UNIVERSITAT DE BARCELONA

The Re-emergence of the Chinese Economy: Internationalization and Technological Catch-up in the Automobile Industry (1953-2018)

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PhD in Economic History

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To my mother

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Summary

Over the last four decades, China has emerged as the world's main economic actor. This thesis aims to provide a new understanding of the re-emergence of the Chinese economy. The main hypothesis is that this process was achieved through the interdependence of industrial policies and internationalization strategies of Chinese firms. The thesis analyses whether state intervention shaped a two-way internationalization pattern (inward and outward) for the case of China's automobile industry from 1953 to 2018. The dissertation is divided into three main chapters. Chapter 2 examines the extent to which state intervention affected the dynamics of internationalization of automobile firms. Chapter 3 explores the output growth and technological dependence in China's automobile sector, analysing the limits of China's industrial policy using a novel indicator. Chapter 4 analyses how Chinese automobile firms interacted with foreign actors in the domestic market and abroad through internationalization decisions conditioned by the industrial policy.

The results confirm the robustness of the hypothesis. Chinese enterprises were initially state-owned, and only after the economic reforms the government allowed non-state-owned enterprises. Industrial policies enabled the inward internationalization process to begin first, with the entry of foreign capital through joint ventures, and the outward process began later. However, even though the "market for technology" strategy failed to achieve technological independence, China’s automobile industry accumulated learning in internal combustion vehicles which laid the foundation for competing in the new era of electric vehicles. Another piece of evidence that supports the main argument is that state-owned enterprises that followed the outward internationalization strategies

promoted by the Chinese government to access Europe had different internationalization strategies than non-state-owned enterprises.

The thesis is a contribution to the existing literature on political economy and international business for the Chinese automobile case. From the political economy approach, this research demonstrates that state intervention in China's industry modernization was not static but remained the main agent over time. From the international business perspective, the focus was on the internationalization of emerging economies and the investment decision drivers of enterprises. This dissertation argues that the OLI paradigm and Uppsala approach can be complementary, particularly considering the peculiarities of the Chinese economy and its transition from a non-market to a market-oriented system.

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Acronyms

BAIC	Beijing Automotive Industry Corporation
BAM	Beijing Automobile Manufacturer
BJC	Beijing Jeep Corporation
CAAM	China's Association of Automobile Manufacturers
CAIY	China's Automotive Industry Yearbook
CATARC	China's Automotive Technology Rearch Center
CCAG	China Chang'an Automobile Group
CCP	China Communist Party
CNAIC	China National Automobile Industry Corporation
DMC	Dongfeng Motor Company
FAW	First Automotive Works
FDI	Foreign Direct Investment
FYP	Five-year Plan
GAC	Guangzhou Automotive Corporation
GM	General Motors
GPAC	Guangzhou Peugeot Automotive Corporation
JVs	Joint Ventures
MOFCOM	Ministry of Commerce
NAC	Nanjing Automotive Corporation
NDRC	National Development and Reform Commission of the PRC
OECD	Organisation for Economic Co-operation and Development
OEM	Original equipment manufacturer
PRC	People's Republic of China
PSA	Peugeot société anonyme
RMB	Renmingbi
SAIC	Shanghai Automotive Industry Corporation
SAW	Second Automotive Works
SOE	State-owned enterprises
SAIC-GM	SAIC General Motors
SVW	Shanghai Volkswagen Automobile
USD	Dollar

Contents

Chapter 1. Introduction

1.1. Motivation and Relevance

The re-emergence of the Chinese economy in the 21st century can be attributed to a significant growth in production and trade capacity. China has become the world's factory and one of its main global traders, and its economy has seen a substantial increase. In the first half of the 19th century, China used to be one of the world's major economic powers, producing one-third of the world's GDP (Brandt et al., 2014). However, its importance waned when the technological revolution expanded in Western countries, creating the Great Divergence (Pomeranz, 2000). Its economic renaissance started in the late 1970s when the People's Republic of China (PRC) began its process of reform and opening up.[1] China's GDP has increased threefold, making it the second-largest economy in the world only behind the USA. This growth was accompanied by an increase in trade surplus and international reserves, which allowed China to become a world issuer of foreign direct investment (Buckley et al., 2007; Child & Rodriguez, 2005; Howell et al., 2020; Li et al., 2016; Mathews, 2006; Rugman & Verbeke, 2004). China's big gain in power today is the result of a long-term process to overcome a century of economic backwardness (Brandt et al., 2008, 2014).

Foreign direct investment (hereafter FDI), technology transfers and the strategies of internationalization of Chinese firms will be the three fundamental topics to be studied

[1] In this dissertation the study of China excludes Hong Kong, Macao and Taiwan.

in this dissertation. China began hosting FDI decades earlier than its outward investment path, which began notably on the wave of the global financial crisis of 2008–09. From the late 1970s, the Chinese government opened the market under restrictive conditions in pursuit of foreign capital and technology that corresponded to the early-learning stage of laggards. Like Amsden (2001) maintains, initial dependence on other countries' commercialized technology is necessary since it allows developing countries to technologically catch up with advanced economies. FDI helped China's industry development, and its contribution to GDP almost doubled from the 1990s to 2010s. China was the emerging economy that attracted more FDI, especially after it became a WTO member. The milestone symbolised its recognition as a globally integrated trade player.

Investment relations between domestic enterprises and foreign companies were not static over time as market liberalization and privatization were progressively introduced in China by the central government. Chinese enterprises changed their role from passive receivers of foreign capital and technology to proactively capture updated technology and other specific assets through mainly direct investment (Bian, 2005; Cazurra et al., 2014; Chang, 2007; Qian & Wu, 2000; Xu, 2011). Hence, studying their internationalization strategies would contribute to a better understanding of the re-emergence of China (Alon et al., 2018; Berning & Holtbrügge, 2012; P. P. Li, 2010; Schüler-Zhou & Schüller, 2009; Xiao & Liu, 2015). This dissertation studies whether there is a link between China's industrial policy and the internationalization pattern of Chinese enterprises. It does so through an empirical case study: the automobile industry.

As a latecomer, China first became a global player in labour-intensive industries and then gathered a rapidly increasing share of capital and technology-intensive manufacturing sectors. The best example to illustrate the increase in China's industrial capacity may be its world's total output share in automobiles. China's automobile industry has experienced a great metamorphosis over seven decades and became the first producer of automobiles in 2009. This dissertation wants to unveil how and when Chinese enterprises fully or partially controlled consolidated assets of Western automobile companies.

The period of study runs from the establishment of the first five-year plan and the foundation of FAW (First Automotive Works) in 1953 to 2018.[2] Before the first trucks made in China were produced, the global automobile industry had been running for more than a half century. During the first half of the 20th century, the United States had possessed by far the lion's share of world motor-vehicle production. By the 1950s, America's Big Three (Ford, General Motors and Chrysler) shared 95 percent of all domestic car sales, and North America accounted for three-quarters of the world's total vehicle production. European automobile production was still craft-based; car manufacturers in the UK, Germany, Italy, France, Sweden and Spain lagged behind (see, for example, Enrietti et al., 2022; Fridenson, 1995; García Ruiz, 2001; Wilkins & Hill, 2011). Furthermore, the entry of foreign capital and technology through the establishment of joint ventures (guided by government's policies) contributed to the sector development in Spain and Italy (Binda & Perugini, 2018; García Ruiz, 2018).

World automobile production experienced the final take-off after the Second World War when total output rose from 10.5 million units in 1950 to 39 million in 1973. During the golden age of capitalism (1950–1973), European car output increased significantly as Figure 1.1. shows. Great Britain's and Italy's output reached above two

[2] I decided to stop in 2018 in order to exclude any effects and interpretations involving COVID-19, the effects of which create distortions in the global output statistics, particularly in China.

million units, France and Germany three million, and Belgium and Spain reached around one million. That growth was the result of replicating innovations of Ford and General Motors (Catalan, 2017).

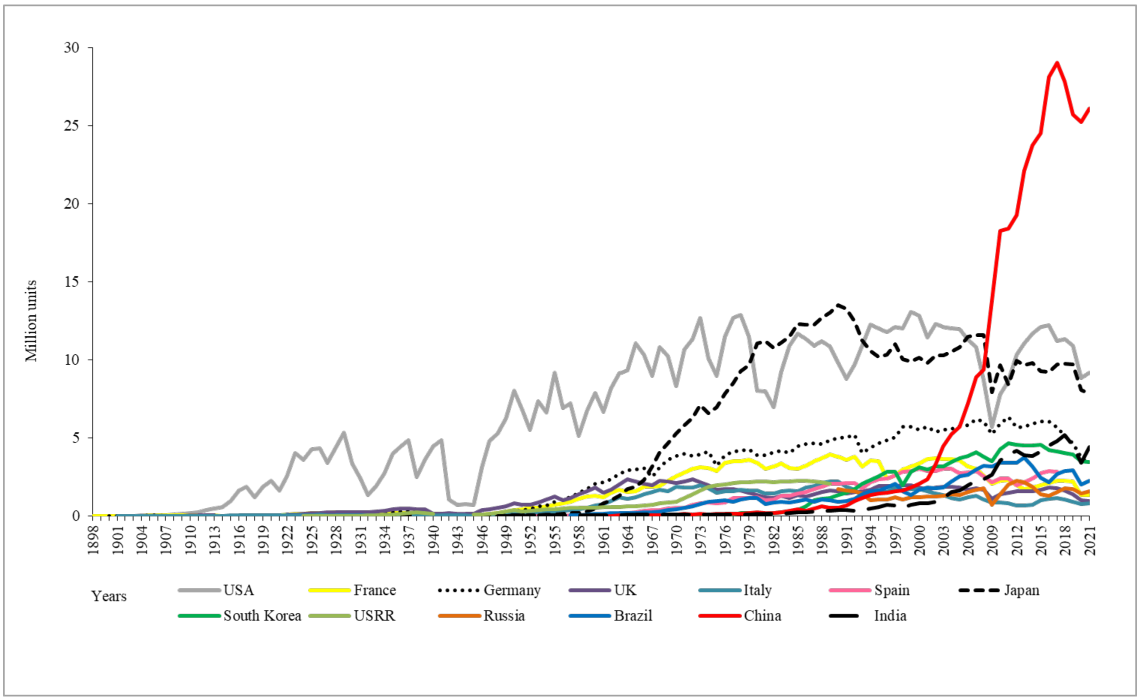
The oil shocks of the 1970s represented another historical turning point. Global output growth slowed down and Western European manufacturers' production was hit by the so-called stagflation, whereas Toyota's production system allowed Japan's automobile output boost, whereby Japan replaced the US as the world leader in units of automobiles manufactured.[3] As Figure 1.1. shows, since the mid-1970s, automobile production in the US and Japan moved in parallel, occupying the world's top first and second places intermittently until the irruption of China. During the last quarter of the 20th century, the US's world output share was on yearly average 22 percent, the same as Japan, and Western Europe had around 30 percent.

In the early 1990s, China's car production increased, and this upward trend was unstoppable thereafter. In 1988, the CEO of Chrysler, Lee Iacocca, said that the modernisation in China's industry would have a long way to go (Mann, 1997). Certainly, its contribution to world production rose more than in the US during the 1950s or in Europe and Japan in the 1960s (Freyssenet et al., 2003). The breakthrough can be seen in Figure 1.1. In two decades, China emerged as the world's top automobile producer, leaving the traditional manufacturers behind at a considerable distance. Other emerging economies, such Brazil, Russia and India, lagged behind as well (OICA, 2020). In 2015, China's 'Big Three' (First Automotive Works, Shanghai Industry Company and

[3] See chapter by Andrei I. Miniuk, Valentina Fava, Manfred Grieger and Burghard Ciesla in Grieger, Gutzmann and Schlinkert (2009): *Towards mobility: Varieties of autobilism in East and West.*

Dongfeng) totalled a domestic market share of around 60 percent, while total output in China reached one-third of the global total (CATARC & CAAM, 2016). How has China become such an automobile power? This research will try to address this question with a new approach that mixes FDI, technology transfers, industrial policies and the internationalization strategies of firms.

Figure 1.1. World production of automobiles by main manufacturing countries (1898–2021)



Source: Author's elaboration based on Michael Freyssenet's Project Database and Production statistics of Organisation Internationale des Constructeurs Automobiles (accessed 30 October 2022). Notes: The nationality of production corresponds to the country where the final assembly of the vehicle took place, regardless of its original manufacturer brand or shareholder ownership.

It is hoped that the results of this historical analysis will also be helpful in envisioning the future. Chinese companies' internationalization process and the degree of success in technology transferring shall affect the dynamics of global production networks (Kano et al., 2020; Yeung, 2022), which are determined by the ongoing energy transition (Arent et al., 2017; Rubio-Varas, forthcoming) and the New Auto Industry Revolution (Freyssenet, 2009).The new energy vehicles (electric, hybrid or plug-in), the geopolitics of energy and the waves of innovation in the NEVs will be crucial issues in the future developments of the sector.[4]

1.2. Aim of the study and state of the art

The aim of this research is to establish whether there is a relation between China's industrial policies and the internationalization of Chinese companies, their investment flows and technology transfers. It is not the intention of this dissertation to assess whether the Chinese government should intervene or not, nor whether free-market entrepreneurial activity would be more efficient without state intervention.[5] Rather it studies what the government's role has been in the internationalization of Chinese enterprises, taking into account institutional changes (Amsden, 1989, 2001; Jenkins, 1991; C. Johnson, 1982; White, 1993).

The political economy literature claims that institutional changes have an impact on economic growth (see, for example, Acemoglu et al., 2005; Acemoglu & Robinson, 2012; North, 1981), while the literature on international business links China's re-emergence with the internationalization of its companies (see, for example, Fletcher, 2001; Huang et al., 2017; Liu et al., 2005). Together, these bodies of literature provide the theoretical framework of this thesis and justify the following research hypothesis: state intervention

[4] "Energy is an instrument of geopolitical competition", see more in Petersen and Barysch (2011, p. 1)

[5] The 'new political economy' attempts to remedy the shortcomings of neo-classical economics while supporting its arguments that state intervention in national economies will always be harmful; see more in Duckett (1996, p.181).

in China led to a bidirectional process of internationalization (inward and outward). This bidirectional movement of technology transfer and investment explain how China shifted from a passive recipient of technology to a proactive technology captor in the 21st century in the automobile industry.

1.2.1. Political economy literature

Institutional factors are considered key to understanding the world's economic development (Acemoglu et al., 2005; Freeman, 2013; Gerschenkron, 1962; Olson, 1997). Institutionalist scholars tend to give importance to the role of the state in the economy to explain industry transformations, and most of the literature on China's economic growth does that (see, for example, Brandt et al., 2014; Brandt & Rawski, 2008; Deng, 2011; Feng et al., 2016; Lardy, 1993, 1998; Naughton & Tsai, 2015; Zheng & Huang, 2018).

North's (1981) theory inspires studies of the dynamics of gradual institutional changes in economic systems in transition. He shows that interactions between institutions (laws, policies or regulations) and organisations (enterprises, cooperatives or syndicates) determine the direction of institutional changes. His conception of 'path dependency' explains how state and administrative guidance can remain strong—by influence of past political decision—despite the possibility of gradual institutional changes (Johnson, 1987; White, 1988, 1993). In line with this theory, this dissertation looks at how institutional changes regulated the entry of foreign organisations through FDI and laid the basis for interactions between domestic and foreign enterprises in the automobile industry over decades.

To identify the role of the state in China, it is necessary to adopt a historical perspective. Some Sinologists study the industrialization process in China in the long durée by connecting the latter half of 19th century with the Mao era (Kajima, 2022); and bridging China's industrialisation before the arrival of socialism with the economic reform (Brasó Broggi, 2016; Brasó Broggi & Ge, 2020). The current research, however, begins in 1953 with the issue of the first five-year plan, the '156 projects' programme for industry building (Dong, 1999), and the establishment of the First Automotive Works, during the period of a socialist state construction and, furthermore, when China introduced market mechanisms during the reform and opening up period (Brandt et al., 2008, 2014, 2017; Brandt & Rawski, 2008; Fairbank et al., 1986). In 1993, the National People's Congress promulgated the 'socialist market economy' (Vogel, 2011), [6] reaffirming the socialist identity of China while moving to a more market-oriented system (Bian, 2005; Kennedy & Stiglitz, 2013; Qian & Wu, 2000; Selden, 2016; White, 1988). For some scholars China's state developmental model is unique because its economic and political spheres overlap while preserving a strong and formally socialist state (Ang, 2016; Meier, 2018; Weber, 2021).

Naughton (2021) notes that the nature of state intervention is more important than the government's size and intensity of intervention. What is generally known is that despite waves of centralisation and decentralisation in China (Lin et al., 2013) and market flexibilization, the Chinese Communist Party (CCP) has been overseeing resource and

[6] See National People's Congress, 'Constitution of the People's Republic of China', Amendment Two. Approved on 29.03.1993 by the 8th National Party Congress at its 1st Session. In his political report 'The objective of the congress', Jiang Zemin, General Secretary of the CCP, stated that reform of the economic structure will establish a socialist market economy that will further liberate and expand productive forces.

investment allocation (Feng et al., 2016; McGregor, 2010; Vogel, 2011; Wu, 2005). Many scholars associate 'state capitalism' with China's post-reform economic model (Brandt & Rawski, 2008; Milanovic, 2019; Naughton, 2015; Qian & Wu, 2000). In fact, this terminology captures the combination of an increasingly predominant market economy, state intervention and large state-owned corporations in China (Naughton & Tsai, 2015).

This research contributes to these debates by exploring how the state's intervention in a socialist market economy permits the establishment of different types of ownership, and how industry policies regulated interactions between domestic and foreign players in pursuit of technology catching up and industry modernisation. In other words, the international expansion path of Chinese enterprise should be interpreted regarding policy changes over time, i.e. how and when the domestic market opens up to let foreign players in to establish production subsidiaries, and how and when indigenous players were given permission to access foreign technology and expand the global production networks.

Yet, Bremmer (2009) argues that instead of viewing firms as an integral part of the state, the state can be viewed as the 'main player' and the market as 'the conductor for political gain'. From this perspective, the government adopts an agent's role, and the government's policies are instruments. The strategic sectors of extractive or energy-related firms, banking and automotive were still predominantly state-owned during the post-Mao period, but investment decisions of non-state-owned enterprises were also expected to follow the state's guidelines. This dissertation explores the impact of institutional changes on the automobile industry since these changes can drive economic transformation of late industrial economies. To this end, some scholars agree that it is necessary to bundle together the overall effects of institutional changes, economic policies and business internationalization (C. Johnson, 1987; Stiglitz, 2002).

1.2.2. International business literature

The basics of international business (IB) theory suggest that when emerging economies transition from non-market to a market-oriented system, the internationalization process becomes a fundamental object of analysis. This affects how firms make decisions about international expansion, investment flows and globalisation of their business (Benito et al., 2022; Cuervo-Cazurra, 2012; Rugman et al., 2011). Whereas, from the 1980s to 2000, the Chinese case was often considered an exception in the studies of globalization (Buckley, 2002, 2004, 2009), from the 2000s onwards, the IB literature has studied China in comparative perspectives with other emerging economies, such as India, Brazil and Russia (De Beule & Duanmu, 2012; M. H. Li et al., 2018; Sauvant, 2005).

This comparative approach has also been adopted to examine the performance of specific economic sectors, such as the automobile industry. When comparing China's output growth to countries like India, Brazil, and Russia, it becomes clear that China has experienced steady internal market expansion and structural market change, while the others have faced some decline. Moreover, in recent years, China has promoted business model innovation in order to lead the new era of electric vehicles, envisioning its potential to become a leader in this industry (Z. Li, 2016, 2018; Zhao & Li, 2021). However, despite this potential, automobile production in China has mainly been domestically oriented and it remains a net car importer, while India is a net car exporter (Amighini, 2012; Z. Li, 2010).

Of the traditional theories, Dunning's Ownership Location Internationalization (OLI) paradigm is by far the most frequently used for international expansion decisions (see, for example, Buckley, Clegg, & Wang, 2007; Child & Rodriguez, 2005; Luo & Tung, 2007). The eclectic paradigm (DEP) is based on assumptions of market imperfection with three determinants or the OLI paradigm: Ownership, Location, Internalisation (Dunning, 1973, 1988, 2006). In a response to the rapid economic growth and dynamics of multinationals, Dunning (2001) extended his OLI paradigm to incorporate the investment development path, which suggests that inward FDI can help domestic firms improve competitiveness, allowing them to undertake outward investment in markets across the board over time. Furthermore, FDI through joint ventures is a way to transfer 'tacit knowledge' from the foreign to the domestic partners (Dunning, 1994).

However, the theory does not take into account the possibility of dynamic outward investment activities by a middle-income country, let alone by a laggard like China. This trend is not limited to emerging multinationals but also applies to automobile manufacturers in the United States and other technology-intensive manufacturing sectors. Traditional IB literature has focused on the global expansion of multinationals from developed economies to late developing countries, which frequently involves the establishment of production subsidiaries and the transfer of capital and technology as shown by Wilkins and Hill (2011) for 'Ford in six continents' or in Anbinder's study (2018) on how General Motors sells globally. Similarly, the accumulation of human capital in host economies through knowledge transfer and technical capacity building is a crucial factor in the process of international expansion and has been widely explored by business scholars (Álvaro-Moya et al., 2020; Fernández Pérez, 2020; Fernández-de-Pinedo et al., 2020; Puig & Álvaro-Moya, 2018).

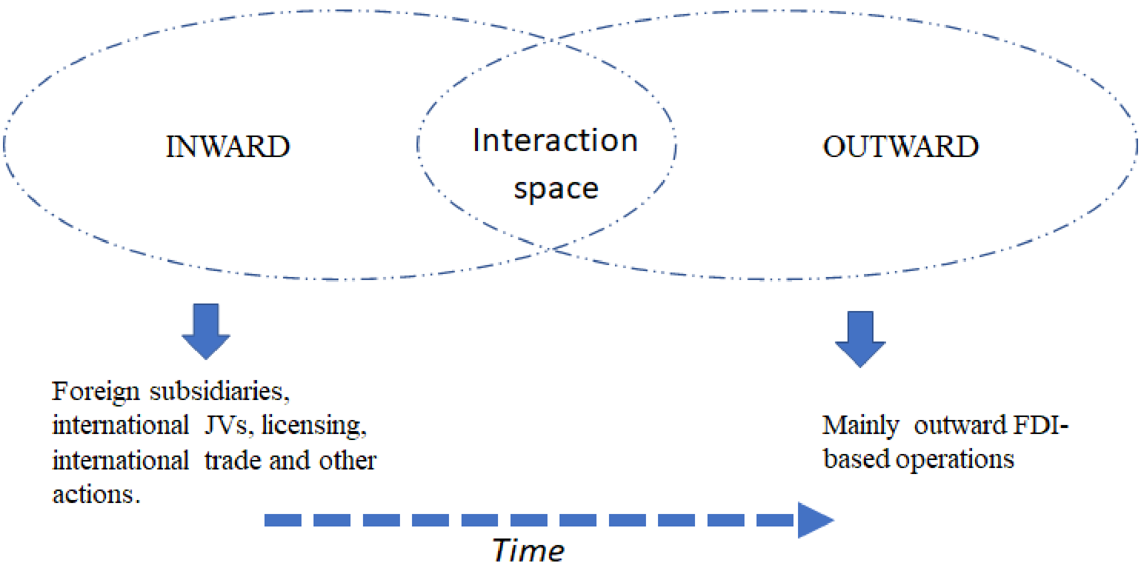
The Uppsala model (henceforth UPM) (Johanson & Vahlne, 1977; C. Johnson, 1982; Welch & Luostarinen, 1993) which focuses its main argument on the gradual internationalization of enterprises is used more rarely to explain the internationalization of firms in emerging economies (Child & Rodriguez, 2005; Fletcher, 2001; Welch & Luostarinen, 1993) because industrial strength has been associated with outward investment and production allocation. To adapt to the characteristics of emerging economies, research has so far focused on analysing how ownership (see, for example, M. H. Li et al. 2018; Zhang et al. 2016) and government policies (Dunning & Lundan, 2009; Freeman, 2013; Seaman et al., 2017) impact on the choice of outward investment locations.

Several authors have pointed out that the ownership advantages of a socialist market system characterised by strong state intervention do not fit well with the OLI internationalization theory in explaining emerging multinationals, especially in the case of China (see, for example, Elia et al., 2020; Ramamurti & Singh, 2009; Verbeke & Kano, 2015). As Rugman (2006) has also argued, exogenous market imperfections, such as political risk, information costs and related environmental factors in the host economy, should be taken into account when considering internationalization decisions in the real world. This theory was supported by Binda and Perugini (2018) in their study of the Spanish and Italian automobile industry. They found that foreign companies may decide to establish joint ventures with local partners to mitigate political risks in the host economy. This suggests that traditional international business theories may not fully capture the unique context and characteristics of Chinese enterprises and their international expansion.

Others have pointed to the possibility of dynamic processes of internationalization over time: ‘the present state of internationalization is one important factor explaining the course of the following internationalization’ (Vahlne & Johanson, 2013, p. 26). The development of an industry often takes time, and this was the case for China's automobile industry. It took approximately 40 years for the country to produce one million vehicles, an important part of which was produced through joint ventures. Since FDI is a conductor of technology and know-how to allow developing countries to catch up and close technology gaps (Fu et al., 2011; Lee et al., 2016; Malerba & Nelson, 2011; Mathews, 2002), this research examines the establishment of equity joint ventures in China's automobile industry and traces the historical investment relationships between various Chinese companies and their foreign partners. To the best of my knowledge, there has been no research on whether internationalization in the Chinese case should be understood as a combination of inward and outward internationalization.

In short, this thesis looks at the inward and outward internationalization of Chinese companies, considering that the transformation of the Chinese automobile industry cannot be described using a single theoretical model and that inward internationalization preceded outward; the import stage (industrial equipment and machinery or complete vehicles) began before the export stage because it received financial support from the state (FAW, 1991; Harwit, 1995), although an ‘interaction space’ is possible as Figure 1.2. illustrates. Recent research points in this direction: both Icksoo (2009), for the whole Chinese economy, and Drauz (2013), who studied the automotive industry, have suggested that inward internationalization began with market liberalization in the late 1970s. Other scholars have been focusing on the internationalization efforts of Chinese automobile manufacturers in order to access overseas markets, such as Russia (Z. Li, 2010; Z. Li & Wang, 2013).This work presents a novel perspective that moves away from the 'market' obsession and instead encompasses the entire development process of an industry, including its internationalization, starting from the Maoist era.

Figure 1.2. The interconnection of inward and outward internationalization models



Source: Author's own elaboration.

1.3. Methodology and Data

This dissertation tests whether there is an interdependence between the internationalization of Chinese enterprises and central government industrial policies. It does so by analysing the case study of the automobile sector. The hypothesis is that state intervention in China led to a bidirectional process of internationalization (inward and outward) in this industrial sector. This section presents the methodology followed and the sources of data used.

1.3.1. Methodology

The case-study method is common in the social sciences (Flyvbjerg, 2006; Hartley, 1994) being recognised as a ‘distinctive method of empirical inquiry’ that investigates a contemporary phenomenon within its real-life context, especially when the boundaries between phenomenon and context are not clear. It is also a method in which multiple sources of evidence are used (Yin, 2009). Hence case studies are frequent in economics, political science and the evaluation of public policies, as well as in developing and explaining the testing of political phenomena theories (J. B. Johnson et al., 2015). The main advantage of a case study is the opportunity it provides for a holistic view of a certain fact, useful when one needs to understand some situation, new processes or new forms of behaviour that are little understood (Meyer, 2001; Noor, 2008; Thomas, 2011).

The automobile industry is an excellent candidate as a case study for this research. First of all, it has occupied a central position in the national economic development and has been one of the major sources of employment. For instance, as a world average, one in every seven people is directly or indirectly employed by the automobile industry (Sako, 2002), and one in every six in China (CATARC & MOFCOM, 2014). Drucker (1946) reasonably confirms that the automobile industry is ‘the industry of industries’, and its backward linkages with other economic sectors involve attempts to create a wide spectrum of manufacturing activities from raw materials like rubber, plastics and steel, and other components (Doner et al., 2021; Guillén, 2010; Wilkins & Hill, 2011). In China, the automobile industry has been treated as one of the pillar industries (see, for example, Brandt et al., 2008; Brandt & Thun, 2010; Harwit, 1995, 2001; Jones, 2006; Thun, 2006; Yang et al., 2017) exemplifying the aspirations of Chinese leaders to promote ‘national champions’ that would lead other economic sectors to develop through their multiplier effects on employment and economic growth (Harwit, 2001; W. Liu & Dicken, 2006; 2006; Thun, 2004; Yoshimatsu, 2000).

Second, FDI has played a central role in the development of China's automobile industry. It is the only industry in which joint ventures have been embedded in each new foreign-investment project over time. The Chinese government's intervention can therefore also be expected to have been crucial because the design of and modifications to industrial policies that involve FDI regulations for the automobile industry have always been part of its economic planning. In other words, this industry is still seen as occupying the 'commanding heights' of China's economy.[7]

Former empirical analyses of the Chinese automobile industry have been studied by Mann (1997), Harwit (1995, 2001), Thun (2004, 2006), Donnelly et al (2010), Collis and Donnelly (2012), Guang (2015, 2020), Doner et al. (2021), Li (2010, 2014, 2015), Meier (2018), and Zhang (2019), though none has undertaken a comprehensive analysis of China's automobile industry by considering the revised theory model of the internationalization path and its correlation with political economy explanations in the long run, nor have previous publications have studied two-way investment and technology transfers at corporate level and using original archival information. The period of this study runs from the establishment of the first five-year plans and the foundation of FAW in 1953 to 2018.

Ownership diversity in China's automobile industry is a clear testament to its evolution over seven decades. Enterprises in the Chinese automobile industry can be

[7] Though the impact of government intervention varies across industries, the automobile sector has been the one in which official instruments, such as tax reductions, subventions, or interest rates, are more embedded; see more in Brandt et al. (2008, p. 623).

classified as large SOEs, joint ventures, private or non-SOEs, and publicly funded companies as shown in Table 1.1. Before economic reforms, purely private companies did not exist in the automobile sector. Forms and degrees of state control varied significantly over time with the emergence of non-SOEs, and the formation of Sino-foreign joint ventures with non-SOEs began from the 2000s. Therefore, non-SOE is used instead of 'private' as many scholars use non-state categories which include truly private firms, shareholding enterprises, domestic joint-ownership and foreign invested enterprises or Sino-foreign joint ventures. Especially for describing outward investment decisions of Chinese enterprises.

Some clarifications for SOEs should also be pointed out. According to Dussel (2015), SOEs can either be 100 percent state-owned or partially owned by the public sector, and they are divided into different levels of control, such as those directly managed by the State Council and those managed by local governments. Companies with a minority shareholding in public ownership, in which the state has no 'apparent' decision-making rights can make strategic decisions. In this sense, yangqi [央企] are directly managed by the state through SASAC (State-owned Assets Supervision and Administration Commission of State Council) or just state-owned by virtue of their public capital. Only two automobile companies, Dongfeng and FAW, are still directly managed by SASAC, other yangqi, such as ChemChina or AVIC, may produce automobile parts and accessories but with other main activities.

In any case, China's automobile industry has experienced a great transformation over seven decades from a planned economy to a market-oriented one, driven by a series of economic reforms, government policies and international trade agreements. This industry development is divided into three main developing phases. The first period

(1953–1977) covers high socialism, the second period (1978–2001) considers economic reforms under Deng Xiaoping, when a protectionist market emerged, and the third period (2002–2018) considers post-WTO membership and integration into the global market.

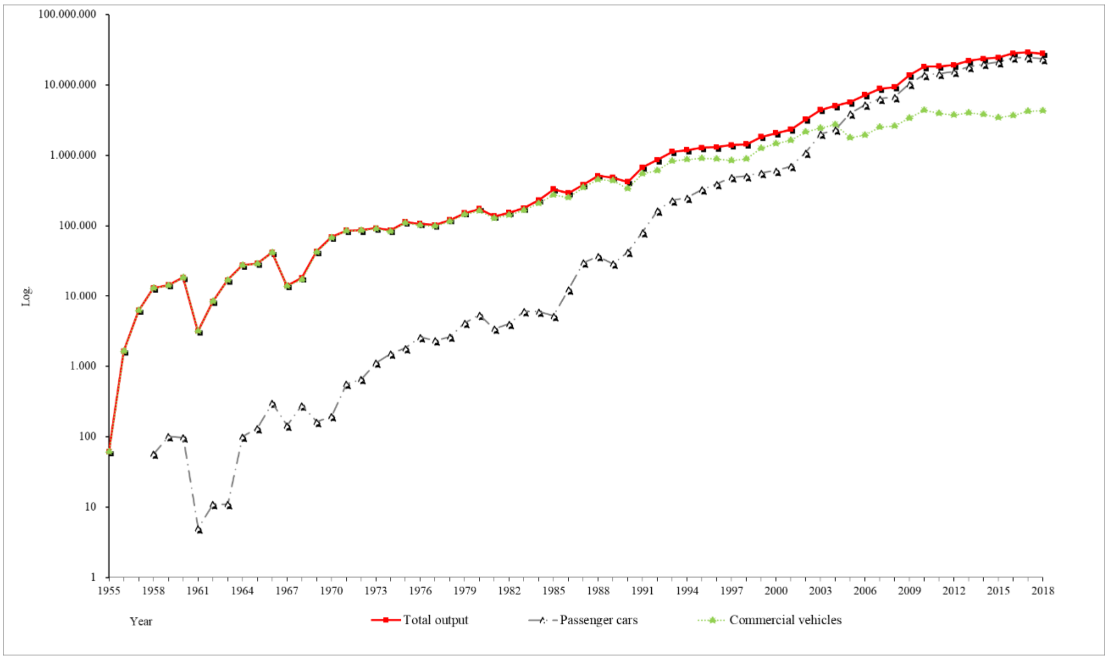
Table 1.1. Property type in the automobile industry in China

Property type	Description	Main company examples
Large SOEs or groups of companies	They usually profile the monopolistic or oligopolistic market.	First Auto Works (FAW), Beijing Automotive Industry Corporation (BAIC), China Changan Automobile Group (CCAG), Guangzhou Automobile Group (GAC), Shanghai Automotive Industry (SAIC)
	Few actions accessible to the general public	Dongfeng Motors
Joint Ventures	Joint ventures involving a foreign partner with a capital not exceeding that of the national partner. The most frequent conditions include access to the Chinese market in exchange for technology transfers.	Shanghai Volkswagen, Shanghai General Motors, Guangzhou Honda, FAW Volkswagen, Changan Suzuki.
	The control and regulation of contracts for the production of complete vehicles are stricter.	Dongfeng PSA
Private funded or non-SOEs	Encouraged by a more 'friendly' economic policy They protect them from foreign competition.	BYD, Great Wall, Lifan
	They receive state support for internationalisation.	Geely
Companies financed by publicly owned investment funds	Foreign private investors, venture capital funds or provincial governments	BitAuto, China Auto Rental Ltd.

Source: Adapted from Balcet et al. (2012).

This work examines how government policies and regulations organised the interactions between domestic and foreign players in each of the three abovementioned phases of development. Doing so, it provides insights into the transformation of the industry in long term perspective. The growth of automobile production in China during its early years cannot be understood without considering the Soviet and communist technical assistance. During the period of high socialism (1953–1977), the inward internationalization of the industry began with the attraction of foreign technology, first from the Soviet Union, and furthermore from other players. During this time, Chinese companies had a low level of internationalization. In global terms, automobile production in China remained low and was concentrated in commercial vehicles, as illustrated in Figure 1.3.

Figure 1.3. China's total automobile production, 1955–2018



Sources: Author's elaboration based on China's Automotive Industry Yearbook (various issues). Note: yearly average; SUVs were included in commercial vehicles until 2001; China's total automobile production includes the output domestic companies and Sino-Foreign joint ventures. See technical notes in Appendices A.1

The growth in output in passenger car production (see Figure 1.3.) can only be understood by considering the establishment of Sino-foreign joint ventures as well as the emergence of non-SOEs in the period of economic reform, in particular during the 8th five-year plan (1991–1995). During this period, the automobile industry experienced rapid growth due to the entry of FDI, the establishment of equity joint ventures and increased investment in the innovation system. Outbound FDI transactions began timidly in the early 1990s, but they were limited to certain state-owned companies and public entities. In other words, internal internationalization intensified with the arrival of FDI, and outward FDI was highly restricted.

The joint-venture-based development model was maintained after China's WTO membership, but indigenous manufacturers became more outward-oriented and focused on developing new and smart vehicles. The outward expansion of Chinese companies began notably during this period of economic reforms after integrating with the global market (2001–2018). During this time, private (non-SOE) companies and public entities gained weight in terms of domestic output and share of total Chinese outward FDI. As the wave of international expansion continued, Chinese automobile companies moved from being passive recipients of foreign technology to proactively accessing up-to-date technology. Furthermore, restrictions on outbound investment became more flexible, allowing non-SOEs to invest abroad and receive support for it. They acquired partially or fully consolidated carmakers from industrialised countries, such as Volvo, Peugeot or Daimler Chrysler, and established a considerable number of greenfield operations in developing countries by opening assembly plants or producing auto parts and accessories. The target of these investments, however, was primarily developed regions, such as Europe.

1.3.2. Sources of data

The research is based on original archival documents, sectoral and investment statistics as well as the collection of complementary primary sources. Original corporate information during the first decades of economic reforms was obtained from the Volkswagen Historical Archives in Wolfsburg, Germany and the Centre d’archives de

Terre Blanche in Hérimoncourt, France, where the archives of Peugeot are available. The archives in Wolfsburg provided access to the minutes of board meetings from 1979 to 1990 as well as to the protocols from Volkswagen and feasibility studies for Chinese projects. The agreement conditions of the first Sino-German joint ventures were identified through extensive negotiation rounds. Internal reports and letters exchanged between Volkswagen and Chinese representatives shed light on the initial concerns surrounding the market liberalisation and China's production capacity.

At Terre Blanche, the extensive and well-preserved documents relating to the feasibility studies for the first Sino-French joint venture projects (Peugeot Citroën) were accessed, along with the salary registration of expatriates and contractual agreements between French and Chinese companies. The technology and know-how transfer conditions were key aspects of the negotiation rounds, as reflected in the contractual appendices. Additionally, much attention was given to the workers by the French partner. Access was also granted to blueprints, production plant layouts, technical licenses and instructions for various Peugeot Citroën cars assembled in China.

Interestingly, both Volkswagen and Peugeot Citroën established more comprehensive contracts for their second joint ventures in China. For instance, the transfer of technology and know-how was accompanied by specific technical assistance conditions, such as fees, duration or the number of technicians involved. European carmakers also implemented exhaustive quality control measures, such as ‘plan qualité totale’ reports for car models assembled in China at Terre Blanche and regular internal reports from German expatriates in China regarding the quality of local auto parts suppliers and the control of production plants.

Additionally, oral histories collected from plant managers, engineers and Chinese officials provided in-depth information on how decisions were made and managed within SOEs and public entities. The negotiation process with foreign partners and historical agreements were analysed in compilations edited by Chinese official organisations, such as the Committee of Studies, Culture, and History, as well as by Chinese specialists like Ge Baning. The latter also provided original evidence of who and how Chinese representatives negotiated with foreign partners, which were the priorities of contractual agreements from the 'Chinese point of view'. More importantly, this serves to provide a contrast with Western corporate archival information.[8] In this regard, a novel database of key personages that participated in the initial development of automobile industry in China is built, with special attention being paid to company positions and Sino-foreign contractual negotiations. Historical reports of FAW and Dongfeng gave excellent information regarding how foreign expertise was transferred and the initial domestic industrial environment. Domestic transfer of technology and know-how were also identified by company positions of different key personages.[9] Most of them worked at more than one company. These sources helped to analyse how foreign players were introduced in China and contributed to the learning process.

Sectorial statistics were collected mainly from China's Automotive Industry Yearbook (CAIY henceforth), edited by the China Automobile Technology and Research Center (CATARC), China's Association of Automobile Manufacturers, were used to

[8] Due to COVID-19, initial planned research activities at Chinese institutions and in-person archival work were not possible, nor were in-person interviews with former Chinese employees plausible. However, I was able contact some former managers virtually and receive original insights to widen my knowledge in the automobile case in China.

[9] See more in Appendices B.3

obtain statistics regarding national output, company production capacity, trade information, R&D expenditure, yearly outstanding regulations and new Sino-foreign production collaborations. Information in CAIYs was checked for domestic production, but international automobile organisations like L'Organisation Internationale des Constructeurs d'Atutomobiles (OICA), official country-level automotive databases, like Research and Innovative Technology Administration (RITA) from the USA or the European Automobile Manufacturers' Association (ACEA), provide global automobile and national-level information. Moreover, Freyssenet's research project *Vers une théorisation des rapports sociaux* offers a complete database of the main automobile manufacturers since 1989, which helps to complete the historical picture of global automobile history.

To study the science and technology (S&T) system and its main outcomes, the China National Intellectual Property Administration (CNIPA) was utilised to track the evolution of patents in the transport category, while the World Intellectual Property Office (WIPO) was consulted for the global context. These data sources enabled a quantitative analysis of the technological dependence of automobile industry in China and its technology catch-up in the 21st century. CATARC also registered technical collaboration contracts with foreign companies for the period 1974–1985. A novel database of imported technology by company, country of origin, type of technology, duration and type of contract was built to identify how technology transfers were organised between the end of high socialism and the first years of economic reform.[10]

International investment databases were used to obtain a new investment database for the international expansion of Chinese automotive companies. For instance, during

[10] See details in Appendices B.2

my visit to the University of Zhejiang,[11] I was able to access the Bureau van Dijk (BvD) Zephyr and Amadeus. The former contains global investment database registers, merger and acquisitions (M&As), joint ventures and initial public offers, among other operations. BvD Amadeus is used to filter information regarding the ownership of companies. This database was used together with the China Global Investment Tracker from the American Institute and Heritage Foundation, the latter registering operations of different types (M&As or greenfield investment). In addition, on the one hand, company annual reports, financial statements and corporate websites provided complementary information for investment transactions in cases of missing data. While on the other hand, approved Chinese firms by cross-board investment transactions are extracted from the MOFCOM (Ministry of Commerce of PRC). The sources also examined the investment transactions of Chinese enterprises, i.e. outward-oriented internationalisation.

