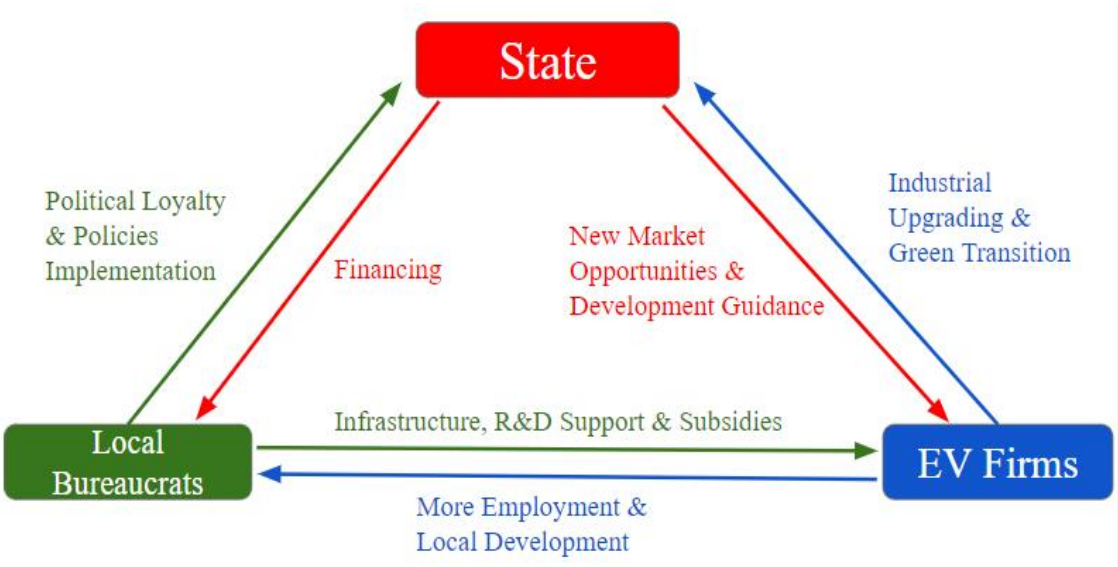

Chart 6: The Interconnecting Rents in the Political Coalition in the EV Industry (build by the author based on Whitfield and Buur, 2014)

5.3 Comparisons and Discussions

In Part IV, we discovered that the rising indigenous private firms, well-functioning market with clear state guidance (through pilot projects) and more effective monitoring and disciplining measures all contributed to the success of the EV industry. Why were these elements not present in the FV industry. The answer is laid in the political settlement analysis in Part V. From the 1980s to 2000s, under the political decentrialisation, the state had limited direct involvements in the FV policies implementations. It increased the likelihood that local governments and SOEs deviate from the state instructions and seek for rents without contributing to industrial development. Additionally, foreign firms, owning the key technologies, had large bargaining powers, which enabled them to distort the state industrial policies. Worsen even, the presence of foreign firms can create rents to local bureaucrats and SOEs. Such the interests connection and power distributions led to confined industrial upgrading in the FV industry.

However, the political settlement in EVs was different. The pressure from industrial upgrading, controlling corruption and green transition reminded the state to have more direct involvement into economic and social affairs. After power centralisation in Xi's regime, the state became the most powerful actors. Collusion between firms and local bureaucrats for private economic interests could be perceived as corruption and punished by the state, especially after Xi's anti-corruption campaign. Furthermore, in the late 2000s, due to the EV industry's portrait as a global new industrial sector, the diminishing technological dominance of foreign firms weakened their bargaining powers. Therefore, both local bureaucrats and firms were less powerful than the state. More importantly, the compliance to the state instructions can create benefits for local bureaucrats and the EV firms. Especially for the indigenous private firms, they could gain tremendous profits if they break the monopoly of JVs and start to conquer the Chinese or even overseas market through choosing the EV industry as a new track. It

formed into the political coalition among state, firms and bureaucrats through which each of them can get the benefits. It incentivised local bureaucrats to become embedded autonomous to offer more support to the EV firms and also pushed the EV firms to develop their productivity through technological growth.