Official documents in the repositories of Chinese political agencies and the National Bureau of Statistics, the Bulletins of Outward Foreign Direct Investment by MOFCOM, and data from institutions, organisations and the daily press were used to acquire general information on the historical evolution of the automobile industry and the interactions between domestic and foreign companies. In addition, official documents of the Chinese government and ministries and European think tanks, like the Rhodium Group or the Mercator Institute for China Studies (MERICS), offer information on Chinese investments that complements the investment drivers and performance of Chinese and foreign enterprises in domestic and foreign markets. Abundant information was obtained in open Western financial media, like Bloomberg and Thomson Reuters, and in national dailies, like China Daily or Xinhua. Academic publications from Chinese

[11] 12–15 December 2019, Hangzhou, Zhejiang (China).

universities and institutes, such as Zhejiang Gongshang University, University of Wenzhou and the Institut für Sinologie der Universität Wien, were consulted for additional information.[12]

Last but not least, interviews with those involved in IT governance and with product managers in SEAT and specialists in the automotive market in Spain help to understand better the current situation and future projection of the global and European car industry and market.[13]

1.4. Line of action

The analysis of the re-emergence of the Chinese economy is grounded in three chapters. Chapter 2 establishes the extent to which the state's intervention affected the internationalization dynamics of Chinese automobile companies. Chapter 3 explores how institutional changes allowed the entry of FDI and regulated the outflows of FDI in the automobile sector. Chapter 4 analyses how Chinese automobile enterprises interacted with foreign players in the domestic market and abroad through internationalization decisions conditioned by China's industrial policy.

Chapter 2 studies the metamorphosis of China's automotive industry from 1953 to 2001 as a long process of inward internationalisation. The main argument is that the internationalization of this industry started before automotive enterprises were encouraged to take dynamic actions abroad. This process relied on technology transfers

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[12] Research stay at the Sinologist Department of East Asian Studies Institute, University of Vienna from 1 September to 30 November 2022.

[13] See Interviews in Appendices C.4

to develop the indigenous capacity and accumulate learning, while government policies regulated the entry of foreigners and the market conditions. The interactions of national and foreign players are examined during the Maoist period and the first two decades of the reform to determine when and how foreign automotive manufacturers were given access to China.

Chapter 3 examines the output growth alongside the technological dependence in China's automobile sector and thus analyses the limits of China's industry policy using a novel indicator. This indicator attempts to approach levels of Chinese technological dependence and exposes the limitations of a joint-venture-model-based development. Certain technological catch-up was identified, and China's economic growth in the last three decades has been outstanding. However, measuring the progress of innovation capacity in an economy, especially in a technology-intensive industry and its upgrading, can be complex. This chapter unveils the technological (in)dependencies of China's automobile industry between 2000 and 2018 and the 'market for technology' strategy carried out by the Chinese government. The technological dependence indicator shows that the technological dependence remained relatively high until 2015, after which China gained technological leadership in smart and environmentally friendly vehicles.

Chapter 4 studies the growing weight of China's outward investment in the past two decades. This is particularly the case for Chinese automotive enterprises that have been investing the most in the European Union (EU). This chapter looks at the ways in which previous investment in European companies in China, as well as China's industrial policies, have shaped China's outward investment strategies in Europe in the 21st century. The government allowed European carmakers to enter the Chinese market through equity joint ventures with backbone SOEs in the 1980s and 1990s. However, after China's integration into the WTO in 2001, Chinese non-SOEs were encouraged to invest abroad.

This chapter compares European investment in the automobile sector in China with Chinese investment in that sector within the EU from the 1980s until 2018. The dissertation concludes in Chapter 5. This final chapter links the lessons learned from automobile industry in China to the global automobile industry and highlights potential areas for future research based on the limitations of the current study.

Chapter 2. The metamorphosis of China's automobile industry (1953–2001): Inward internationalization, technological transfers and the making of a post-socialist market

2.1. Introduction

Mao Zedong's dream of a national automotive industry came true in 1953, when the First Automotive Works (FAW) was founded with the aid of communist allies. However, technology transfers from the Communist bloc reached a standstill at the end of the decade and car production in China remained symbolic. Domestic production only expanded significantly in the mid-1980s and accelerated above the global average in the 1990s. In 2009, China became the world's top automotive manufacturer, a position that maintains today, accounting for one-third of the world's total output (OICA, 2020). Chinese automobile firms showed their maturity and global ambitions by investing abroad and exhibiting a technological upsurge in electric car manufacturing. China's automobile industry has thus experienced an outstanding metamorphosis over the last seven decades.[14]

Scholars have explored the development of this industry, focusing on institutional changes and government policies (see, for example, Harwit, 1995; Thun, 2004, 2006; Brandt et al., 2008; Donnelly et al., 2010); the role of multinationals in their joint ventures

[14] The paper of Chapter 2 is a co-authored paper with Carles Brasó Broggi and is currently under review at the journal *Business History*.

(Huang, 2003; Thun, 2006; Collis & Donnelly, 2012; Chin, 2010; Hertenstein et al., 2017); the developmental state in comparison with other East Asian economies (Doner et al., 2021; Meier, 2018); and the geographical set up of major companies (Liu and Yeung, 2008; Sit and Liu, 2000). This chapter aims to study the long-term inward internationalization process of China's automobile industry and its relationship with growth and technological upgrade.

The business literature defines internationalization mainly as an outward movement of companies (Buckley & Casson, 1985; Dunning & Lundan, 2008). According to Rugman (2006, p. 13), internationalization occurs when 'a firm engages in international production and distribution with at least one foreign nation'. These theories include market mechanisms (Hymer, 1976; Buckley, 2002; Donnelly et al. 2002) and the Dunning's eclectic paradigm, which combines the advantages of ownership, location and internationalisation (Dunning, 2001, 2006). The link between internationalization and outward investment is also dominant in the business history of emerging economies like China (Child & Rodriguez, 2005; Fletcher, 2001; Hertenstein et al., 2017; Young et al., 1996), where research has focused on analysing how ownership (see, for example, Cazurra et al., 2014; Li et al., 2018; Zheng et al., 2016) and government policies (Dunning & Lundan, 2008; Seaman et al., 2017) shape investment location decisions.

Less attention has been paid, however, to the process of 'inward internationalization'. This may include irregular foreign transactions, joint ventures or other activities that occur when firms lack capacity to invest abroad. Inward internationalization is not so much driven by market mechanisms as by the necessity of acquiring technological skills and foreign market knowledge (Johanson & Vahlne, 1990, 1977). Scholars from the Uppsala model (Johanson & Wiedersheim-Paul, 1975; Olson &

Welch, 1978; Welch & Luostarinen, 1988) argue that there is an incremental path from inward and cooperative modes of internationalization to outward international business activities (L. Welch & Luostarinen, 1993). The existing literature has not considered this inward-oriented dimension as a form of internationalization in China's automobile industry. This article attempts to fill this gap by identifying when and how this internationalization process began and how it evolved.

The article hypothesizes that inward internationalization led the metamorphosis of China's automotive industry, underlining that the role of non-market mechanisms such as state support or the knowledge acquisition, were crucial not only in the establishment of joint ventures since the 1980s (Collis & Donnelly, 2012), but also in the Maoist period, when the automobile industry and the "backbone companies" were born with the help of other Communist countries.[15] When, in 2001, Chinese enterprises were encouraged to invest abroad following the 'Go Out' policy and China's accession to the World Trade Organization, the automobile industry in China had accumulated decades of experience of inward internationalization, aspiring to reach international quality standards and global competitiveness.

The chapter gathers new datasets and archival evidence: quantitative data comes from the trade records of the *Dangdai zhongguo duiwai maoyi* (Dangdai zhongguo congshubianji weiyuanhui, 1992) and production datasets of the *Zhongguo qichegongye nianjian* (CATARC, China Automotive Industry Yearbooks, various years, henceforth CAIY). Regarding the Chinese backbone companies, evidences have been sourced from the historical reports of the First Automotive Works (FAW, 1991, henceforth FAW),

[15]The phrase 'backbone enterprises' [gugan qiye] refers to firms that receive aid and they are usually large SOEs (Huchet, 2014).

Second Automotive Works (SAW, 2001, henceforth SAW) and the China's Automotive Industry History(CATARC & MOFCOM, 2014; Editorial Board, 1996). This chapter also uncovers new archival material from the protocols of the meetings of the Board of Managers of Volkswagen from 1978 to 1990 (Volkswagen Corporate Archives in Wolfsburg, Germany, hereafter VCA) and the negotiations of the Sino-French joint ventures of Peugeot (1981-1995), held at the French Centre d'Archives de Terre Blanche in Hérimouncourt (hereafter PCA). Additional evidence is obtained from compilations of oral histories of former managing directors, engineers and Chinese Communist cadres from the Essay collection of the 100th anniversary of the birth of Comrade Rao Bin (Dong & Tao, 2013), and the documents about the development of China's automotive industry by the People's Political Consultative Conference (Culture, History and Study Committee of the Chinese People's Political Consultative Conference, 2007).

This introduction is followed by three more sections. Sections 2 to 4 discuss the evolution of inward and outward internationalization, dividing the period of analysis in two stages: the Maoist years (1953–1978);[16] and the first two decades of economic reforms (1979-2001). The chapter concludes in section 5.

2.2. Internationalization without a market: the Maoist years

The Maoist period (1953–1976) saw the birth of the backbone companies which have led China's production of cars until today. Whereas foreign collaboration was short-lived and erratic during the Maoist period, it was essential in the creation of China's main domestic

[16] Mao died in 1976, followed by a period of transition until December 1978, when the reformist project of Deng Xiaoping was consolidated. For this reason, the period up to 1978 is considered Maoist.

producers. This chapter shows how the early development of China's automotive industry was led by an inward internationalization process that took place in the context of the Cold War, mainly but not exclusively between Socialist countries.

Since the proclamation by Mao Zedong of the People's Republic of China (PRC) in October 1949, the economy of China was gradually controlled by the Chinese Communist Party (CCP) and the Socialist system of five-year plans (Bernstein et al., 2010). Following the Stalinist orthodoxy, the heavy industry was emphasized against agriculture and light industry (Kong, 2010). In 1952, the Ministry of Heavy Industry and its First Machinery Industry unit was set up to expand production of capital-intensive goods (Editorial Board, 1996). The government paid special attention to strategic sectors such as mining, metallurgy, and the automotive industry. These were considered pillar industries and received the most important allocations of public investment in the first Five-Year Plan (FYP) 1953-1957, when the Sino-Soviet collaboration reached its peak.

The quantity and category of automobiles produced by China during this period were determined by the state which established production quotas for every given category of goods: commercial or industrial vehicles (trucks and SUVs for military use) were given priority at the expense of passenger vehicles (Editorial Board, 1996). Until the early 1970s, the yearly average production of passenger cars was below one thousand units, representing less than one percent of China's total car production (see Table 2.1.). During the Maoist period, all automotive companies were state-owned, although only three, the First Automotive Works (hereafter, FAW), the Second Automotive Works (hereafter, SAW) and Sinotruck were directly managed by the central government through its First Machinery Industry Unit. Other companies —Guangzhou Automobile Corporation (hereafter, GAC), Shanghai Automotive Industry Company (hereafter, SAIC), and Beijing Automobile Industry Company (hereafter, BAIC)— (see Table 2.2),were controlled by the local governments (Editorial Board, 1996).

Table 2.1. China's Automobile Production by Five-Year Plans, 1953 –1980 (yearly average)

Five-year Plan	Period	Total (units)	Passenger cars (units)	Commercial vehicles (units)	others (units)
1st FYP	1953-1957*	3,206	-	2,648	559
2nd FYP	1958-1962	14,301	54	11,351	3,154
Restructuration	1963-1965	29,728	81	24,611	5,036
3rd FYP	1966-1970	48,322	217	40,056	8,049
4th FYP	1971-1975	116,013	1,136	90,498	24,379
5th FYP	1976-1980	163,530	3,430	122,949	37,151

Source: Author's elaboration based on CAIY (various issues)
Notes: *1st FYP yearly average from 1955, 1956 and 1957; from 1955-1959 national total output is equivalent to FAW's production; commercial vehicles include SUVs for military use; others include chassis productions and other special vehicles.

China's First Automotive Works (FAW) was founded in 1953 with the Soviet assistance. It was located in Changchun (Jilin), in Northeast China (see Map in Appendices B.1). This location was chosen not only on economic criteria —Manchuria was the only industrial region of China that had not been destroyed by the war (Hirata, 2021)—, but also on operational criteria, as it was near the Soviet Union. Indeed, FAW was a mirror of the Zanov Imeni Likhachyova (ZIL) factory in the Soviet Union (Guang, 2020). The Soviet collaboration was materialized in a massive flow of imports of industrial equipment and the training of Chinese engineers in Soviet factories.[17] While

[17] See more in Ge Bangning: *Tuo Huang [opening up the land]* (2015) and memories of Jiang Zemin collected in FAW development history by the Culture, History and Study Committee of the Chinese People's Political Consultative Conference, 2007, p. 10.

the machinery was not only imported from Moscow and Leningrad but also from Kharkov, Prague and East Berlin (FAW, 1991), the blueprints and the intellectual property (not the machines) were basically free of charge (Kirby, 2006). Five hundred Chinese technicians were trained in Soviet manufacturing plants, and 200 Soviet specialists assisted in the construction of FAW and its production activities. The first vehicle assembled in China was a copy of the light-duty truck (up to four tonnes) ZIS-150, named Jiefang [Liberation] CA10. This became the main production model for decades, as shown in Table 2.3. (FAW 1991, p. 354; Siegelbaum 2011).

Furthermore, the Cantonese GAC, the Shanghainese SAIC and the Pekinese BAIC appeared in the mid-1950s as a result of the socialist transition period. Between 1953 and 1956, local governments enhanced mergers of former private companies that were transformed into public-private corporations, following Mao's directives for a comprehensive socialist transition of the economy (Feng, 2009). In 1955, SAIC emerged from the fusion of the Shanghai Automobile Manufacturer and Tractor Industry and Shanghai Automotive Limited, which were, at the same time, mergers of former private transportation, component and car repair firms (Shanghai Automobile Industry Committee, 1992). Similarly, the Beijing Second Automotive Works and Beijing Motorcycle Manufacturers were founded in 1955 and 1958, also as a result of the socialist takeover of private firms. In 1958, these two companies became the Beijing Automotive Industry Company Group (BAIC). The same could be said of GAC, the first company from a local government (see Table 2.2).

Table 2.2. China's Backbone Automobile Companies

Company	Complete name	Year foundation	Location	Property	Main product category
FAW	First Automotive Works	1953	Changchun (Jilin)	Central government	Commercial Vehicles
GAC	Guangzhou Automobile Group	1955	Guangzhou (Guangdong)	Local government	Light commercial
SAIC	Shanghai Automotive Industry Corporation	1955	Shanghai	Local government	Passenger car
Sinotruck	China National Heavy Duty Truck Group	1956	Jinan (Shangdong)	Central government	Commercial Vehicles
Yuejin (former NAC)	Nanjing Automobile Corporation	1947[a]	Nanjing (Jiangsu)	Local government	Commercial Vehicles
BAIC (BAW)	Beijing Automotive Industry Corporation	1958	Beijing	Local government	Commercial vechiles
DFM (former SAW)	Second Automotive Work or Dongfeng Motor Corporation	1969	Shiyan (Hubei)	Central government	Commercial vechiles
CCAG or Changan	China Changan Automotive Group	1983	Chongqing (Sichua)	Local government	Commercial vehicles and passenger cars
Hafei	Hafei Motor Company	1982	Harbin (Heilongjiang)	Local government	Commercial vechiles and passenger cars
JAC	Anhui Jianghuai Automobile Group	1999	Hefei (Anhui)	Local government	Commercial vehicles

Source: Author's own elaboration based on CAIY (various issues) and (Editorial Board, 1996). Notes: Current company name is used to avoid being misleading. For instance, FAW, SAIC, Yuejin, BAIC, GAC and DMC were formally constituted groups in 1992–2000 and SAW changed into the Dongfeng Motor Group. BAIC was also formally constituted from 172 affiliated companies. a. Nanjing Automobile was founded earlier than FAW but did not start making light-duty trucks until 1958; b. In 1987, Beijing Second merged with the Beijing Motorcycle Manufacturer to form the Beijing Automobile and Motorcycle Association Manufacturer (BAM). *At the moment of foundation.

These companies, however, had no experience in car or truck manufacturing and developed a very limited production capacity, while Western brand models were copied for assembly as passenger cars. In 1958, the first car copying the French Vedette (Simca) with was assembled in China with a Daimler Benz-190 engine: it was known as the Dongfeng CA71, produced by FAW and it was followed by the Hongqi [Red Flag] model, which was a luxury limousine imitating the Daimler Benz 220 (Editorial Board, 1996).

Passenger cars in China were produced as a symbol of national pride and were only consumed by the small elite of high-ranking Communist cadres.

Table 2.3. First Automotive Works: Output by Model, 1955–1973

Year	Total output	Jiefang	SUV	Hongqi
1955	61			
1956	1,654	1,225		
1957	7,904	6,227		
1958	14,322	11,919	33	
1959	16,469	10,876	221	47
1960	17,407	10,678	613	61
1961	1,146	960	121	1
1962	7,602	6,017	258	6
1963	17,665	14,052	1	11
1964	23,251	-	-	307
1965	34,155	32,545	1,58	30
1966	46,605	42,419	4,104	82
1967	15,068	13,062	1,953	33
1968	16,638	14,668	2,008	22
1969	37,267	33,057	4,185	25
1970	50,303	44,185	6,078	40
1971	60,01	50,605	9,303	102
1972	-	-	-	-
1973	58,005	49,864	8,039	113

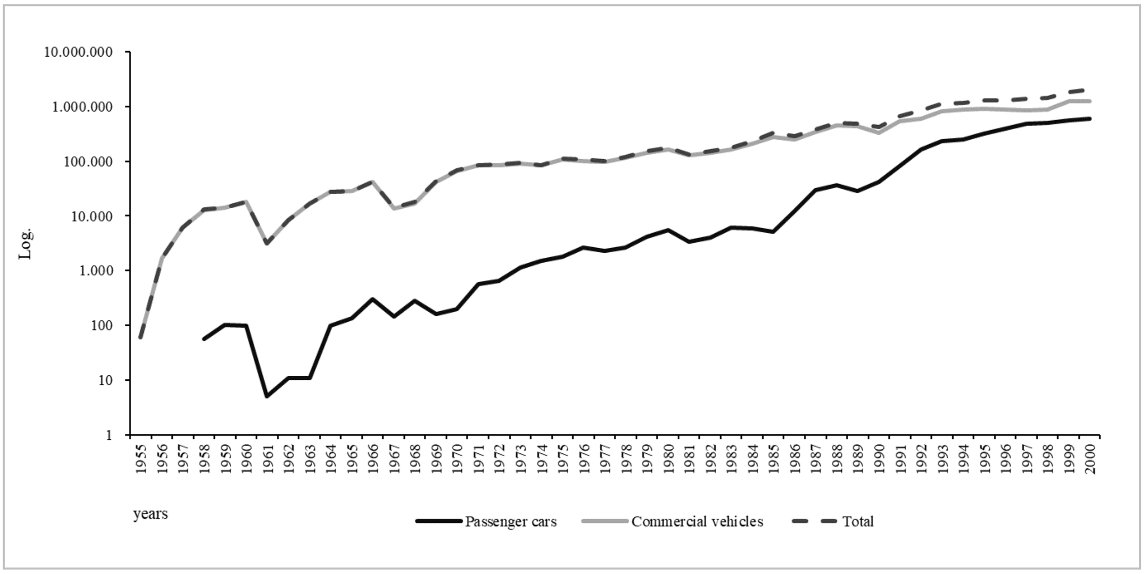
Source: adapted from (Guang, 2020, p. 120)

Indeed, the bulk of production went into commercial vehicles, especially trucks that were badly needed for the transportation of goods. In July 1954, the Transportation Party Committee of Shanghai announced the confiscation of the 1,200 cars that were in private hands. That was the stock of cars available in the most industrialized city of China. Following with Mao's directives of socialist transition, these cars (old models of Dodge, Nissan and Studebaker) were incorporated in a public transportation company that would obtain a transport capacity of 5 million ton per year, partially alleviating the problems of distribution that were inherited from the previous period of war and turmoil.[18] China's weakness in transportation infrastructure (not only in cars and trucks, but also, in railways, highways, routes, etc.) was one of the main objectives of the Sino-Soviet technical agreements and the first five-year plans. However, this collaboration was short-lived and only carried out partially during the 1950s.

The Great Leap Forward caused a sharp downfall of China's production of cars that coincided with the Sino-Soviet split (see Figure 2.1). The sinkhole in production in the early 1960s can not only be attributed to domestic policies (the Great Leap Forward, 1958–1960) but also to the Sino-Soviet split (see, for example, Schaufelbuehl et al., 2018; Zhang, 2001), which resulted in the cessation of technical assistance, machinery supplies and advisory services from the Soviet Union. Trade data indicate that the Sino-Soviet tensions of the late 1950s and early 1960s halted trade between China and the Soviet Union while Eastern Europe saw a drop of 50 percent of its total trade with China as shown in Figure 2.2. (Dangdai zhongguo congshubianji weiyuanhui, 1992). China's average car and truck imports were already low, because the state protected its nascent domestic industry with import tariffs of 200 and 250 percent during both the 1950s and the 1960s (China Customs, 2018).

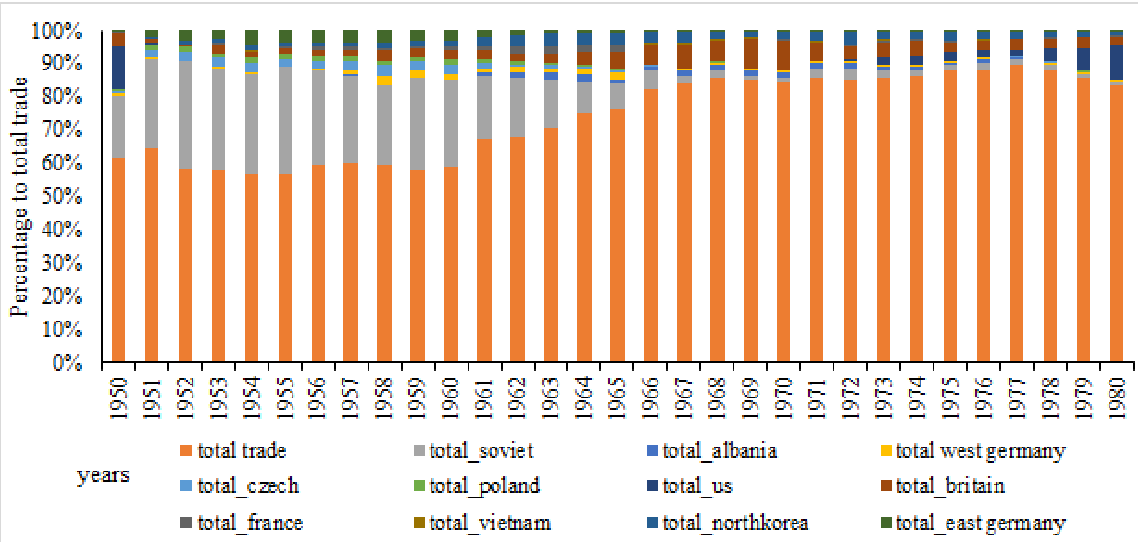
[18] "Zhonggong shanghai shi weidui jiaotong yunshuju dangwei guanyu siying qiche yunshuye jinxing shehui zhuyi gaizao de yijian de pishi" ("Instructions of the Shanghai Municipal Committee of the Communist Party of China on the opinions of the Party Committee of the Transportation Bureau on the socialist transformation of the private automobile transportation industry), October 7, 1954, in Chinese Communist Party History Materials, 1993, p. 309.

Figure 2.1. China's total automobile industry output, 1955–2000 (by main category)



Sources: Author's elaboration based on CAIY (various issues) and OICA (2020). Note: SUVs were included in commercial vehicles until 2001.

Figure 2.2. China's trade with main foreign countries, 1950–1980



Source: Author's own elaboration based on China today: Foreign Trade (Dandai Zhongguo Press, 1992)

However, in the mid of the 1960s, despite the Soviet pressures to cut ties with China and Mao's autarchic claims, some Eastern European countries resumed exports of trucks and cars to China: In 1959, Czechoslovakia signed a long-term trade agreement with China which was praised by Chinese premier Zhou Enlai as a hallmark in China's modernisation effort. It would provide with buses (Skoda) and trucks (Tatra), in exchange of foods and fibres (Adamec, 2018); in 1965, Poland sold around 6,000 vehicles to China and Romania exported 1,000 Carpati (three-ton trucks) (Business China, 1983). If between 1950 and 1957 China imported 67,500 vehicles —81.3 percent of which were heavy-duty trucks— the import of truck cars resumed in the 1960s after the Great Leap Forward, while trade in passenger cars became even more erratic and marginal (see Figure 2.3.). In the third and fourth FYP (1966–1975), the total quantity of imported vehicles grew significantly to 139,000 units, particularly for heavy-duty trucks, while imports of passenger cars remained meagre, only 3,300 units (CATARC, 1994, pp. 269–270). After the Sino-Soviet split China exported a symbolic number of vehicles, including SUVs, special vehicles, and trailers, to its communist allies like Albania, Cuba, Vietnam or North Korea (Baranson, 1969; CNAIC, 1984).

In a similar way than Eastern European countries faced the Sino-Soviet split, Western European countries also tried to develop trade with China, circumventing the pressures of the United States and its trade embargo established upon the People's Republic of China since the Korean War. During the Geneva Conference of 1954, the Chinese delegations had started contact with Western Europeans to purchase commercial vehicles and, since then, Switzerland became a platform for contacts between the PRC and Western European business interests (Knüsel, 2022). These contacts did not materialize in significant business operations until years later, when the Sino-Soviet split opened the door for China to collaborate with Western Europe (Zanier, 2017).

Figure 2.3. Imports of China's Automobile Industry, 1955–2000 (total and main categories)

Source: Author's own elaboration based on CAIY (various issues)

In 1965, China signed an agreement with French truck producer Berliet for technical assistance, licence transfer and industrial designs. Furthermore, cars and trucks became the main export item of France to China, receiving the support of the full diplomatic relations between both countries, since 1964 (Zhou, 2018). Italy also undertook business deals with China in the oil and petrochemical industries as well as in the automotive industry, mainly with the Italian company Fiat (Capisani, 2013; Zanier, 2017). Fiat had been a close partner of the Soviets and Eastern European countries (with production subsidiaries in Poland and Romania), but it also engaged in business with other socialist countries who had abandoned the Soviet sphere of influence, like Yugoslavia —where the company signed an agreement with Crvena Zastava in 1954 (Fava & Gatejel, 2017; Miljković, 2017)—, or with China, after the Sino-Soviet split.

As a result, China consolidated diverse sources of truck suppliers from Eastern and Western European and also from Japan. This trade was organized according to the types of trucks purchased: 4 to 5 ton trucks (Rumania, Hungary, and Eastern Germany), 7 to 8 tons (Italy, Japan), 10 to 15 tons (Czechoslovakia and France), 12 tons (Sweden) and tractors (Japan) (Zhou, 2018, p. 110). The Czechoslovak delegates complained that instead of a longer commitment as expected for Communist countries, the Chinese were placing orders on a year-by-year basis as they were planning to produce or copy Czechoslovak goods (Adamec, 2018). Meanwhile, China had to export primary goods (foodstuffs and fibres) which were needed by the Chinese population to pay for their imports. In the early 1970s, however, after the worst years of the Chinese famine (where exports of edible goods continued) and the Cultural Revolution, the "petroleum faction" in charge of the Ministry of Petroleum Industry enhanced oil production in Northeast China as an export good (Zanier, 2017), easing China's foreign trade tensions and enhancing the domestic production of cars.

In 1969, the second company controlled by the central government, SAW, was created in the remote town of Shiyan (Hubei), following Mao's idea of spreading industrialization in the interior of China for defensive strategic purposes (Meyskens, 2020). After several delays, SAW started production in 1969 and, despite claims of technological independence and autarchy, the industrial plant followed the FAW designs and copied the Soviet manufacturer of commercial vehicles. The first models were a 2.5 ton truck called GAZ51 and the military models SUV Y20 and Y25. Moreover, it was FAW's technical personnel, trained in the Soviet Union, who assisted in the creation of these first truck prototypes (Meyskens, 2020). Given the fact that both FAW and SAW were SOEs controlled by the central government, there was an interindustry transfer of technology from the previous Soviet assistance (CNAIC, 1984; FAW, 1991; SAW History Journal, 2001; Xu & Ou, 2017). In the early 1970s, passenger cars were enhanced when oil exports allowed China to increase its programs for importing complete technological equipment from Western European countries.

To sum up, the metamorphosis of the Chinese automobile industry started when the market of cars was absent and the role of the state was all-determining. The Chinese central and local governments were not only the main acquirers and distributors of all automobiles, including imported units, but had total ownership of the industry. However, foreign-oriented activities were important since the beginning, first, through international collaboration agreements in both sides of the Cold War and, second, through trade. Although the industrial growth during the Maoist period, consisting of more commercial vehicles than passenger cars, was modest, it was essential in the configuration of backbone companies which led China's production of cars.

2.3. Joint ventures in protected markets

The Chinese automotive industry suffered its major metamorphosis after 1978. International technology transfers increased substantially through international joint ventures between Chinese backbone companies, owned by the central or local governments, and foreign private multinationals. At the same time, China allowed Independent Chinese Automobile Manufacturers (ICAMs) to appear and compete with the former backbone companies and their international collaboration projects. This was the period of the economic reforms led by Deng Xiaoping, when a domestic market for automobile consumption gradually emerged. Meanwhile, protectionist policies were not unleashed until China's entrance to the World Trade Organization (2001). As Deng put it in his speech of October 1986 at the Second Plenary Session of the 20th Central

Committee of the Communist Party, 'we keep our doors open, but we are selective, we do not introduce anything without a purpose and a plan' (Deng, 1993).

Indeed, the automotive sector continued to be a 'pillar industry' in the 6th FYP (1981-1985) and 7th FYP (1986-1990). However, in contrast with the Maoist period, passenger cars, ICAMs and private consumption were brought into play. In 1979, the Chinese output of passenger cars was negligible and suffered from severe shortcomings of capital and technology. In the short term, domestic production could not fulfil the expected boom of the domestic demand. Therefore, the Chinese government encouraged international joint ventures to transfer mass production facilities to supply the domestic market with various types of automobiles and a selective importation of finished cars in small quantities, especially the so-called "Complete Knock Down" cars (hereafter CKD): a complete car delivered in parts to be assembled at destination.[19]

The conditions to establish joint ventures were restrictive to ensure international technology transfers and, ultimately, the completion of an inward internationalization process. First, joint ventures could only be established between a foreign and a Chinese partner, where the latter owned, at least the 50 percent of participation. Second, the foreign partner should not engage in more than two joint ventures in China to assemble the same model of vehicle. Third, the foreign partner should guarantee technology and know-how transfers —including human capital training— to the domestic partner. Fourth, the joint venture should produce newly designed cars specific to the Chinese market. And last but not least, national or local suppliers of parts and accessories were to be given preference among foreign suppliers so that the national content level in a finished automobile

[19] Interview with Chou Ke collected by Editorial Committee of the 100th Anniversary of the Birth of Comrade Rao Bin, in Dong, et al., 2013, 162.

unit ought to gradually increase (Editorial Board, 1996; SDPC, 1994).[20] This was the normative framework which affected the first round of joint ventures (see Table 2.4.) until the formalization of an Automobile Policy in 1994 (see, for example, Nam, 2011; Tang, 2012).

Table 2.4. Sino-Foreign Joint ventures, 1983–1992

Partners			Joint Venture	Year	Location	Participation	
Domestic	**Foreign**	**Foreign country**				**Domestic (%)**	**Foreign (%)**
BAIC	Jeep American Motors Corporation (AMC)	USA	Beijing Jeep Corporation (BJC)	1983	Beijing	68,65	31,35
BAIC	Daimler-Chrysler	Germany	Beijing Jeep Corporation (BJC)	1998	Beijing	57,2	42,4
SAIC	Volkswagen	Germany	Shanghai Volkswagen (SVW)	1984	Shanghai	50	50
Tianjin Automotive	Daihatsu	Japan	Dafa	1984	Tianjin	na	na
GAC	Peugeot	France	GAC-Peugeot	1985	Guangzhou (Guangdong)	66	34
Nanjing Automtoive	Fiat-IVECO	Italy	Nanjing-Iveco (NAVECO)	1985	Nanjing	50	50
Chongqing Qingling Automotive	Isuzu	Japan	Qingling Isuzu	1985	Chongqing	77	23
FAW	Volkswagen	Germany	FAW-VW	1991	Changchun (Jilin)	60	40
Dongfeng	Peugeot Citröen	France	Shenlong	1992	Wuhan (Hubei)	50	50

Source: Author's compilation is based on CATRAC & MOFCOM (2014), CAIY (various issues), Editorial Board (1996), Wang (2003), and Harwit (1995). Notes: "na", data not available.

[20] Some small firms based in Southeast Asian countries, especially those in the special administrative regions of Hong Kong and Macao, that invested in the early stages of the Chinese automobile industry were allowed to sidestep the 50:50 participation conditions. The majority were manufacturers of components and assemblers of motorcycles that were looking to reduce labour costs and were not technology-intensive. See more in *China's Automotive Industry History 1901-1990,* by Editorial Boar (1996).

In 1979, multinationals like General Motors and Isuzu started negotiations to launch new production facilities in China.[21] But the first endeavour of this kind took place in 1983, after thirty years of the establishment of FAW. It was a joint venture between BAIC and American Motors Company (AMC) (FAW, 1991). AMC had been an important producer in the US market in the 1950s and 1960s but was experiencing financial difficulties while its market share was declining against the US Big Three (General Motors, Ford and Chrysler) and the massive entry of cheaper Japanese cars. In 1983, AMC was almost owned by French SOE Renault but agreed to have a minor stake (31.35 percent) in a joint venture with BAIC that would be called Beijing Jeep Corporation. AMC invested USD 16 million, half of which was in a technological package of industrial machinery and equipment (CATARC & MOFCOM, 2014). Interestingly, the new joint venture produced two models: BJ212 using the technology that BAIC had acquired from the Soviet Union and the Jeep Cherokee XJ, with the American technological package. But the process was slow and the next model, the Grand Cherokee, was only produced in 2001, after the AMC had been purchased by Chrysler (Hu & Jefferson, 2008, p. 318).

Volkswagen Group was the second firm to reach a joint venture agreement in China and it became the most successful. Since 1979, automobile expert, Rao Bin[22] met several times with the Chairman of Volkswagen Group, Carl H. Hahn and exchanged a frequent correspondence. Rao Bin was invited to visit the Volkswagen production plant

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[21] "Les entreprises à capitaux chinois étrangers" *Cahiers d'Études Chinoises,* Special issue, 1981, p. 93.

[22] See more information of Rao Bin in Appendices B.3 Key personages in the Chinese Automobile Industry development. He was one of the most prominent key figures in the early periods of the Chinese automobile industry. He led the negotiation rounds of the first joint ventures between FAW, Dongfeng and Volkswagen. He was director of FAW, SAW, and CNAIC.

in Brazil, with a capacity of assembling 300,000 units yearly.[23] In May 1982, Rao Bin became the Chairman of the newly created China National Automotive Industry Corporation (CNAIC) a public agency with the mission to introduce the mass production of passenger cars in China, through joint venture operations with foreign multinationals, in collaboration with research and design institutes. China adopted the industrial standardization procedures of Western Germany, in collaboration with the Deutsches Institut für Normung [DIN]), and some aspects of the patent laws. The economic diplomacy of Bonn, while avoiding sensitive political issues, was well-received by the pragmatist reformers of Beijing, setting the base for an enduring alliance (Martin, 2016).

It took near six years of negotiations (from June 1979) until the final contract of a joint venture agreement for 25 years was signed between Volkswagen and SAIC in October 1984.[24] This joint venture called Volkswagen Shanghai was such a big deal that it was recognized as the most important industrial project of 7th FYP. German chancellor Helmut Kohl travelled to China to side with Carl H. Hahn in the signature ceremony. The registered capital of the joint venture summed RMB 160 million, with the following equity: Volkswagen owned a 50 percent, while the Chinese half was shared between SAIC (25 percent), Bank of China and Shanghai Trust and Consultancy Company (15 percent), and CNAIC (10 percent). Volkswagen would invest USD 60 million in cash at the very beginning, increasing to USD 300 million in a second stage in the 1990s.[25]

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[23] 'Report on the Commencement of External Machining and Assembly Operations' [Guangyu kaizhan duiwai jiagongpeijian yewude baogao] See interviews with Chen Xianglin, Chou Ke, Zhang Changmou, Ye Yanzhang, Wang Ronjun collected in Dong, et al., 2013, 156-166.

[24] Strassburger an Horst Münzner und Claus Milztrey betr. Kurzbericht China-Reise from 2. to 15.9.1979: in VCA, 373/220/2.

[25] Letter from Qiu Ke (President of STAC) to Volkswagen (Mr. Muenzner) on June 20, 1983, in order to show production capacity and attitude towards the imminent joint venture, in VCA,

In a first stage, yearly production capacity was set at 30,000 cars of the model Santana, which was no longer in the Western markets. In a second stage, the productive capacity of the Shanghai plant would grow to 150-200 thousand cars per year. SAIC and, ultimately, the Shanghai government, guaranteed the purchase of Santana vehicles (for instance all Shanghai's taxis), whilst Volkswagen ensured the technology transfers through CKD imports and training programs for workers. Chinese authorities emphasized the importance of training Chinese workers in mid-to-long term, in order to be able to manufacture the auto parts that had been imported. While around 60 German experts were expatriated to Shanghai, 2,500 Chinese workers were trained, some of them in Germany, to guarantee the correct assembly of CKDs.[26]

Volkswagen had ambitions to lead China's domestic market of cars. In February 1991, the company announced a new joint venture with FAW, with a whole new production plant in Changchun. According to a study of feasibility, both joint ventures could give Volkswagen a lead in China's car market for 25 years.[27] Volkswagen and FAW agreed to invest RMB 1.7 billion (or USD 320 million) in a new joint venture called FAW Volkswagen: 40 percent corresponding to Volkswagen and 60 percent to FAW. At the beginning, however, Changchun was only an assembly plant; FAW Volkswagen would purchase 150,000 CKDs from Volkswagen to be assembled in China. While the

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128/414/2; In 1983, both parties agreed to a trial production of 100 Santana in order to test production capacity and quality in Shanghai, see more in an interview with Chou Ke in Dong, et al., 2013, 162.

[26] 'Shanghai Volkswagen AG Joint Venture Contract', Vorstandssekretariat Werner P. Schmidt from 13 August 1984 to 31 October 1984, in VCA, 366/79/1; 366/79/2.

[27] 'First Automobile Works PRC und Volkswagen Aktiengesellschaft FRG, Economic Feasibility Study, 1989'. Vorstandssekretariat Werner P. Schmidt, from 28 January 1989 to 30 November 1990, VCA, 366/99/1.

contribution of FAW was in land, workers (more than 40 thousand in the mid-1980s) and facilities, Volkswagen gradually moved its industrial equipment and installations from Westmoreland (United States) to China as part of investment. Yearly capacity was set to reach 150 thousand cars in 1996 of the models Golf and Jetta.[28]

Volkswagen also transferred technical documentation and know-how (prototypes, production blueprints, and industrial drawings)[29] and organized start-up training courses involving 1,600 workers per month. Like the former Joint Venture with SAIC, technology transfers were paid up by FAW Volkswagen with a flat fee for ten years of DM 126 million (USD 60 million), including licensing and consulting fees. In 1993, a huge training plan of industrial workers started operations in a formation centre with an additional investment of RMB 200 million. During the following 10 years, a total of 363,969 workers received different kinds of training courses, while around 150 German experts were expatriated to Changchun.[30]

According to the "Project China" plan of Volkswagen, 85 percent of the production in China would be sold in the domestic market, while 15 percent would be exported, primarily to Southeast Asia and the Arab countries.[31] The second joint venture

[28] See the oral histories about Lv Fuyuan, former Deputy Director of FAW, compiled by Ge Bangning (2009) in *Qicheshangye pinlvn.* From 1985 to 1990, Fuyuan traveled between Europe and the United States conducting negotiations for joint ventures. Fuyuan was respected by FAW people who called him "FAW's Kissinger"; on the workers of FAW in 1982, see Wemheuer, 2019, p. 244. See more details about Fuyuan and other key personages in Appendices B.3

[29] Part of these transfer agreements can be seen in History of introduction of technology and equipment in China, Appendices B.2

[30] Memories and interviews of Huang Jinhe collected by Culture, History and Study Committee of the Chinese People's Political Consultative Conference, 2007, pp. 577-585.

[31] 'Overview of the main points on FAW-Volkswagen joint venture contract Vorstandssekretariat Werner P. Schmidt. From 28.01.1989 to 30.11.1990: in VCA, 366/99/1

was more detailed in terms of how technology transfers were to be paid, separating royalty payments and licence fees.[32] The conditions negotiated in these joint ventures would lay the foundations for similar transactions in the future.

The conditions set by the Chinese government to foster technological spillovers from the original CKD deals became a reality. Local contents[33] of Shanghai produced cars increased from a meagre 5 percent in 1990 to 81 percent in 1996.[34] Expert Rao Bin stressed the hardships of domestic producers to fulfil German quality standards that were monitored for the first Santana model, but this process of adaptation became the main test of quality progress for the Chinese automobile industry.[35] According to Rao Bin, "a joint venture with foreign company requires importing continuously foreign technics and it takes time. Additionally, "not only technics are important but also it is crucial to capture managerial and organizational methods".[36] When the output of cars became massive in the late 1990s, the model Jetta, with a yearly production of 150 thousand cars, had already

[32] 'VW-FAW Changchun-Stand der Verhandlungen'. Vorstandssekretariat and Generalsekreatriat 05.03.1990: in VCA, protokoll und vorlagen 133/208/1, Nr. 9.

[33] The term "local content" refers to the nationality of the components and accessories assembled in a unit of the completed car. For example, a car produced in a JV company could have some imported components and some from local suppliers. The term "national content" is also used for the components produced throughout Chinese territory.

[34] Report to the Executive Board by Carl H Hahn on 26 November 1990; Vorstandssekretariat Werner P. Schmidt from 1.01.1988 to 28.11.1990 in VCA 366/99/1.

[35] Interview to Zhang Xiaoyu as former worker in FAW and SAIC relates memories with Rao Bin, in the compilation of oral histories by Ge Bangning. In *Tuo Huang [opening up the land]* (2015), 49-56.

[36] Memories and interview with Zhang Changmou (former General Director of Shanghai Volkswagen Company) when he met Rao Bin, compiled in Dong et al., 2013, 165-166.

a local content of 84 percent (Harwit, 1995; Nam, 2011).[37] The joint ventures of Volkswagen became a hallmark of China's inward internationalization process, where Chinese firms learned from foreign partners, first, through CKD assembly and, gradually, integrating domestically the production of auto parts (Johanson & Vahlne, 1990, 1977; Johanson & Wiedersheim-Paul, 1975).

Deng Xiaoping, who had worked in a French automobile factory in 1925, emphasized the collaboration with European partners to modernize China's industry, preventing China to appear too dependent on both the United States and Japan which were, themselves, struggling in the US market of cars. Therefore, while Germany took the lead, Italy and France also made their presence felt in China. Since 1975, Giovanni Agnelli, as Chairman of Fiat, had been negotiating with Chinese parties a joint venture for light-duty commercial vehicles, but it was not until 1985 that Fiat Iveco and the SOE Nanjing Automobile Corporation (NAC) signed an agreement to produce light commercial vehicles. The joint venture between NAC and Fiat Iveco was the most important regional project in the automotive industry during the 7th FYP (1986-1990).

According to Rao Bin, after the visits to Italy in 1983, the negotiations went fast. The process of technology transfer was planned for 15 years, where technical document, patents and know-how would be transferred to the Chinese partner. The newly constituted NAVECO received an investment of USD 446 million in cash (and a loan of 210 million), and a commitment to improve the already successful Yuejin truck while the new Italian models were in progress (FIAT S.p.A. 2006). In 1985, NAVECO imported 1,000 units of semi knocked down cars and began the assembly activity as a trial period. Next year,

[37] Memories and interviews Hang Yuling and Tai Shiang collected by Culture, History and Study Committee of the Chinese People's Political Consultative Conference, 2007, pp. 571-575.

however, the planned mass production of 60,000 units was not achieved and, in the following years, Fiat established a new joint venture with Yuejing Automotive Group (former NAC) to assemble light commercial vehicles and passenger cars. For instance, the models Siena and Palio became quite popular in the middle segment market (CATARC & MOFCOM, 2014), but the two models designed and produced in China (Encore and Unique) received unexpectedly poor results. Finally, the model Deyi [Delightful] reached 10,000 units in the first year of production in 1997. The learning process took long, but it was finally profitable for a while.

But not all collaboration projects went smooth. In 1985, Peugeot signed a joint venture with GAC in Guangzhou. The French parties (Automobiles Peugeot and Banque Nationale de Paris) had a minor stake of 34 percent, investing USD 170 million (or FF 62.4 million), mainly through manufacturing equipment and production license: the lump-sum of the industrial property and know-how license contract was valued in FF 23 million, while industrial engineering service fees at FF 17 million. The technology transfers of Peugeot were classified in six items: industrial property and technical know-how; engineering and technical assistance; plant renovation; a research and development centre; the state of technology; and IP protection. The Chinese side, GAC and China International Trust and Investment Corporation held 66 percent of the new company stake equivalent to FF 120 million.[38]

As it happened with the joint ventures of Volkswagen, there was an exchange of skilled workers. Chinese engineers were trained at Peugeot's main industrial plant at Montbéliard and French expatriates came to Guangzhou. However, in contrast to

[38] Contract of the joint venture between GPAC and Peugeot made on 15 of March, 1985: DOS2008RE-30210; H11-3/H11-3.41/H11-3.40.14 in PCA.

Volkswagen, the negotiations emphasized the wage conditions of the French expatriates in China (including payments in kind, salaries, travel expenses, and housing facilities) while the training process of the Chinese staff received less attention.[39] Furthermore, in the industrial plants, each department was jointly managed by two persons, one from Peugeot and another from GAC.[40] Comparing the archives of the negotiations of Peugeot and Volkswagen the perception of mistrust is more visible in the former.

On the other hand, the supply contract of CKD cars imported from Peugeot to China would be deployed in three phases.[41] During the first phase, yearly production of model Peugeot 505 was set at 15,000 units, mostly assembled; in a second stage Peugeot 505 was to reach a yearly production capacity of 30,000 units, that would be increased to 50,000 in a third phase. However, the introduction of locally produced auto-parts was not as clear as in other joint ventures, perhaps because Guangzhou had not a tradition of automobile and auto-parts production like Shanghai or Changchun: in the early 1990s, local content reached 60 percent, not enough to satisfy the Chinese authorities (Harwit, 1995; Nam, 2011). Be as it may, the joint venture incurred in losses from the mid-1990s and was dissolved in 1998 (CATARC & MOFCOM, 2014).

Despite the notable presence of European automobile companies, some Japanese

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[39] Transfer of Peugeot workers to Guangzhou in "Chine études-1ère phase: démarrage GPAC: DOS2008RE-30210, H11-3/H11-3.41/H11-3.40. 14; follow up of expatriate worker wage conditions to Guangzhou: "Chine 2ème phase: AP 1986": DOS2008RE-30211; H11-3/H11-3.4I/H11-3.4I.14 in VPA; Technical Annex of Joint Venture contract of GPAC and Peugeot -Item G- 'Conditions concerning employment of Peugeot Expatriate Personnel': DOS2008RE-30210; H11-3/H11-3.41/H11-3.40.14 in VPA.

[40] Technical Annex to *Joint Venture contract of GPAC and Peugeot* -Item F-'Organization Chart of the Joint Venture': DOS2008RE-30210; H11-3/H11-3.41/H11-3.40.14 in VPA.

[41] Technical Annex of GPAC and Peugeot joint venture contract: DOS2008RE-30210; H11-3/H11-3.41/H11-3.40.14 in VPA.

companies decided to enter the market cautiously. As shown in Table 2.4,, in 1984, Tianjin Automotive Industry Corporation established the first Sino-Japanese joint venture with Daihatsu Tianjin for producing light vans or Hijet850 through CKD contracts. These vehicles were popularly known as "huang dafa" and became part of the taxi fleet in Tianjin. In 1985, Qingling Automotive and Isuzu founded a new joint venture named Qingling Isuzu for assembling light duty commercial vehicles through SKD (semi knock down) and CKD (complete knock down) imports. In both cases, the volume of production was quite modest (Editorial Board, 1996).

During the first decades of the opening up and reform, China did not open its domestic market to foreign trade of automobiles, but rather allowed foreign companies to reach agreements with China's backbone SOEs to establish joint ventures to produce in China, with very precise instructions of how technology transfers should be carried out. The two joint ventures of Volkswagen adapted to these requirements and were highly backed by both the Chinese and German governments. They succeeded in leading the Chinese market consumption of cars and trespassing the German know how to local manufacturers, allowing to increase the local share of suppliers. But this process of inward internationalization also originated problems and conflicts between companies and other stakeholders, and not all joint ventures were successful, like the case of Peugeot demonstrates.

2.4. Internationalization and the emergence of a domestic market

Since the mid-1980s non-state companies with domestic capital were allowed to compete in the automobile business, breaking with the monopoly of the SOEs. These companies like Geely, Great Wall, Lifan and BYD were classified as Independent Chinese Automobile Manufacturers (ICAMs). Whereas some of them still have some kind of state participation, their purpose was to create Chinese indigenous brands that could compete against multinationals and their "backbone" partners (Li, 2008, 2014). Geely was founded in 1986 in Hangzhou (Zhejiang) and it is considered the first privately owned automotive company. In 1984, Great Wall was registered in Baoding (Hebei), and it was originally an SOE, but it was later privatized (CATARC & MOFCOM, 2014). During the first half-1990s, the private firms Lifan and BYD were founded in Chongqing (Sichuan) and Shenzhen (Guangdong) respectively. In addition, private auto part firms were allowed to sell to both SOEs and non-SOEs. Thus, international technology transfers were still controlled by SOEs, but non-SOEs were encouraged to compete and help to increase the market supply (FAW, 1991; SAW History Journal, 2001; Shanghai Auto Industry Committee, 1992).

The fact that non-SOEs were also highly commanded by the state was not exclusive to the automobile sector: during the reform, private companies were allowed to exist only under tight conditions and following the state directives, something that has produced a rich scholarship about the adequacy of calling them "private companies" (see Huang, 2003). Whereas SOEs backbone firms were more bureaucratic and tightened to the strict regulations, not only from the government but also from the joint-venture agreements, ICAMs were more flexible and adaptable. At first, ICAMs were not allowed to form joint ventures and faced budged constraints, exchange rate limitations, trade barriers and less investment choices (Guang, 2015; Li, 2014). Nevertheless, in the mid-1980s specific production goal was fixed for ICAMs at 200 thousand passenger cars per year, indicating that the state would allow private companies to compete and prosper, but to a limited extent (Li, 2009, 2014). Both in the 1980s and 1990s, the top five SOEs, including their joint ventures with foreign partners, accounted for more than half of China's total industrial output (CNAIC, 1984; Editorial Board, 1996).

As shown in Table 2.5, Geely, Great Wall and BYD were set up from the mid-1980s. They were classified as Independent Chinese Automobile Manufacturers (ICAMs) due to their independence from both foreign and state partnerships (Li, 2014). Geely is considered the first fully privately owned automotive company, founded in 1986 in Hangzhou (Zhejiang). Great Wall was founded in 1984 in Baoding (Hebei), but it was originally state-owned according to official registers in CATARC. In 1995, BYD was founded in Shenzhen (Guangdong) with private capital. [42] See location of these manufacturers in Appendices B.1)

Table 2.5. Independent Chinese Automobile Manufacturers (ICAMs)

Company	Complete name	Year foundation	Location	Property	Main product category
Great Wall	Great Wall Motor Automobile Manufacturer	1984	Baoding (Hebei)	Private	Commercial and passenger cars
Geely	Geely Automotive Company	1986	Hangzhou (Zhejiang)	Private	Passenger cars (SUVs)
Brilliance	Brilliance Auto Group	1992	Shengyang (Liaoning)	State	Commercial and passenger cars
Lifan	Lifan Group	1992	Chongqing (Sichuan)	Private	Commercial and passenger cars
BYD	BYD Automotive Company	1995	Shenzhen (Guangdong)	Private	Commercial (coach) and passenger cars
Chery	Chery Automobile Company	1997	Wuhu (Anhui)	State	Passenger cars

Source: Author's elaboration based on CAIY (various issues) and CATARC & MOFCOM (2014). Notes: Privately property means no state-owned or directly controlled by the central or local government.

During the 8th FYP (1991–1995), the automobile industry was restructured with the Automobile Industry Policy [*Qiche fazhan gonce*] issued by the NDRC in 1994

[42] This company is non-state-owned, however, as can be appreciated in Appendices B.3 the Chairman and President Wang Chuanfu is a Party member.

(SDPC 1994), which coincided with the first general law on private companies. In short, the government kept a protectionist policy (tariff for imported finished vehicles was set to 110-150 percent), while enforcing foreign direct investment. However, all companies willing to enter the market of China had to ensure effective technology transfers, registering as joint ventures and committing to source a minimum of 40 percent of their inputs with local providers, while training Chinese engineers in technical research centres. These conditions, however, did not deter foreign multinationals to enter China: from a total of USD 880 million of FDI in the automobile sector in the 1980s, inflow of capital reached USD 60 billion in the next decade (Hu & Jefferson, 2008, p. 319).

While allowing private enterprises to enter the game, the government continued to favour SOEs and their joint ventures. The State Council and the NDRC encouraged the formation of *qituan qiye* [business groups] to achieve economies of scale, which was essential in capital intensive sectors (Friedlaender et al., 1982). To accomplish this goal, the government supported the merger of intraregional enterprises, annexations and joint-stock operations. Other measures such as tax deductions, low-interest loans and preferential foreign currency access were granted to companies with a capacity of 300 thousand cars per year. The objective was the consolidation of two or three large groups, plus six or seven state-controlled manufacturers as backbone companies. As a result, SAIC and BAIC became business groups owned by both the central and provincial governments and with subsidiaries. In 1995, after structural changes, NAC changed its name to Yuejing Automotive Group and merged with SAIC in 2007 (CATARC & MOFCOM, 2014). Additionally, the central government encouraged an inter-regional competition to attract foreign capital, especially in new development zones of second-tier cities like Changsha, where the local government fixed better production costs and favourable conditions against the more consolidated areas (Coase & Wang, 2012). If these policies aimed at accelerating competition and market conditions, they also introduced duplicities and inefficiencies (Chin, 2010; Donnelly et al., 2010).

The successor of Deng Xiaoping, Jiang Zemin, who had worked at FAW's factory in Changchun in the 1950s, encouraged the establishment of new joint ventures while his main economic advisor, Zhu Rongji (which became premier in 1998), tried to rationalize what was perceived as an excessive weight of state-owned enterprises. While Deng Xiaoping made the famous southern tour of 1992, symbolizing the deepening of the reform process, the liberal faction led by Jiang Zemin and Zhu Rongji established the policy of "exchange technology for market access" (*yi shichang huan jishu*), where foreign companies would have better facilities to enter the Chinese market (Yue, 2018).

That year, Peugeot Citroën signed a joint venture agreement with Dongfeng (former SAW) in Wuhan (Hubei province), which became one of the most important "motor cities" of China. The equity was established on a 50:50 basis between Dongfeng and Aeolus-Citroën Automobile Company for producing under the two brands of Peugeot and Citroën.[43] It seems that the French side learned some lessons from the previous joint venture and more attention was put to favouring local suppliers: local content should reach 75 percent in the first phase and 97 percent between the second and seventh year, of which around 45 percent were made by the joint venture and 55 percent by local manufacturers.[44]

[43] Contract of assembly and distribution: *Partenariat avec 'Second Automobile Works' sur le projet d'implantation en Chine, assemblage et vente de CKD* between SAW and Aeolus Citroën Automobile Company and Automobiles Citroën: DOS2022ECR-00008; H11-1/H11-3.7F/H11-3.7F.15 in PCA.

[44] Article 9. 'Local Content' in the *Contract on the Establishment of the Joint Venture Company Aeolus-Citroen Automobile Company. LTD between the Second Automobile Works and*

The training program and the technical exchange were also described following the model of Volkswagen. The agreement included a list of technical documentation supplied by Citroën, and a training program involving 800 men per month (increasing to 1,200) with a total estimated cost of FF 68 million, payable by the joint venture to Citroën (training fees were set up to FF 500 per man/day).[45] From January to December 1992, monthly billable hours amounted to 471,450 including engineers' assistance, quality control checks, and all other training services.[46] Under these conditions and, according to the French company, the production of the ZK Fukang model in 1992 was a total success.[47]

However, the second wave of joint ventures of the 1990s was led by Japanese companies (see Table 2.6.) At first, multinationals from the neighbour country were wary to form joint ventures with the Chinese manufacturers to prevent potential Chinese competition in the Asian markets (Harwit, 1995). From 1992 to 2000, nine out of fifteen international joint ventures were Japanese. All key Japanese manufacturers —Toyota, Nissan, Honda, Isuzu and Suzuki— established production facilities in China in

Automobiles Citroën signed in 19 of December 1990: DOS2022ECR-00008; H11-1/H11-3.7F/H11-3.7F.15 in VPA.

[45] Article 10. 'License, Technical Assistance and Technical Training Supplied to the JVC by Citroen' in the *Joint Venture Contract*: DOS2022ECR-00008; H11-1/H11-3.7F/H11-3.7F.15 in VPA; Annex 1 to *Citroën Technical Assistance Agreement*: DOS2022ECR-00008; H11-1/H11-3.7F/H11-3.7F.15 in VPA.

[46] *Automobiles Citroën. - Marché chinois, intégration du modèle ZX par la société "Dong Feng Citroën Automobile Company":* DOS2022ECR-00049; H11-3/H11-3.7/H11-3. F14 in VPA.

[47] Resources and comments of technical implementation were examined according to main phases of production, see more in *Plan Qualité Totale Citroën, Objectives par Direction:* 'Procedures de Suivi de l'Expedition de la Documentation Technique Etude', DOS2022ECR-00049; H11-3/H11-3.7/H11-3. F14 in VPA.

partnership with Chinese SOEs.

During the same period, former Sino-Japanese joint ventures intensified their production activities in China. For example, Qingling Isuzu introduced Isuzu's fifth generation of F line heavy-duty commercial vehicles, while Tianjin Daihatsu expanded its production activities by introducing a new passenger car model known as the Xiali. Due to its low consumption and low price, the Xiali quickly gained popularity among both private and taxi drivers in several Chinese cities. In fact, in 1992, the production of 150 thousand Xiali cars was approved by the central government as one of the main projects during the 8th five-year plan. By 1998, the Xiali passenger car market share had ranked second, only after Shanghai Volkswagen's Santana. Therefore, Tianjin extended its collaboration with Toyota [48] to continue the assembly of passenger cars in China.(CATARC & MOFCOM, 2014).

Another interesting turning point was when GAC acquired 22 percent of Peugeot's stake in their existing joint venture, and shifted its partnership interest to Japanese manufacturers such as Honda and Isuzu (see Table 2.6). The first French experience in Guangzhou was not satisfactory, as mentioned earlier, and the local government sought to re-establish production activities with Japanese technology.

The massive entry of Japanese capital was a response to the previous success of Volkswagen in terms of output and market share. However, if in the late 1980s the Japanese and Korean companies symbolized the shift towards Asian hegemony in the global production of cars (Catalan, 2017; Meier, 2018), Asian multinationals faced a harsher competition in China, especially from ICAMs like Geely and Great Wall Motors.

[48] Parent company of Daihatsu.

This competition led to frequent intellectual property disputes with Japanese producers for unfair competition and copyright infringement (Hu & Jefferson, 2008, p. 319).

Table 2.6. Sino-Foreign Joint ventures, 1993–2001

Partners			Joint Venture	Year		Participation	
Domestic	Foreign	Foreign country			Location	Domestic (%)	Foreign (%)
Changan	Suzuki	Japan	Chongqing Changan-Suzuki	1993	Chongqing	51	49
Dongfeng	Nissan	Japan	Zhengzhou Nissan	1993	Wuhan (Hubei)	78,8	20,4
Changan	Suzuki	Japan	Changan Suzuki	1993	Chongqing	51	49
Nanjing Yuejing	Fiat	Italy	Nanjing Fiat	1995	Nanjing	50	50
Changhe	Suzuki	Japan	Changhe Suzuki	1995	Jiangdezhen (Jiangxi)	51	49
Fujian Automotive	Yulon	Taiwan	Fujian Yulon	1995	Fujian	50	50
FAW	Volkswagen	Germnay	FAW-VW-Audi	1996	Changchun (Jilin)	60	40 (which 10 is Audi)
Dongfeng Motors	UD Trucks	Japan	Dongfeng Nissan Diessel Motor (DND)	1996	Guangzhou (Guangdong)	50	50
SAIC	GM	USA	Shanghai GM Wuling	1997	Shanghai	50	50
Jiangsu Yaxing Motor & Coach	Benz	Germany	Yaxing Benz	1997	Yangzhou (Jiangsu)	50	50
GAC	Honda	Japan	Guangqi Honda	1998	Guangzhou (Guangdong)	50	50
FAW	Toyota	Japan	FAW Toyota	1998	Changchun (Jilin)	50	50
Tianjin Xiali	Toyota	Japan	Tianjin Toyota	2000	Tianjin	50	50
GAC	Isuzu	Japan	Guangzhou Isuzu	2000	Guangzhou (Guangdong)	51	49
Changan	Ford-Mazda	USA, Japan	Changan-Ford	2001	Chongqing	50	50

Source: Author’s compilation based on CATARC & MOFCOM (2014), CATARC (various issues), Wang (2003), Harwit (2001, 1995) and other open company sources.

Volkswagen remained the main contributor of China’s inward internationalization. First, the German company headquarters imposed tight quality controls in collaboration with the government and the standard and quality agencies (Grieger, 2010; Grieger et al., 2008). Second, Volkswagen had strong attraction power of other German companies: German suppliers disembarked in China and constituted joint ventures with local manufacturers of auto parts and components (Tilly, 2019). For instance, in 1997, following the FAW Volkswagen factory in Changchun, 49 joint ventures of auto parts were formalised at the same time in Jilin, Shanghai and Beijing. Thanks to the supply network created between Sino-German manufacturers of parts and accessories (Depner & Bathelt, 2005), the national content of the Santana (assembled by Shanghai Volkswagen) increased up to 80–90 percent, while the national content for Passat and Jetta (assembled by FAW Volkswagen) exceeded 90 percent by the late 1990s (Harwit, 1995; Nam, 2011). Furthermore, some domestic companies (both private and state-owned) were accepted as suppliers first to the Sino-foreign joint ventures and then to the global activities of the Volkswagen group, becoming themselves multinational companies (Hertenstein et al., 2017).

Finally, being a first mover and setting ambitious targets in terms of investment, Volkswagen allowed a significant and rapid accumulation of production capacity and know-how. Hence the total output per worker increased from 6 units in 1990 to almost 30 units by 2000 (CATARC, 1994, 2001). Since the beginning, the joint ventures of Volkswagen and all other concerns of the German company in China, which were merged into Volkswagen Group China in 2004, led China's market of automobiles, with a share in production of passenger cars of 40-50 percent during the 1990s and an overall investment of 6.8 billion euros (Volkswagen, 2008) as shown in Table 2.7.

The growing presence of foreign companies in the supply chain and China's negotiations to enter the World Trade Organization brought some modifications to the conditions of technological transfers: the "trade-related investment measures" (TRIMs) of the WTO agreement implied that China could no longer impose conditions regarding the local contents of auto-parts (or any other condition that create trade restrictions) in the future joint venture agreements (Branstetter & Lardy, 2006, pp. 651–652). Even though these measures were not implemented after China's accession to the WTO in 2001, the joint ventures that were set in motion in the 1990s would not have to carry the burden of transferring the technology of the whole production process as Volkswagen did in the 1980s. These new policies allowed the diversification of models and a general lowering of the price of cars in a growing domestic market: for instance, from a prohibitive 120.000 RMB in 2001, the iconic Santana model was available for 80.000 RMB in 2003 (Hu and Jefferson, 2008).

Table 2.7. Output share of Sino-European joint ventures, 1990–2000

Year	Passenger cars	SVW		FAW-VW		GAC-Peugeot		Dongfeng - Peugeot Citröen	
	(unit)	(unit)	share (%)	(unit)	share (%)	(unit)	share (%)	(unit)	share (%)
1990	42,409	18,537	44	na	na	3,415	8	na	na
1991	81,055	35,005	43	na	na	9,094	11	na	na
1992	162,725	65	40	8,062	5	15,67	10	na	na
1993	229,697	100	44	12,12	5	16,08	7	na	na
1994	250,333	115,33	46	8,219	3	4,805	2	na	na
1995	325,461	160,07	49	20	6	6,936	2	1,314	0
1996	391,099	220,22	56	26,86	7	2,522	1	9,158	2
1997	487,695	230,44	47	46,4	10	1,557	0	30,04	6
1998	507,861	235	46	63,92	13	2,246	0	36,24	7
1999	566,105	230,95	41	75,57	13	na	na	40,2	7
2000	612,376	253,12	41	50,93	8	na	na	23,84	4

Source: Author's elaboration based on OICA (2020), CAIY (various issues) and (Harwit, 1995, 2001).

The impact of the joint ventures in output growth was incremental, particularly in the subsector of passenger cars. As shown in Figure 2.1. and Table 2.8., the production initiatives of the 6th FYP (1981-1986) had limited results: while total output grew by 16 percent, it was mostly due to the improvements in the production of commercial vehicles, while passenger cars increased by only 3 percent. It was not until the second half of the 1980s that the output of passenger cars took off, especially due to the success of the first joint ventures: production increased by 66 percent, whereas commercial vehicles only grew by 7 percent. In the early 2000s, China reached a yearly output of four million cars of which two million were commercial and two million passenger cars.

Table 2.8. China's Automobile Production by Five-Year Plans, 1981–2005 (yearly average)

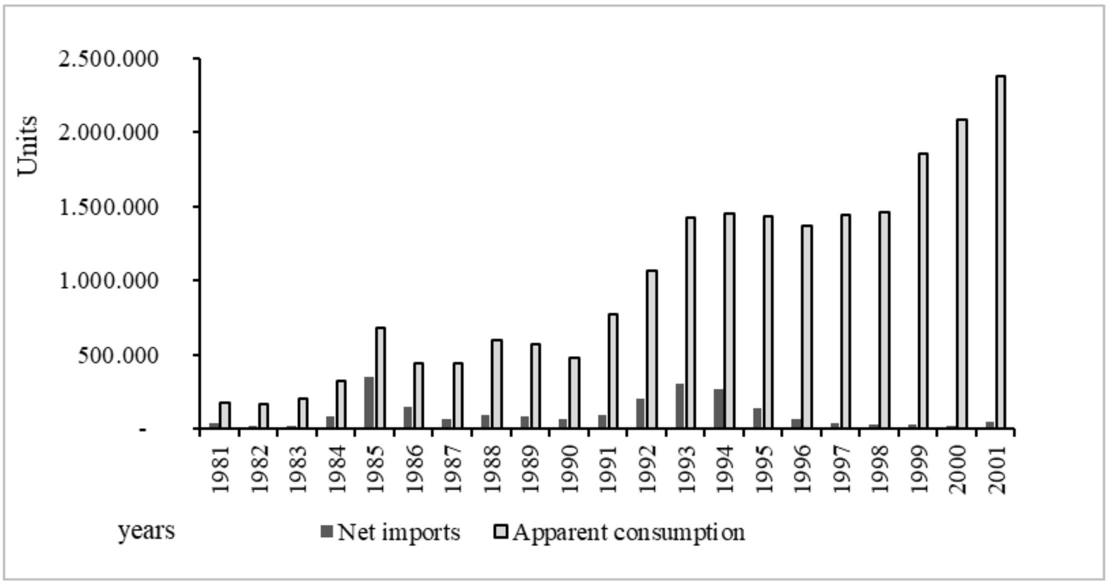
Five-year Plan (FYP)	Period	Total (units)	Commercial vehicles (units)	Passenger cars (untis)
6th FYP	1981-1985	205,654	183,344	4,944
7th FYP	1986-1990	416,839	365,414	30,038
8th FYP	1991-1995	1,027,854	754,245	209,854
9th FYP	1996-2000	1,608,727	1,068,944	511,340
10th FYP	2001-2005	4,161,060	2,148,803	2,012,257

Source: Author's elaboration based on CAIY (various issues)

However, the growth of automobile industry in China was still not sufficient to fulfil the boom of domestic demand, especially in the years 1985-95 (see Figure 2.4). Thus, despite the protectionist policies and high price of imported cars, net import units were positive from 1981 to 2000, especially for high purchasing power consumers. Exports remained symbolic like in the Maoist years: around 3,000 commercial vehicles, especially light-duty trucks, were exported per year in the 1980s (13,000 in the 1990s) to developing countries in Asia, Latin America and Africa, (CAIY, various issues). In the 1980s and 1990s, main importers of passenger cars were Germany, Japan, the United States and France, which together accounted for around 90 percent of the value of total imported cars (UN Comtrade, 2021).

Thus, during the first decades of the opening up and reform, Chinese non-state companies were allowed to emerge and participate in a nascent domestic market, although with limited conditions, while the government encouraged the backbone companies and their joint ventures to become market leaders. In the 1990s, the inflows of foreign direct investment grew exponentially and expanded along the supply chain. While China was relatively closed to the foreign trade of cars, from the mid-1990s, the conditions for foreign investment were relaxed as domestic suppliers succeeded in substituting imports of auto parts. China was getting ready to open its restrictions to trade and to undertake a turn towards outward internationalization process.

Figure 2.4. Apparent Consumption of Automobiles in China, 1981–2001



Source: Author's own elaboration based on CAIY (various issues). Note: Apparent consumption = total output + total imports – total exports of automobiles

2.5. Conclusions

This chapter shows how the industrialisation in the Chinese automobile sector is consistent with the inward internationalization theory (Johanson & Wiedersheim-Paul, 1975; Olson & Welch, 1978; Welch & Luostarinen, 1988), where technology transfers and know-how acquisition precede market conditions. In the 1950s, during the Sino-Soviet alliance and under the economic system of the five-year plans, China built the backbone of its automobile industry with large SOEs that produced trucks for the public transportation system. Due to the Great Leap Forward and the Sino-Soviet split these endeavours were erratic and industrial output remained low, but the automobile industry continued to rely on this initial transfer of technology. The next big step came in the first years of the leadership of Deng Xiaoping, where China's backbone companies signed joint venture agreements with foreign partners, mainly private multinationals from Western Europe. This business was controlled by China's SOEs, but integrated a provision to gradually include local suppliers, securing an effective transfer of technology and an adaptation of domestic production to the international standards.

The joint ventures of Volkswagen were the most successful and representative case study of this inward internationalization. This article has examined some European joint venture as case studies, especially the cases of Volkswagen, Fiat and Peugeot, dealing with original corporate archives, and oral history compilations of engineers and Party Comrades, to highlight both the successes and the failures, the opportunities and the problems that appeared in these negotiations. From the Chinese perspective the essential point was the capacity to evolve from the assembly of an imported car in parts (the CKDs) to the manufacture of an automobile with auto parts made in China. That was the key issue of China's inward internationalization through the first wave of joint ventures, which contrasts with the perspective of foreign multinationals who sought market access and IP protection. While the latter has been the focus of most of the literature, the former deserve further research in addition to this article, especially when more archives in China will become available.

The metamorphosis of China's automobile industry, which began in the 1950s when the market was absent and the role of the state was all-determining, continued in the 1980s, when market conditions were still not ripe, due to the protectionist laws for foreign trade, the lack of private companies and the still meagre private consumption of cars. The weakness of market conditions changed gradually in the mid-1980s with the apparition of private and other mixed companies that worked under a highly regulated market (the so-called ICAMs) and the growing competition between backbone companies and their joint ventures.

If in the 1990s the acceleration in the supply side was evident, it was hardly catching up with the growing demand of private cars. Entry flows of foreign direct investment skyrocketed, looking for business opportunities as the economic growth of China attracted global attention. Despite the fact that the prime movers (especially Volkswagen) continued to lead the market, accumulating expertise and improving their collaborative methods, newcomers engaged in joint ventures that went beyond automobile manufacturing, extending to the supply chain of auto parts. Once the share of local supplies of these prime movers reached 90 percent, the inward internationalization process was completed and China was ready to enter a new stage of outward internationalization, with the integration to the World Trade Organization, the Go-Out Policy and the deepening of market reforms.

Chapter 3. The limits of the Chinese government 'market for technology' strategy: The case of the automobile industry (2000-2018)

3.1. Introduction

Over the 40 years of economic reform and opening that began in the late 1970s, China's macroeconomic indicators of economic growth have made outstanding progress. What is less obvious and more difficult to measure, however, is its progress in science and technology (henceforth S&T) and industrial upgrading. On the one hand, Chinese S&T has made notable advances (Lei et al., 2019) and, in the last 20 years, its industry has gone from trailing behind developed countries to leapfrogging the group of emerging countries becoming a fast follower (see, for example, Kennedy, 2016; Naughton, 2021). Moreover, China's economy is today considered a newly industrialized economy by UNIDO (United Nations Industrial Development Organization) (UNIDO, 2013, 2019)[49] because of the intensification of R&D expenditures, technological accumulation and depth, and its impact on global manufacturing, which has been greater than that of any other developing country. On the other hand, however, the lack of international recognition of domestic brands and the high presence of foreign partners in China's

[49] See the industrial competitiveness ranking of China in *The Industrial Competitiveness of Nations,* UNIDO, (Vienna, 2013); and Competitive Industrial Performance Report 2018, UNIDO (2019).

market have led to an academic debate on whether excessive technological dependence is embedded in China and how state intervention might have forged this path dependence.

The automobile industry is the ideal case for studying this conundrum. While the Asian dragon has led the world in automobile production since 2009, with one-third of total output (OICA, 2020), indigenous Chinese manufacturers and their national branded cars have not yet gained enough competitiveness in markets across the board, nor have they received international recognition. Moreover, it is an industry that has received great attention from the Chinese government. The automobile industry was recognized as one of the pillars to be developed after the foundation of the People's Republic of China, and direct state intervention has been constant through policies and regulations regarding industry structures, internationalization strategies, and research and innovation programmes. Like other late-industrialized economies, initial state intervention and foreign assistance were crucial to setting this development in motion. However, what distinguished the Chinese case from its neighbours, South Korea and Japan, is that central and local governments maintained their participation in backbone automobile companies (Altenburg et al., 2008; Jenkins, 1991; Pavlínek, 2002). The Chinese government has followed a 'market for technology' strategy since 1978, when economic reforms started i.e., attract the technological expertise of foreign multinationals in return for market opportunities in China by establishing the mode of entry of foreign automobile manufacturers to China: they were to establish production subsidiaries with local companies, creating Sino-foreign joint ventures (see, for example, Chin, 2010; Harwit, 2001; Thun, 2006).

This chapter examines to what extent the Chinese government's 'market for technology' strategy has meant the rise of indigenous technological capability in China's automobile industry. 'Did Chinese carmakers become simply cheap assemblers employed by foreign auto manufacturers or have Sino-foreign JVs pushed local partners and domestic rivals to higher standards?' (Hu & Jefferson, 2008, p. 624). The hypothesis is that the catching up in this industry has resulted in positive output growth without achieving technological independence, showing the limits of the Chinese government's strategy. While the government and domestic automobile enterprises have leveraged foreign firms' access to the domestic market for their technology and managerial skills (Thun, 2004) domestic manufacturers are still seeking strategic partners and importing technology-intensive parts and accessories (CATARC & MOFCOM, 2019).

To test this hypothesis, this chapter looks first at the evolution of the 'market for technology' strategy of the Chinese government and its implications in the automobile sector, and then at the degree of technological independence achieved. We quantify technological dependence in the automotive industry for the period 2000 to 2018 by means of a novel indicator. Technological independence would manifest itself in a lower degree of 'foreignness' in either the domestic industry or in the final assembled car content, a higher share in markets across the board and stronger own-brand models in the global market. Additionally, progress with R&D would result in fewer royalty payments and more innovation patent applications abroad by Chinese residents. Technological dependence, conversely, would manifest itself in imports of key technology-intensive automobile components and industrial equipment. That makes sense as far as the main part of technology transferred to Chinese companies was channelized through ordinary market mechanisms known royalty payments for the right of license use, import of machinery, and FDI (foreign direct investment).[50] Essentially, the indicator we propose

[50] Despite part of the technology is being conducted through FDI, Chinese local companies still need to pay royalties and fees for transfers of technology and know-how in form of technical

is the result of the comparison of expenditure in purchasing foreign technology with national expenditure in developing in-house technology. The overall results call into question the general belief that the automobile industry in China was transitioning towards technological independence starting from the turn of the century. Nevertheless, they also indicate that an upward trend of technological dependence was reversed in 2015. This may well illustrate that persistent technological dependence in the production of classic (internal combustion) cars does not necessarily mean the same for the production of smart and environmentally friendly vehicles.

What follows is an account of the 'market for technology' strategy of the Chinese government and its application to technology transfer and FDI. It also aims to relate this strategy to China's process of catching up and development. Then this chapter presents the methodological approach to the novel indicator and describes the results. A robustness test is also provided. The chapter ends with conclusions and suggestions for further research.

3.2. Technology, state intervention and foreign direct investment

This chapter sits at the intersection of two theoretical debates regarding technological development: the one regarding the role of state intervention and the one on FDI as a source of technological diffusion. While explaining the logic of the 'market for technology' strategy of the Chinese government, these debates also help discern why such a strategy may not succeed in achieving technological independence. The literature on

services and consultancy, reason why in this thesis FDI and Sino-foreign joint ventures are segregated from the sectorial analysis. See more in Chapter 2.

developing countries' catching-up process has traditionally focused on economic convergence as a measure of success. Nevertheless, measuring progress this way may be misguiding because it does not consider innovation outcomes (Odagiri et al., 2010; Perez & Soete, 1988; A. Zhou, 1995). The dependency on foreign technology increases if domestic industry cannot create sufficient in-house innovation capacity or increase its absorption capacity in parallel (Gallagher, 2003; Long, 1996; C. Zhou, 2009). If China wants to be internationally competitive and lead technologically, domestic companies should enhance their own innovation and design capacity instead of relying on foreign partners.

China and other latecomers have gone faster and skipped some stages in the catching-up process, with technological solutions more easily copied and adapted from industrialized economies by host economies and newer technologies adopted more rapidly than old ones through cross-country variations (Comin & Hobijn, 2010; Schaefer, 2020). Nevertheless, the learning process takes time, and 'blind imitation' results in inflexible routines and a lack of effectiveness when facing market changes (Li & Kozhikode, 2008). Effective technology transfers entail both transfers of updated technology from foreign partners and indigenous R&D efforts to reinforce the absorption capacity.

While governments in catch-up countries usually try to both hasten the attraction of technology from developed countries and to enforce in-house technological innovation (Acemoglu, 2002; Fu & Gong, 2011; Lee et al., 2016), there is no consensus on the role of state intervention in the catching-up process. Gerschenkron (1962) argues that in case of market deficiencies, state intervention is key to developing strategic industries in pursuit of catching up. His legacy was continued by Abramowitz who focused on how state intervention may help reduce the technology gap between incumbents and followers (Abramovitz, 1986). Nevertheless, the conclusions reached by the large group of academics that have researched the effects of state intervention in the industries of latecomers are not clear-cut (Balassa, 1981; Bremmer, 2009; Cazurra et al., 2014). The role of the Chinese state has been relevant considering its contributions and drawbacks. In general, state intervention in economic progress was unsatisfactory during Maoism. Industrial policy design and production suffered from the shocks of political instability. In the post-Mao era, both China's economy and its industry have grown rapidly, but based on the attraction of foreign capital and technology, which has created technological dependence.

In the case of Chinese automobiles, both technical and capital assistance from communist allies were crucial at the beginning (under Mao Zedong's leadership). Nevertheless, after three decades of a highly controlled industrial model, based on the construction of trucks and vehicles for military use, in the late 1970s Deng Xiaoping's government shifted production to the manufacture of passenger cars and liberalized the domestic market (Guang, 2020; Zhang, 2019), both permitting the entry of foreign enterprises and allowing the creation of non-state-owned companies. The entry of FDI was allowed through the creation of equity joint ventures with a Chinese company. This 'market for technology' strategy to capture FDI and foreign expertise in exchange for domestic market share has persisted over time, leading to various joint-venture waves despite the tough conditions imposed by the government.

In the late 1970s, the entry of foreign automobile companies through joint ventures had to comply some restrictive conditions (see Chapter 2). Despite the conditions, according to investments registered in *History of China's Automotive Industry 1990-2010* (CATARC & MOFCOM, 2014), the first wave of Sino-foreign joint ventures took place from 1983 to 1991. It was mainly the result of China's state-owned automobile enterprises attracting FDI from manufacturers in developed countries of European region, such as the Volkswagen Group and Peugeot-Citröen (or PSA Group). Automobile companies from other developed countries, mostly the United States and Japan, came later and with a more cautious strategy.

The second wave of Sino-foreign joint ventures took place in the early 1990s, when economic reforms were strengthened with Deng's Southern Journey in 1992. The 1994 Policy on Automobile Industry Development was the first official policy to directly target the structure of automobile manufacturing in China (SDPC, 1994). This policy brought together the regulations that were already in practice regarding joint ventures, permitted more enterprises to establish foreign affiliates and further promoted domestic liberalization. Known also as the period of 'Zhu Ronji's agenda' of economic restructuring, industrial policy efforts were supported by extended financial, legal and intermediary institutions (Heilmann & Shih, 2013) and designated firms (whose numbers grew) were allowed to deal directly with foreign companies (Vogel, 2011). The new wave of Sino-foreign joint ventures was a largely Japanese one. Japanese manufacturers seemed to switch their internationalization strategies in China as they rapidly began establishing production subsidiaries in the country. For instance, Toyota, Nissan, Honda, Isuzu and Suzuki all created new entities with local partners (CATARC & MOFCOM, 2014).[51]

A third wave of joint ventures took place after China's accession to the World Trade Organization (WTO) in 2001.[52] The latter meant a reduction in tariffs and a general opening to investment in the Chinese economy. In the automobile sector, import tariffs

[51] See more about equity joint ventures before 2001 in Chapter 2.

[52] See more about equity joint ventures after WTO membership in Chapter 4.

on passenger cars fell to 25 percent by 2006, a significant change given that the industry had previously been highly protected, with import tariffs of up to 200 percent (China Customs, 2018). Moreover, while the automobile industry was still affected by the limitation of 50 percent of foreign participation (Nolan, 2001), the number of Sino-foreign joint ventures grew at a higher pace than that in the previous period (CATARC & MOFCOM, 2014). While China attracted 114.17 billion USD in FDI from 1991 to 1995, since 1995 it has attracted over 40 billion USD annually (NBS, 2020).

The Chinese government strategy of 'market for technology' from the 1970s onwards makes sense due to the role of FDI as a source of technology, as a latecomer, China pursued to access advanced technologies, well-established brands, and managerial know-how. Multinational companies have incentives to internationalize by transferring technology across the board and sharing it with their subsidiaries (Markusen & Venables, 1998). Transfers of technology take place from multinationals to their subsidiaries due to both access barriers to knowledge and the technological gap between incumbents and latecomers (Buckley et al., 2007; Liu et al., 2020; Neven & Siotis, 1996). Hence, multinationals are regarded as the major drivers of capital and R&D, and FDI is recognized as the main vehicle for transferring technology from developed to developing countries (Dunning & Lundan, 2008, 2009). Yet, as Gabriele (2020) pointed out, FDI per se as a technology conveyor should not be overestimated because it is contingent on the indigenous absorption capacity through S&T system upgrading and modernisation of domestic enterprises.

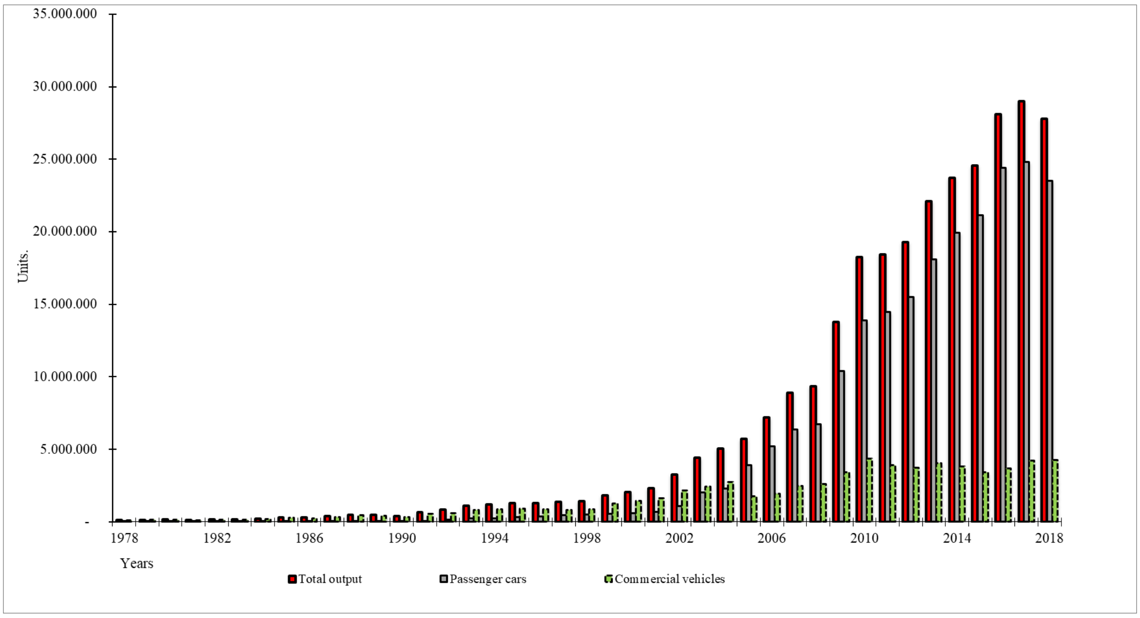
Theoretically, FDI may have two opposite impacts on host-country firms (Aitken & Harrison, 1999). On the negative side, it may reduce the productivity of indigenous firms. Research carried out for developing countries like India (Malerba & Nelson, 2011), Venezuela (Aitken & Harrison, 1999) or East European countries (Djankov & Hoekman,

2000) shows that manufacturing sectors can be negatively affected by the entry of FDI because the entry of more competitive enterprises disincentivizes investment activities. The so-called 'cannibalization effect' entails a negative correlation between foreign investments and indigenous technological innovation capacity, especially when foreign subsidiaries introduce strong competition and disincentivize local R&D efforts (Howell, 2018; Hu et al., 2005; Ramachandran, 1993).