VI. Conclusions and Implications

This study attempted to research the political economy of the automotive industry development in China, through comparing the robust EV industry to relatively weak FV industry. It established two objectives that industrial policies must fulfil: offering benefits to facilitate technological improvement and punishing the uncompetitive firms. In the FV industry, powerful profit-seeking foreign firms and private collusion between local bureaucrats and SOEs distorted the policies, hindering technological improvement and economies of scale formation. In contrast, in the EV industry, government sponsored financial subsidies, battery repurchase, R&D centres, and EV-specific infrastructure opened larger market for firms, reduced their marginal production costs and encourage them to develop technological strength. The Announcement on the Pilot Subsidies and the dual-credit policies accelerated technological and productivity growth through establishing punishing mechanisms: excluding high emissions and unsafe EVs from the state benefits. In addition, the smooth and effective implementation of the EV policies is attributed to the political settlement changes. Since the 2010s, the state has not only hold superior powers that can discipline the local bureaucrats and firms, but also created rents for them two to ensure their willingness to comply to the state development instructions. It led to the formation of embedded autonomy and development-enhancing political coalitions for EV industry development.

It has important implications for future development of China. In reality, besides the state instructions and policies, different provinces in China also adopted some different

provincial-level approaches to boost their local EV industry development. For instance, in Zhejiang province, the government introduced policies that allowed people to rent batteries and EVs separately to reduced their renting costs, while in Chongqing province, the government had independent investment plans in fast-charging batteries (Marquis et al, 2013, pp.55). However, unlike the fragmentation in the FV industry, most of those provincial-level approaches worked well. The core reason was discussed above, that the powerful state, as well as the massive rents from fast development of the EV industry for local actors, guided both local bureaucrats and firms to work on the same direction to promote industrial development and upgrading. For future industrial policies in both automotive industry and other technology-intensive industries, the state should continue to design policies in a way that forms self-incentivising mechanisms between bureaucrats and firms and punishes those staying uncompetitive to ensure sustainable implementations.

We spend most of our paragraphs in analysing the behaviours and motives of the firms and bureaucrats under the power distribution. Meanwhile, what is equally important is the motive of the state. Behind the industrial policies, promoting economic and industrial development to deliver larger economic welfare gains for the people should always be the only motive of the ruling elites. It is also the main principle for the development-enhancing political coalitions. Deviating from this principle will ruin all the efforts of bureaucrats and firms, causing economic slowdown and political instability. In China, Xi's regime had great contributions to industrial upgrading and economic transformation before 2019. However, since 2020, he spent more efforts in ideological construction, rather than economic development, which were reflected in national security laws and stricter political censorship in China especially during the Covid. It weakened the economy and led to the White Paper protests (Murphy, 2022).

For other developing countries, the implications of this study are different. First, for lower income countries, at early stage of development, a strong and centralised state is not that important, since their primary objective is to attract more foreign capital to

build up labour-intensive industries as their development foundation. In the 1980s China, although foreign firms did not promote industrial upgrading in heavy industries, they established export processing zones in coastal areas, which increased capital flows and laid the cornerstone for economic taking-off (Zeng, 2012). After reaching the middle-income level, developing countries have two options to develop technology-intensive industries. If they have strong and capable state, such as new African developmental states like Rwanda, they could imitate Chinese model to subsidise the firms and strengthen the monitoring mechanisms. In absence of strong & centralised state, they can learn from the Indian FV industry in the 1980s to create self-incentivising mechanisms for firms through promising them awards or benefits after they attain productivity growth, rather than subsidising them at the beginning (Khan, 2013).

In sum, the logic and mechanisms behind industrial policies are the combination of economics and politics. Both of the two sides should be considered to deliver better developmental outcomes.

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