FDI, however, can also have a positive impact on domestic companies by increasing technological diffusion. Technology transfers through FDI can create complementary relationships between in-house R&D and imported technology (Andreosso-O'Callaghan & Qian, 1999; Griffith et al., 2003; Hu et al., 2005) particularly investments in technology-intensive assets (Neven & Siotis, 1996). If inward FDI is a conductor of technology, then it can contribute to the economic growth and development of the country of destination (Buckley, 2002; Liu et al., 2020; Wang, 2003). Hence the government's role in emerging economies tends to be FDI policy-oriented (Eun & Lee, 2002; Sit & Liu, 1997), seeking joint ventures to reduce the cost to domestic firms of acquiring technology and guaranteeing control of technology transfers by local partners.

Empirical studies have found a positive relationship between R&D and foreign firms in China's manufacturing industries showing that the intensity of domestic innovation has increased. Nevertheless, there are important variations regarding competitiveness across sectors (Cohen & Levinthal, 1989; Mathews, 2006). For example, the telecommunications equipment industry and the automobile industry experienced different learning processes, even though in both cases foreign investment and state intervention were used to promote development (Fan, 2006; He & Mu, 2012; Mu & Lee, 2005). In the former, the private company Huawei that began receiving government support in the early 2000s leapfrogged global industry leaders in terms of revenues and patent grants following a strategy focused on developing in-house innovation capability (Anwar & Sun, 2013; Z. L. He et al., 2006; Schaefer, 2020). In the case of automobile production in China, the entry of FDI enhanced economies of scale and production increased notably. However, *de facto* control might differ from theoretical control because foreign partners are reluctant to transfer up-to-date technology.

Figure 3.1. China's automobile output total and by main categories, 1978–2018



Source: Author's own elaboration based on *China's Automotive Industry Yearbooks* by China Automotive Technology and Research Center (CATARC) and China's Association of Automobile Manufacturers (CAAM) (*various issues*).

The progressive opening up of the Chinese automobile market to foreign investment was clearly very successful in terms of domestic production. The most important growth in automobile production took place at the turn of the millennium: as Figure 3.1. shows, total output increased by 17 percent year on year from 2001 to 2018. From 2006 to 2009, total output tripled from 5.7 to 17 million automobiles, and from 2010 to 2018, it rose from 18 to 29 million. Production categories also experienced an important shift since passenger cars went from representing one-third of total output in

2000 to 80 percent in 2018. By contrast, production in developed countries in Western Europe, the USA and Japan contracted during the global economic crisis of 2008 (OICA, 2020).

Regarding S&T, the central government intensified its intervention in the industry and its efforts regarding R&D activities at the turn of the century (Chen & Naughton 2016). In 2004, the State Council announced that a new Automotive Industry Development Policy was to replace the earlier policy from 1994 (NDRC, 2004). While the general conditions of the previous policy remained, the 2004 policy aimed to restructure and upgrade the automobile industry after accession to the WTO. Regarding technology and strategic partnership, the policy highlights the principle of combining foreign technology and indigenous independent capacities, actively cooperating internationally while generating new products that entail intellectual property rights. The policy also emphasizes the creation of indigenous brands that can compete in international markets. To achieve those aims, the government stipulated that investment projects concerning new automobile production enterprises should comply with certain new conditions: the total project amount should not be less than RMB 2 billion (of which no less than RMB 800 million in capital) and no less than RMB 500 million should be earmarked for R&D (CATARC & CAAM, 2005).

Last but not least, the condition of the exchange rate balance of automobile enterprises was removed due to WTO membership. In the same period, China's Fuel Economy Standard (FES) was issued, reducing the technological gaps between vehicles sold in China and those sold in advanced economies. Featured in the list of 16 'Megaprojects' drawn up in 2006 as part of the National Medium- and Long-Term Program for Science and Technology Development (2006-2020) (Cao et al., 2006; Chen & Naughton, 2016), China's FES limits fuel consumption by the weight the of gasoline or diesel vehicle and thus the greenhouse gas emissions from the automobile sector. China was the first developing country to adopt a national FES for passenger cars, while developed economies, such as the USA, Japan, Canada, South Korea and Australia, had officially adopted FES from former voluntary agreements.[53]

In 2009, in response to the global economic crisis, the Chinese government issued a document entitled 'Planning for the Restructuring and Revitalization of the Automobile Industry 2009-2011', also known as the 'Auto Stimulus Program', which enhanced and expanded the 2004 Auto Policy (NDRC, 2004). Fundamental objectives included the pursuit of production concentrations, the promotion of hybrid vehicles, and investment in R&D activities to encourage the development of NEVs. The programme was followed by initiatives such as the New Energy Saving Protocol and the New Energy Vehicle Development Organization 2012-2020 (State Council, 2012). The aim was clearly the upgrading of China's automobiles in the global value chain to getting ready for the new automobile industry revolution: China was transitioning from high-speed growth to medium-high growth with higher quality in manufacturing activities (Guo et al., 2020). This was just aligned with China's 'new normal' phase that began in 2012, the same year when 18th National Congress of the Communist Party of China celebrated.

In that line, in 2010 a 'Strategic Emerging Industries' programme was launched to fund and promote investment in new industries in seven key areas of technology, including those related to energy saving and environmental protection, the new generation of information technology, high-end biological equipment manufacturing, new forms of energy, new materials, and new energy automobiles. Years later, in 2015, the 'Made in China 2025' strategy identified 10 strategic sectors for promotion, including NEVs and

[53] See more details of S&T programmes in Appendices C.1 and technology policies in Appendices C.2.

smart vehicles again, with the aim of leapfrogging the global politics of the renewable energy of traditional technology leaders (Chinese Government, 2015; Albert, 2022).[54] Development strategies followed the policies set out in the five-year plans, as set out in Table 3.1.

While continuing to attract foreign expertise through FDI, China has been increasingly looking for strategic partnerships and to promote domestic innovation. In fact, it is prepared to reduce the equity barriers with foreign partners. In 2018, the National Development and Reform Commission (NDRC) announced the introduction of flexibility regarding foreign participation limits in China's automobile industry by 2023, after which foreign partners will be allowed to own more than 50 percent of a newly constituted company in China (Chipman, 2018).To summarize, Sino-foreign joint ventures have helped the automobile industry in China to consolidate as the world's top automobile producer and the Chinese government has tried to enhance domestic S&T. In the last decade, most of these efforts have focused in NEVs. Yet, the S&T results of applying the 'market for technology' strategy in the automobile sector in China are still a matter of debate. Some authors argue that the joint-venture strategy contributed to China's ascent to becoming the world leader in manufacturing because it stimulated the combination of exports of high-technology goods and in-house innovation capacity (Cao et al., 2006). Others, however, argue that instead of creating more R&D capacity, this Chinese growth model has tended to create a more 'passive' learning mode in the automobile industry (Nam, 2011). The aim of the next section of this chapter is to help answer this question.

[54] See more details of the programme Appendices C.1

Table 3.1. Timing of China's policy changes in automobile industry (five-year plans)

Five-year Plan	Period	Guidelines
1st - 4th FYP	1953-1975	Focus on commercial vehicles.
5th FYP	1976-1980	Passenger cars began to be included as production category.
6th – 7th FYP	1981-1990	Passenger cars need to be produced in China.
8th FYP	1991-1995	Strengthen passenger car and passenger cars' parts and accessories production, increase national content, FAW, SAW and SAIC to build foreign equity JV.
9th FYP	1996-2000	Continue developing automobile industry as a pillar industry.
10th FYP	2001-2005	Increase manufacturing capacity and the quality of passenger cars and parts and accessories.
11th FYP	2006-2010	Support to NEV development and international production cooperation.
12th FYP	2011-2015	Support to R&D activities in energy efficiency, indigenous capacity, production of NEVs and hybrid vehicles.
13th FYP	2016-2020	Further develop indigenous intellectual property-made engines, electronic parts and related accessories; encourage the use of environmentally friendly and new energy vehicles.
14th FYP	2021-2025	Encourage the use of environmentally friendly and smart vehicles, management and consumption innovation.

Source: Author's own elaboration

3.3. A comprehensive technological dependence indicator

The technological dependence indicator (TDI) of China's automobile production (from the late 1990s to 2018) proposed here was designed taking into account previous research on the subject. Pietrobelli (1996) states that technology can be transferred between firms and countries via different channels, whether through movements of goods (international trade), capital (inward and outward FDI) or people (movement of human capital), or through international research collaboration. By so doing, his research indicates that international trade may help measure technological dependence. Following this path, (Chen & Naughton, 2016, p. 47) later argued that when total expenditure on purchasing foreign technology falls while expenditure on domestic R&D increases, technological dependence declines. They showed how the relationship between domestic R&D and imports of foreign technology changed in China from 2003 to 2012. Translating their logic into an equation (from now on the basic equation), we have that the TDI at moment *t* would be the result of dividing the expenditure on purchasing foreign technology (TE) at that moment by the total amount expended in technology, that is, TE and the expenditure on national research and development (R&D):

$$TDI_t = \frac{TE_t}{(TE_t + \ R\&D_t)}$$

This indicator builds on this equation, but we use a broader conceptualization of TE, and thus of 'dependence', by including both international royalty payments and investments in fixed assets. The former is included because while imports of technology at the sector level are usually split into two main categories, hard and soft (Zhao, 2007), TE in the classical TDI only includes the hard category, that is, industrial machinery and equipment, chassis fitted with engines, parts and accessories, and complete motor vehicles, among other parts. Including royalty payments in the equation, therefore, is a way to capture the soft category of TE, that is, licence payments, technological services, technological consultancy, and co-production.

Investments in fixed assets are included to capture the annual expenditure of the domestic automobile sector to increase or maintain up-to-date production capacity. The FA value included in the equation is after yearly amortization and is an aggregate from the automobile sector, i.e., most representative automotive companies in China. While TE in the basic TDI includes the imports of hard items, it does not include all investment in fixed assets. This is a problem for two reasons. First, long-term assets, basically machinery and industrial equipment, are used in production activities, and in the automobile industry those items and other capital goods, such as robots, account for the main share of a company's immobilized investment; robotic automatization equipment is disrupting technology globally, as robots have become the main category of fixed assets. This information is corroborated by looking at the various annual reports of Ford, General Motors and Shanghai Automotive Industry Company. Secondly, the automobile industry is both capital- and technology-intensive, requiring relentless investment in capital and technology to maintain its quality standards and economies of scale. The previous equation is thus improved by adding royalty payments (Roy) both in the numerator and in the denominator, and fixed assets (FA) in the denominator. FA is included only in the denominator because imports of industrial machinery are already considered within the TE. This new equation can be called the comprehensive TDI or CTDI:

$$CTDI_t = \frac{(TE_t + Roy_t)}{(TE_t + \ FA_t + Roy_t + \ R\&D_t)}$$

The data sources I use to operationalize both the basic TDI and the CTDI can be classified according to whether they are official or derive from Chinese institutions. The main part of the data used has been obtained from CAIYs by China's Automotive Technology and Research Centre (CATARC) and China's Automotive Association Manufacturers (CAAM). The international Comtrade United Nations database was also mined to collect global trade statistics. The consistency between both datasets was confirmed by comparing Comtrade with 'China-autos'. The latter is produced by the Centre of Studies China-Mexico (CECHIMEX-UNAM, 2021), which filters data from the General Customs Administration of China. Having tracked the main automobile-manufacturing countries and the most relevant groups of items for the last two decades, any significant differences between these databases was found thus both are used interchangeably for the years 1997-2018.

To quantify the expenditure on purchasing foreign technology through hard items (TE), we extract the import value from Comtrade and weight it for the automobile industry according to the automobile industry's value in relation to total industrial output.[55] It is not a perfect measure because while imports of finished vehicles and parts and accessories are needed to obtain technology, learning and assimilation are also required, however this part of expenditure is rarely explicitly registered by companies (Coe & Helpman, 1995; Fagerberg, 1994; Freeman & Soete, 1997). In principle, therefore, technology transfers require taking absorption costs into account (Wu et al., 2016). Unfortunately, this limitation still affects this research because adaptation costs are not directly recorded by companies in their financial statements. Royalty payments (Roy) consist of purchasing expenditure that compensates owners for the use of intellectual property (patents) or payments through licence agreements. Owing to statistical limitations and the lack of consistency on soft imports of technology between datasets from the Almanac of China's Foreign Economic Relations and Trade, Roy are used as proxies to quantify the expenditure on purchasing foreign technology through soft items. We use official data on the balance of payments by SAFE (State Administration of Foreign Exchange), which also coincides with the World Bank's database. Charges of intellectual property in the case of automobiles are weighted total payments based on the share of the automobile industry output in total industrial output.

[55] Conducting an analysis that considers every part and accessory of which a car is composed is beyond the scope of this research, but the most relevant parts are included.

Investment in fixed assets (FA) is the annual expenditure of the automobile sector and the increase in production capacity that can be obtained through both imports of hard technology and by building up one's own capital goods in the forms of machinery or robots. As explained before, this makes special sense for the automobile industry as assembly lines become progressively more automated. Automobile investment in fixed assets is compiled from CAIY 2016 and 2018. In addition, for the robustness check we also utilize the China National Intellectual Property Administration (CNIPA, 2019)[56] to construct datasets of patent applications and grants.[57] The National Bureau of Statistics (NBS) of the Ministry of Science and Technology of China and reports from potential automobile countries and members of the International Organization for Motor Vehicle Manufacturers (OICA) are also consulted to complete the analysis.

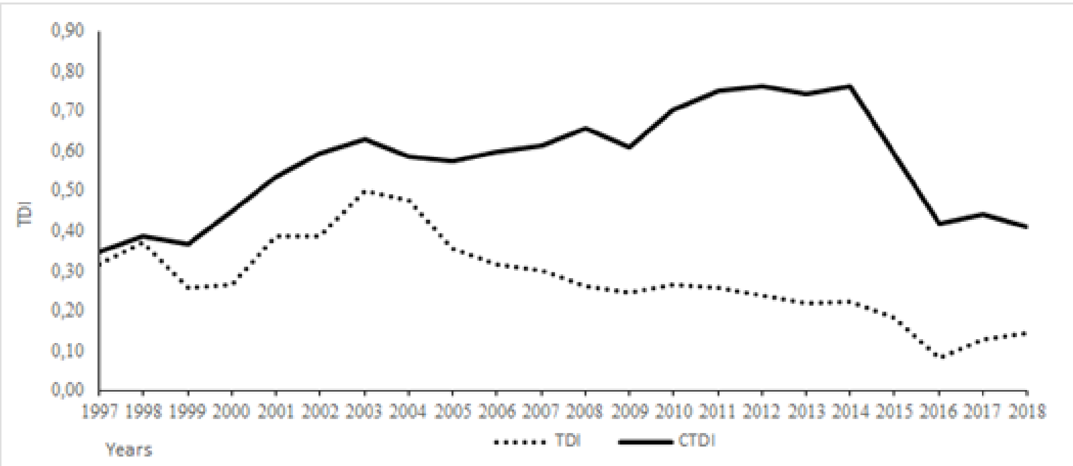
Lastly, National R&D expenditure is frequently expressed as GERD (Gross Domestic Expenditure on R&D), which captures all spending on R&D carried out within an economy according to technical notes in Main Science and Technology Indicators (OECD, 2019). Following the same logic, R&D in the automobile industry is the annual amount of expenditure on R&D made by China's automobile sector. I do not distinguish among different forms of ownership of expenditure (state-owned or privately-owned, fully indigenous or joint venture) since the objective is to capture all expenditure in R&D. This expenditure in the automobile industry is collected from CAIY (various issues) and converted to USD at current rates. For the years 1997 to 2001, R&D expenditure is computed from investment in R&D over total sector income. Since the data are obtained from the same source, there is no need to check for constancy.

[56] Formerly the State Intellectual Property Office (SIPO).

[57] Group of patents in B60 "一般车辆" [common automobile] is taken according to CNIPA's classification.

All in all, the results show that both the basic and comprehensive indicators have a similar evolution from 1997 to 2004. From 2004 to 2015, however, CTDI shows an upward slope of technological dependence, while TDI in Figure 3.2. shows a falling trend. The basic indicator results are compatible with the general decrease in technological dependence for China found in Chen and Naughton (2016). Nevertheless, the CTDI indicates that the level of technological dependence captured by the basic indicator is artificially low because it ignores both expenditure on imports of soft technology and investment in production capacity (fixed assets). When these other variables are taken into consideration, the level of dependence increases, calling into question the success of the Chinese government's 'market for technology' strategy in the automobile industry.

Figure 3.2. Technological independence indicator, 1997–2018



Source: Author's own elaboration.

The indicator is bounded (0-1), so it allows interpretation quantitatively that otherwise would not. 0 means absolute autonomy while 1 indicates null technology capacity of assemblers in China. The results of the CTDI reveal that the response to China's integration into the global market (entry into WTO) was insufficient to improve technological independence. From 2003 to 2009, the dependence level was stable at around 0.6 even though domestic automobile manufacturers increased R&D expenditure and benefited from the government support of innovation efforts through the Medium- and Long-Term Program for Science and Technology Development (2006-2020). The CTDI also signals that the increase in technological dependence from 2009 to 2014 to around 0.8 may be explained by an increase in domestic automobile output, which led to more imports of basic accessories, parts and industrial machinery. In short, the CTDI suggests that the strategy of 'market for technology' was not as successful as the basic indicator indicates. Nevertheless, the CTDI results also show that things started to change in 2015-2016, at the time of the launch of the 'Made in China 2025' programme and of the development of smart and environmentally friendly vehicles.

3.4. Robustness of the indicator

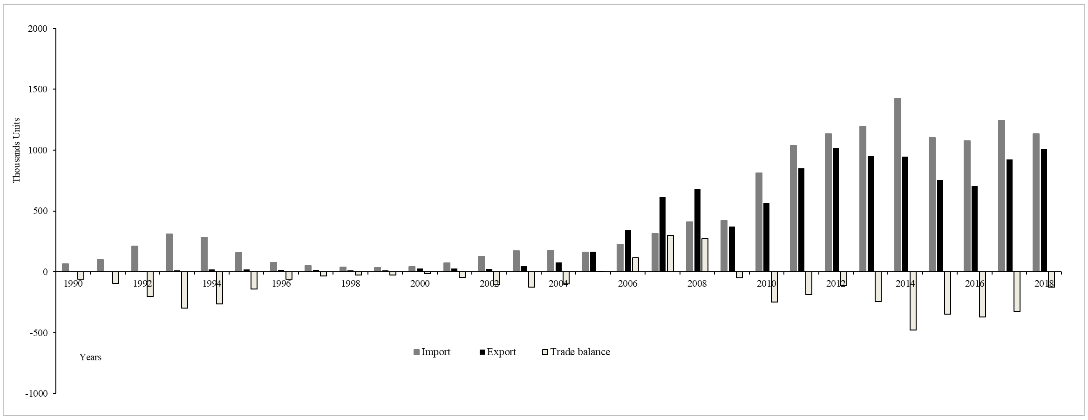
This section evidences that the CTDI better captures the evolution of technological dependence than the TDI. First, the section reveals that without including Roy and FA, the impact of R&D in technological dependence is overestimated. Second, it shows that the results obtained with the CTDI are consistent with the data on the relevance of joint ventures in the sector. Third, there are signs that continued technological dependence in the production of classic cars does not necessarily imply that the same will be true for the production of smart and environmentally friendly vehicles, explaining the only change in the upward trend of CTDI in 2015.

The basic TDI focuses on two variables: TE and R&D. Considering the evolution of both, it is normal that this indicator offers a more optimist view of the decrease in technological dependence. China's exports and imports have been negligible compared to domestic production and consumption. The weight of export units to total domestic output has remained at 3-4 percent on a yearly average and the weight for imports at 8 percent on a yearly.[58] Focusing further on exports, China's automobile exports have been a small part of global trade for decades, even after its industry became the world's top car producer in 2009. In the 1980s, few commercial vehicles were exported to nearby developing Asian countries or to developing regions of Latin America and Africa (CATARC, 1994). Regarding passenger cars, China was unable to export more than a couple thousand to developing regions in Asia and the Middle East, given that national production was not enough to meet increasing domestic demand during the 1990s.

As Figure 3.3. shows, China started exporting cars regularly after it joined the WTO in 2001 and its automobile industry opened itself up to global markets. Despite that, however, its trade balance in units has been negative almost every year. China accumulated 10 million automobiles exported and 15 million automobiles imported in 2018. Only in commercial vehicles did export units surpass import units from 1997 onwards, though imports exceeded exports in 2017-2018. It is not only the trade balance in units that was negative for decades. In value the deficit is even more pronounced (United Nations, 2021). These trade results indicate that China's core production may have been domestically oriented due to its market size (Dussel, 2019).

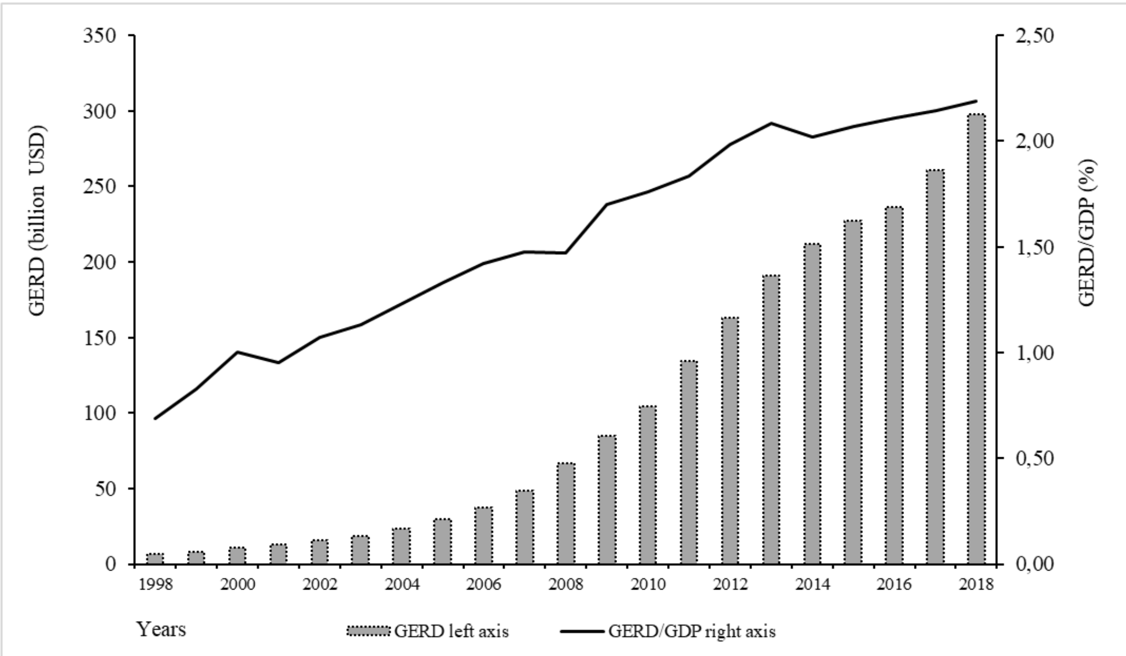
[58] Based on Chinese Automotive Industry Yearbook (various issues) by CATARC and CAAM.

Figure 3.3. Import and export of automobiles, 1990-2018 (units of complete vehicles)



Source: Chinese Automotive Industry Yearbook (various issues).

Figure 3.4. China's gross expenditure on R&D, 1998-2018



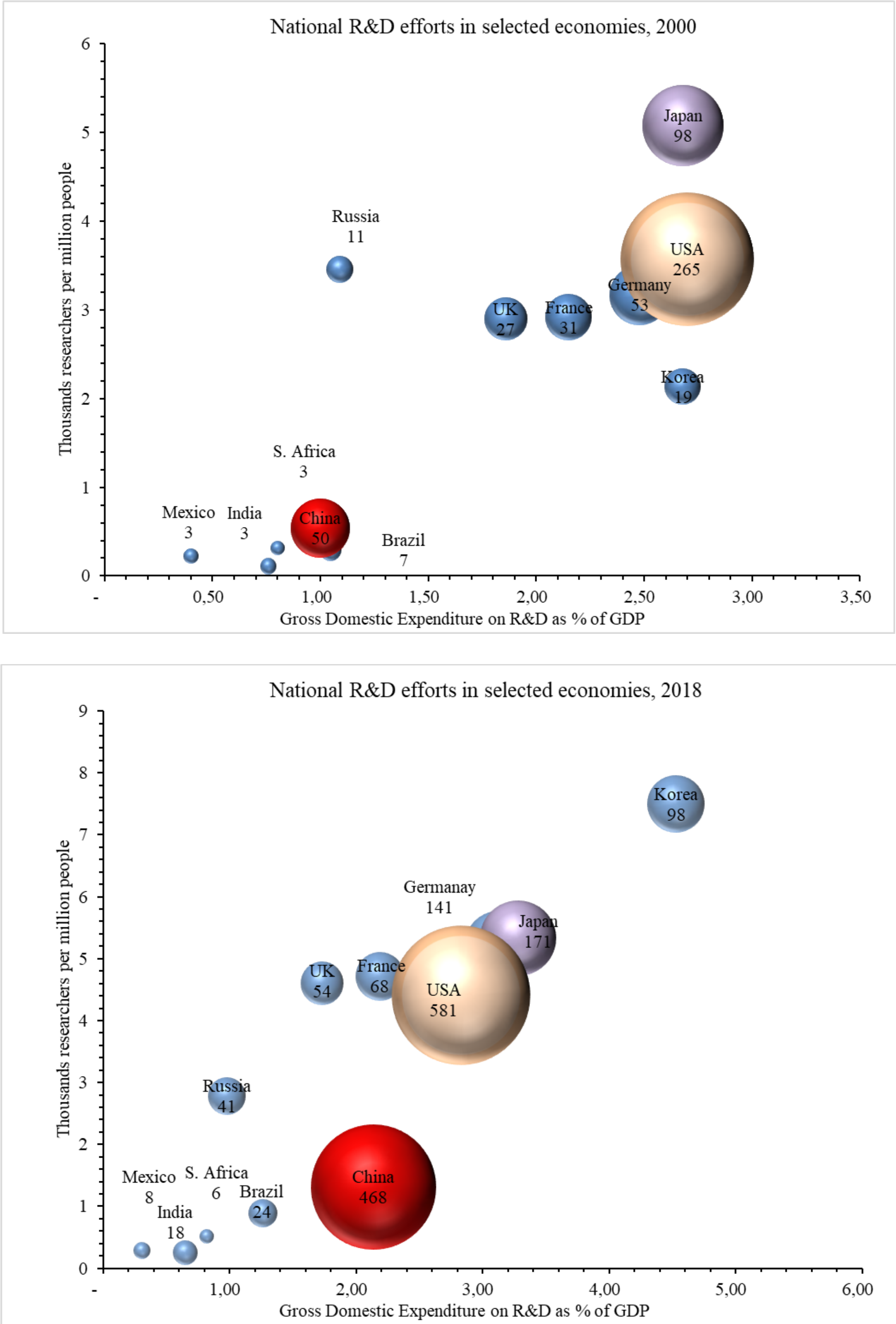
Source: Author's own elaboration based on OECD Main Science and Technology Indicators.

Contrasting with the stability of the trade variable, China's efforts in S&T have intensified over the last 30 years, which is reflected in several national programmes that provided a long-term consistent institutional base for national R&D activities. The most comprehensive and frequently reported measures of innovation efforts in the National Innovation System are the ratio of R&D expenditure to GDP and GERD over GDP, as well as the proportion of scientists and engineers in the total population and the share of R&D dedicated to basic research. In the case of China, all three have increased above the OECD countries' average and, as Kennedy (2016) shows, surpassed by far India. Figure 3.4. shows that China's GERD has steadily grown since the late 1990s and accelerated from 2003. From 2000 to 2018, total national R&D expenditure increased 30 times, while in the same period GERD over GDP increased from 0.6 to 2.2 percent. Most OECD economies lay in the same range of 2-3 percent, but South Korea, Germany and Japan stand out by allocating above 3 percent of GDP (UNIDO, 2019). Figure 3.5. shows how China has surpassed all countries in absolute terms of R&D expenditures with the exception of the USA, although in relative terms it still follows behind many industrialized countries. Finally, in 2000 the ratio of scientists and engineers per million of the population was only 539. This ratio increased to 1307 in 2018. Despite being notably lower than those of Japan (5331), the USA (4412), France (4715) and South Korea (7498), it well exceeds that of emerging economies such as India (253) or Mexico (281).

Both the evolution of Roy and of FA indicate that the basic indicator (the TDI) is overestimating the improvements in technology in China's automobile industry by giving too much weight to R&D expenditure. Despite the notorious increase in R&D investment and the growth of patent grants, China is still a country with a deficit balance as far as the payment of royalties is concerned. The amount of royalties paid are expenditures, while the amount received denotes the innovation capacity of a National System of Innovation (Freeman & Soete, 1997) and are direct results of patent creation. As shown in Figure 3.6., the level of payments received from intellectual property has remained low, whereas royalties charged have been high. China imports more technology than it exports and remains dependent on foreign technology. Royalty payments received for intellectual property were between 5-15 percent over the total payments made by China. In addition, the payments received did not experience any important growth until 2016 even though patent applications and patent grants accelerated from the 1990s (CATARC & CAAM, 2016)

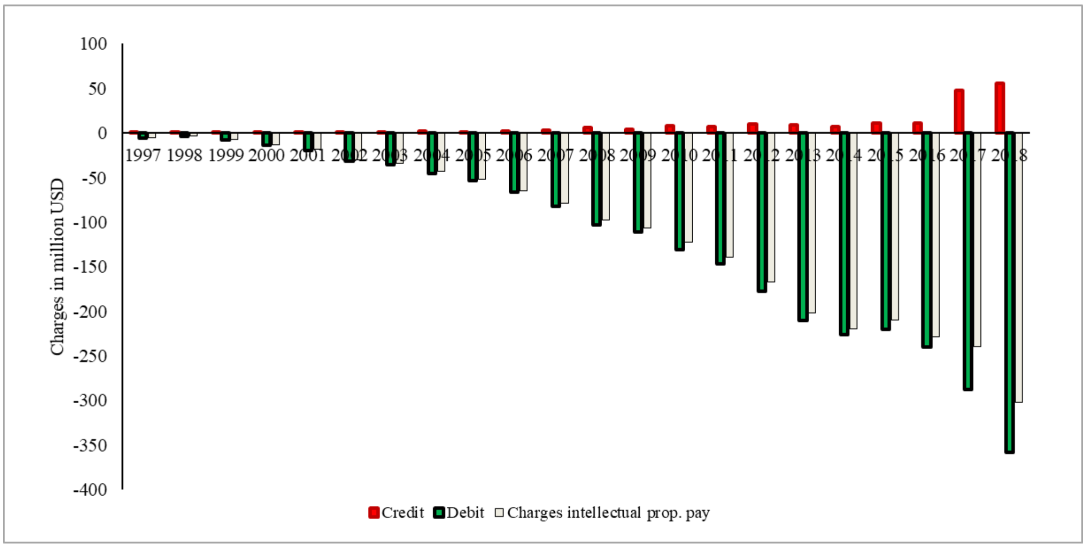
The data on FA further confirm that the R&D variable cannot be taken at face value. Patent applications have been treated as results of technology changes within a country (Basberg, 1987). Latecomers who are catching up with developed economies are expected to invest in R&D to increase their number of patents. In China, the total number of patents granted expanded in 2003 and rose sharply after 2014. Regarding the automobile industry, as shown in Figure 3.7., total patent grants follow a similar evolution to the national total, but there is a dominance of utility model patents over inventions. Invention patents require higher standards of novelty, and utility applications employ mainly adaptations of existing technology, either imported or transferred. Hence a large amount of patenting activities in China came from the replication and adaption of foreign-based technology (Kennedy, 2016). Furthermore, in 2018, half of patent applicants were from foreign-based R&D centres or automobile enterprises in China. For example, Ford, Honda, Robert Bosch, Hyundai and GM were the top five companies that applied for patents in 2018 (CATARC & CAAM, 2018). All in all, the technological leaders—the USA, Japan, Germany and South Korea – shared 40 percent of total patent applicants in China.

Figure 3.5. National R&D efforts in selected economies



Sources: Author's own elaboration based on World Development Indicator (World Bank, 2020); Science and Technology Main Indicators (OECD Statistics, 2021).
Notes: the bubbles show gross expenditure of R&D in billion USD.

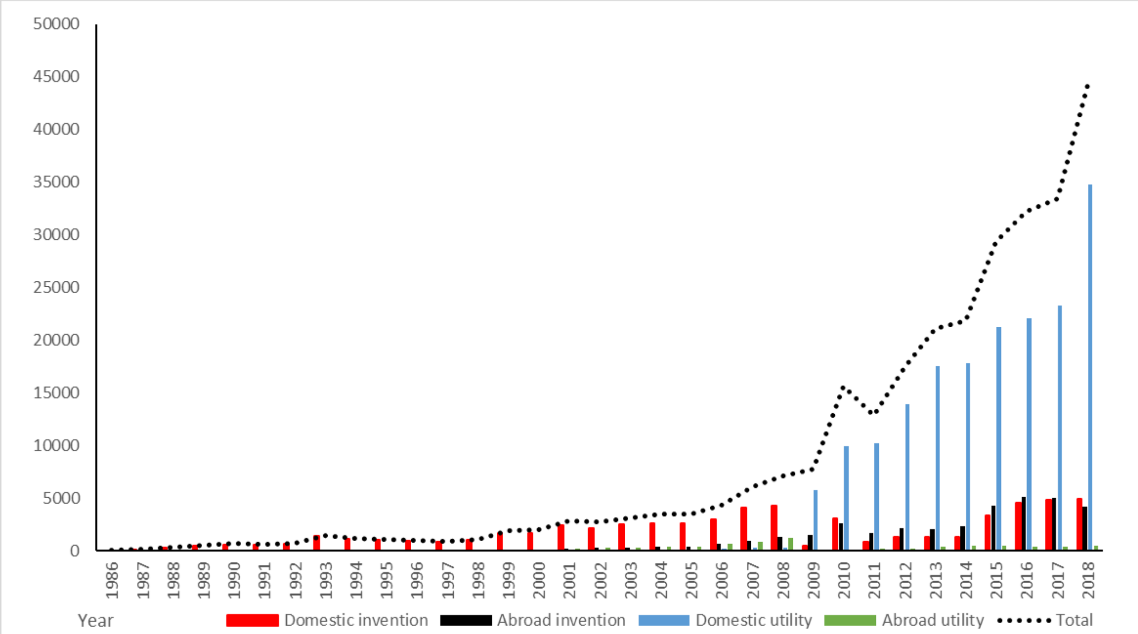
Figure 3.6. Royalty payments for intellectual property used in China, 1997-2018



Source: Balance of Payments of China, State Administration of Foreign Exchange (SAFE).

Another piece of evidence in favour of the results obtained with the CTDI is that they are consistent with the data on the relevance of joint ventures in the Chinese automobile industry. Foreign investment has been central to automobile sector development because each core project has been related to a newly constituted joint venture with a foreign company (Wang, 2003). In the 1990s, over 95 percent of the Chinese market's demand was fulfilled by domestic-produced volume, of which two-thirds was produced by joint ventures. In 2018, as shown in Tables 3.2. and Table 3.3., half of the joint-venture share still came out of total domestic production. Among them, China's Big Three (First Automotive Works, Dongfeng and Shanghai Automobile Industry Company) are all state-owned backbone companies and have joint ventures with traditional foreign automobile manufacturers like Volkswagen or General Motors. They rank among the world's top 25 manufacturers (OICA, 2020).

Figure 3.7. Patent grants for invention and utility model by origin of applicant, 1986-2018



Source: Author's own elaboration based on CNIPA.
Notes: Class of IPC B60 common vehicles are illustrated.

The main technology source of automobile clusters comes from foreign partners, as can be observed in Table 3.2. The positive correlation between FDI distribution through Sino-foreign joint-venture creation, cluster formation (Liu & Dicken, 2006) and R&D intensification (Wei et al., 2002) is evidenced by the distribution of the main automobile production cities in China, which coincides with the national R&D-intensive regions listed.[59] The Zhu San Jiao region represents 18.42 percent of total national output. Its main technology sources are Nissan, Isuzu, Toyota, Mitsubishi, Fiat and Daimler Chrysler. Similarly, the Chang San Jiao region has long tradition joint ventures and its technology sources are mainly Volkswagen, General Motors, Kia and Fiat.

[59] The R&D intensity of these regions is 1.4 percent. Author's own calculation based on CATARC and CAAM (2018, p.431).

Table 3.2. Automobile clusters in China by output and R&D intensity in 2018

Region	Locations	Joint Ventures	Main technology source	Output share to total (%)	R&D intensity (% to income)
Chang San Jiao (长三角)	Shanghai, Suzhou, Nanjing, Hangzhou	Shanghai Volkswagen, Shanghai GM, Shanghai GM Wuling, Dongfeng Yueda-Kia, Naveco, Nanjing Fiat, Yaxing Benz, Changan Mazda, and Dongfeng Yulong	Volkswagen, General Motors, Kia, Fiat	11,5	2,08
Zhu San Jiao （珠三角）	Guangdong, Shenzhen	Dongfeng Nissan Diesel, Guangqi Honda, Guangzhou Isuzu, Guangzhou Toyota, Dongfeng Nissan, GAC Hino, Shenzhen BYD Daimler, Guangzhou Mitsubishi, Guangzhou Fiat Chrysler	Nissan, Isuzu, Toyota, Fiat, Daimler Chrysler, Mitsubishi	18,42	1,62
Huang Bo Hai （黄渤海）	Beijing, Tianjin	Beijing Jeep, Tianjin FAW Toyota, Beijing Hyundai, Beijing Benz, Beijing Foton Daimler	Jeep, Toyota, Hyundai, Daimler Chrysler	7,17	1,55
Northeast	Changchun, Shenyang, Liaoning	FAW-Volkswagen, FAW-Audi, FAW-Mazda, FAW GM, Tianjin FAW-Toyota, Brilliance BWM	Volkswagen, BWM, Toyota, GM	7,82	1,44
Hua Zhong (华中)	Wuhan	Shenlong, Zhengzhou Nissan, Dongfeng Honda	PSA, Nissan, Honda	5,99	2,43
Southwest	Chengdu, Chongqing	Qingling Isuzu, Chongqing Changan-Suzuki, Changnan-Ford, Changan Peugeot Citroën, Daqing Volvo	Isuzu, Ford, PSA, Volvo	10,52	2,05

Source: Author's elaboration based on Liu & Yeung (2006), Liu & Dicken (2008); for output share, China's Automotive Industry Yearbook 2018. Notes: main Sino-foreign joint ventures updated to 2018 in China. R&D intensity is average ratio of expenditure to total income.

Table 3.3. Automobile companies in China by output (top 20, selected years)

Year	2000			2010			2018		
Ranking	Company	Output (units)	Share (%)	Company	Output (units)	Share (%)	Company	Output (units)	Share (%)
1st	SAIC-VW	221.524	10,7	SAIC-GM Wuling	1.252.888	6,9	SAIC-VW	2.077.006	7,5
2nd	Dongfeng	210.937	10,2	SAIC-VW	1.017.249	3,7	FAW-VW	2.018.497	7,3
3rd	FAW	210.178	10,2	BAIC-Hyundai	704.441	2,5	SAIC-GM Wuling	1.955.353	7,0
4th	Changan	203.127	9,8	BAIC Foton	695.445	2,5	Zhejiang Geely	1.457.795	5,2
5th	Harbin Hafei	122.007	5,9	Chery	691.924	2,5	Dongfeng Automobile	1.287.559	4,6
6th	Wuling	111.508	5,4	Donfeng-Nissan	673.838	2,4	SAIC-GM	1.246.111	4,5
7th	FAW-VW	110.006	5,3	Chongqing Changan	584.238	2,1	Great Wall	1.053.174	3,8
8th	CAIG	103.233	5,0	BYD	521.232	1,9	Chongqing Changan	1.038.782	3,7
9th	BAIC Beijing Foton Motor	83.815	4,1	SAIC-GM	513.180	1,8	BAIC-Hyundai	794.000	2,9
10th	Tianjin FAW-Xiali	81.951	4,0	Tianjing FAW-Toyota	483.847	1,7	GAC-Honda	750.706	2,7
11th	FAW Jinbei	77.078	3,7	Anhui JAC	464.061	1,7	GAC-Honda	750.706	2,7
12th	Juejin	67.902	3,3	Jingbei	459.891	1,7	Dongfeng-Honda	740.090	2,7
13rd	Hefei Jianghuai	47.889	2,3	Geely	416.776	1,5	FAW-Toyota	720.366	2,6
14th	Qingling Motors	42.269	2,0	Changan Ford-Mazda	407.342	1,5	GAC-Toyota	599.352	2,2
15th	GAC-Honda	32.228	1,6	Great Wall	398.692	1,4	Chery	594.115	2,1
16th	SAIC-GM	30.024	1,5	GAC-Honda	385.755	1,4	GAC Motor	550.474	2,0
17th	Jiangling Motors	26.810	1,3	Shenlong (Dongfeng - Peugeot Citröen)	376.331	1,4	BYD	529.315	1,9
18th	FAW-Hongta Yunnan	19.193	0,9	Dongfeng-Kia	338.362	1,2	BAIC Foton	510.252	1,8
19th	Shouth East (Fujian) Automotive	19.145	0,9	Dongfeng Xiaokang	302.134	1,1	Brilliance-BMW	491.127	1,8
20th	BAM	16.013	0,8	FAW Car	273.888	1,0	BAIC- Benz	485.868	1,7
	Total national output	2.069.069	88,8	Total national output	18.264.761	65,7	Total national output	27.809.196	70,7

Sources: Author’s own elaboration based on China’s Automotive Industry Yearbooks (various issues). Note: company and brands used equally as in the Chinese official reports in which brands are company names.

The importance of joint ventures is further highlighted by the fact that foreign technology-based output dominates the Chinese domestic market, although own-brand models increased significantly after China joined the WTO as Table 3.3. shows. The Chinese market is attractive enough to adapt existing imported models. For instance, the Volkswagen group not only pioneered partnerships with local companies, but it also adapted original car models to the Chinese market. The Passat, Jetta, Santana and Golf are classic models in Germany, while the Lavida is the first compact car to be designed by a Chinese partner, to be produced exclusively assembled by SAIC-VW. The Mogotan was a variant of the Passat model and was only assembled in China, as well as Sagitar, which as a variant of the Jetta was initially only targeted at Chinese consumers. These imported brand models were based on existing car models and competed for the top 10 sales rankings.[60] Furthermore, own-brand cars were concentrated in the production of small and economic models, whereas the upper-medium segment was predominated by joint ventures that sold cars.

Finally, another piece of evidence coherent with the CTDI results has to do with NEVs. The trade balance of the technology-intensive automotive parts and accessories, and main automobile categories had a deficit before 2000 except for lithium batteries. Lithium accumulators as a new basic part for NEVs emerged as the main trade item and had a trade surplus from the 2010s, China is the first global acquirer of lithium, Australia being the first global exporter: the bilateral share of trade between these two countries increased from 53.9 percent in 2014 to 93.4 percent in 2018 (LaRocca, 2020). China has now an advantage downstream of lithium processing and is the net exporter of lithium-

[60] See further details of top sales in Appendices C.3 Top 10 model ranking by sales volume of sedans in the Chinese market, 2008-2018.

ion batteries, exports of which grew 140 percent from 2012 to 2018.[61] Data indicate that while China may have been struggling in leading oil-based technology cars, it seems to lead in the design and production of NEVs. This would be consistent with the change in trend in the CTDI only in 2015.

Own-brand cars like Geely, Chery and BYD compete directly with foreign brands in the race for NEVs and smart-vehicle production. While China is already the world's largest NEV market, manufacturing 1.25 million units in 2018 or 4.6 percent of total output (CATARC & CAAM, 2018; CATARC & MOFCOM, 2019), which is very similar to the total average of 5.3 percent in Europe (CCFA, 2020), joint-venture production is only 5 percent of the Shenzhen city total, that is, of the city in China with a greater production of new energy vehicles. This signals that Chinese brands lead the market for NEVs. In the electrification transformation in China, the government and large automobile groups that are still under state control, play a decisive role in terms of policy design and implementation. Furthermore, the government aims to enhance the role of entrepreneurs and business innovation through the interconnection between the governmental institutions, firms, markets, and the controlled entry of private companies (Dong & Liu, 2020; Sheng, 2020; Zhao & Li, 2021).

3.5. Conclusions

The main value that this chapter adds to the literature is what its novel indicator quantifies and how successfully it demonstrates the technological dependence in the Chinese automobile industry. It shows that the existing basic TDI overestimates the importance of

[61] Author's calculation based on Comtrade (United Nations, 2021).

R&D expenditure in a country and that to fully capture technological independence, both Roy and FA should be included. In the case of the Chinese automobile industry, while the Chinese government has strengthened national S&T in the last decades, China is still a 'technology debtor'. Its patent applications for innovation are far below the technological leaders and the payment received from intellectual property versus royalties charged has remained low. Moreover, in 2018 the main technology source for automobile clusters still came from foreign partners.

This novel indicator contributes to the literature on government intervention, particularly the role of the state in the catching-up process through main scientific and technology policies and programmes as well as industrial policies from the 1980s, by underlining its limits. In the last 40 years, the Chinese government has tried to ensure the development of a more technology-independent automobile industry. Its 'market for technology' strategy has been designed to avoid the 'cannibalization effect' that may ensue from FDI by establishing strong conditions to foreign investments and by incentivizing local R&D efforts. China's enormous market potential has allowed the government to attract FDI only through a certain type of joint ventures to guarantee the control of technology transfers to local partners. The Chinese government has also made important efforts to develop indigenous learning and innovation; both GERD and R&D activities in the automobile industry have shown upward sloping growth in the last decades. Despite all these efforts, however, its main success so far has been an increase in output; the new indicator shows an increasing technological dependence until 2015.

The results of the new indicator are coherent with the literature on S&T that indicates that FDI transfers are not magic bullets and that the learning process takes time. The decrease in the technology dependence curve from 2015 onwards may signal that there have been positive spill-over effects through FDI that lie in accumulated learning.

While this process is taking a long time in oil-based technology cars, where China has struggled to lead, this may not be the case in the new era of NEVs. The 'market for technology' strategy of the Chinese government for oil-based cars may have prepared the industry to rapidly adapt to the next generation of cars and it is in fact one of the potential outcomes that this research has proved.[62] Many Chinese indigenous companies plunged into semiconductor manufacturing considering increasing US restrictions, as well as the existing automotive companies intensified R&D activities in electric vehicles and high-performance lithium batteries.

While the comprehensive indicator proposed in this chapter improves the pre-existing debates on Chinese technological dependence, it still presents limitations. First, technological adaptation and absorption are neither homogeneously nor methodologically registered over time; second, the accuracy of investments made in China's automobile industry throughout different stages of the project lacks monitoring. Firm-level research may be needed to further ascertain FDI effects on technology transfers and indigenous R&D capabilities in the automobile sector in China. In any case, further improvements may be devised by applying this analytic framework in other manufacturing industries in China.

[62] For example, the imminent entry of Chinese electric cars into the European Union presents healthy competition for consolidated car brands. However, Chinese manufacturers are likely to encounter several obstacles, including passing quality controls and earning the trust of consumers. For further details on this matter, please refer to the interviews with the SEAT IT Governance and Product Manager in Appendices C.4.

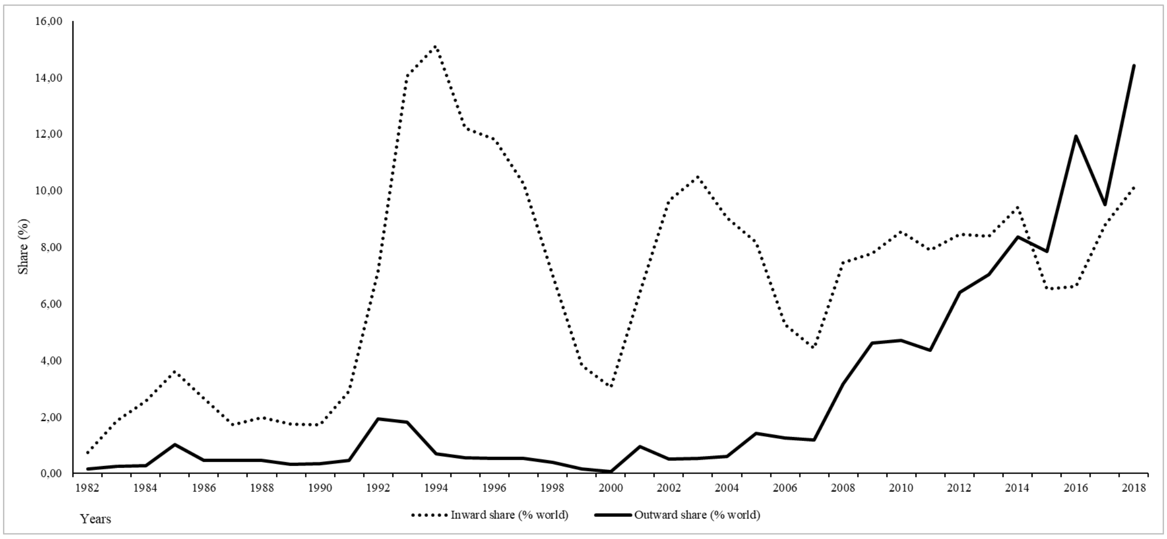
Chapter 4. China's Outward Investment in the European Automobile Industry: Squaring the Circle (2001-2018)

4.1. Introduction

The growing weight of China's outward foreign direct investment (OFDI) in the world has attracted much attention in the past two decades from both economic and international business scholars. Emerging Chinese multinationals are no longer passive recipients of foreign investment but proactively invest abroad themselves. As shown in Figure 4.1., while its share of inward flows of FDI globally reached a peak of 13 percent in 1993, the country's share of OFDI was only 0.8 percent in the late 1990s. After 2007, however, its share of OFDI started a steep upward trend; from being the world's 19th in 2007, China climbed to the 6th position in 2009. In 2016, it was the second-largest investor in the world (USD 196.15 billion) and in 2018 (USD 129.83 billion) the third, with 10 percent of the world's total OFDI – only the USA and Japan had more weight.

While the main recipient of China's investment has always been the Asian region (60 percent of China's OFDI between 2003 and 2018), the European Union (EU) has been the ultimate destination for Chinese automotive-related investments: 33 percent of the total number of transactions and 50 percent of the total investment value were in the EU, whereas only 15 percent of deals were in North America and 20 percent in East Asia. As captured in Table 4.1. , the most relevant investment transactions in terms of both volume and value in the manufacturing sector have involved the European core. Both Nolan (2012) and Schuman (2014) have pondered whether China was trying to buy an entire car industry during the new millennium.

Figure 4.1. China's Foreign Direct Investment, 1982–2018



Source: Author's own elaboration based on UNCTAD data center.

The existing literature indicates a prominent pattern of Chinese investment decisions seeking strategic assets in developed regions. Therefore, emerging multinationals pursue access to advanced technologies, consolidated brands and organizational know-how (or specific assets) in technology incubators through merger and acquisitions or M&As (see, for example, Hong & Sun, 2006; Pietrobelli & Rabellotti, 2011; Rui & Yip, 2008). It is broadly known that the increase in Chinese OFDI interest in Europe is mainly technology-seeking (see, for example, Hong & Sun, 2006; Pareja-Alcaraz, 2016; Pietrobelli & Rabellotti, 2011; Rui & Yip, 2008). Technology accession is also understood as a form of "asset augmentation" in the domestic economy because firms acquire a variety of intangible assets and end up receiving technology transfers

(Balcet et al., 2012; Buckley et al., 2016; Yakob et al., 2018). However, what is less clear is how capital flows accommodate the 'reverse technology spillover' in the technology and capital-intensive sectors, which means that technology and investment transfers go in opposite directions, i.e., investors invest abroad to capture technology instead of receiving it from foreign investors. In fact, Ouyang (2010) and Yuan and Zhang (2018) claim that this phenomenon is at work when China tries to capture technology through outbound investment transactions.

Table 4.1. China's OFDI in the automobile industry by world regions, 2005–2018

Region Wolrd	Number of transaction	Share (%)	Total investment (million USD)	Share (%)
Europe	50	33	34.835	50
East Asia	29	19	13.620	20
North America	32	21	10.053	14
West Asia	17	11	6.190	9
South America	18	12	3.743	5
Sub-Saharan Africa	4	3	1.120	2
Total	150	100	69.561	100

Source: Author's own elaboration based on Heritage Foundation (2019) and Bureau van Dijk's Zephyr (2019). Note: all countries that received Chinese FDI in the European region are part of the EU.

There is some literature about Chinese outward investment in the automobile sector, but little is known about how this OFDI may have been influenced by the Chinese government's industrial policy and previous investment relations with European companies. Amighini and Franco (2013) and Amighini (2013) focus on China's OFDI in the automotive industry, but their conclusions do not consider the most interesting part of active outbound investment, which began in 2008-9 with the world economic crisis. Other scholars have written about the impact of WTO membership on China's automotive industry organization (see, for example, Brandt et al., 2019; Harwit, 2001; Thun, 2004), and changes to industrial policy (see, for example, Brandt et al., 2017; Doner et al., 2021; Meier, 2018). What has not been studied is to what extent Chinese industrial policy may influence two-way FDI decisions in the automobile industry and how inward FDI decisions affect outward ones.

In China, Inward FDI and Outward FDI are both subordinated to state planning and industrial policy. The Chinese government's policies regarding the automobile industry have discriminated between the different types of ownership over time. It was only in the late 1970s that it started a progressive liberalization of the sector through joint ventures. What is very interesting is that in the 1980s and 1990s European companies were promoted to form equity joint ventures with SOEs chosen by the Chinese government. However, non-SOEs and independent car manufacturers (ICAMs) were excluded until the 21st century. In other words, Chinese industrial policy favored backbone over non-SOEs, leading to different investment relations between European companies and the different Chinese companies. One of the key questions of this chapter is whether non-SOE car manufacturers seek in foreign (outward) markets what backbone SOEs had already achieved domestically (inward).

The goal of this chapter is to figure out the effect of inward FDI on outward FDI, that is, the impact of Chinese industrial policy on regulating the entry of European automotive companies into China and Chinese investment in the EU (28 countries, including the UK). This chapter examines which European automotive companies founded joint ventures with SOEs in China and then describes the modus operandi and motivations of the ten largest Chinese investors in the EU (around 90 percent of total investment) captured.[63] The selection consists of five SOEs and five non-SOEs, which include original equipment manufacturers (OEMs) and manufacturers of auto parts and accessories.

The selection relies on the China Global Investment Tracker (henceforth CGIT) from the American Enterprise Institute and Heritage Foundation launched in 2005. This is the only comprehensive public dataset covering China's global investment (it includes over 3,700 large transactions across a wide scope of sectors). This database is not commonly used in the literature because the statuses of deals are mixed (some of them rumours and others not yet completed), which justifies the use of the second source: the Zephyr BvD (henceforth Zephyr), a specialist database of global M&A where "completed-confirmed" and "completed-assumed" deals are filtered carefully by transaction years for China (Hong Kong not included). Furthermore, transaction information is complemented with data from the "Statistical Bulletin of China's Outward Foreign Direct Investment" of the Ministry of Commerce of China (MOFCOM), the investment report of Rhodium Group, the companies' annual financial reports and prestigious financial and public media like *Thomson Reuter* or the *China Daily*. The latter two cover international investment transactions with publicly announced information.

The chapter is structured into three more sections. Section 2 presents the Chinese government's policies and shows how China became a passive FDI recipient with a special focus on the establishment of Sino-European joint ventures. Sections 3 and 4 then show how China became a proactive investor and compare the SOEs and non-SOEs

[63] See selection of companies in Appendices D.1 Internationalization of Chinese companies in the EU by ranking of investment amount.

Chinese companies' modus operandi when investing in the EU. The last section concludes.

4.2. Policy Background: Inward and Outward FDI

Market liberalization began in 1978 in China and the automotive industry was progressively opened up to host foreign investment (Sino-foreign joint ventures) and the emergence of domestic privately capitalized enterprises. The "Law on Sino-Foreign Equity Joint Ventures" was issued in 1979 by the State Council [64] and was followed, in 1983, by specific approval of the establishment of joint ventures for assembling passenger cars. In 1988, the "Law of the People's Republic of China on Chinese-Foreign Contractual Joint Ventures" was issued with the purpose of expanding economic cooperation and technological exchange with foreign countries.[65] These laws laid down general institutional framework for the establishment of joint ventures in China.

During the same period, bilateral investment treaties (BITs) were signed between China and investing countries to give additional institutional support to hosting FDI in the automobile industry (UNCTAD Investment Policy HUB, 2022).[66] However, the establishment of Sino-Foreign equity joint ventures was limited to SOEs: to be more

[64]Revised in accordance with the Decision of the National People's Congress Regarding the Revision of the Law of the PRC on Chinese-Foreign Equity Joint Ventures adopted at the Third Session of the Seventh National People's Congress on April 4, 1990; see more in Law Archive of State Council: www.gov.cn/archive

[65] See more in Appendices D.2. Foreign Investment and Sino-Foreign Joint Venture Law and Policies

[66] China signed BITs with all EU members except Ireland; see length and year of first BIT in Appendices D.3

precise, only selected SOEs were promoted to establish new foreign-invested companies.

Table 4.2. Automobile Industry Policy 1994

General statements	
Objectives	To open up markets (domestic and foreign); promotion of large scale-production; industry concentration (elimination of dispersed production and small scale manufacturing plants) in order to exploit economies of scale
Investment policy	Ecouragement for automotive companies to raise funds from diverse and to support increased industry concentration.
Foreign Investment policy	Ecouragement of joint ventures with foreign manufacturers that meet conditions (R&D facilities newly established, own R&D center, independent trademarks and patent, and enough capital capacity).
Foreign joint venture conditions	Manufacturing of automobiles, motorcycles, complete vehicles and motor engines with foreign joint partners cannot take more than 50% of participation.
Trade policy	Import policy: restriction of imports, entry points limited to four seaports, prohibition of import of used vehicles (but, tariff reduction for passenger cars from 220-180 percent to 150-110 percent). Export policy: expansion of exports as production increases, companies who have export shares exceeding 3-8 percent out annual sales for passenger cars will have loan priority.
Tecnology policy	Ecouragement of independent product development
Product Approval	Automotive enterprises must submit future product plans for approval; products which are not approved cannot be sold, imported or used.
Organization guidelines	Ecourage enterprises or automotive industry groups to attain critical mass; government support for companies which exceed certain production volume and effort in investing R&D
Consumption and market policy	Individual and private ownership of automobiles is encouraged. Price of vehicles to be decided by own enterprises according to market demand.
Local content incentives	Preferential localization tax rates for companies with high localisation rates (use of local and national content); prohibition of Knock-down kit imports.
Planning and Project Management	No new complete car facilities to be approved during 1994-95.

Source: Author's elaboration based on State Development and Planning Commission (1994)

During the 1980s and 1990s, foreign carmakers were only allowed to form joint ventures with SOEs chosen by the Chinese government, in what was known as 'obligated embeddedness' (Liu & Dicken, 2006, p. 1238). Preferences were given to FAW, Dongfeng and SAIC — the so-called Chinese "Big three"—and other state-driven companies like BAIC, NAC or GAC. The first wave of Sino-foreign joint ventures was dominated by European carmakers (1983-1992);[67] the main European automotive companies invested in China before WTO membership. Volkswagen, Peugeot, Citroën, Iveco, Fiat and Mercedes Benz led the adventure. Volkswagen created a joint venture with SAIC and FAW. Iveco founded the new NAVECO with NAC. Peugeot Citroën created joint ventures with GAC and Dongfeng (see details in Chapter 2). European carmakers did invest alone in China, and their domestic supplier of automotive parts and accessories followed the leading firms.

As mentioned in Chapter 2 joint venture projects and their contractual agreements gave the most attention to technology and know-how transfers, the training of Chinese technicians, and the import price of CKDs (see more in Chapter 2) (In other words, Chinese SOEs were passive recipients of foreign technology and tried to secure access to foreign expertise under restrictive contractual conditions for foreign partners. Basic conditions for each new project were unified in the first specific industrial policy for the automotive industry, the so-called 1994 Policy on the Development of the Automotive Industry (SDPC, 1994). The main goal was to build China's automotive industry into a pillar industry of the national economy as soon as possible.

The 1994 Auto Policy issued regulations strengthening the formation of equity joint ventures with foreign manufacturers while maintaining the dominance of SOEs. In addition to the "Big three" SOEs, the "Small three" should be Tianjin Xiali, Beijing Jeep and Guangzhou Peugeot. As sum up in Table 4.2. the government favoured automobile companies with their own R&D centres and proposals to create jointly new R&D centres in China. Conditions restricted the foreign stakeholder's stake to no more than 50 percent

[67] See more in Section 3. Joint ventures in protected markets (Chapter 2).

of the joint venture,[68] and local content was required to reach 90 percent.[69] Furthermore, any new foreign project that exceeded USD 50 million had to be approved by the National Development and Reform Commission (NDRC). Given that the automobile sector is capital-intensive, new projects easily surpassed that approval amount. In either case, foreign carmakers were not free to choose local partners.

ICAMs emerged from the mid-1980s (Li, 2009, 2014) as an alternative to the existing strategies of producing with foreign partnership. However, these young automobile companies struggled to compete in a highly protected market dominated by large SOEs and Sino-Foreign joint ventures that began flourishing during the same period. ICAMs like Great Wall Motor, Geely, Lifan, BYD, Brilliance and Youngman needed to create their own innovation and design capacity to satisfy the domestic demand for passenger cars. It was only after the entry of China in the WTO in 2001 that joint ventures were extended to non-SOEs. It was in 2003 when the first ICAM, the state-owned Brilliance, established an equity joint venture with BMW. In 2010, for the first time, a non-SOE manufacturer established an equity joint venture with a foreign carmaker (see more in Chapter 2). For instance, Daimler Chrysler created Denza with BYD in Shenzhen with the main goal of producing electric vehicles.[70] In 2013, Daqing Volvo established a joint venture for assembling SUVs, which was also a non-state-driven joint venture in

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[68] According to the *Law on Sino-Foreign Equity Joint Venture*, foreign partners must not hold less than a 25 percent stake. See more details in Appendices D.2 IV.2 for laws and policies regarding FDI.

[69] The term "local content" refers to the nationality of production as analysed in Chapter 2.

[70] BYD was originally a manufacturer of electric batteries, so it has a competitive advantage in producing electric vehicles. Currently it is the second largest manufacturer of EV batteries in China. See more in *The Battery Report 2021* by Volta and Intercalation Foundations (January 8, 2022).

China. In line with the previous joint ventures of SOEs, equal 50:50 participation contracts dominated in order to guarantee access to technology, although in a few cases domestic partners had greater participation (this was especially the case in the Daqing Volvo joint venture, 70:30).[71]

China issued more than 3,000 laws and regulations due to WTO admission, most of them regarding import tariff reduction and FDI flexibilization.[72] Tariff reductions in the automobile industry were relatively more notorious than in other manufacturing industries since it was highly protected. For passenger cars, tariffs were reduced from 70-80 percent in 2001 to 25 percent in 2006. For new foreign projects in the automotive industry, requirements regarding local content, foreign exchange, and technology transfer were eliminated. All investments in technology-intensive sectors, projects above USD 30 million, and industries promoted by the Chinese Foreign Investment Catalogue[73] would receive tax reductions of 15 percent (WTO, 2001). Due to China's domestic market potential plus investment flexibilization, automobile industry in China experienced a new wave of joint ventures (Chin, 2010; Harwit, 2001).

[71] We come back to this case in the next section.

[72] In fact, negotiations began already in 1986 under GATT. See more in *China's Timeline and Key Agreement* on WTO: www.wto.org (accessed 25 August 2022).

[73] The Catalogue for the Guidance of Foreign Investment Industries approved by the State Council has the goal of encouraging, recommending, or restricting foreign investment. China gave financial and exchange rate support, or export tax reductions to foreign companies and classified them within the "promoted" category.

Table 4.3. Main Sino-European Joint Ventures, 1984–2018

Partners			Joint Venture	Year		Participation	
Domestic	Foreign	Foreign country			Location	Domestic	Foreign
SAIC	Volkswagen	Germany	Shanghai Volkswagen (SVW)	1984	Shanghai	50	50
GAC	Peugeot	France	GAC-Peugeot	1985	Guangzhou (Guangdong)	66	34
NAC	Fiat-IVECO	Italy	Nanjing-Iveco (NAVECO)	1985	Nanjing	50	50
FAW	Volkswagen	Germany	FAW-VW	1991	Changchun (Jilin)	60	40
Dongfeng	Peogueot Citröen	France	Shenlong Limited	1992	Wuhan (Hubei)	50	50
Nanjing Yuejing	Fiat	Italy	Nanjing Fiat	1995	Nanjing	50	50
FAW	Volkswagen	Germany	FAW-VW-Audi	1996	Changchun (Jilin)	60	40 (which 10 is Audi)
Jiangsu Yaxing Motor & Coach	Benz	Germany	Yaxing Benz	1997	Yangzhou (Jiangsu)	50	50
Brilliance	BMW	Germany	Brilliance BWM or CBA	2003	Shengyang (Liaoning)	50	50
BAIC	Mercedes Benz	Germany	Beijing Benz Automotive	2005	Beijing	51	49
BAIC, Fujian Motors	Daimler	Germany	Fujian Benz Automotive	2007	Fuzhou (Fujian)	50	50
Changan	Peugeot Citröen (PSA)	France	Changan Peugeot Citröen	2010	Chongqing	50	50
BYD	Daimler	Germany	Denza (Shenzhen BYD Daimler New Technology)	2010	Shenzhen (Guangdong)	50	50
BAIC Foton	Daimler Chrysler	Germnay	Beijing Foton Daimler Automotive	2010	Beijing	50	50
GAC	Daimler Fiat Chrysler	Italy /Germany	GAC Fiat Chrysler	2010	Guangzhou (Guangdong)	50	50
Daqing	Volvo (Geely)	Sweden (China)	Daqing Volvo Automotive Manufacturer	2013	Chengdu (Sichuan)	70	30
Dongfeng	Renault	France	Dongfeng Renault	2013	Wuhuan (Hubei)	50	50
Great Wall	BMW	Germany	Great Wall BMW	2018	Jiangsu	50	50

Source: Jia-Zheng (2022), see the full table International Sino-Foreign Joint Ventures (2002-2018) in Appendices D.4

However, the conditions for FDI flexibilization in the automobile industry that were issued for WTO admission were soon revised. Since the automotive sector was one of the sectors that were most affected by WTO admission, the government tried to avoid the foreign domination of its domestic market (Meier, 2018). Furthermore, reforms of "the original investment system have broken the highly centralized mode of investment administration under the traditional planned economic system" (Guofa No.20 [2004]).[74] As a result, in a Decision of the State Council on Reforming the Investment System, China tried to deepen reforms of the system in 2004. Along these lines, the government would update the Foreign-Invested Industry Guidance Catalogue for foreign investment projects in a timely fashion, deciding which industries would be encouraged, permitted or restricted. Since then, any new project with a total investment above USD 100 million requires the authorization of the NDRC. The new automotive industry policy of 2004 replaced the former 1994 Policy, in which restrictive foreign equity participation and demanding conditions for technology transfer were maintained (NDRC, 2004).

The 2004 Auto Policy and revisions to the investment law did not discourage the entry of more foreign carmakers into China (see more in Chapter 2 and Chapter 3). In 2000, the Chinese economy only represented 1.5 percent of the global automobile market while the United States, which with just 5 percent of the world's population, had 25 percent of the world's automobiles (CATARC & CAAM, 2001). China was too attractive due to the huge growth margin of its domestic market. As in the previous period, the new foreign partners in the joint ventures came from consolidated international automotive industries like Germany, Japan, and the United States. The presence of European technology was still strong, while earlier Sino-European joint ventures were renewed. For example, in 2002, the Volkswagen Group renewed its contracts with SAIC and FAW for another twenty years (CATARC & MOFCOM, 2014). On the other hand, new European

[74] See more *Decision of the State Council on Reform of the Investment System* in State Council: www.gov.cn/archive.

carmakers, mainly German, made their entry into the Chinese market, like BMW, Mercedes Benz and Daimler Chrysler. Other competitors from the USA, Japan or South Korea, like General Motors, Toyota, Nissan, Honda and Hyundai, also established joint ventures with local partners, which were still dominated by SOEs (see full list in Appendices D.4)

China's "Big three" continued to lead domestic production from 2002 to 2018, though total automobile production in China was much more fragmented in comparison with those of Japan, Germany, or the USA. Proof of that was that SAIC and FAW surpassed one million of cars assembled in 2006[75] and that Dongfeng reached the same volume in 2007 (CATARC & MOFCOM, 2014); the same three captured total domestic sales of around 56 percent in 2015 (CATARC & CAAM, 2016). Young manufacturers, both state-owned (Chery and Brilliance) and privately owned (Geely, BYD and Great Wall), started to gain market share. Their national ascent can be corroborated in terms of both increases in production volumes and launches of new car models (CATARC & CAAM, 2011, 2018). In short, large SOEs benefited the most with the establishment of equity joint ventures which explained the more outstanding output growth in China and accumulated learning for decades, i.e., inward-oriented internationalization (see Chapter 2), whereas non-SOEs were given such no favourable conditions to attract FDI. Therefore, one expects a different performance by Chinese enterprises in the outward internationalization process, that is, the outward investment decisions.

Deng's "Open Door" policy inaugurated the cautious process of outward internationalization that started with his economic reforms in 1978. From 1979 to 1985, the first period of reform, only state-owned trading corporations under MOFTEC

[75] Including output of their joint ventures in China.

(Ministry of Foreign Trade and Cooperation) were allowed to invest abroad. During the following decade, the government partially liberalized existing restrictive policies and allowed more enterprises to invest abroad. The outward expansion of Chinese companies began when the "Going Out" or "Go Global" policy was launched as part of the 9th five-year plan (1996-2000) and accelerated in the global financial crisis of 2008.

The international expansion of Chinese automotive companies also followed state guidelines. During the "Go Global" 1.0 (1996-2012), domestic enterprises went abroad to set up sales networks and engage in low-end international trade. This outbound investment strategy was a complement to the efforts to promote inflows of foreign capital (China Org, 2003). What is worth noting is that China and the EU became mutually complementary economies. The first Sino-EU Policy Paper was issued in 2003 — diplomatic relations between China and the European Community had been established in 1975, and in 2001 both parties established a full partnership — in which the EU was recognized as the "major force in the world". The Chinese government therefore showed an interest in developing long-term and stable relations with the EU and its members (Fanjul, 2011, 2020).

In 2009, the Planning for the Restructuring and Revitalization of the Automobile Industry was issued with the goal of stabilising automobile consumption, fastening industrial restructuring, and strengthening innovation capacity, but more importantly, the government looked at industry to upgrade. In this regard, the government supported the new energy vehicle development and international production cooperation, which also coincides with the slogan "strong instead of large" (zhuoqiang qudai zhuoda) (CATARC & CAAM, 2010) and the so-called "Go Out" policy was stressed again (CATARC & MOFCOM 2014, p.264). During the 12th FYP (2011-2015), in 2013, the "One Belt, One

Road" (OBOR, henceforth) programme was announced. This was one of the major geopolitical expressions of "Go Global" 2.0. The OBOR sought to build up trade, investment, and human links across Eurasia (Germany, Poland and Italy included) through a "Silk Road Economic Belt" (China Policy, 2017). Further financial support was given to outbound investment transactions to expand the new silk route (Economist Intelligence Unit, 2016). So, the programme has provided more flexibility on across-the-board investment transactions and has helped Chinese automobile manufacturers to export and acquire specific assets.

With the launch of the "Made in China 2025" programme in 2015, "Go Global" 3.0 was also inaugurated. The plan proposes transforming China into a leading manufacturer by 2040 and identifies improving innovation, integrating technology, and strengthening the industrial base, among others, as the nine crucial tasks to be carried out. In this context, private enterprises turned out to be the protagonists, as they invested in foreign markets to set up factories, employed local labour, and acquired foreign companies. The State Council recognized two outstanding acquisitions through private initiatives: Lenovo's acquisition of IBM in 2015, and Geely's acquisition of Volvo in 2010.

All in all, SOEs had ownership advantages for decades. They were given enough institutional support to start the inward internationalization process, whereas non-SOEs and independent carmakers were sidelined from the process. It seems that the outward internationalization in the automobile industry, although state-guided within a planned economy, finally encouraged all firms, both SOEs and non-SOEs, to undertake outward investments. Therefore, Sino-European investment relations were different depending on the type of firm ownership and were shaped by industry policies over time, as seen above.

Whether equity joint ventures had the main goal of securing technology and knowhow transfers, it is expected that non-SOEs will undertake more aggressive acquisitions in Europe to compensate for what large SOEs had already achieved and accumulated.

4.3. Chinese SOEs' investment in the EU

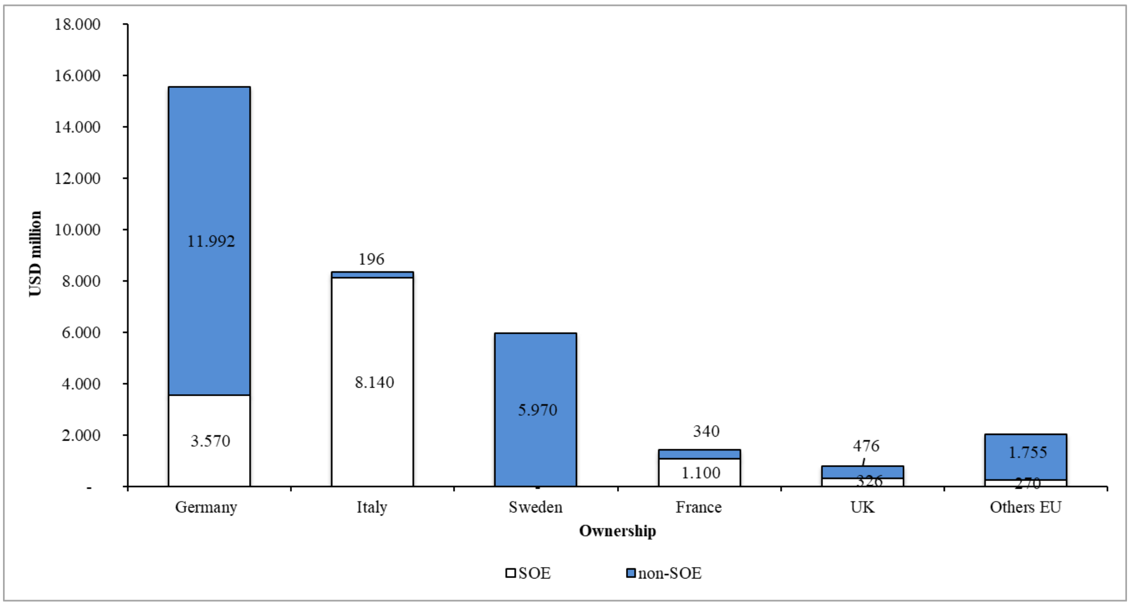
China's proactive attitude to capturing technology in the EU is evident in Germany, Italy, Sweden, France, and the UK, the main recipients of China's automotive investment. This group of five attracted 96 percent (32,110 USD million) of total Chinese OFDI in the EU automotive sector between 2005 and 2018. While Germany, Italy and France had entered the Chinese market before China's WTO membership, Sweden came later. As Figure 4.2. shows, investment from state-owned companies was outstanding in Italy and France, but not very representative in Germany or Sweden.

Trade figures show that Europe's main automobile-manufacturing countries, Germany, France, Italy and the United Kingdom, shared around 40 percent on average of China's total imports of automobiles between 1992 and 2018.[76] The EU is certainly the biggest exporter of passenger cars to China, accounting for 53.3 percent of total Chinese car imports by value (China Customs, 2018). More relevant to mention is Germany's worldwide exports of automobiles, at 16 percent of the world's total and with a weight of 11.7 percent of the total value of its national exports, being China the major destination for its exports. In fact, Germany has also consolidated itself as China's largest European trading partner, the composition of goods exchanged mainly consisting of industrial machinery, automobile equipment and components, and IT teams, supporting Chinese

[76] Author's calculation based on Comtrade database (United Nations, 2021).

investors' interest in investment locations in these sectors (Hansakul & Levinger, 2014). The intensification of the investment relationship between China and the EU with regard to the automobile sector has not affected trade flows, which confirms the fact that the bulk of international trade is now organized and coordinated by leading firms with FDI, and trading inputs and outputs with global partners, suppliers and customers (UNCTAD-OECD-WTO, 2013). However, the EU's trade policy seems to be shifting from negotiating bilaterally with emerging economies like China, to being more focused on developed countries and pursuing multilateral agreements (Garcia-Duran & Eliasson, 2018; Garcia-Duran & Millet, 2014).

Figure 4.2. China's OFDI in the European Automobile Sector by ownership, 2005-2018



Source: Author's elaboration based on CGIT and Zephyr BVD (2019).

Germany has the largest European automobile industry (and was in the world's top five in 2018 according to OICA production statistics), and Volkswagen was also the first European carmaker to establish a joint venture in China. Volkswagen, BMW and

Daimler are the three largest German automobile carmakers, their long-tradition and prestige being recognized worldwide. Total patent applications in Germany in the transport sector carried out intensive innovation activities (see more in Appendices D.5). The number of researchers in R&D (4,112) and (1,528) technicians during 2003-2018 per million people were higher than the EU average and significantly higher than China, with around 1,000 (World Bank, 2019). In addition, the Sino-German trade relationship has been intensively subject to commitment, and diplomatic relations have been well addressed. Accordingly, Bundeskanzler Angela Merkel used to travel to China almost once a year from 2005 to 2019 (Bundes Kanzler, n.d.). Germany consolidated itself as China's largest European trading partner, the composition of goods exchanged being mainly industrial machinery, components, IT teams and automobiles (European Commission, 2020) .

Italy is the second preferred destination for China's OFDI. It ranks as the fourth largest patent applicant in the EU and has long-traditional automobile brands like Fiat (FCA group),[77] Alfa Romeo and Ferrari. Furthermore, the Italian government has strengthened its scientific and technological cooperation with Chinese automotive SOEs, particularly in the automotive cluster in Turin.[78] For example, the Changan Automobile Group founded the Changan Europe Research and Design Center Company in 2006, as well as JAC Motors, which followed later.[79] Investment interest in Sweden is as easily justified as it has two long-standing automobile brands in Volvo and Saab. Both

[77] Stellantis automotive group was founded in 2021 between FCA and PSA Group with headquarters in the Netherlands, for more information see the official company website see more in www.stellantis.com/en (accessed 21 August 2022).

[78]See the origins of Italian automotive industry and Turin cluster in Enrietti et al. (2022).

[79] See more in Automotive World (2015): *JAC Italy R&D center has been established for 10 years;* and Changan R&D corporate information (2022) (accessed 19 August 2022).

symbolized the country's long-term industrial capacity. France is the third largest patent applicant in the EU, with intensive patent activities in the transport sector, though this has not captured much interest with Chinese carmakers apart from Dongfeng.

China turned the global economic crisis of 2008 into an excellent opportunity to acquire European companies with liquidity problems. Chinese automotive firms' investments were boosted following the 2009 Revitalizing Plan, which updated the Go Out Policy. Evidence from 16 SOEs (see Table 4.4) confirms that SOEs did not always invest back into their "old" partners, yet former investment relations affected the cross-board investment decisions since the 2000s. That pattern was clearly identified with investment decisions made by Dongfeng, and SAFE and the People's Bank of China. In both cases there was previous historical investment in China from those European carmakers. So, the stake acquisitions in PSA Group and FCA Group were more straightforwardly.[80] Other state-driven investments that had targeted companies like Pirelli, Kion, Inalfa or Hilite had not established equity joint ventures in China before China's entry into Europe.

Chinese SOEs were more likely to undertake partial stake purchases when targeting large European automotive companies like PSA, Pirelli or FCA. In general, SOEs investment operations were more influenced by industry development strategies through industrial policies changes. For instance, SOEs were interested to access technologies related to sustainability and electric and intelligent vehicles, which was due to the Chinese 2012 New Energy Vehicle Policy and 2018 Intelligent Vehicle Strategy

[80] Dongfeng, ChemChina and AVIC are state-owned companies managed by SASAC (State-owned Assets Supervision and Administration Commission of State Council), and only Dongfeng and FAW are manged by SASAC as automotive groups. See more in Appendices D.6 List of yangi (classification by industry sector).

(see more details of S&T policies and programmes in Chapter 3). While investment in large automobile groups was more determined by former historical investment, low investment operation targeted small or medium companies.

The largest state-driven investment operation that deserves our interest took place in 2015: ChemChina's (or Sinochem Group) and SAFE's (State Administration of Foreign Exchange) acquisition of a 26 percent stake of Pirelli for USD 7.2 billion. This was the largest Chinese outward investment transaction in the manufacturing sector until that year (MOFCOM, 2017).[81] While the Chinese group worked in agrochemicals, chemical materials and rubber, which includes tyres for motor vehicles, Pirelli had more than 140 years of Italian heritage as a premium tyre manufacturer and ranked the world's fifth (2015), China did not have any internationally recognized brand competing in the international market. Although Pirelli had been producing in Yangzhou since 2007, it seemed that ChemChina's filial China National Tire & Rubber Corporation (CNRC) had the intention to strengthen production collaboration to satisfy domestic demand. China was interested in increasing exports of its own brand of auto parts (Dussel, 2019) ,[82] and needed to acquire an internationally competitive tyre brand. In the global automobile industry, interfirm control is usually influenced by global leading firms to ensure cost competitiveness, rapid reaction and action time to market changes, and quality standards (Yeung & Coe, 2015). Different regional actors organize and cooperate for a greater share of value creation. In a technology and knowledge-intensive sector like the automobile industry, the creation of joint ventures between OEMs and manufacturers of auto parts

[81] The stake in shares increased to 30 percent when ChemChina acquired shares held by Edizione months later; see more in Tyre Editors (2015).

[82] See world brand ranking in Brand Finance: brandirectory.com/rankings/tyres/ (accessed 17 November 2022).

should produce higher network centrality (Kano et al., 2020).

Therefore, on the one hand, ChemChina sought to expand its global production networks with premium tyres for the increasing growth of high-end products in China, as well as export-oriented production. On the other hand, Pirelli also sought to configure production networks in the same APAC region (Asia Pacific Countries) but with different market strategies. In 2016, Aeolus Tyre (ChemChina's subsidiary) signed an agreement to use updated technology and Pirelli's innovations through the complete acquisition of Pirelli Industrial SRL for USD 148 million.[83] In 2018, Pirelli announced the acquisition of 49 percent of a new plan in China through a joint venture with the Hixih Group, the latter also having joint ventures with German Continental and Belgium Bekaert (Pirelli, 2018). The giant ChemChina could not completely take Pirelli over, but it achieved full access to technology and the consolidated supply-chain network of a main auto part through direct and indirect participation in Pirelli's filial companies. Pirelli gained from the transaction since sales by region data show that the APAC region share to in group total sales increased significantly from 11 percent in 2015 to 19 percent in 2021, while South America's share fell from 28 percent to 12 percent during the same period (Arosio & Masoni, 2015; Pirelli, 2015, 2016, 2022).

The second largest state-driven company with investment deals in the EU was BAIC. The first international expansion of BAIC in Europe took place in 2011, when the Beijing Hainanchuan Automotive Parts Company —60 percent of the stake held by BAIC—completely acquired Inalfa Roof Systems in the Netherlands for USD 270 million.

[83] See corporate information: www.aeolustyre.biz/aeolus-history.html (accessed 19 February 2023). To be noted that the Aeolus tyre company was founded in Jiaozuo (Henan Province) specialized in tyre manufacturing, and the Aeolus seen in Chapter 2 is the passenger car brand of Dongfeng.

It is to be noted that Inalfa is the only wholly owned foreign subsidiary of Hainanchuan. Again, the objective was clearly technology-oriented, since the Chinese investor manufactures sunroofs, while Inalfa specializes in designing and producing car roof systems for a considerable customer portfolio. Hainanchuan has above 1,600 patents in force, but Inalfa contributes the most in terms of patents, i.e., more than 700 patents in force registered (WIPO, 2020).[84] After the acquisition of Inalfa, Hainachuan consolidated its position as a global auto part supplier by intensifying cooperation with international suppliers like Hella, Leoni, and the Spanish firm Gestamp, among other Asian and American partners. This means an increasing share of value created in the global production networks and global value chains, with an increasing market share in different regions through production collaboration.

In 2014, BAIC conducted its second outward investment. Its subsidiary, Foton BAIC, acquired the mythical Borgward to produce SUVs in China. This takeover would complement the part of the product category that Foton lacked: SUVs. The main declared interests for the Chinese SOE were in brand acquisition and German engineering for producing urban SUVs. However, for Borgward, more than a strategic operation, the capital injection and the establishment of new networks in China was a matter of survival. China's production strategy was mainly export-oriented, which means that Borgward SUVs made in China were to be exported to other regions. This strategy suits the company's strategy of highlighting the Borgward brand using German engineering and creating a 'worldwide footprint', i.e., to gain a new market by strengthening production

[84] See more information in official sites, for Hainanchuan: www.bhap.com.cn and for Inalfa: www.inalfa.com (accessed 19 November 2022).

first at home. Unfortunately, the rescue operation failed, and Foton sold the major stake a year later (Zhang, 2018).

In 2014, Dongfeng Motor became the third largest investor in Europe after acquiring 14 percent of Peugeot Citroën (PSA Group) for USD 1.1 billion. This transaction was considered successful but raised national concerns in France. In the annual financial reports of PSA, the deal was interpreted as 'a strategic operation' (Huotari, Otero-Iglesias, et al., 2015) to strengthen the global partnership with Dongfeng Motor Group, which had begun in the mid-1980s. As Yan reported (2014), Dongfeng injected liquidity to reduce the group's debt, when the PSA group was in trouble (Groupe PSA, 2015). In other words, Dongfeng's rescue was well justified given that they were old partners. Output growth in China was expected to reach 1.5 million units; a new joint R&D centre would be created; and sales would spread among Asian countries as well as in Latin America and Russia.

However, this transaction was not well-received. First, this was due to Beijing's particular interest in acquiring high technology and accessing the new market in developed regions (Hanemann & Huotari, 2016; Meunier, 2014; Meunier et al., 2014).[85] Secondly, the transaction was concluded just after President Xi's official visit in March 2014. A month later, China updated the first White Paper on the European Union (EU), which was issued in 2003, with a new guideline: the China-EU Comprehensive Strategic

[85] In 2012, Dongfeng acquired T Engineering AB, which was a unit of the bankrupt car manufacturer Saab. At that moment, the company had 12 researchers on technologies related to internal combustion engines, hybrid vehicles, electric cars and chassis control systems. Hence, the Chinese party sought out technological capacity and know how. So, Dongfeng was trying to locate near non-SOE competitor Geely in Sweden, which we will analyse carefully in next section. See more in Ning (October 18, 2012).

Partnership for Mutual Benefit and Win-Win Cooperation (China Org, 2003). In this context, the deal was interpreted as a threat to national pride, particularly from SOEs, because they would imply political interests (Meunier, 2017). On the Chinese (opposite) side, Dongfeng's "rescue of PSA" was considered a desirable transaction given that the 50th-anniversary celebrations of diplomatic relations between France and China took place in 2014. Besides they celebrated their long-term investment collaboration since Peugeot Citröen had been investing in China for decades, and Shenlong still operated in Changchun. In other words, Dongfeng's investment meant safeguarding its long-term interest (Groupe PSA, 2015) .

In general, the EU attitude towards Chinese FDI became less resilient. In February 2017 the French Minister of the Economy, together with his German and Italian counterparts, called for a common European screening mechanism for foreign investments, particularly in sectors where European firms possess 'key technologies' (Nicolas & Thomsen, 2008; Seaman et al., 2017). Moreover, from the beginning of trade and geopolitical tensions between China and the United States in 2018, the US began preventing China from catching up in the production of certain products and services like microchips or semiconductors on the basis of national security arguments (Bown, 2020; Goulard, 2020; Kwan, 2020). The growing inflow of Chinese capital to acquire western strategic assets has stimulated even more concerns by international policymakers than in the EU.

The fourth SOE of relevance here is AVIC (Aviation Industry Corporation of China) and its single acquisition of Hilite in 2014. This SOE has over 100 subsidiary companies that produce military and civil aircraft, trucks, auto parts, electronics, robotics, and ships. Its subsidiary, AVIC Electromechanical Systems, which specializes in automobile engines and transmission systems, acquired German Hilite Automobile Technology in 2014 for USD 640 million. Hilite is a global supplier of automotive system solutions which control transmissions and emissions to improve fuel efficiency and reduce emissions for both passenger cars and commercial vehicles. Volkswagen, Daimler, BMW, General Motors, and Dongfeng Nissan are all customers of Hilite. For AVIC, the acquisition sought to obtain expertise in the design and simulation of new products to help AVIC with product design upgrades. For instance, its Robust Design Optimization (RDO) system is patented and complemented by its testing performance processes. No historical investment relationship was found between the two parties before 2000, but Hilite opened its first representative office for commercial purposes in Shanghai in 2005 and established its first production plant in Changshu in 2011. After the AVIC-Hilite deal, a second production plant was established in Changshu, and a third in Ostrava (Czech Republic).[86] Cleary, AVIC was trying to expand its production networks not only in Europe so as to penetrate this market with a local brand and technology but also in China.

The fifth-largest investing company, Weichai Power, acquired a 25 percent stake in the German Kion Group in 2012, a manufacturer of forklifts, trucks, and warehouse equipment. There was no historical investment connection between. It seems that the Weichai Group invested worldwide to expand its brand portfolio, boost manufacturing capacity in Europe, and to access a greater variety of technology but did not completely acquire the target company.[87] In terms of its main production activity and international projection, the investment strategy of Weichai power was similar to that undertaken by

[86] See history and evolution of Hilite: www.hilite.com (accessed 19 November 2022).

[87] See more information in corporate sites, for Weichai: weichai.com/wmdgs/cyqy1/wcdjt/ (accessed 19 February 2023) and for Kion: www.worldhighways.com (accessed 19 November 2022).

Hainachuan, i.e., increasing production networks.

It is worth mentioning that SAIC's acquisition of Ricardo 2010 in 2005 is not very relevant in terms of the investment amount – as Table 4.4. shows, only USD 1.2 million – but it was relevant in terms of historical investment relations and networks. In 1980, China applied for internal combustion consultancy services to Ricardo Consulting in a service contract agreed for two years. The same company has lasted over time.[88] In 2001, NAC and Ricardo Consulting established a joint venture and founded Ricardo 2010, but the latter was taken over by the Chinese company in 2005, when the British MG (Rover) declared bankruptcy in April (CATARC & MOFCOM, 2014; MOFCOM, 2022).

Analysis of the above transactions confirms the ongoing literature that defines Chinese investment decisions as asset-seeking (technology and brands). But market-oriented drivers in high-income countries like Europe are compatible with asset-seeking drivers (see, for example, Beule & Duanmu, 2012; Amighini & Franco, 2013; Child & Rodriguez, 2005; Kolstad & Wiig, 2012). The Chinese state-driven investments sought to create new production plants in investment destinations and in China in order to gain weight in global production networks. But most importantly, the outward investment decisions of SOEs were not influenced by historical investment relations except with European companies that experienced liquidity or production troubles. For instance, the Dongfeng-PSA Group transaction was politically influenced to continue consolidating long-term collaborations when required a considerable capital increase. Furthermore,

[88] UK was one of the pioneer European countries to provide technical assistance and consultancy, in which Ricardo took part in the early times of economic open up. See more in History of introduction of technology and equipment in China, Appendices B.2 History of technology and equipment introduction in China's Automobile Industry

SOEs' investments into auto-part firms confirm the fact that state-driven investments looked for extending supply networks in Europe, which involved suppliers of European OEMs that had established equity joint ventures in Chinas. The pattern is similar to the European carmaker's outward internationalization in China, i.e., they did not go alone as far as their domestic supplier of automotive parts and accessories followed the leading firms.

Table 4.4. Internationalization of Chinese SOEs in the EU

Year	Ownership	Investor	USD million	share EU (%)	Target Company	Country	share %	mode
2015	SOE	ChemChina and SAFE	7.860	22,56	Pirelli	Italy	26	pa
2014	SOE	BAIC Beijing Borgward	1.190	3,42	Borgward	Germany	100	ca
2014	SOE	Dongfeng Motor	1.100	3,16	PSA Peugeot Citröen	France	14	pa
2014	SOE	Aviation Industry Corp. (AVIC)	640	1,84	Hilite	Germany	100	ca
2012	SOE	Weichai Power	617	1,77	Kion Group	Germany	25	pa
2011	SOE	China's Citic Dicastal	420	1,21	KSM Castings	Germnay	100	ca
2016	SOE	Asia-Pacific Mechanical & Electronic Group	340	0,97	Groupe Mécanique		100	ca
2014	SOE	SAFE/BOC	280	0,80	Fiat	Italy	2	minor
2011	SOE	BAIC Hainanchuan Automotive PartS	270	0,78	Inalfa Roof Systems	Germany	100	ca
2016	SOE	Aeolus Tyre	149	0,43	Pirelli Industrial	Italy	100	pa
2016	SOE	China International Marine Containers (Group)	120	0,34	Retlan Manufacturin	UK	100	ca
2018	SOE	Tsinghua Holdings	105	0,30	Telit Communicati	UK	100	ca
2005	SOE	Nanjing Automobile	100	0,29	Powertrain Ltd	UK	100	ca
2005	SOE	Lingyun Industrial	8	0,02	WALDASCH AFF	Germany	100	ca
2007	SOE	SAIC Motor Corporation	1	0,00	Ricardo 2010	UK	100	ca

Source: Authors' own elaboration, see section on Theory and Methodology.
Notes: pa= partial acquisition, ca= complete acquisition or take over, minor=<10 percent stake acquisition. *Investment amount estimated from press and open company sources.

4.4. Chinese non-SOE investment in the EU

Overall Chinese non-SOEs carried out more investment in the EU than SOEs, as Figure 4.2. shows. Chinese non-SOEs established investment relations more recently than SOEs, but their investment was more "aggressive", the main purpose being to access technology and other specific assets in order to compete with large SOEs. China's domestic market has been dominated by large SOEs and their joint ventures with foreign partners. Even though a development model based on joint ventures created certain technology dependence (see Chapter 3), selected automotive SOEs had accumulated almost four decades of experience from foreign partners.

The first Sino-European equity joint venture with non-SOEs started in 2010, when Chinese firm BYD and Daimler founded Denza. Since the mid-1980s, large state-owned carmakers have been learning from their foreign partners, which implies local manufacturers receiving transfers of technology, local workers being trained abroad and foreign experts being sent to China to demonstrate the correct utilization of technology, as well as, even more importantly, local manufacturers being able to accumulate certain design and R&D capacities for their own makes of car. Whether "Chinese manufacturers are getting a lot of practice and moving down the learning curve" (Shih, 2018), those started before accumulated more experience than the latecomers. Therefore, the way to compensate for this gap was directly accessing the foreign core. The faster they learn the better.

To that purpose, they took dynamic actions through M&As rather than greenfield operations, created new brands with target companies, and established more equity joint ventures to guarantee the access and absorption of foreign knowledge. Regarding the *mode of entry*, non-SOEs were more likely to fully acquire the target company no matter what the size or historical investment relationship. Most frequent were cases that target companies in Europe with no previous equity joint venture with the investing company. They also established new R&D centres to ease technology transfers.

To prove how non-SOEs were more dynamic than SOEs, the largest non-SOE investing companies have been selected for the analysis according to investment volume—Geely, Ningbo Dongfeng Yisheng, Ningbo Joyson, Great Wall, Luxshare,—to examine their investment transactions in the EU (see Table 4.5.). Other companies like Youngman are in focus because they offer interesting comparative strategies with Geely. In this chapter, much attention is given to Geely due to three reasons. First, it is the most internationalized Chinese company in the motor sector by foreign assets and foreign employees to group total. Geely is also the only non-SOE motor vehicle company ranked in the top 100 non-financial multinationals from developing and transition economies (UNCTAD, 2022). Second, this is the largest investor in the European automotive sector, weighting around 44 percent of total Chinese OFDI. Third, its outflow of FDI located in the EU is the highest (above 80 percent to total foreign investment).

Controversial though it might seem, this 'young tiger' founded, by Li Shufu, did not obtain its automobile production license until a few months before China's WTO membership. In 2012, Zhejiang Geely Holdings was constituted for investment operations in Hangzhou (capital of Zhejiang province) (Z. Wang, 2011). The first across-the-board transactions, in the early 2006, were the signature of Sino-foreign joint ventures with Manganese Bronze Holdings (MBH), the mythic UK producer of London taxis. It was not relevant in terms of investment deal but it was the attempt of Geely to access European technology. In 2013, it completely acquired the black cab manufacturers for USD 150 million. But the greatest milestone was the Geely-Volvo acquisition in 2010 for USD

2.700 billion. It was a very important operation because it was the first time that a young non-state carmaker from an emerging economy took over a consolidated car company in an industrialized economy. Some years later, Geely continued its international expansion with the acquisition of Volvo Trucks in 2017 for USD 3,270 million (8 percent participation) and the acquisition of Daimler for 9,030 million USD (9.7 percent participation).[89]

The first relevant transaction of Geely was in Sweden. The Geely-Volvo acquisition was indeed significant in terms of how this private company sought technology and strategic partnerships abroad. None expected such a young emerging carmaker to become the final acquirer of a consolidated brand owned by Ford. One might ask why this relatively unknown Chinese carmaker ventured this transaction instead of a Chinese SOE (Ma & Overbeek, 2015). The reality was that Li Shufu (Geely's CEO) had been monitoring the evolution of Volvo and planning the transaction some years before the global financial crisis finally broke in 2008.[90] He was also aware that Greely had urgent requirements of collaboration with foreign manufacturers, due to its lack of global connections, unlike Chinese SOEs. He knew how unrealistic it was to compete with them and their foreign partners that have been producing in China for decades (Z. Wang, 2011). Furthermore, the state's approval for this large investment transaction was required.

Ford had acquired Volvo in 1999 as a tactic move to counter its fall in sales and loss of global market share. In the following years, Ford also acquired Land Rover, Jaguar

[89] Geely's investment in Daimler has been agreed but was not yet completed in 2018 according to the Zephyr register.

[90] The "Ningbo Declaration" [Ningbo xuanyan] was an authentic declaration of intentions and strategies that Li Shufu exposed to gain the government's favor. See more in www.auto.sina.com.cn (accessed 6 December 2022).

and Aston Martin. These four brands were conceived as being integrated into the premium-segment automobile group. Hence, through these acquisitions, Ford pursued greater growth potential in Europe, a region with less competition and lower production cost than in the United States (Catalan, 2007). In other words, Ford's investment decisions were not driven by technology but the need to penetrate the European market. That might explain why Ford had never been too implicated in R&D activities at Volvo. According to Wang (2011, 2021), the former Geely Deputy Director who fully supervised the Geely-Volvo acquisition, the budget for Sweden was limited and reported production issues were just not as important as other groups' issues. Volvo only made some profit in 2005 but afterward its sales soared 18.3 percent and its losses increased to USD 9.24 billion, during the period 2005-2009. In 2010, Volvo accepted an offer by Geely that, by value, was only a third of Ford's earlier takeover. In November 2010, Geely received a summon from Carl XVI Gustaf, King of Sweden, in Hangzhou, which meant the recognition of a new era for the Chinese automobile industry.

This transaction allowed Geely to make structural changes and upgrade the company to an international automobile group by having technology catch up with its foreign competitors, and equally importantly, bringing technology purchased abroad home in order to compete with domestic SOEs. However, innovation synergies are time-consuming. Unlike Ford, Geely's main investment decision was technology-seeking. Hence the outward internationalization strategies match theories of reverse technology spillover because technology transfers are accommodated in two-way investment flows (Cozza et al., 2015; Yuan & Zhang, 2018; Zhou, 2009). More importantly, like other Chinese emerging enterprises, Geely needed to access technology proactively to transfer it back home (Li et al., 2016; Yao et al., 2016; Ouyang, 2010).

Trademarks and patents are equally relevant to efficiency gains in modern firms in advanced economies (Luo & Tung, 2007). It is to be noted that Geely had not established any joint venture in China with foreign partners before the big deal, so it lacked direct access to all these strategic assets but subcontracted technical consultancy and design services instead. The best way to guarantee full access to technology is through complete M&As and becoming the owner of intellectual property (Alvstam & Ivarsson, 2014; Buckley et al., 2016; Stiebale, 2016). If the most effective strategy was to become the owner of Volvo's intellectual property in the fullest sense, with Volvo's acquisition, Geely successfully accessed what the Chinese company perceived as the "eight magnific assets" [badabaogui zichan] (Z. Wang, 2021, p. 174).

The first asset was that Geely became the owner of all intellectual property and had the right to use and transfer the Volvo trademark worldwide. This help to fill the shortage of product brands, upgrade research capacity and development the quality of automotive parts and accessories globally. Second, Geely obtained ten in-progress product lines, including complete vehicles, accessories, and environmentally related projects. Third, the Volvo SPA platform design was completed and went to the assembly plan in 2013. Fourth, Geely became the owner of Volvo's modern installation facilities in Gothenburg and Udevalla (Sweden), Ghent (Belgium) and Malaysia. Fifth, Geely became a full stakeholder in one engine and three auto parts and accessories companies, and owned 40 percent stakes of a company manufacturing chassis. Sixth, Volvo had 83 years of accumulated expertise in developing complete vehicles, parts and accessories, a rich data source, and 3,800 top qualified researchers, engineers and technicians, i.e., invaluable human capital that Geely would benefit. Seventh, Geely also accessed to over 2,325 distribution points in more than 100 countries. Last but not least, Geely became the owner of 10,963 patents that Volvo had accumulated up to 2010.

Geely's assets definitely increased after it became the ultimate owner of a huge amount of strategic assets (tangible and intangible) that were progressively transferred to China (Yakob et al., 2018). Several shreds of evidence prove the fact. First, the establishment of the joint venture between Volvo and Geely in Daqing led to Daqing Volvo Car Manufacturing and two more production plants in Chengdu and Zhangjiajie.[91] Geely achieved reverse-engineering transfers and created innovation synergies in the host country. The creation of China-Euro Vehicle Technology (CEVT) in 2013 in Gothenburg —the heart of the Swedish automotive industry cluster— had the main goal of developing a new brand named LYNK&CO. Design and innovation activities were introduced under Mats Fagerhap's management (Z. Wang, 2021).

Three years later, the group of international researchers in CEVT had grown to over 2,000 from more than 20 nationalities. [92] Meanwhile, Volvo established a new R&D centre in China named Volvo Car Research and Development in China. In 2016, the LYNK&Co brand was established with European design in Gothenburg. In 2017, Geely-Volvo Technology formed a joint venture with LYNK&Co, though Geely was already the full owner of LYNK&Co, which made both ownership and technological collaboration official.

Geely achieved reverse technology transfer, innovation synergies, and access to both consolidated and new brands to compete in the domestic market as well as in the

[91] Geely, better said, Li Shufu, held Volvo's 100 percent stake since 2010, with headquarters in Gothenburg (Bureau Van Dijk, 2019), therefore Chinese authorities did not recognize Volvo as a domestic (or indigenous) company; this is the reason why the joint venture in China is registered as a Sino-foreign one. For Geely the new company was born like "zijiyuziji jiehun" [marrying own self]; see more in Geely's "unhistory" (Z. Wang, 2021).

[92] See more about R&D center history in official site: www.cevt.se (accessed 19 November 2022)

international markets. The results showed that Geely's technology catching up was dual tracked. On the one hand, Volvo created joint ventures in China and produced Chinese drivers directly. In the same vein, Geely received technology transfers from Volvo and could create new car models like the Bo Rui model. In 2015, Geely presented new versions of Bo Yue, Emgrand GL and Emgrand GS, all SUVs that are similar to Volvo's SUV models. On the other hand, a new global brand, neither Swedish nor Chinese, was being incubated in Gothenburg to access international markets and would be imported to China as made in EU cars, i.e., higher quality and more prestigious. Therefore, Geely achieved technology transfers from host company (and innovation outcomes in Europe) to China, new invested the company in China, and created innovation and design synergies (Ouyang, 2010; van Pottelsberghe De La Potterie & Lichtenberg, 2016; Zhou, 2009).

The second important transaction of Geely was also located in Sweden; the third in Germany. Geely's international expansion did not cease with Volvo cars, since it launched itself in Europe's core with the acquisition of Volvo Trucks in 2017 for USD 3,270 million (8 percent participation). That participation did not give Geely decision-making power on the managing board, but at least it could access the commercial vehicle branch. Geely's third relevant investment transaction was in Germany. In 2018, Li Shufu stepped forward with more acquisitions and became one of the largest stakeholders in Daimler. Months later, Geely and Daimler Mobility Services announced plans to create a joint venture in the sector of premium-ride hailing in China. It is perfectly understandable that Geely was not seeking production synergies for traditional Mercedes Benz since this German carmaker had already established a joint venture with BAIC in 2005. However, Zhejiang Geely and Daimler joined the venture (50:50) to produce Smarts in 2019.

So, Geely was not competing with SOEs with the same model of cars, nor with other non-SOEs like BYD in the production of same vehicle category. It is fair to recall at this point that China's industrial policy in the automotive sector continues to regulate the entry of FDI. For instance, no foreign carmaker can produce the same motor vehicle model with more than one local partner, nor does any foreign partner hold more than 50 percent of total stakes (exception admitted but private carmakers). Clearly, Geely sought to learn from high-end carmakers, particularly in the production of electric vehicles on the wave of a changing energy paradigm.

Ningbo Dongfang Yisheng and Ningbo Joyson Electonic are all based in the city of Ningbo (Zhejiang province), and they are the second and third largest non-SOE investing companies in the EU. Before Geely acquired Volvo cars in 2010, it had more than 500 suppliers, of which 80-90 percent were in Zhejiang (Z. Wang, 2021). Their investment transactions in Europe were highly concentrated in German high-tech sectors related to automobile manufacturing. In 2016, Yisheng acquired Punch Powertrain in Belgium for USD 1.11 billion. This auto parts company is a business division of the Dongfang Group, which is specialized in the production of wire and cable but also has supplementary business branches in finance and insurance investment. With this acquisition, the group would score with its extensive strategy in improving industrial chain and injecting more technological content into the "Dongfang [Orient]" brand. Therefore, the complete acquisition was pursued to expand industrial activities.

Joyson Electronic successfully accessed three German auto parts manufacturers through three consecutive investment transactions, being one of the main auto parts manufacturing companies in China, as well as an important supplier of Geely (CATARC & MOFCOM, 2019). Joyson's first acquisition took place in 2011, when it acquired Prech for USD 100 million with the aim of achieving acquisitions of technology and assets, expanding product line-ups and accelerating globalization activities.[93] Joyson's second transaction was made in 2015, the same company completely acquired Quin GmbH for USD 287 million. The third acquisition happened in 2016, Joyson and its German subsidiary (Preh Holding GmbH) jointly acquired the automotive division of TechniSat Digital GmbH in Germany. In 2018, Prech completed the construction of its R&D centre in Stuttgart.

These outward foreign investment decisions provide a reminder of how globalization has challenged countries and organizational structures to leverage advantages in economic, political, and social aspects to gain positions in the global market. While development trajectories and international operations may differ between late industrialized countries and more advanced ones (Colli, 2010; Guillén, 2010) this phenomenon highlights the need to adapt to a constantly changing global landscape.

As we can appreciate, Dongfang Yisheng and Ningbo Joyson Electronic invested mainly in German manufacturers of auto parts and accessories through complete M&A operations. The investment patterns of Ningbo's auto part companies were induced by their regional leading carmaker Geely. Since Geely's adventure in Sweden and its outward internationalization in Europe, those auto part manufacturers tried to increase their global production networks in Europe by replicating the existing automotive cluster in Zhejiang. Those cases of outward investment decisions were affected by the lead firm, but with no former inward investment in China.

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[93] See more in corporate information Joyson Electronic: www.joyson.cn (accessed 27 November 2022); and transaction information in: www.marklines.com (accessed 19 February, 2013)

The fourth largest investing company was Great Wall. Great Wall is considered a private automobile company and classified as ICAM like Geely, BYD or Youngman. Specialized in SUVs and pick-up vehicles, however, it was state-owned in its origins and gradually transitioned to collective property in the early 2000s, and then became a private company. Like Youngman, even though is officially registered a private company, it has been influenced and managed by members of the China Communist Party. In fact, the current Chairman and Executive Director, Wei Jianjun is a Party member (also his father).[94] For instance, in 2010, Li Keqiang, Member of the Standing Committee of the Central Political Bureau and Vice Premier of the State Council, visited the Great Wall Motor Company to investigate the development of the enterprise. It received treatment as a national champion, since the brand was launched as a "Made in China Great Wall Car" and appeared in publicly controlled media like People's Daily, which came to interview the company and reported on the development of Great Wall's independent innovation capacity.[95]

That said, Great Wall's first deal in Europe was with Litex Motors in Bulgaria, and it is still unclear how much stock Great Wall holds, but USD 120 million was registered in order to start assembling activities and access European market. The second deal took place in 2018, the same company invested 700 million in German's H2 Mobility, the world's largest hydrogen refuelling station operator. It is quite notorious how Great Wall sought to access technology for the new generation of automobiles. Its investment objectives were also market-related, perhaps in east European countries. In the same year, Premier Li Keqiang and German Chancellor Angela Merkel hosted the fifth round of

[94] See more of Wei Jianjun public profile in www.bloomberg.com/profile/person/6076856

[95] See more development history of Great Wall in official site: www.gwm.com.cn (accessed 19 February 2023)

Sino-German government consultations in Berlin. In the presence of government officials from both countries, China Great Wall Motor Company and BMW signed a joint venture contract, and the new company was named Beam Automotive to develop electric SUVs.[96] Before that, no historical investment relation was found. More importantly, this transaction brought more insights to support the idea of state intervention and control of this non-SOE carmaker. Is it not remarkable that the highest political representatives were involved in a non-SOE agreement?

The fifth most relevant non-SOE here was Luxshare Precision Industry; s founded in 2004 under Wang Chunlan's leadership (Forbes 500), whose main activity is designing and manufacturing electronic connectors. The group's products include USBs, data connectors, power cables, extension connectors, and connectors for coaxial cables among others. Their products are intended for consumer electronic manufacturing, computer manufacturing, or the automotive industry. In 2017 it took over German's ZF Friedrichshafen AG's body control systems unit for USD one billion. This German company is a global supplier, but with no equity joint venture in China. This target company is a global leader in driveline and chassis technology, as well as in active and passive safety technology. This acquisition was reported by ZF Press (2017): "The Global Body Control Systems business will become a major growth driver within the Luxshare corporate portfolio," explains Laichun Wang[97], CEO of Luxshare. She also stated that "Luxshare will leverage its experience to create significant growth for Luxshare Precision

[96] See more development history of Great Wall in official site.

[97] She is one of the few leading women entrepreneurs in the automotive sector, specifically in the auto parts and accessories sector. This is a highly male-dominated sector, a common trait in China, as evidenced by the fact that historically only two women have been found to have held important positions. See Appendices B.3

and help the Body Control Systems business to expand and to execute their defined strategy to be a global leader in automotive interface solutions. It will give Global Body Control Systems access to new customers and to consumer technologies for automotive applications […].

Evidence enough to confirm that both companies produce similar automotive products, but Luxshare Precision required technology for new product developing and product technology upgrading" (Reuter Staff, 2017; ZF Press, 2017). In other worlds, Luxshare sought to expand and upgrade its global supply chain. According to Yeung (2022), South Korea, Taiwan, and China have become significant players in global electronics production by incorporating their home macroregion, East Asia, into the interconnected networks that have traditionally been dominated by the US, East Asia, and Europe.

In a nutshell, Geely invested in one of the most advanced regions in the world and became a full owner of Volvo cars in order to compensate for the lack of equity joint ventures with foreign carmakers and sped up the learning process. By so doing, this non-state-owned ICAM technologically sought to converge with SOEs in the domestic market and achieve international competitiveness in cross-board markets. Other manufacturers of automobiles and auto parts, which were located in the same Zhejiang province, followed behind Geely's investment steps in Europe. They also tried to access updated technology and increase their production networks.

Table 4.5. Internationalization of Chinese non-SOEs in EU

Year	Ownership	Investor	USD million	share EU (%)	Target Company	Country	share %	mode
2018	non-SOE	Zhejiang Geely Technology Ltd.	9.030	25,92	Daimler AG	Germany	10	minor
2018	non-SOE	Zhejiang Geely Holding Group	3.270	9,39	Volvo AB Trucks	Sweden	8	minor
2010	non-SOE	Zhejiang Geely Holding Group	2.700	7,75	Volvo AG Cars	Sweden	100	ca
2016	non-SOE	Ningbo Dongfang Yisheng	1.113	3,20	Punch Powertrain	Belgrium	100	ca
2017	non-SOE	Luxshare Precision Industry	1.000	2,87	Friedrichshaf en AG's Boty	Germnay	100	ca
2018	non-SOE	Great Wall Motor	700	2,01	H2 MOBILITY	Germany	nd	minor
2017	SOE/POE	Zhengzhou Coal, Rennaisance Capital	595	1,71	Robert Bosch Industrietreuh	Germany	100	ca
2018	non-SOE	Ningbo Jifeng	450	1,29	Grammer	Germany	26	jv
2013	non-SOE	Zhuzhou Times New Material Technology	400	1,15	ZF Friedrichshaf	Germany	100	ca
2015	non-SOE	Ningbo Joyson Electronic	287	0,82	Quin GmbH (former	Germany	100	ca
2012	non-SOE	Liaoning Dare Group	210	0,60	Carcoustics (AlpInvest	Germany	100	ca
2016	non-SOE	Anhui Zhongding	210	0,60	Druckguss & Co KG	Austria	100	ca
2013	non-SOE	Zhejiang Geely Holding Group	200	0,57	Emerald Automotive	UK	100	ca
2016	non-SOE	Ningbo Joyson Electronic	200	0,57	TechniSat Digital	Germany	100	ca
2013	non-SOE	Youngman Automobile	186	0,53	Swedish Automobile	Netherlands	100	ca
2014	non-SOE	Zhejiang Geely Holding Group	150	0,43	Manganese Bronze	UK	100	ca
2016	non-SOE	Anhui Zhongding	150	0,43	AMK Holding	Germany	100	ca
2011	non-SOE	Wolong Holding Group	140	0,40	ATB Group	Austria	100	cp
2009	non-SOE	Great Wall Motor	120	0,34	Litex Motors (Litex	Bulgaria	nd	jv
2015	non-SOE	Anhui Zhongding	110	0,32	Wegu Holding	Germany	100	ca
2011	non-SOE	Ningbo Joyson Electronic	100	0,29	Preh	Germany	75	pa
2012	non-SOE	Guangxi Liugong Machinery	100	0,29	Huta Stalowa Wola	Poland	100	ca
2007	non-SOE	Fuyao Glass Industry Group	73	0,21	Fümo Tec GMBH	Germany	100	ca
2018	non-SOE	Lingyun Industrial	69	0,20	WALDASCH AFF	Germany	100	ca
2018	non-SOE	Loncin Motor	47	0,13	CMD COSTRUZIO	Italy	67	pa
2012	non-SOE	Youngman Automobile	12	0,03	Viseon Bus	Germany	75	pa
2014	non-SOE	Changzhou Xingyu Automotive Lighting Systems	6	0,02	NEUE I&T	Austria	70	pa
2016	non-SOE	New Long March (NLM)	6	0,02	Smith GT Bentley	UK	60	pa

Source: authors' own elaboration, see section [Theory and Methodology]
Notes: pa= partial acquisition, ca= complete acquisition or take over, minor=<10 percent stake acquisition

4.5. Conclusions

This chapter has looked at whether the increasing Chinese OFDI has been influenced by industrial policies and the past performance of inward FDI. It contributes by showing how China transitioned from a passive recipient of investment to proactively capturing technology abroad. The Chinese government began liberalizing the market and enabled foreign automobile manufacturers to open production subsidiaries in China. The Chinese 'Big Three' (FAW, Dongfeng and SAIC) and other SOEs were promoted to create joint ventures with foreign manufacturers and to capture the bulk of total output. Non-SOEs emerged within the wave of economic reforms, yet they were not allowed to capture foreign investment until the 21st century.

The inward internationalization process affected the outward process of Chines enterprises. The increasing trend of outbound investment became notorious since the issue of the first policy White Paper on the European Union (EU) in 2003, both SOEs and non-SOEs received support to go out. Especially during the global financial crisis in 2008-9, China saw a great opportunity to take advantage of accessing the European core automotive companies with financial problems. Empirical analysis of statistics proved the relevance of Europe as the world region that received Chinese automotive-related outward investment until 2018. State-driven outward FDI transactions showed that asset-seeking interests could be compatible with market-oriented interests in high-income countries (Child & Rodriguez, 2005; De Beule & Duanmu, 2012; Kolstad & Wiig, 2012). This pattern was even more notable whether internationalization of those operations sought to strengthen production networks and gained a larger share within the global value chain(Coe & Yeung, 2015; H. W.-C. Yeung, 2022).

Relevant investment transactions are examined in this chapter by distinguishing the ownership of different Chinese investors. The largest investing Chinese companies and their transactions are studied covering up to 90 percent of China's total OFDI in the EU automotive industry, where, in terms of investment amount and strategy, Dongfeng-PSA and Geely-Volvo stand out. The case studies analysed in this chapter highlight how inner investment drivers of SOEs and non-SOEs in the EU were different.

First, non-SOEs without historical equity partnerships invested in the EU because they urged more than SOEs to access foreign technology. Therefore, non-SOEs needed to guarantee access to specific assets and technology transfers through complete M&As operations; the SOEs seemed less likely to fully acquire the target company. Even so, for either SOEs or non-SOEs, M&As is the favourite modus operandi when accessing European automotive industry because this is the fastest way to obtain technology (Hong & Sun, 2006; Pietrobelli & Rabellotti, 2012; Rui & Yip, 2008).

Second, non-SOEs created new brands, established R&D centers and constructed new production plants in the host and domestic markets to increase competitiveness in the latter. For example, after the Geely-Volvo acquisition, Geely opened an R&D center known as CEVT in Gothenburg (Sweden) and another one in China. The Chinese carmaker also created a global car brand, LYN&Co, to compete in both the domestic and international markets. Furthermore, it established a new equity joint venture in China years after Volvo's acquisition. This process confirms how China became a proactive investor seeking to organize technology and knowledge transfers in both directions (Ouyang, 2010; Yuan & Zhang, 2018).

Third, SOEs started to go abroad earlier than private firms, but the emergence of non-SOE investment in the EU has been more important in the reconfiguration of the domestic automobile industry during the era of the re-emergence of the Chinese economy. Two facts characterized the non-SOE investment decisions. Non-SOEs usually undertook larger investment deals than SOEs, with the exceptions of Dongfeng and ChemChina (both are *yangi*). Besides, non-SOE investments created a gravitational force and attracted more domestic suppliers and competitors to follow. That was the case with Geely's deal in Sweden in 2010, which attracted domestic-local suppliers and non-SOE carmakers to invest in Europe.

Fourth, governmental support seems crucial for investors of either ownership. While inward investments have been controlled, outward investment decisions are still regulated. For state-owned companies, central or local governments have direct control, yet non-SOEs have been following general state recommendations. Those Chinese automobile companies acquired completely or partially consolidated European automotive companies. However, ownership in Chinese enterprises should be analysed carefully since government's intervention could be present even in non-SOEs.

Having this backdrop, it can be confirmed that the impact of former European investment in China had some effects on state-driven investment in the EU from the 2000's, yet SOEs did not investment always back to the "old" partners. What seemed to be determinant was how companies that suffered from liquidity and production constrain attracted the attention of SOEs. It is found that even though capital injection was justified in terms of global expansion strategies and long-lasting investment relations, political influences were clear. That transaction rose concerns of European policymakers that Chinese government aimed to drain technology in Europe. Therefore, Chinese investors might have to carry out a broader overhaul in Europe due to the increasing restrictiveness of inbound investment regulations, especially in relation to state-supported investments for sensitive technologies and infrastructure since 2018. On the other side, the lack of former equity partnership with foreign companies, made non-SOEs to capture technology through aggressive M&As in Europe.

The main limitation of this work also reveals the possibility of future work in automotive industry clusters in China. There were more than 12,000 registered auto parts manufacturers in China in 2015, hence regional analysis of interfirm networks would contribute to the debate on whether indigenous or foreign manufacturers dominate the domestic market and to what extent Chinese auto parts companies increase their share in the global value chain. By doing so, we could know how dependent global automobile companies are on China's supply chain.

Chapter 5. Lessons from China's Automobile Industry

The present study has discussed the re-emergence of the Chinese economy in the 21st century. Using the automobile industry as a case study, the thesis examines the interdependence between the internationalization of Chinese enterprises, taking into consideration inward internationalization under strict state control, which was standard procedure before Chinese automobile enterprises began to engage in FDI abroad; technology catch-up; and outward internationalization decisions, which were influenced by state industrial policy. It has been hypothesised herein that the state instigated a bidirectional process of internationalization in the automobile sector (i.e., inward and outward), which in turn enabled the country's automotive sector to become a world leader. The present chapter discusses the value-added of this process both from a sector-based and a theoretical perspective, thereby opening the way to further research.

5.1. Sector-Based Value-Added

The automobile sector in China has been the subject of studies by Mann (1997), Harwit (1995, 2001), Thun (2004, 2006), Donnelly et al. (2010), Collis and Donnelly (2012), Guang (2015, 2020), Doner et al. (2021), Li (2010, 2014, 2015), Meier (2018), and Zhang (2019). However, none of these have investigated the relationship between government industrial policy and long-term company internationalization. The present study contributes to the literature on the evolution of the Chinese automobile sector by examining the inward and outward nature of that internationalization in the context of strict state industrial policy, though the success of the *technology for the market* policy of the Chinese government is a matter of debate. The strategies of non-SOEs were also influenced by industrial policy and the experiences of SOEs.

Chapter 2 showed that the internationalization of China's automobile industry began before enterprises in the sector were encouraged to operate abroad. The historical analysis was based on original corporate archives of contractual negotiations, historical reports of backbone SOEs, and the oral testimonies of former engineers, managers, and plant directors in China's automobile industry. During the Maoist era, when the state had an all-controlling role in overseeing and allocating resources, foreign aid and international technology transfers were crucial for the establishment of the first automobile manufacturers. China not only received assistance from the Soviet Union but also from other communist allies. Inward internationalization developed further in the first decades of economic reform, with a protective market that was limited to selective SOEs, such as First Automobile Works (FAW), Dongfeng (formerly SAW), and SAIC (formerly STAC). Foreign players who entered the domestic market had to comply with strict contractual conditions to ensure the transfer of technology and know-how to local partners helped develop indigenous capacity and accumulate learning. These conditions were set out in the 1994 Automobile Industry Policy. Consequently, China became a passive recipient of foreign technology, creating a dependency that persisted and led to more joint ventures. Such inward internationalization laid the foundation for China's industrial modernisation and market development.

Chapter 3 employed quantitative analysis and a novel indicator to measure the technological (in)dependencies of China's automobile industry between 2000 and 2018. The indicator demonstrates the limitations of government policy in the automobile industry. Despite the government's efforts to strengthen the science and technology sectors in the past decades, the country is still a *technology debtor*, and indigenous innovation capacity has not been able to compete with traditional global car manufacturers. Revenue from intellectual property has not compensated for outgoing royalty payments, and the trade balance is negative. The indicator highlights the limitations of the market for technology policy during the past 20 years. The findings of the present study are consistent with the literature, which states that foreign investment and technology transfers are not magic bullets, even though they permit the accumulation of learning. However, technology dependency seems to have decreased since 2015 because Chinese electric and other environmentally friendly automobile manufacturers have begun to realise some of their potential.

Chapter 4 showed how previous investment by European companies in China and the government's industrial policies have shaped the country's outward investment strategies in Europe in the present century. The chapter compared European investment in the automobile sector in China and vice versa between the 1980s and 2018. An investment transaction database, which was built using data from prestigious research centres, as well as official policy repositories, showed that Chinese outward investment in the European automotive sector was influenced by historical investments by European automotive companies in China and the Chinese government's industrial policy. While non-SOEs became proactive technology captors through aggressive mergers and acquisitions, SOE investment decisions were geared towards their historic partners and they followed state guidelines.

The historical analysis pointed to two significant examples of Chinese internationalization. Volkswagen was the most successful case of inward internationalization, while Geely, the leading non-SOE in China, began its outward internationalization during the 21st century. The success of Volkswagen in China may be explained by various factors: the first-move approach that characterised Volkswagen's internationalization strategy in emerging countries; the choice of location (with Shanghai one of the most industrialised regions in China); and the ability of the company to adapt to the Chinese government's conditions in terms of technology transfers through local–national content ratios. Geely has been the most active outbound investor because, as a non-SOE, it lacked direct access to foreign assets. Having to compete with SOEs that had partnered with foreign multinationals such as Volkswagen drove Geely to seek outward opportunities rather than inward investment (which was the case with many of its rivals).

Notwithstanding the difficulties of attempting to predict future trends, the present study has provided additional value by offering a visionary perspective on international economics and some of its constituent organisations. If current trends continue, the Chinese automotive industry might not only consolidate itself as the world's largest automobile manufacturer and lead the field in environmentally friendly vehicles but also become a technology leader. China's ongoing investment in science and technology, which is above the average of OECD countries, is reflected in the increasing number of innovation and applications patents it has registered (at home and abroad). China's search for strategic partnerships in global markets has been based on the need to create synergies in the supply chain through outward direct investment while attracting more foreign investment in the domestic market. The focus has been on the production of cutting-edge automobiles rather than new technology *per se*, with Tesla's gigafactory in Shanghai being possibly the best example.

The Chinese government is making greater efforts to reduce its dependence on fossil fuel energy. This is evidenced by its support for the rapidly growing number of electric battery manufacturers, a trend that is likely to continue. Of these, CATL and BYD are global leaders. Finally, the findings of the present study lend support to Freynesset's conceptualisation of the *new auto industry revolution* and contribute to ongoing environmental discussions.

5.2. Theoretical Value-Added

The political economy literature argues that China's industrial modernisation has been shaped by institutional changes, whereas the international business literature emphasises the connection between China's resurgence and its international expansion business strategies. The present study has attempted to reconcile and complement these two perspectives by examining the degree to which government policies have influenced the internationalization of the automobile industry in China. In particular, it has examined technology transfers and direct investment to explain how China was to upgrade its manufacturing sector as a latecomer. Rather than attributing China's success to the uniqueness of the involvement of the state in, inter alia, resource distribution (Ang, 2016; Duckett, 1996; Meier, 2018; Weber, 2021), the study offers a more nuanced understanding of the role of government policies.

From a political economy perspective, the study demonstrates that the state's role in the modernisation of China's industry was not static and remained the main agent over time. During the high socialist period, the Chinese Communist Party had absolute control over the national economy and its industry, and only SOEs were allowed. At that time, there was an absence of market mechanisms or any specific industrial policy. With the emergence of the socialist market economy in the 1980s and 1990s, different forms of ownership appeared, but the Chinese state continued to dominate the automobile sector through guided policies and investment regulations. These were formalised for foreign partners from 1994, when the first specific policy was issued for the automotive sector (Bremmer, 2009; Dussel, 2015; Harwit, 1995; Huang, 2008; Johnson, 1987). The present study has complemented the previous literature by revealing how state intervention evolved, shaping the two-way investment relationship between domestic and foreign players. It has been argued that examining the different types of ownership of Chinese firms helps towards an understanding of how government policies have influenced investment and technology transfers.

The previous literature has focused on the internationalization of emerging economies and the factors that drive the outward investment decisions of enterprises. A prominent group of scholars has been studying China's outbound investment using Dunning's OLI model, which does not fully account for the particularities of Chinese ownership, industry, and market structure in cases where firms decide to expand internationally. Moreover, the model overlooks the internal process of internationalization. In both cases, state intervention and the effects of China's economic transformation are significant. By contrast, the Uppsala model emphasizes the gradual nature of internationalization, beginning with internal but outward-oriented decisions in cases where domestic firms lack sufficient investment and innovation capacity (Johanson & Vahlne, 1977; C. Johnson, 1982; Welch & Luostarinen, 1993). Additionally, adherents of the Uppsala model have concentrated on factors such as political and cultural proximity rather than on purely market-driven internationalization decisions. This thesis argues that the OLI and Uppsala models should be considered complementary, especially given the particularities of China's economy and the way it transitioned from a non-market to a market-orientated system.

A singular theory model or a static interpretation of state intervention makes it difficult to acquire a comprehensive understanding of the automobile industry, given the institutional changes that have occurred during each major period of development: high socialism or Maoism, 1949–1977; privatization and the move towards a (socialist) market economy, 1978–2001; and the expansion of economic reform after China joined the World Trade Organisation, 2002–2018. The present study has examined institutional changes in industrial policy and forms of ownership over seven decades, from the establishment of the first Five-year plans and the foundation of FAW in 1953 up to 2018. It challenges existing theories by considering the complementarity of both approaches. In other words, there is no need for a new model or specialist theory but rather the reinterpretation of existing ones, especially given that the various economic actors involved play dynamic roles.

The outcomes of this thesis support the hypothesis that state intervention in China led to a bidirectional process of internationalization. However, this hypothesis may be rejected in other economic sectors due to different development strategies driven by the government. Private ownership and investment played a prominent role in the textile industry, as highlighted by Brasó Broggi (2016) and Kajima (2022). In contrast, the banking sector and equity market remained under highly commanded-state control, as noted by Naughton and Tsai (2015) and Dussel (2015). Despite the establishment of foreign bank branches in China, equity joint ventures are still not permitted. The extractive and petrochemical sectors not only have a high level of state control but also pioneered investment abroad in the early stages of market opening without hosting foreign investment in China. In technology-intensive sectors, such as new energy, however, the internationalization process appears to follow a similar pattern to that observed in the automobile industry due to the government's strategies of attracting cutting-edge technology and strengthening innovation capacity through the establishment of new entities and partnerships for further collaborations. Thus, the outcomes of this thesis corroborate the pragmatic nature of the Chinese government and its industrial policy, which is characteristically adaptable to each economic sector.

5.3. Limits and research agenda

The study has highlighted the continuity of different research avenues and their convergence at the sectoral level (namely the automobile industry). For example, the historical China-European relationship, FDI, technology, and knowledge transfers, and the impact of energy transition within the disciplines of economic and business history, international business, and political economy.

It is essential that automobile industry-related data be updated in light of COVID-19, and within a reasonable time frame. This would allow for a more comprehensive evaluation of the pandemic's impact on production strategies, market structure, investment, and trade flows. Moreover, access to international databases and official government sources, which have been subject to certain revisions, would permit a better estimation of China's weight in the global value chain. The period covered by the study is justified because COVID-19 marked a step change in the development of the sector; additionally, the government's response to the pandemic made research more problematic. Archival research in China remains a challenge that will need to be addressed in the near future, though it is hoped that outcomes of the present study will help to establish the scope of ongoing research line.

This study primarily focuses on examining the development of the Chinese automobile industry and its relationships with foreign manufacturers, specifically

European automobile companies. While European companies entered the Chinese market rapidly during the early stages of economic reforms, the Japanese automobile industry took a more cautious strategy. Nevertheless, future research should compare both ways of approaching China's reforms and opening up period, both in terms of their contribution of China's industry development and in terms of market access and business success. To state it in a different manner, analysing the modes of collaboration and transfer of technology and know-how between these two Asian economies, as compared to the European cases which has been the focus of this work, will provide further insights into China's internationalization patterns in the long run.

Research into the diffusion of technology and knowledge and government intervention might be addressed by exploring the displacement of project managers, technicians, and engineers during the automobile's early stages of development. This would illuminate the ways know-how was transmitted amongst state-owned enterprises. Technology and knowledge transfer can take place through channels such as capital goods, trade licences, technical consultancy, and personnel. By using network research analysis, new evidence could be generated on how technology was and is organised in China. A historical comparative analysis of the relationships between SOEs and non-SOEs might also be conducted, since technology absorption is not uniform either across or within the industry, and the costs related to learning are not always accurately reflected in company financial statements. A firm-level analysis of learning investment—and the degree to which direct control of foreign assets through mergers and acquisitions accelerates the learning process more than access to foreign technology based on equity joint ventures—would be very valuable. Such an analysis would also provide additional information on the overall effects of foreign investment.

An examination of long-term investment relationships between the Chinese and Mediterranean European automobile sectors is needed since they tend to be overlooked in favour of traditional ones such as Germany. It would be worth investigating why Fiat failed to internationalize its operations in China from the early stages of the economic reforms whereas other European companies were successful. It is important to note that Spanish investment in China's automobile sector is chiefly in parts and accessories rather than complete automobiles.

Comparing China's expansion strategies in Europe with those in both developed and developing regions could be a fruitful avenue for research. Differentiating the investment strategies of SOEs and non-SOEs as a key governmental instrument post-WTO membership and the strengthening of the *go out* or *go global* policy might shed light on the extent to which non-SOEs are directly or indirectly controlled by the state. More generally, it would provide fresh insights into international relations and geopolitical interests – as would an analysis of the ownership structure of investing firms and government investment projects. According to official registers of MOFCOM, Chinese firms have been involved in 44,000 outbound transactions, albeit the distribution of investment globally is uneven both at the sector and country level.

Another interesting area for research would be the role of women in what is a traditionally masculine sector. Although females were involved in the transfer of knowledge and technology between Europe and China, the present study found only two women who had played an outstanding role in the inception of the automobile industry in China. In the 1950s, Ai Biyao (艾必瑶) was the only female member of the first interior design group for the legendary Hongqi limousine. Her contributions to the vehicle are still remembered. During the early decades of industry development, Wang Shujin (王淑静) held the unique distinction of being the only woman to hold the position of party secretary (委书记) at a state-owned chassis production plant of the Beijing Automobile Industry Corporation. Further investigations into employee resource allocation in state-controlled production plants might throw up other examples. Gender equality in late-industrialized economies could be compared (and contrasted) with that of Western production plants. Gender distribution in China's automobile industry could be compared longitudinally with other developed regions, for example, the USA, Japan or South Korea; this would make a great contribution to the literature on gendered economic and business history.

Finally, the question of how far electric or hydrogen-fuelled vehicles can provide solutions to environmental issues should be examined. Climate change is not peripheral; indeed, it is arguably the most significant challenge faced by the sector. The energy transition is already the major concern of the global automobile industry, and the new energy sector is closely collaborating with the automobile sector. In fact, research and production of electric batteries have already become the core investment activities, often pushed by environmental policies and regulations. However, how far should industrial activities be determined by environmental considerations? Should countries surrender their sovereignty to international agreements aimed at tackling climate change, even if it means limiting their economic development? These are complex and open questions that continue to be widely debated, and they deserve all the attention of academic researchers and policymakers.

Bibliography

Abramovitz, M. (1986). Catching Up, Forging Ahead, and Falling Behind. *The Journal of Economic History* 46 (2), 385-406. https://doi.org/10.1017/S0022050700046209

Acemoglu, D. (2002). Directed Technical Change. *The Review of Economic Studies* 69 (4), 781-809. https://doi.org/10.1162/003355398555838

Acemoglu, D., Johnson, S., & Robinson, J. A. (2005). Institutions as a fundamental cause of long-run growth. *Handbook of Economic Growth*, 1, 385–472.

Acemoglu, D., & Robinson, J. (2012). *Why nations fail: The origins of power, prosperity, and poverty.* Currency.

Adamec, J. (2018). 'Our friendship is longer than the river Yangtze and higher than the Tatra Mountains': Sino-Czechoslovak Trade in the 1950s. In J. M. Schaufelbuehl, M. Wyss, & V. Zanier (Eds.), *Europe and China in the Cold War: exchanges beyond the bloc logic and the Sino-Soviet split* (pp. 175–191). Brill.

Aeolus Tyre Official. (n.d.). History. Retrieved February 19, 2023, from https://www.aeolustyre.biz/aeolus-history.html.

Aitken, B. J., & Harrison, A. E. (1999). Do domestic firms benefit from direct foreign investment? Evidence from Venezuela. *American Economic Review*, *89*(3), 605–618. https://doi.org/10.1257/aer.89.3.605.

Alon, I., Anderson, J., Munim, Z. H., & Ho, A. (2018). A review of the internationalization of Chinese enterprises. *Asia Pacific Journal of Management*, *35*(3), 573–605. https://doi.org/10.1007/s10490-018-9597-5

Altenburg, T., Schmitz, H., & Stamm, A. (2008). Breakthrough? China's and India's Transition from Production to Innovation. *World Development* 36 (2), 325-344. https://doi.org/10.1016/j.worlddev.2007.06.011

Álvaro-Moya, A., Puig, N., & Torres, E. (2020). Managing foreign know-how and local human capital: Urquijo Group and the rise of Spanish engineering firms. *Business History*, *62*(7), 1231–1253. https://doi.org/10.1080/00076791.2017.1413093

Alvstam, C. G., & Ivarsson, I. (2014). The 'Hybrid' Emerging Market Multinational Enterprise — The Ownership Transfer of Volvo Cars to China. In C. G. Alvstam, H. Dolles, & P. Ström (Eds.), *Asian Inward and Outward FDI* (pp. 217–242). Palgrave Macmillan. https://doi.org/10.1057/9781137312211_11

Amighini, A. A. (2012). China and India in the international fragmentation of automobile production. *China Economic Review*, 23(2), 325–341. https://doi.org/10.1016/j.chieco.2012.01.002

Amighini, A. (2013). The international expansion of Chinese auto firms: typology and trends. *International Journal of Automotive Technology and Management*, 12(4), 345. https://doi.org/10.1504/ijatm.2012.051360.

Amighini, A., & Franco, C. (2013). A sector perspective on Chinese outward FDI: The automotive case. *China Economic Review*, 27, 148–161. https://doi.org/10.1016/j.chieco.2013.09.002

Amsden, A. H. (1989). *ASIA's next giant: South Korea and late industrialization*. Oxford University Press.

Amsden, A. H. (2001). *The rise of "the rest": Challenges to the West from late-industrializing economies*. Oxford University Press.

Anbinder, J. (2018). Selling the world: Public relations and the global expansion of General Motors, 1922–1940. *Business History Review*, *92*(3), 483–507. https://doi.org/10.1017/S0007680518000740

Ang, Y. Y. (2016). *How China escaped the poverty trap.* Cornell University Press.

Andreosso-O'Callaghan, B., & Qian, W. (1999). Technology transfer: A mode of collaboration between the European Union and China. *Europe - Asia Studies*, *51*(1), 123–142. https://doi.org/10.1080/09668139999155

Anwar, S., & Sun, S. (2013). Foreign entry and firm R&D: Evidence from Chinese manufacturing industries. *R and D Management*, *43*(4), 303–317. https://doi.org/10.1111/radm.12009

Arent, D., Arndt, C., Miller, M., Tartp, F., & Zinaman, O. (Eds.). (2017). *The political economy of clean energy transitions*. Oxford University Press.

Arosio, P., & Masoni, D. (2015, March 23). *ChemChina to buy into Italian tire maker Pirelli in $7.7 billion deal.* Reuter. Retrieved October 24, 2022, from, https://www.reuters.com/article/us-pirelli-chemchina-idUSKBN0MI0PQ20150323.

Automotive News. (2015, July 3). *JAC Italy R&D center has been established for 10 years.* Automotive World. Retrieved August 19, 2022, from https://www.automotiveworld.com/news-releases/jac-italy-rd-center-established-10-years/.

Balassa, B. A. (1981). The Newly Industrializing Developing Countries after the Oil Crisis. *Weltwirtschaftliches Archiv,* 117-190.

Balcet, G., Wang, H., & Richet, X. (2012). Geely: A trajectory of catching up and asset-seeking multinational growth. *International Journal of Automotive Technology and Management*, *12*(4), 360.

Baranson, J. (1969). *Automotive industries in developing countries*. World Bank Group.

Basberg, B. L. (1987). Patents and the measurement of technological change. *Research Policy*, *16*, 131–141.

Beijing Hainanchuan. (n.d.). Retrieved November 19, 2022, from www.bhap.com.cn.

Benito, G. R. G., Cuervo-Cazurra, A., Mudambi, R., Pedersen, T., & Tallman, S. (2022). The future of global strategy. *Global Strategy Journal*, *12*(3), 421–450. https://doi.org/10.1002/gsj.1464

Berning, S. C., & Holtbrügge, D. (2012). Chinese outward foreign direct investment - A challenge for traditional internationalization theories? *Journal Fur Betriebswirtschaft*, *62*(3–4), 169–224. https://doi.org/10.1007/s11301-012-0086-5

Bernstein, T. P., Chen, T. M., Goikhman, I., Guan, G., He, D., Hou, X., Ji, Y., Kong, H., Luthi, L., & McGuire, E. (2010). *China learns from the Soviet Union, 1949–present* (Bernstein T. P & H.-Y. Li, Eds.). Rowman & Littlefield.

Beule, F., & Duanmu, J. L. (2012). Locational determinants of internationalization: A firm-level analysis of Chinese and Indian acquisitions. *European Management Journal*, *30*(3), 264–277. https://doi.org/10.1016/j.emj.2012.03.006

Bian, M. L. (2005). *The making of the state enterprise system in modern China*. Harvard University Press.

Binda, V., & Perugini, M. (2018). Il Settore dell'auto tramultinazionali straniere e imprese locali. Italia e Spagna a confronto. In *La industria del automóvil de España e Italia en perspectiva histórica.* (pp. 335–336). Universidad de Alicante.

Brand Finance. (n.d.). *Tyres 15 2022 Ranking*. Retrieved November 17, 2022, from www.brandirectory.com/rankings/tyres

Bown, C. P. (2020). How the United States Marched the Semiconductor Industry into Its Trade War with China. *East Asian Economic Review*, *24*(4), 349–388. https://doi.org/10.11644/kiep.eaer.2020.24.4.384.

Brandt, L., & Rawski, T. G. (2008). *China's great economic transformation*. Cambridge University Press.

Brandt, L., Rawski, T. G., & Sutton, J. (2008). China's industrial development. In L. Brandt & T. G. Rawski (Eds.), *China's great economic transformation* (pp. 569–632). Cambridge University Press.

Brandt, L., & Thun, E. (2010). The fight for the middle: Upgrading, competition, and industrial development in China. *World Development*, *38*(11), 1555–1574. https://doi.org/10.1016/j.worlddev.2010.05.003

Brandt, L., Ma, D., & Rawski, T. G. (2014). From divergence to convergence: Reevaluating the history behind China's economic boom. *Journal of Economic Literature*, *52*(1), 45–123. https://doi.org/10.1257/jel.52.1.45

Brandt, L., Ma, D., & Rawski, T. G. (2017). Industrialization in China. In K. H. O'Rourke & J. G. Williamson (Eds.), *The spread of modern industry to the periphery since 1871*, 197-228 Oxford University Press.

Brandt, L., van Biesebroeck, J., Wang, L., & Zhang, Y. (2019). WTO accession and performance of Chinese manufacturing firms. *American Economic Review*, *109*(4), 1616–1621. https://doi.org/10.1257/aer.109.4.1616

Branstetter, L., & Lardy, N. (2006). China's embrace of globalization. In L. Brandt & T. G. Rawski (Eds.), China's great economic transformation (pp. 633–682). Cambridge University Press.

Brasó Broggi, C. (2016). *Trade and technology networks in the Chinese textile industry.* Palgrave Macmillan.

Brasó Broggi, C., & Ge, J. (2020). Planning China's future: Liu Guojun's conception of China's post-war economic recovery. *Economic History of Developing Regions*, *35*(3), 155–170. https://doi.org/10.1080/20780389.2020.1762172

Bremmer, I. (2009). State capitalism comes of age: The end of the free market? *Foreign Affairs*, *88*(3), 40–55.

Buckley, P. J. (2002). Is the international business research agenda running out of steam? *Journal of International Business Studies*, *2*, 365–373.

Buckley, P. J. (2004). Asian network firms: An analytical framework. *Asia Pacific Business Review*, *10*(3–4), 254–271. https://doi.org/10.1080/1360238042000264351

Buckley, P. J. (2009). Business history and international business. *Business History*, *51*(3), 307–333. https://doi.org/10.1080/00076790902871560

Buckley, P.J., Casson, M. (1985). *The economic theory of the multinational enterprise*. Springer.

Buckley, P. J., Clegg, J., & Wang, C. (2007). Is the relationship between inward FDI and spillover effects linear? An empirical examination of the case of China. *Journal of International Business Studies*, 38(3), 447–459. https://doi.org/10.1057/palgrave.jibs.8400274

Buckley, P. J., Clegg, J., Cross, A. R., Liu, X., Voss, H., & Zheng, P. (2007). The Determinants of Chinese Outward Foreign Direct Investment. *Journal of International Business Studies*, *38*(4), 499–518.

Buckley, P. J., Munjal, S., Enderwick, P., & Forsans, N. (2016). Cross-border acquisitions by Indian multinationals: Asset exploitation or asset augmentation? *International Business Review*, *25*(4), 986–996. https://doi.org/10.1016/J.IBUSREV.2015.10.006

Bundes Kanzler. (n.d.). *The Federal Chancellor of the Federal Republic of Germany*. Retrieved August 18, 2022, from https://www.bundeskanzler.de/bk-en.

Bureau Van Dijk. (2019). *Amadeus*.

Bureau Van Dijk. (2019). *Zephyr.*

Business China. (1983). *China Industry Profile: Automotive*, part 6. In Business China (pp. 128–129).

Cao, C., Suttmeier, R. P., & Simon, D. F. (2006). China´s 15-year science and technology plan. *Physics Today*, 59(12), 38–43.

Catalan, J. (2007). El siglo europeo de Ford y los límites del fordismo. Revista de Historia Industrial, 33, 167–186.

— (2017). The stagflation crisis and the European automotive industry, 1973–85. *Business History*, *59*(1), 4–34. https://doi.org/10.1080/00076791.2016.1237505

Capisani, L. M. (2013). Dino Gentili. La comet e il dialogo commerciale fra Italia e Cina. *Studi Storici*, 54(2), 419–448.

CATARC. (1994). *中国汽车工业年鉴1994 [China Automotive Industry Yearbook 1994]*. Jijie gongye.

CATARC & CAAM. (2001). *中国汽车工业年鉴 2001* [China Automotive Industry Yearbook 2001]. Zhongguo qiche gongye nianjian qikan.

— (2005). *中国汽车工业年鉴 2005* [China Automotive Industry Yearbook 2005]. Zhongguo qiche gongye nianjian qikan.

— (2006). *中国汽车工业年鉴 2006* [China Automotive Industry Yearbook 2006]. zhongguoqiche gongye nianjian bianjibu.

— (2009). *中国汽车工业年鉴2009* [China Automotive Industry Yearbook 2009]. Zhongguo qiche gongye nianjian qikan.

— (2010). *中国汽车工业年鉴2010* [China Automotive Industry Yearbook 2010]. zhongguoqiche gongye nianjian bianjibu.

— (2012). *中国汽车工业年鉴2012* [China Automotive Industry Yearbook 2012]. Zhongguo qiche gongye nianjian qikan.

— (2016). *国汽车工业年鉴2016 [China's automotive industry yearbook 2016]*. Zhongguo qiche gongye nianjian qikan.

— (2017). *中国汽车工业年鉴2017* [China Automotive Industry Yearbook 2017]. Zhongguo qiche gongye nianjian qikan.

— (2018). *中国汽车工业年鉴2018* [China Automotive Industry Yearbook 2018]. Zhongguo qiche gongye nianjian qikan.

— (2019). *中国汽车工业年鉴2019* [China Automotive Industry Yearbook 2019]. Zhongguo qiche gongye nianjian qikan.

CATARC & MOFCOM. (2014). *中国汽车历史 1991-2010* History of China's Automotive Industry 1990-2010]. (China Automotive Industry Advisory Committee, Ed.). Zhongguo qixie chubanshe.

CATARC & MOFCOM. (2019). *中国汽车贸易高质量发展报告2019* [Annual Report on High-Quality Development of China's Automotive Trade]. Zhongguoqiche jishuyanjiuzhongxin youxiangonsi qichejishu qingbaoyanjiushuo.

Cazurra, A. C., Inkpen, A., Musacchio, A., & Ramaswamy, K. (2014). Governments as owners: State-owned multinational companies. *Journal of International Business Studies*, *45*(8), 919–942. https://doi.org/10.1057/jibs.2014.43

CCFA. (2020). *L'Industrie Automobile Française*.

CECHIMEX-UNAM. *Cadena automotriz-autopartes.* Retrieved March 16, 2021, from http://www.economia.unam.mx.

CEVT (n.d). Retrieved November 19, 2022, from, www.cevt.se.

Changan. (2022). *Changan R&D | The Changan Difference*. Retrieved August 19, 2022, from http://www.tcchangan.com/corporate/en/difference/research.php.

Chang, H. (2007). *State-owned enterprise reform. UN DESA Policy Note.*

Chen, L., & Naughton, B. (2016). An institutionalized policy-making mechanism: China's return to techno-industrial policy. *Research Policy*, *45*(10), 2138–2152. https://doi.org/10.1016/j.respol.2016.09.014

Child, J., & Rodrigues, S. B. (2005). The internationalization of Chinese firms: A case for theoretical extension?. *Management and Organization Review*, *1*(3), 381–410. https://doi.org/10.1111/j.1740-8784.2005.0020a.x

Chin, G. (2010). *China's automotive modernization: The party-state and multinational corporations*. Springer.

China Org. (2003, October). *China Issues First EU Policy Paper*. Retrieved November 2, 2022, from http://www.china.org.cn/english/international/77157.htm.

China Policy. (2017). *China Going Global: between ambition and capacity*. Beijing. April. 12.

CNAIC. (1984). *中国汽车工业年鉴1983* [China Automotive Industry Yearbook 1983]. Jijie gongye.

China Customs. (2018). *改革开放40年中国对外贸易发展报告* ［China's Foreign Trade Development Report in the 40th Anniversary of Reforms and Opening Up]. Zhongguo haiguang chubanshe.

Chinese Communist Party History Materials. (1993). *中国资本主义工商业的社会主义改造，上海卷*[The socialist transformation of Chinese capitalist industry and commerce] (Vol. Shanghai). Zhongguo dangshi chubanshe.

Chipman, A. K. (2018). *China's Auto Industry: Foreign Ownership Limits Scrapped*. China Briefing. Retrieved March 25, 2021, from https://www.china-briefing.com/news/chinas-auto-industry-foreign-ownership-limits-scrapped/.

Coase, R., & Wang, N. (2012). *How China became capitalist*. Basingstoke: Palgrave Macmillan.

Cohen, W. M., & Levinthal, D. A. (1989). Innovation and Learning: The Two Faces of R&D. *The Economic Journal*, 99(397), 569–596.

Colli, A. (2010). Foreign Enterprises (1912-72). In A. Colli & M. Vasta (Eds.), *Forms of Enterprise in 20th Century Italy. Boundaries, Structures and Strategies* (pp. 87–111). Edward Elgar.

Collis, C., & Donnelly, T. (2012). Joint ventures and the development of the Chinese automotive industry. *International Journal Automotive Technology and Management*, 12(4), 318-329.

Comin, D.& Hobijn, B. (2010). An Exploration of Technology Diffusion. *American Economic Review* 100 (5), 2031-2059. https://doi:10.1257/aer.100.5.2031.

Cozza, C., Rabellotti, R., & Sanfilippo, M. (2015). China Economic Review The impact of outward FDI on the performance of Chinese firms. *China Economic Review*, *36*, 42–57. https://doi.org/10.1016/j.chieco.2015.08.008

CNIPA. (2019). *Invention Patent Applications Originated from China Mainland.*Retrieved January 1, 2021, from https://www.cnipa.gov.cn/tjxx/jianbao/year2019/f/f1.html

Cuervo-Cazurra, A. (2012). Extending theory by analyzing developing country multinational companies: Solving the Goldilocks debate. *Global Strategy Journal*, *2*(3), 153–167. https://doi.org/10.1111/j.2042-5805.2012.01039.x

Culture, History and Study Committee of the Chinese People's Political Consultative Conference (2007). *一汽创建发展历程* [FAW development history]. Zhongguo wenshi.

Dangdai zhongguo congshubianji weiyuanhui. (1992). *当代中国对外贸易* [China’s Contemporaneous Foreign Trade]. Vol I, II. Dangdaizhongguo chubanshe.

Djankov, S., & Hoekman, B. (2000). Foreign investment and productivity growth in Czech enterprises. *World Bank Economic Review,* 14(1), 49–64. https://doi.org/10.1093/wber/14.1.49

Deng, X. (1993). *Selected Works of Deng Xiaoping: Vol. III*. Renmin Chubanshe.

Deng, K.G. (2011). *China’s political economy in modern times: changes and economic consequences, 1800–2000*. Routledge.

Depner, H., & Bathelt, H. (2005). Exporting the German Model: The Establishment of a New Automobile Industry Cluster in Shanghai. *Economic Geography*, *81*(1), 53–81. https://doi.org/10.1111/j.1944-8287.2005.tb00255.x

Donnelly, T., Mellahi, K., & Morris, D. (2002). The European automobile industry: Escape from parochialism. In *European Business Review* (Vol. 14, Issue 1, pp. 30–39). https://doi.org/10.1108/09555340210414223

Donnelly, T., Collis, C., & Begley, J. (2010). Towards sustainable growth in the Chinese automotive industry: internal and external obstacles and comparative lessons. *International Journal Automotive Technology and Management,* 10(3), 289–304. https://doi.org/https://doi.org/10.1504/IJATM.2010.032629

Doner, R. F., Noble, G. W., & Ravenhill, J. (2021). *The political economy of automotive industrialization in East Asia*. Oxford University Press.

Dong, F., & Liu, Y. (2020). Policy evolution and effect evaluation of new-energy vehicle industry in China. *Resources Policy*, *67*. https://doi.org/10.1016/j.resourpol.2020.101655

Dong, Y., & Tao, S. (2013) (Eds.). *中国汽车工业建设杰出的奠基人和开拓者 饶斌同志诞辰100周年纪念文集* [Outstanding founder and pioneer in the construction of China's automobile industry. Essay collection of the 100th anniversary of the birth of Comrade Rao Bin]. Beijing Ligong Daxue.

Dong, Z. (1999). 关于 "156项" 的确立 [On the establishment of " 156 Project"]. *Zhongguo Jingjishi Yanjiu*, 4, 93–107.

Drauz, R. (2013). In search of a Chinese internationalization theory: A study of 12 automobile manufacturers. *Chinese Management Studies,* 7(2), 281–309. https://doi.org/10.1108/CMS-Jan-2012-0018

Drucker, P. (1946). *Concept of the corporation.* The John Day Company.

Duckett, J. (1996). The emergence of the entrepreneurial state in contemporary china. *Pacific Review*, 9(2), 180–198. https://doi.org/10.1080/09512749608719178

Dunning, J. H. (1973). The Determinants of International Production. *New Series*, *25*(3), 289–336.

— (1988). The eclectic paradigm of international production: in defence of the eclectic theory. *International Business Studies*, *19*(1), 1–31.

— (1994). Reevaluating the benefits of foreign direct investment. *Transnational Corporations, 3*(1–2), 23–51.

— (2001). The eclectic (OLI) paradigm of international production: Past, present and future. *International Journal of the Economics of Business*, *8*(2), 173–190.

— (2006). Comment on Dragon multinationals: New players in 21st century globalization. *Asia Pacific Journal of Management*, *23*(2), 139–141. https://doi.org/10.1007/s10490-006-7161-1

Dunning, J.H., & Lundan, S.M. (2008). *Multinational enterprises and the global economy.* Edward Elgar Publishing.

Dunning, J. H., & Lundan, S. M. (2009). The internationalization of corporate R&D: A review of the evidence and some policy implications for home countries. *Review of Policy Research*, *26*(1–2), 13–33. https://doi.org/10.1111/j.1541-1338.2008.00367.x

Dussel, E. P. (2019). China's Foreign Direct Investment in Latin America and The Caribbean: Conditions and Challenges. *Universidad Nacional Autónoma de México. Red Académica de América Latina y El Caribe Sobre China.*

Dussel, E. P. (2015). La «omnipresencia» del sector público de China y su relación con América Latina y el Caribe. *Nueva Sociedad*, *259*, 34–44.

Editorial Board (Ed.). (1996). *中国汽车工业史 1901-1990 [China's Automotive Industry History 1901-1990]*. Rengmin Jiaotong Chubanshe.

Elia, S., Kafouros, M., & Buckley, P. J. (2020). The role of internationalization in enhancing the innovation performance of Chinese EMNEs: A geographic relational approach. *Journal of International Management*, *26*(4), 100801. https://doi.org/10.1016/j.intman.2020.100801

Enrietti, A., Geuna, A., Nava, C. R., & Patrucco, P. P. (2022). The birth and development of the Italian automotive industry (1894–2015) and the Turin car cluster. *Industrial and Corporate Change*, *31*(1), 161–185. https://doi.org/10.1093/icc/dtab058.

European Commission. (2020). The European Union and its Trade Partners. *Fact Sheets on the European Union*. Retrieved February 19, 2022. https://www.europarl.europa.eu/factsheets/en/sheet/160/the-european-union-and-its-trade-partners.

Fairbank, K. J., & Feuerwerker, A. (1986). The People's Republic, Part I: The Emergence of Revolutionary China 1949-1965. The Cambridge History of China (D. Twitchett & J. K. Firbank, Eds.; Vol. 14). Cambridge University Press.

Fanjul, E. (2011). *EU-China bilateral trade relations and business cooperation*. CEU Ediciones.

Fanjul, E. (2020). *Informe Ejecutivo de Propuestas para la Política Exterior Española*. CEU Ediciones.

Fan, P. (2006). Catching up through developing innovation capability: Evidence from China's telecom-equipment industry. *Technovation,* 26(3), 359–368. https://doi.org/10.1016/j.technovation.2004.10.004

FAW. (1991). *第一汽车制造厂厂志 1950–1986 [First Automotive Works Factory Magazine 1950–1986]* (F. H. E. Office, Ed.). Jilin Kexue Jishu Chubanshe.

Fava, V., & Gatejel, L. (2017). East-West cooperation in the automotive industry: Enterprises, mobility, production. *Journal of Transport History*, 38(1), 11–19. https://doi.org/10.1177/0022526617698157

Feng, X. (2009). 政治生存与经济生存，上海人如何走进公私合营之路 [Political and Economic Survival, How Shanghai People Walked the Private-Public Joint Partnership Path]. *Dangdai yanjiu, 2*, 181–197.

Feng, X., Ljungwall, C., & Guo, S. (2016). *The political economy of China's great transformation*. Routledge.

Fernández-de-Pinedo, N., Castro, R., & Pretel, D. (2020). Technology transfer networks in the first industrial age: the case of Derosne & Cail and the sugar industry (1818–1871). *Business History*, *62*(7), 1107–1136. https://doi.org/10.1080/00076791.2018.1551365

Fernández Pérez, P. (2020). Partners in a journey to the centre of the world: Spanish and Japanese knowledge transfer and alliances in the Spanish healthcare industries (1960s–1980s). *Business History*, *62*(7), 1202–1230. https://doi.org/10.1080/00076791.2017.1348498

FIAT S.p.A. (2006). *Iveco and NAC Joint Venture Agreement* (Vol. 2).

Fletcher, R. (2001). A holistic approach to internationalisation. International Business Review, 10, 25–49. Flyvbjerg, B. (2006). Five misunderstandings about case-study research. *Qualitative Inquiry*, *12*(2), 219–245. https://doi.org/10.1177/1077800405284363

Freeman, D. (2013). China's Outward Investment: Institutions, Constraints and Challenges. *Brussels Institute of Contemporary China Studies, Asia Paper*, 7(4), 1–15.

Freeman, C., & Soete, L. (1997). *The economics of industrial innovation*. Psychology Press.

Freyssenet, M. (2009). *The second automobile revolution: Trajectories of the world carmakers in the 21st century*. Palgrave Macmillan. https://doi.org/10.1057/9780230236912

Freyssenet, M., Shimizu, K., & Volpato, G. (2003). *Globalization or regionalization of the American and Asian car industry?* Palgrave Macmillan in association with GERPISA.

Freyssenet, M., *la production automobile Mondiale, des quatre continents et des principaux pays constructeurs, 1898-2018.* CNRS. ISSN 1996-0941. Retrieved December 19, 2022, from http://freyssenet.com/?q=en/node/393.

Fridenson, P. (1995). Fordism and quality: The French case. In H. Shiomi & K. Wada (Eds.), *Fordism Transformed: the Development of Production Methods in the Automobile Industry* (pp. 160–183). Oxford University Press.

Friedlaender, A. F., Winston, C., & Wang, D. K. (1982). Costs, Technology, and Productivity in the U.S. Automobile Industry (No. 294).

Fu, X., Pietrobelli, C., & Soete, L. (2011). The role of foreign technology and indigenous innovation in the emerging economies: Technological change and catching-up. *World Development*, *39*(7), 1204–1212. https://doi.org/10.1016/j.worlddev.2010.05.009

Gabriele, A. (2020). *Enterprises, Industry and Innovation in the People's Republic of China: Questioning Socialism from Deng to the Trade and Tech War*. Springer Nature.

Gallagher, K. S. (2003). Foreign Technology in China's Automobile Industry: Implications for Energy, Economic Development, and Environment. *China Environment Series*, *6*, 1–18.

Garcia-Duran, P., & Eliasson, L. J. (2018). Squaring the circle: Assessing whether the European Union's pursuit of bilateral trade agreements is compatible with promoting multilateralism. *Journal of Self-Governance and Management Economics*, *6*(1), 7–32.

Garcia-Duran, P., & Millet, M. (2014). Lectura de la política comercial de la UE desde una perspectiva multilateral / Reading EU trade policy from a multilateral perspective. Revista CIDOB d'afers Internacionals, 119–140. https://www.jstor.org/stable/24364585

García Ruiz, J. (2001). La evolución de la industria automovilística española, 1946–1999: una perspectiva comparada. *Revista de Historia Industrial. Economía y Empresa*,), 133–163. https://doi.org/10.1344/rhi.v0i19-20.19366

García Ruiz, J. L. (2018). Luces y sombras de las políticas industriales en España: el caso del automóvil. In *La industria del automóvil de España e Italia en perspectiva histórica.* (pp. 23–52). Universidad de Alicante.

Ge, B. (2009). *一汽的"基辛格"吕福源充满智慧的一汽岁月* [FAW's "Kissinger", Lv Fuyuan's wisdom-filled years at FAW]. Qiche Shangye Pinlvn.

Ge, B. (2015). *拓荒* [Open up land]. Zhongguo gonren chubanshe.

Gerschenkron, A. (1962). *Economic backwardness in historical perspective: A book of essays*. Belknap Press.

Goulard, S. (2020). The Impact of the US–China Trade War on the European Union. *Global Journal of Emerging Market Economies*, *12*(1), 56–68. https://doi.org/10.1177/0974910119896642

Great Wall. (n.d.). Development History. Retrieved February 19, 2023, from https://www.gwm.com.cn/

Grieger, M. (2010). Volkswagen in China. Die Anfänge der Probemontage 1982 in dem heute grössten Einzelmarkt. *Ferrum*, 82, 55–65.

Grieger, M., Gutzmann, U., & Schlinkert, D. (2008). Volkswagen Chronicle Becoming a Global Player. Volkswagen AG.

Grieger, M., Gutzmann, U., & Schlinkert, G. (Eds.). (2009). *Towards mobility: Varieties of automobilism in East and West*. Volkswagen Aktiengesellschaft.

Griffith, R., Redding, S., & van Reenen, J. (2003). R&D and absorptive capacity: Theory and empirical evidence. *Scandinavian Journal of Economics*, *105*(1), 99–118. https://doi.org/10.1111/1467-9442.00007

Groupe PSA. (2015). *2014 Annual Results- Groupe PSA*. Retrieved November 19, 2022, from https://www.groupe-psa.com/en/publication/2014-annual-results/

Guang, Y. (2015). 中国汽车工业的早期发展 （1920-1978）[China's Automobile Industry in Early Development Period, 1920-1978]. PhD Thesis. Huazhong Normal University.

Guang, Y. (2020). *中国汽车工业发展史论 1920-2008* [China's Automobile Development History 1920-2008]. Shanghai Renming.

Guillén, M. F. (2010). *The limits of convergence. In The Limits of Convergence*. Princeton University Press.

Hanemann, T., Huotari, M., & Kratz, A. (2019). Chinese Fdi in Europe: 2018 Trends and Impact of New Screening Policies. *Papers on China*, *March* 1–26.

Hanemann, T., & Huotari, M. (2016). A New Record Year for Chinese Outbound Investment in Europe. *Mercator Institute for China Studies*, *February* 1–11.

Hansakul, S., & Levinger, H. (2014). China-EU relations: Gearing up for growth. *Deutsche Bank Research*.

Hartley, J. F. (1994). Case studies in organizational research. In C. Casell & G. Symon (Eds.), *Qualitative methods in organizational research* (pp. 208–229). Sage Publications.

Harwit, E. (1995). *China's automobile industry: Policies, problems, and prospects*. M.E. Sharpe.

Harwit, E. (2001). The impact of WTO membership on the automobile industry in China. *The China Quarterly*, *167*, 655–670. https://doi.org/10.1017/s0009443901000365

Heilmann, S., & Shih, L. (2013). The Rise of Industrial Policy in China, 1978-2012. In Harvard-Yenching Institute Working Paper (No. 7; 17).

Hertenstein, P., Sutherland, P., & Anderson, J. (2017). Internationalization within networks: Exploring the relationship between inward and outward FDI in China's auto components industry. *Asia Pacific Journal of Management*, 34, 69–96. https://doi.org/https://doi.org/10.1007/s10490-015-9422-3

Heritage Foundation & American Enterprise Institutions. (2020). *CGIT*.

He, X., & Mu, Q. (2012). How Chinese firms learn technology from transnational corporations: A comparison of the telecommunication and automobile industries. *Journal of Asian Economics*, *23*(3), 270–287. https://doi.org/10.1016/j.asieco.2011.10.004

He, Z. L., Lim, K., & Wong, P. K. (2006). Entry and competitive dynamics in the mobile telecommunications market. *Research Policy*, *35*(8), 1147–1165. https://doi.org/10.1016/j.respol.2006.09.004

Hilite International (EN). (n.d.). Retrieved November 19, 2022, from https://www.hilite.com/en/

Howell, S. T. (2018). Joint ventures and technology adoption: A Chinese industrial policy that backfired. *Research Policy*, 47(8), 1448–1462. https://doi.org/10.1016/j.respol.2018.04.021

Howell, A., Lin, J., & Worack, S. (2020). Going out to innovate more at home: Impacts of outward direct investments on Chinese firms' domestic innovation performance. *China Economic Review*, *60*, 101404. https://doi.org/10.1016/J.CHIECO.2020.101404

Hong, E., & Sun, L. (2006). Dynamics of internationalization and outward investment: Chinese Corporations' Strategies. *China Quarterly*, *1*(187), 610–634. https://doi.org/10.1017/S0305741006000403

Hu, A. G. Z., & Jefferson, G. H. (2008). Science and technology in China. In China's Great Economic Transformation. In L. Brandt & T. Rawski (Eds.), *China's great economic transformation* (pp. 286–336). Cambridge University Press Cambridge.

Hu, A. G. Z., Jefferson, G. H., & Qian, J. (2005). R&D and technology transfer: Firm-level evidence from Chinese industry. *Review of Economics and Statistics,* 87(4), 780–786. https://doi.org/10.1162/003465305775098143

Huang, Y. (2003). *Selling China: Foreing Direct Investment during the Reform Era*. Cambridge University Press.

Huang, Y. (2008). *Capitalism with Chinese characteristics: Entrepreneurship and the state*. Cambridge University Press.

Huang, Y., En, X., Li, Y., & Reddy, K. S. (2017). Does state ownership facilitate outward FDI of Chinese SOEs? Institutional development, market competition, and the logic of interdependence between governments and SOEs. *International Business Review*, *26*(1), 176–188. https://doi.org/10.1016/j.ibusrev.2016.06.005

Huchet, J.-F. (2014). From Dirigisme to Realism: Chinese Industrial Policy in the Era of Globalisation. In X. Richet, V. Delteil, & P. Dieuaide (Eds.), *Strategies of Multinational*

Corporations and Social Regulations (pp. 57–76). Springer-Verlag. https://doi.org/10.1007/978-3-642-41369

Hymer, S. H. (1976). *International operations of national firms*. MIT press.

Icksoo, K. (2009). Inward and outward Internationalization of chinese firms. *SERI Quaterly*, 2(3), 23–33.

Inalfa. (n.d.). Retrieved November 19, 2022, from https://www.inalfa.com/who-are-we/

Jenkins, R. (1991). The political economy of industrialization: A comparison of Latin American and East Asian newly industrializing countries. *Development and Change*, *22*(2), 197–231. https://doi.org/10.1111/j.1467-7660.1991.tb00409.x.

Jianjun Wei, Great Wall Motor Co Ltd: Profile and Biography - Bloomberg Markets. (n.d.). Retrieved February 19, 2023, from https://www.bloomberg.com/profile/person/6076856#xj4y7vzkg.

Jia-Zheng, Y. (2022). The Metamorphosis of China's Automobile Industry: The Establishment of International Joint Ventures (1978-2000). *European Business History Association*. https://ebha.org/Madrid22Program.

Johanson, J., & Vahlne, J.-E. (1990). The Mechanism of Internationalisation. *International Marketing Review*, *7*(4), 11–24.

Johanson, J., & Vahlne, J.-E. (1977). The internationalization process of the firm—a model of knowledge development and increasing foreign market commitments. *International Business Studies*, *8*(1), 23–32.

Johanson, J., & Vahlne, J.-E. (1990). The Mechanism of Internationalisation. *International Marketing Review*, *7*(4), 11–24.

Johanson, J., & Wiedersheim-Paul, F. (1975). The internationalization of the firm: Four Swedish cases. *Journal of Management Studies*, *12*(3), 305–322.

Johnson, C. (1982). *MITI and the Japanese miracle. The growth of industrial policy, 1925–1975.* Stanford University Press.

Johnson, C. (1987). Political institutions and economic performance: a comparative analysis of the business-government relationship in Japan, South Korea, and Taiwan. In F. C. Deyo (Ed.), *The political economy of the new Asian industrialism* (pp. 136–164). Cornell University Press.

Johnson, J. B., Reynolds, H. T., & Mycoff, J. D. (2015). *Political science research methods*. Cq Press.

Jones, G. (2006). *Nationality and multinationals in historical perspective* (No. 06–52). Division of Research, Harvard Business School Boston.

Joyson (n.d). Retrieved November 27, 2022, from www.joyson.cn/en/web/index.php/about.html

Kajima, J. (2022). Light industry: Socialist industrialization and the textile industry. In K. Nakagane (Ed.), *Studies on the Chinese economy during the Mao era.* (pp. 187-207). Springer.

Kano, L., Tsang, E. W. K., & Yeung, H. W-C. (2020). Global value chains: A review of the multi-disciplinary literature. *Journal of International Business Studies.* 51(4), 577-622. https://doi.org/10.1057/s41267-020-00304-2.

Kennedy, D., & Stiglitz, J. E. (2013). *Law and economics with Chinese characteristics: Institutions for promoting development in the twenty-first century*. OUP.

Kennedy, A. B. (2016). Slouching tiger, roaring dragon: comparing India and China as late innovators. *Review of International Political Economy*, 23(1), 65–92.

Kirby, W. C. (2006). China's internationalization in the early People's Republic: Dreams of a Socialist world economy. *The China Quarterly*, 188, 870–890. https://doi.org/doi:10.1017/S0305741006000476.

Kolstad, I., & Wiig, A. (2012). What determines Chinese outward FDI? *Journal of World Business*, *47*(1), 26–34. https://doi.org/10.1016/j.jwb.2010.10.017.

Kong, H. (2010). The Transplantation and Entrenchment of the Soviet Economic Model in China. In T. P. Bernstein, I. Goikhman, G. Guan, D. He, X. Hou, Y. Ji, H. Kong, L. Luthi, & E. McGuire (Eds.), *China learns from the Soviet Union, 1949–present* (pp. 153–166). Rowman & Littlefield.

Knüsel, A. (2022). *China's European Headquarters: Switzerland and China during the Cold War*. Cambridge University Press.

Kwan, C. H. (2020). The China–US Trade War: Deep-Rooted Causes, Shifting Focus and Uncertain Prospects. In *Asian Economic Policy Review* (Vol. 15, Issue 1, pp. 55–72). Blackwell Publishing. https://doi.org/10.1111/aepr.12284.

LaRocca, G. M. (2020). *Global Value Chains: Lithium in Lithium-ion Batteries for Electric Vehicles U.S.* Office of Industries, US International Trade Commission (ID-069; Issue July).

Lardy, N. R. (1993). *Foreign trade and economic reform in China, 1978–1990*. Cambridge University Press.

Lardy, N. R. (1998). *China's unfinished economic revolution*. Brookings.

Lee, K., Gao, X., & Li, X. (2016). Industrial catch-up in China: a sectoral systems of innovation perspective. *Cambridge Journal of Regions, Economy and Society,* 10(1), 59–76. https://doi.org/10.1093/cjres/rsw037

Lei, J., Liu, Y., Qi, Y., & Zhang, Q. (2019). 40 Years of Technological Innovation in China: A Review of the Four-Stage Climbing Track. *Journal of Industrial Integration and Management*, *04*(03), 1950008. https://doi.org/10.1142/s2424862219500088

Li, J. (2018). 国有企业国际化 40 年：发展历程及其制度逻辑 [40 years of state-owned enterprises' internationalization: development and control]. *Jingjiyuguanli yanjiu*, *10*.

Li, J. & Kozhikode, R.K. (2008). Knowledge Management and Innovation Strategy: The Challenge for Latecomers in Emerging Economies. *Asia Pacific Journal of Management* 25, 429-450. https://doi:10.1007/s10490-007-9076-x

Li, J., Strange, R., Ning, L., & Sutherland, D. (2016). Outward foreign direct investment and domestic innovation performance: Evidence from China. *International Business Review*, *25*(5), 1010–1019. https://doi.org/10.1016/j.ibusrev.2016.01.008

Li, M. H., Cui, L., & Lu, J. (2018). Varieties in state capitalism: Outward FDI strategies of central and local state-owned enterprises from emerging economy countries. *Journal of International Business Studies,* 45, 980–1004.

Li, P. P. (2010). Toward a learning-based view of internationalization: The accelerated trajectories of cross-border learning for latecomers. *Journal of International Management*, *16*(1), 43–59. https://doi.org/10.1016/j.intman.2009.05.003

Li, Z. (2008). 奇瑞汽車の競争力形成プロセス 研究開発能力の獲得を中心に [Chery Automobile's Competitiveness Formation Process Focusing on R&D Capability Acquisition]. *産業学会研究年報*, 23, 103–115. https://doi.org/https://doi.org/10.11444/sisj1986.2008.103

— (2009). The Role of International Technology Transfer in the Chinese Automotive Industry. *Manufacturing Management Research Center (MMRC)*, 269.

— (2010). Future International Business Strategy of Chinese Automotive Manufacturers: A Case Study on Their Overseas Operations in the Russian Market. *Annals of Business Administrative Science*, *9*, 13–32. https://doi.org/https://doi.org/10.7880/abas.9.13

— (2014). Foreign Technologies and Domestic Capital: The Rise of Independent Automobile Makers in China, 1990s–2000s. In P.-Y. Donzé & S. Nishimura (Eds.), *Organizing Global Technology Flows* (pp. 187–212). Routledge.

— (2015). Eco-innovation and firm growth: leading edge of China's electric vehicle business. *International Journal Automotive Technology and Management*, 15(3), 226–243. https://doi.org/https://doi.org/10.1504/IJATM.2015.070281

— (2016). Market life-cycle and products strategies: an empirical investigation of Indian automotive market. *International Journal of Business Innovation and Research*, 10(1), 26–42. https://doi.org/https://doi.org/10.1504/IJBIR.2016.073242

— (2018). Defining mega-platform strategies: the potential impacts of dynamic competition in China Defining mega-platform strategies. *International Journal Automotive Technology and Management,* 18(2), 26–41. https://doi.org/https://doi.org/10.1504/IJATM.2018.092192

Li, Z., & Wang, Y. (2013). Does Social Capital Always Create Value for Firm Internationalization? The Case of Chinese Automakers in Russia. Multinationals and Global Consumers: *Tension, Potential and Competition*, 141–160. https://doi.org/https://doi.org/10.1057/9781137307293_7

Lin, J. Y., Liu, M., & Tao, R. (2013). Deregulation, decentralization, and China's growth in transition. In D. Kennedy & J. Stiglitz (Eds.), *Law and economics with Chinese characteristics: Institutions for promoting development in the twenty-first century* (pp. 467–490). Oxford University Press.

Liu, W., & Dicken, P. (2006). Transnational corporations and "obligated embeddedness": Foreign direct investment in China's automobile industry. *Environment and Planning A*, *38*(7), 1229–1247. https://doi.org/10.1068/a37206

Liu, X., Buck, T., & Shu, C. (2005). Chinese economic development, the next stage: Outward FDI? *International Business Review*, *14*(1), 97–115. https://doi.org/10.1016/j.ibusrev.2004.12.003

Liu, W., & Yeung, H. W. (2008). China's dynamic industrial sector: the automobile industry. *Eurasian Geography and Economics*, *49*(5), 523–548.

Liu, Q., Lu, R., & Yang, C. (2020). International joint ventures and technology diffusion: Evidence from China. *World Economy*, 43(1), 146–169. https://doi.org/10.1111/twec.12809

Long, G. (1996). *中国轿车工业国际竞争力分析* [Analysis of the international competitiveness of Chinese car industry report]. Development Research Centre of the Peoples' Republic of China.

Luo, Y., & Tung, R. L. (2007). International expansion of emerging market enterprises: A springboard perspective. *Journal of International Business Studies*, *38*(4), 481–498. https://doi.org/10.1057/palgrave.jibs.8400275

Malerba, F., & Nelson, R. (2011). Learning and catching up in different sectoral systems: Evidence from six industries. *Industrial and Corporate Change*, *20*(6), 1645–1675. https://doi.org/10.1093/icc/dtr062

Mann, J. (1997). Beijing Jeep: A case study of Western business in China. Western Press. https://doi.org/10.4324/9780429502095

Martin, A. (2016). *Britain, France, West Germany and the People's Republic of China, 1969-1982.* Basingstoke: Palgrave Macmillan.

Markusen, J. R., & Venables, A. J. (1998). Multinational firms and the new trade theory. *Journal of International Economics*, *46*, 183–203. https://doi.org/10.1016/S0022-1996(97)00052-4

Mathews, J. A. (2002). Competitive advantages of the latecomer firm: A resource-based account of industrial catch-up strategies. *Asia Pacific Journal of Management*, *19*(4), 467–488. https://doi.org/10.1023/A:1020586223665

Mathews, J. A. (2006). Dragon multinationals: New players in 21st century globalisation. *Asia Pacific Journal of Management*, *23*(8), 5–27. https://doi.org/DOI 10.1007/s10490-006-6113-0

Ma, Y., & Overbeek, H. (2015). Chinese foreign direct investment in the European Union: explaining changing patterns. *Global Affairs*, *1*(4–5), 441–454. https://doi.org/10.1080/23340460.2015.1113796

McGregor, R. (2010). *The party: The secret world of China's communist rulers*. Penguin UK.

Meier, N. (2018). *China–The new developmental state?: An empirical analysis of the automotive industry*. Peter Lang.

Meunier, S. (2014). A Faustian bargain or just a good bargain? Chinese foreign direct investment and politics in Europe. *Asia Europe Journal*, *12*(1–2), 143–158. https://doi.org/10.1007/s10308-014-0382-x

Meunier, S. (2017). Integration by Stealth: How the European Union Gained Competence over Foreign Direct Investment. *Journal of Common Market Studies*, *55*(3), 593–610. https://doi.org/10.1111/jcms.12528

Meunier, S., Burgoon, B., & Jacoby, W. (2014). The politics of hosting Chinese investment in Europe-an introduction. *Asia Europe Journal*, *12*(1–2), 109–126. https://doi.org/10.1007/s10308-014-0381-y

Meyer, C. B. (2001). A case in case study methodology. *Field Methods*, *13*(4), 329–352. https://doi.org/10.1177/1525822X0101300402

Meyskens, C. F. (2020). *Mao's Third Front. The militarization of Cold War China.* Cambridge: Cambridge University Press.

Milanovic, B. (2019). *Capitalism, alone: The future of the system that rules the world*. Harvard University Press.

Miljković, M. (2017). Making automobiles in Yugoslavia: Fiat technology in the Crvena Zastava Factory, 1954–1962. *The Journal of Transport History*, *38*(1), 20-36. https://doi.org/10.1177/0022526617702158

MOFCOM. (2022). *投资项目信息库 [Investment Project Information Base]*. Retrieved April 5, 2020, from https://project.mofcom.gov.cn/.

Mu, Q., & Lee, K. (2005). Knowledge diffusion, market segmentation and technological catch-up: The case of the telecommunication industry in China. *Research Policy*, *34*(6), 759–783. https://doi.org/10.1016/j.respol.2005.02.007

Nam, K. M. (2011). Learning through the international joint venture: Lessons from the experience of China's automotive sector. *Industrial and Corporate Change*, *20*(3), 855–907. https://doi.org/10.1093/icc/dtr015

Naughton, B. (2015). The transformation of the state sector: SASAC, the market economy, and the new national champions. In B. Naughton & K. S. Tsai (Eds.), *State capitalism, institutional adaptation, and the Chinese miracle* (pp. 46–71). Cambridge University Press

Naughton, B. (2021). *The rise of China's industrial policy 1978–2020*. UNAM.

Naughton, B., & Tsai, K. S. (2015). *State capitalism, institutional adaptation, and the Chinese miracle*. Cambridge University Press.

NBS. (2020). *China Annual Statistical Data*. Retrieved April 5, 2020, from http://www.stats.gov.cn/enGliSH/Statisticaldata/AnnualData/.

NDRC. (2004). 2004 汽车产业发展正策 [2004 Automotive Development Industry Policy].

Neven, D., & Siotis, G. (1996). Technology sourcing and FDI in the EC: An empirical evaluation. *International Journal of Industrial Organization*, 14, 543–560.

Ning, W. E. (2012, October 18). Dongfeng sets up R&D center in Sweden. *CarNewsChina.Com*. Retrieved November 19, 2022, from https://carnewschina.com/2012/10/18/dongfeng-sets-up-rd-center-in-Sweden/.

Ningbo Joyson Electronic Corporation - MarkLines Automotive Industry Portal. Retrieved February 19, 2023, from https://www.marklines.com/en/top500/ningbo-joyson-electronic .

Nolan, P. (2001). *China Enters the WTO: Choices and Prospects*. 157-232. Palgrave Macmillan.

Nolan, P. (2012). Is China buying the world? *Challenge*, 55(2), 108–118.

Noor, K. B. M. (2008). Case study: A strategic research methodology. *American Journal of Applied Sciences*, *5*(11), 1602–1604. https://doi.org/10.3844/ajassp.2008.1602.1604

North, D. C. (1981). *Structure and change in economic history*. Norton.

OECD Statistics. (2021). Retrieved November 11, 2021, from https://stats.oecd.org/.

OICA. (2020). *Production statistics*. The International Organization of Motor Vehicle Manufacturers. Retrieved October 30, 2022, from http://www.oica.net/category/production-statistics/2017-statistics/.

OICA. (2022). *Production statistics*. The International Organization of Motor Vehicle Manufacturers. Retrieved October 30, 2022, from http://www.oica.net/category/production-statistics/2017-statistics/.

Odagiri, H., Goto, A., Sunami, A. & Nelson, R. R. (2010). *Intellectual Property Rights, Development, and Catch Up: An International Comparative Study.* Oxford University Press.

Official Global Website. Stellantis. (n.d.). Retrieved August 21, 2022, from https://www.stellantis.com/en .

Olson, H., & Welch, L. S. (1978). Pre-export activity: the first step in internationalization. Journal of International Business Studies, 9(1), 47–58.

Olson, M. (1997). The new institutional economics: The collective choice approach to economic development. *Institutions and Economic Development: Growth and Governance in Less-Developed and Post-Socialist Countries*, 37–66.

Ouyang, Y. (2010). 中国对外直接投资逆向技术溢出的影响因素分析 [Analysis of factors influencing reverse technology spillovers from Chinese OFDI]. *World Economy Study*, *4*, 66–71.

Pareja-Alcaraz, P. (2016). Chinese investments in Southern Europe' s energy sectors: Similarities and divergences in China' s strategies in Greece, Italy, Portugal and Spain. *Energy Policy*. https://doi.org/10.1016/j.enpol.2016.09.034

Pavlínek, P. (2002). Restructuring the Central and Eastern European Automobile Industry: Legacies, Trends, and Effects of Foreign Direct Investment. *Post-Soviet Geography and Economics*, 43(1), 41–77. https://doi.org/10.1080/10889388.1996.10641010.

Perez, C., & Soete, L. (1988). Catching up with technology: entry barriers and windows of opportunity. In G. Dosi, C. Freeman, R. Nelson, G. Silverberg, & L. Soete (Eds.), *Technical change and economic theory* (pp. 458–479). Laboratory of Economics and Management. https://doi.org/10.1108/eb043355.

Petersen, A., & Barysch, K. (2011). *Russia, China and the geopolitics of energy in Central Asia*. Centre for European Reform.

Pietrobelli, C. (1996). Emerging Forms of Technological Cooperation: The Case for Technology Partnerships-Inner Logic, Examples and Enabling Environment. *Science and Technology Issues, Geneva: UNCTAD*.

Pietrobelli, C., & Rabellotti, R. (2011). Global Value Chains Meet Innovation Systems: Are There Learning Opportunities for Developing Countries? *World Development*, *39*(7), 1261–1269. https://doi.org/10.1016/j.worlddev.2010.05.013

Pirelli. (2015). *Archive-Financial Results and documents*. Retrieved November 17, 2022, from https://corporate.pirelli.com/corporate/en-ww/archive/investors/financialresults-and-documents.

— (2016). *Archive-Financial Results and documents*. Retrieved November 17, 2022, from https://corporate.pirelli.com/corporate/en-ww/archive/investors/financialresults-and-documents.

— (2022). *Archive-Financial Results and documents*. Retrieved November 17, 2022, from https://corporate.pirelli.com/corporate/en-ww/archive/investors/financialresults-and-documents.

— (2018). *Pirelli closes on acquisition of 49% of new plant in China through JV with the Hixih Group*. Retrieved November 17, 2022, from https://press.pirelli.com/pirelli-closes-on-acquisition-of-49-of-new-plant-in-china-through-jv-with-the-hixih-group/ .

Pomeranz, K. (2000). *The Great Divergence.* Princeton University Press. https://doi.org/https://doi.org/10.1515/9781400823499.

Pottelsberghe De La Potterie, B., & LIchtenberg, F. (2016). *Does Foreign Direct Investment Transfer Technology across Borders? 83*(3), 490–497.

Puig, N., & Álvaro-Moya, A. (2018). The Long-Term Effects of Foreign Investment on Local Human Capital: Four American Companies in Spain, 1920s-1970s. *Business History Review*, *92*(3), 425–452. https://doi.org/10.1017/S0007680518000764

Qian, Y., & Wu, J. (2000). *China's transition to a Market Economy: How Far across the River?* In Center for Research on Economic Development and Policy Reform (No. 69).

Qiao, Y. (2004). *JV renamed Beijing Benz-DaimlerChrysler.* Retrieved on August 5, 2018, from http://www.chinadaily.com.cn/english/doc/2004-12/07/content_397951.htm.

Ramachandran, V. (1993). Technology transfer, firm ownership, and investment in human capital. *The Review of Economics and Statistics,* 664–670.

Ramamurti, R., & Singh, J. v. (2009). *Emerging multinationals in emerging markets. In Emerging Multinationals in Emerging Markets*. Cambridge University Press. https://doi.org/10.1017/CBO9780511576485

Rubio-Varas, M. (forthcoming). Energy transition(s). In E. R. Padilla & J. Ramos-Martín (Eds.), *Elgar Encyclopedia of Ecological Economics (forthcoming)*. Elgar.

Reuter Staff. (2017, August 30). *UPDATE 1-ZF sells Body Control Systems division to China's Luxshare. Reuters*. Reuter. Retrieved November 19, 2022, from https://www.reuters.com/article/zf-friedrich-luxshare-bodycontrol-idINL8N1LG540

Rui, H., & Yip, G. S. (2008). Foreign acquisitions by Chinese firms: A strategic intent perspective. *Journal of World Business*, *43*(2), 213–226. https://doi.org/10.1016/J.JWB.2007.11.006

Rugman, A. M. (2006). Internalization as a General Theory of Foreign Direct Investment. In, *Inside the Multinationals 25th Anniversary Edition: The economics of internal markets* (pp. 18–33). Palgrave Macmillan. https://doi.org/10.1057/9780230625167_2

Rugman, A. M., & Verbeke, A. (2007). Extending the theory of the multinational enterprise: Internalization and strategic management perspectives. *Journal of International Business Studies*, *3*(2), 125–137.

Rugman, A. M., Verbeke, A., & Nguyen, Q. T. K. (2011). Fifty years of international business theory and beyond. *Management International Review*, *51*(6), 755–786. https://doi.org/10.1007/s11575-011-0102-3.

Sako, M. (2002). Auto industry. *MIT Library*. Retrieved November 19, 2022, from https://dspace.mit.edu/handle/1721.1/737

Sauvant, K. (2005). New Sources of FDI: The BRICs-Outward FDI from Brazil, Russia, India and China. *Journal of World Investment & Trade*, *6*(5), 639.

SAW History Journal. (2001). *第二汽车制造厂志 1969-1983 [Second Automotive Works Manufacturer Magazine 1969-1983]*. Dongfeng Motor Corporation History Journal Office.

Schaufelbuehl, J. M., Wyss, M., & Zanier, V. (2018). *Europe and China in the Cold War: exchanges beyond the bloc logic and the Sino-Soviet split*. Brill.

Schaefer, K. J. (2020). Catching up by Hiring: The Case of Huawei.*Journal of International Business Studies* 51, 1500-1515. https://doi:10.1057/s41267-019-00299-5.

Schuman, M. (2014). *China is Trying to Buy a Car Industry.* Time Magazine, 15–17. Retrieved November 19, 2022, from http://time.com/26840/china-buying-foreign-car-makers/

Shanghai Auto Industry Committee. (1992). *上海汽车工业史 (1901-1990) [Shanghai Automobile Industry History 1901-1990]*. Shanghai Renming Chubanse.

Sheng, C. (2020). Not just the state: The role of entrepreneurs in China's energy transition. *Energy Research and Social Science*, *70*. https://doi.org/10.1016/j.erss.2020.101814

SDPC. (1994). *1994 汽车工业产业政策 [Chinese Industrial Policy for Automobile Industry 1994]*.

Schüler-Zhou, Y., & Schüller, M. (2009). The internationalization of Chinese companies. *Chinese Management Studies*, *3*(1), 25–42. https://doi.org/10.1108/17506140910946124

Seaman, J., Huatari, M., & Otero-Iglesias, M. (2017). Chinese investment in Europe: A country-level approach, A report by the European Think-tank Network on China (ETNC), French Institute of International Relations, Elcano Royal Institute. *Mercator Institute for China Studies*.

Selden, M. (2016). *The political economy of Chinese development*. Routledge.

Shih, W. (July 25, 2018). *Don't Underestimate Chinese Automakers*. Forbes. Retrived August 5, 2019, from https://www.forbes.com/sites/willyshih/2018/07/25/dont-underestimate-chinese-auto-makers/#75b21beeec96.

Siegelbaum, L. H. (2011). *Cars for comrades: The life of the Soviet automobile*. Cornell University Press.

Sit, V. F. S., & Liu, W. (2000). Restructuring and spatial change of China's auto industry under institutional reform and globalization. *Annals of the Association of American Geographers*, *90*(4), 653–673. https://doi.org/10.1111/0004-5608.00216

Sit, V. F. S., & Liu, W. D. (1997). 中国汽车工业_改革开放后的重整与国际化 [China's Automotive Industry: restructuration and internationalization after economic reforms]. *Geographical Research*, *16*(3), 1–11.

State Council of People's Republic of China. (2012). *节能与新能源汽车产业发展规划 (2012-2020)*[Energy Saving and New Energy Vehicle Development Organization 2012-2020].

State Administration of Foreign Exchange (SAFE). (2019). *Balance of Payments*. Retrieved November 20, 2019, from https://www.safe.gov.cn/en/DataandStatistics/index.html.

State Council of People's Republic of China. (2006). *Decision of the State Council on Reform of the Investment System.* Retrieved September 7, 2022, from https://en.ndrc.gov.cn/policies/202105/t20210527_1281397.html.

State Council of People's Republic of China. (2014). *Law of the people's Republic of China on Chinese-Foreign Contractual Joint Ventures*. Retrieved September 7, 2022, from http://english.www.gov.cn/archive/laws_regulations/2014/08/23/content_281474983043570.htm.

Stiebale, J. (2016). Cross-border M&As and innovative activity of acquiring and target firms. *Journal of International Economics*, *99*, 1–15. https://doi.org/10.1016/J.JINTECO.2015.12.005

Stiglitz, J. (2002). *Globalization and its discontents*. The Penguin Press.

Tang, R. (2012). *China's Auto Sector Development and Policies: Issues and Implications*. Congressional Research Service.

Thomas, G. (2011). A typology for the case study in social science following a review of definition, discourse, and structure. *Qualitative Inquiry*, *17*(6), 511–521. https://doi.org/10.1177/1077800411409884

Tilly, S. 2019. Supplier relations within the German automobile industry. The case of Daimler-Benz, 1950–1980. Business History, 61(5), 879-897. https://doi.org/10.1080/00076791.2016.1267143

Tyrepress Editors. (2015, April 15). *ChemChina now holds 30% of Pirelli shares - Tyrepress*. Retrieved November 19, 2022, from https://www.tyrepress.com/2015/04/chemchina-now-holds-30-of-pirelli-shares/.

Thun, E. (2004). Industrial policy, Chinese-Style: FDI, regulation, and dreams of national champions in the auto sector. *Journal of East Asian Studies*, *4*(3), 453–489. https://doi.org/10.1017/s1598240800006044

Thun, E. (2006). *Changing lanes in China: Foreign direct investment, local governments, and auto sector development.* Cambridge University Press.

UN Comtrade. (2021). *UN Comtrade Database*. Retrieved September 10, 2021, from https://comtrade.un.org.

United Nations Industrial Development Organization. 2013. The Industrial Competitiveness of Nations 2012/2013. Retrieved March 6, 2022, from www.unido.org/sites/default/files/2013-07/Competitive_Industrial_Performance_Report_UNIDO_2012_2013_0.PDF

United Nations Industrial Development Organization. (2019). Competitive Industrial Performance Report 2018. UNIDO. Retrieved March 6, 2022, from www.unido.org/news/unido-publishes-new-competitive-industrial-performance-report.

UNCTAD Investment Policy HUB. (2022). *International Investment Agreements Navigator (China)*. Retrieved March 8, 2022, from https://investmentpolicy.unctad.org/international-investment-agreements/by-economy.

UNCTAD-OECD-WTO. (2013). *Implications of Global Value Chain for Trade, Investment, Development and Jobs*. Retrieved November 1, 2022, from https://www.oecd-ilibrary.org .

UNCTAD. (2022). *FDI database*. Retrieved November 17, 2022, from https://unctadstat.unctad.org/wds/ReportFolders/reportFolders.aspx?sCS_

Vahlne, J. E., & Johanson, J. (2013). The Uppsala model on evolution of the multinational business enterprise – from internalization to coordination of networks. *International Marketing Review*, *30*(3), 189–210. https://doi.org/10.1108/02651331311321963

Verbeke, A., & Kano, L. (2015). The new internalization theory and multinational enterprises from emerging economies: A business history perspective. *Business History Review*, *89*(3), 415–445. https://doi.org/10.1017/S0007680515000689

Vogel, E. F. (2011). *Deng Xiaoping and the transformation of China* (Vol. 10). Belknap Press.

Volta, & Intercalation Foundations. (2021). *The Battery Report 2021*.

Volkswagen. (2008). Volkswagen Annual Report. Retrieved October 12, 2010, from https://www.volkswagenag.com/en/InvestorRelations/news-and-publications/Annual_Reports.html.

Wang, H. (2003). Policy Reforms and Foreign Direct Investment: The case of the Chinese Automobile Industry. *Journal of Economics and Business*, *6*(1), 287–314.

Wang, Z. (2011). *吉利收购沃尔沃全记录 [Geely's Acquisition to Volvo, case study]*. Hongqi Chubanshe.

Wang, Z. (2021). *吉利传 一部"不可史" [Geely's "unhistory"]*. Hongqi chubanshe.

Weber, I. M. (2021). How China Escaped Shock Therapy: The Market Reform Debate. Routledge.

Wei, S., Wei, Y., Wakasugi, R., Hu, A. G. Z., & Jefferson, G. H. (2002). FDI Impact and Spillover: Evidence from China's Electric and Textile Industries. *The World Economy, 2002*, *25*(8), 1063–1076.

Weichai Group. (n.d.). Retrieved February 19, 2023, from https://en.weichai.com/wmdgs/wmdls/jtdwc/

Welch, L., & Luostarinen, R. (1993). Inward-outward connections in internationalization. *International Marketing*, *1*(1), 44–56.

Welch, L. S., & Luostarinen, R. (1988). Internationalization: Evolution of a Concept. *Journal of General Management*, *14*(2), 34–55.

Wemheuer, F. (2019). *A Social History of Maoist China: Conflict and Change, 1949–1976*. Cambridge University Press.

White, G. (1988). *The State and Market in China's Socialist Industrialisation*. In G. White (Ed.), Developmental states in East Asia (pp. 193–234). https://doi.org/10.5860/choice.26-2341

White, G. (1993). *Riding the tiger: The politics of economic reform in post-Mao China.* Macmillan. https://doi.org/10.2307/2760424

Wilkins, M., & Hill, F. E. (2011). *American business abroad: Ford on six continents*. Cambridge University Press.

WIPO. (2020). *Patent Applicants Statistics*. Retrieved September 20, 2020, form https://www3.wipo.int/ipstats/index.htm?tab=patent.

World Bank. (2019). *World Developing Indicator. Statistics on Worldwide Patent Activity.* Retrieved December 10, 2019, from https://databank.worldbank.org/source/world-development-indicators.

World Highways. *Chinese firm Weichai has made a strategtic move in Germany with Kion.* (n.d.). Retrieved November 19, 2023, from https://www.worldhighways.com/news/chinese-firm-weichai-has-made-strategtic-move-germany-kion.

World Trade Organization. (2001). *Report of The Working Party on the Accession of China.* Ministerial Conference. Retrieved August 5, 2022, from https://www.wto.org/english/news_e/archive_e/country_arc_e.htm?country1=CHN

World Trade Organization. (n.d.). *China's Timeline.* Retrieved August 5, 2022, from https://www.wto.org/english/thewto_e/acc_e/a1_chine_e.htm

Wu, J. (2005). *Understanding and interpreting Chinese economic reform*. Texere.

Xiao, W., & Liu, L. (2015). *Internationalization of China's Privately Owned Enterprises*. World Scientific Publishing and Zhejiang University Press. https://doi.org/10.1142/9401

Xinlang qiche. (2007, May 19). *《宁波宣言》[Ningbo Declaration]*. Retrieved December 6, 2022, from http://auto.sina.com.cn/news/2007-05-19/1038276229.shtml

Xu, C. (2011). The fundamental institutions of China's reforms and development. *Journal of Economic Literature*, *49*(4), 1076–1151. https://doi.org/10.1257/jel.49.4.1076

Xu, L., & Ou, Y. (2017). *中国汽车史话* [China's Automobile History]. Jixie Chubanshe.

Yakob, R., Nakamura, H. R., & Ström, P. (2018). Chinese foreign acquisitions aimed for strategic asset-creation and innovation upgrading: The case of Geely and Volvo Cars. *Technovation*, *70–71*(December 2015), 59–72. https://doi.org/10.1016/j.technovation.2018.02.011.

Yao, S., Wang, P., Zhang, J., & Ou, J. (2016). China Economic Review Dynamic relationship between China ' s inward and outward foreign direct investments. *China Economic Review*, *40*, 54–70. https://doi.org/10.1016/j.chieco.2016.05.005.

Yang, D., Chin, T., Liu, R. H., & Yao, Z. (2017). Policy support for own-brand innovation in China's auto industry: panacea or placebo? *Chinese Management Studies*, *11*(1), 107–122. https://doi.org/10.1108/CMS-12-2016-0254.

Yeung, H. W.-C. (2022). *Interconnected worlds: Global electronics and production networks in East Asia*. Stanford University Press.

Yeung, H. W. chung, & Coe, N. M. (2015). Toward a Dynamic Theory of Global Production Networks. *Economic Geography*, *91*(1), 29–58. https://doi.org/10.1111/ecge.12063.

Yin, R. K. (2009). *Case study research: Design and methods*. Sage Publications. https://doi.org/10.1300/J145v03n03_07

Yoshimatsu, H. (2000). The role of government in jump-starting industrialization in East Asia: The case of automobile development in China and Malaysia. *Issues & Studies*, *36*(4), 166–199.

Young, S., Huang, C.-H., & Mcdermott, M. (1996). Internationalization and competitive catch-up processes: Case study. *Management International Review*, 36(4), 295–314.

Yuan, X., & Zhang, Y. (2018). OFDI Reverse Technology Spillovers of Western China. *Open Journal of Social Sciences*, *06*(02), 62–70. https://doi.org/10.4236/jss.2018.62006.

Zanier, V. (2017). "Energizing" Relations: Western European industrialists and China's dream of self-reliance. The case of Ente Nazionale Idrocarburi (1956-1965). *Modern Asian Studies*, 51(1), 133–169. https://doi.org/10.1017/S0026749X16000275.

Zhang, J. (2019). Driving toward Modernity: *The Car and the Lives of the Middle Class in Contemporary China.* Cornell University Press. https://doi.org/10.7591/9781501738418.

Zhang, S. G. (2001). *Economic Cold War: America's Embargo against China and the Sino-Soviet Alliance, 1949-1963.* Stanford University Press.

Zhang, X., Ma, X., Wang, Y., Li, X., & Huo, D. (2016). What drives the internationalization of Chinese SMEs? The joint effects of international entrepreneurship characteristics, network ties, and firm ownership. *International Business Review*, 25(2), 522–534. https://doi.org/10.1016/j.ibusrev.2015.09.001.

Zhao, T., & Li, Z. (2021). 技術開発競争とビジネスモデル・イノベーション-中国自動車産業の電動化に関する考察 [Technology Development Competition and Business Model Innovation: A Study on the Electrification of China's Automotive Industry]. 阪産業大学経済論集, *22*(2), 23–42.

Zheng, N., Wei, Y., Zhang, Y., & Yang, J. (2016). In search of strategic assets through cross-border merger and acquisitions: Evidence from Chinese multinational enterprises in developed economies. *International Business Review*, *25*(1), 177–186. https://doi.org/10.1016/j.ibusrev.2014.11.009.

Zheng, Y., & Huang, Y. (2018). *Market in state: The political economy of domination in China*. Cambridge University Press.

ZF Press. (2017, August 30). *Luxshare Limited to Acquire the Global Body Control System business from ZF*. Retrieved November 19, 2023, from https://press.zf.com/press/en/releases/release_2794.html

Zhou, A. (1995). 技术依赖型合资模式"给中国汽车工业带来的思考" [Rely on foreign technique, which bring a rethinking for China's automobile industry]. *中国汽车市场, 11*, 22–25.

Zhou, L. (2018). Paris Sciences et Lettres PSL Research University. P.hD Thesis. Paris Sciences et Lettres PSL Research University.

Zhou, C. (2009). *Study on the absorptive capacity for reverse technology spillovers from OFDI* [对外直接投资逆向技术溢出效应吸收能力研究]. *Journal of Shanxi Finance and Economic University:* 47-53.

A. Appendices to Chapter 1

A.1 Technical Notes of Vehicle Categories Classification

According to CAAM classification of motor vehicles, China's automobiles are categorized into two main groups since 2005. Changes in motor vehicle categories are not always computed in industry yearbooks, which means that CAAM reclassifications are not immediately registered in CATARC. Before 2001 SUVs are classified as commercial vehicles due to their historical military and logistic purpose.

a) *Passenger cars (乘用车) include four types of motor vehicles:*

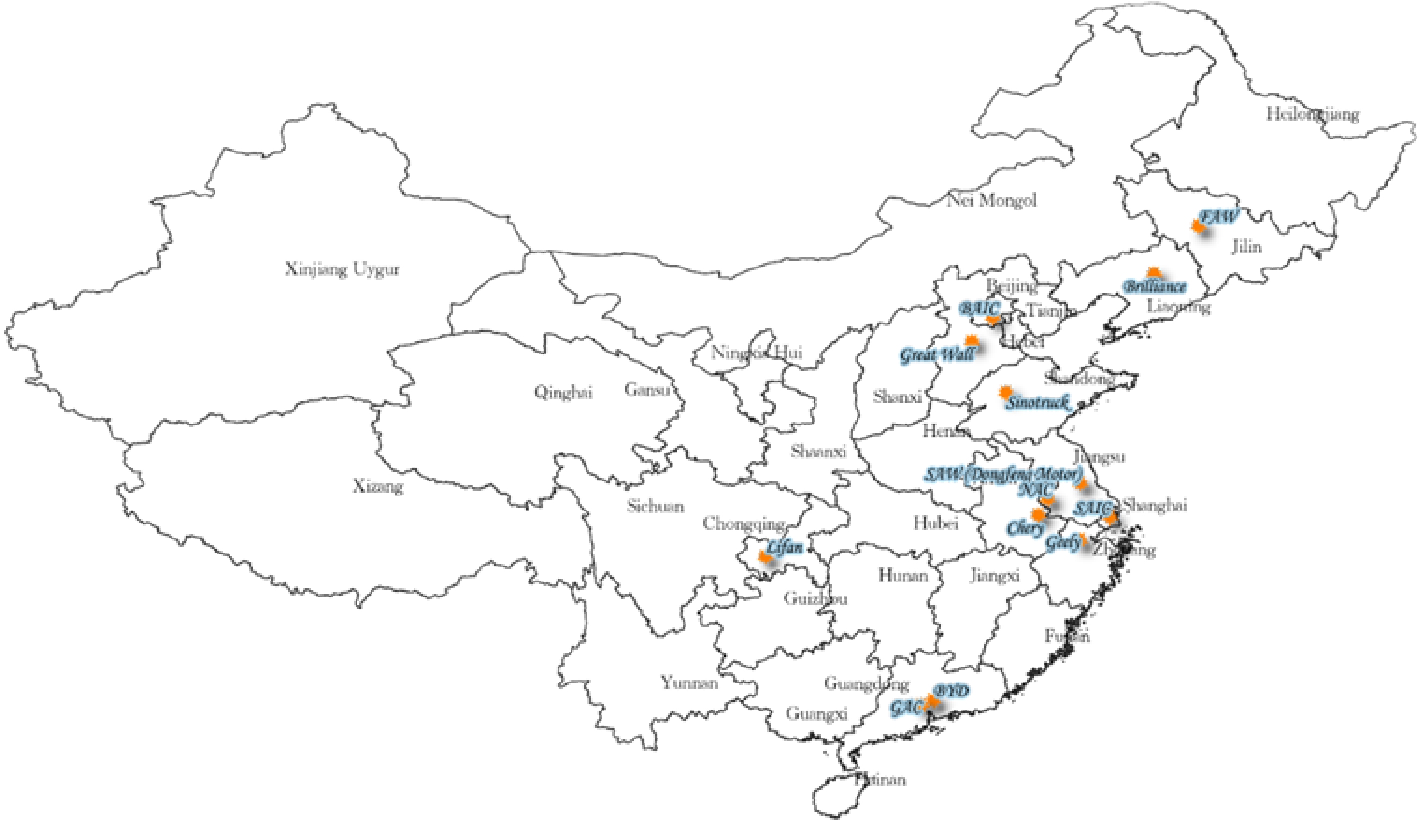
- Basic passenger vehicles or BPV (*基本型乘用车*)
- Sport utilitarian vehicle or SUV (*越野车，运动型多功能车*)
- Multiple purpose vehicle or MPV (*多功能车*)
- Others (for example, minivans for the transport of fewer than 10 persons)

b) *Commercial vehicles (商用车辆):*

- Light-duty trucks (*轻型货车*)
- Heavy-duty trucks (*重型卡车*)
- Bus and coaches (*公交车，长途汽车*)

B. Appendices to Chapter 2

B.1 Map of Main Chinese manufacturers



Sources: Author’s own elaboration

B.2 History of technology and equipment introduction in China's Automobile Industry

Table I.

Contract number	Import contract title (mandarin)	Import contract title	Importer	Supplier company	Country of origin	Content	Signature date	Due date	Duration (months)	Tech Introduction Form
83BMSJ/200126CD	汽车专用设备及生产线设计制造技术	Design and manufacturing technology of special equipment and production lines for automobiles	First Automobile Manufacturing Plant	Huller Helle	Germany	Automotive special equipment and production line design and manufacturing technology and materials, personnel training	30/05/1983	15/08/1983	96	Licensing trade
NA	与美国AMC公司合资生产吉普车合同	Joint venture contract with AMC USA for the production of jeeps	Beijing Jeep Automobile Co.	AMC Corporation	USA	Joint venture to produce Cherokee Jeeps. The American side provides military technology in vehicle design, quality inspection, production processes, sales and service, and business management	05/05/1983	01/06/1983	NA	Joint venture
83NFNC361001CD	重型汽车制造技术转让	Heavy Vehicle Manufacturing Technology Transfer	Heavy Vehicle Industry Associates	Steyr, Austria	Austria	Information on the design and manufacture of the contracted product chassis and engines, standards, drawings and all information on the corporate management and technical development of the Steyr plant, sales and after-sales service, spare parts	12/07/1983	15/03/1984	120	Licensing trade
82BM-CD001	第二汽车制造厂总装配厂多品种生产技术改造咨询协议	Consultancy agreement for the technical transformation of multi-species production at the General Assembly Plant of the Second Automobile Manufacturing Plant	Second Automobile Manufacturing Plant Final Assembly Plant	Fraunhofer Association for the Study of Business and Organization (IAO)	Germany	Development of structural layout improvement plans for the main assembly plant, material supply and production scheduling issues	30/08/1982	26/11/1983	36	Consultancy
83BNSJ-200116CE	里卡多协助改进NJ495汽油机的合同	Contract for Ricardo to help improve the NJ495 petrol engine	Nanjing Automobile Industry Joint Venture Company	Ricardo Consulting	UK	Nanjing Automobile Works supplied an NJ495 engine, Ricardo provided test data and design evaluation and suggested improvements	02/05/1983	23/07/1983	12	Technical Services
CEC-83005	内燃机模拟计算机程序专有技术合作	Proprietary technical cooperation on computer programs for internal combustion engine simulation	China Automotive Industry Corporation, Tsinghua University	Manchester Polytechnic	UK	Transfer of internal combustion engine simulation computer program and related technology from Manchester Polytechnic, UK to the Chinese side	25/07/1983	05/10/1983	NA	Technical Services
BMS-TL83001	汽车蓄电池专有技术和设备合同	Contract for know-how and equipment for automotive batteries	Shanghai Storage Battery Factory	Globe International, Johnson Controls	USA	Automotive battery manufacturing technology and materials, personnel training and production equipment imports	04/10/1983	04/10/1983	120	Technical services, import of key equipment
83NFNC-361004CE	汽车减震器技术转让合同	Technology transfer contract for automotive shock absorbers	Shanghai Auto Chassis Factory	Armstrong	UK	Technical data on three types of automotive shock absorber products	15/12/1983	15/01/1984	84	Licensing trade
83NFNC361002CD	载货汽车车轮制造技术合作合同	Technical cooperation contract for the manufacture of lorry wheels	First Automobile Manufacturing Plant Wheel Factory	Dusseldomannesmann Handel	Germany	A car wheel factory thus introduced the design technology, process and testing technology for 210 mm wheel hubs	19/12/1983	21/02/1984	12	Technical services, import of key equipment
84NFNC361008CN	DAIHATSU850系列微型汽车许可证合同	DAIHATSU 850 Series Microcar Licence Contract	Tianjin Automotive Industry Corporation	Daihatsu Motor Corporation	Japan	Various technical data on the DAIHATSU 850 series of microcars and on retrofit and new models during the contract period	03/03/1984	29/03/1984	84	Licensing trade
NA	上海大众汽车公司与联邦德国大众汽车公司合营合同及技术转让协议	Joint venture contract and technology transfer agreement between Shanghai Volkswagen and the Federal German Volkswagen AG	Shanghai Volkswagen Automobile Company, Shanghai Automobile Tractor Industry Joint Venture Company	Volkswagen AG, Leerfburg	Germany	Transfer of technical data and industrial property rights, know-how and trademark rights in relation to the contracted products (Santana car, 1.8L petrol/diesel engine) for the manufacture and sale of cars and car parts.	10/10/1984（joint venture); 20/03/1984（technical agreement）	29/12/1984, 20/30/1985	300	joint venture, technology transfer

Notes: Author's own elaboration based on History of the introduction of technology and equipment in China, *1972-1985 Qichegongye yingjinjishu zhuankang* [Album of introduced technologies in the automobile industry], 1996, CATARC.

Table II.

Contract number	Import contract title (mandarin)	Import contract title	Importer	Supplier company	Country of origin	Content	Signature date	Due date	Duration (months)	Tech Introduction Form
NA	合资经营生产标致504、505型汽车合同	Joint venture contract for the production of Peugeot 504 and 505 vehicles	Guangzhou Automobile Manufacturing Plant, China International Trust and Investment Corporation	Peugeot, BNP Paribas, IFC	France	A joint venture between China and France to establish the Guangzhou Peugeot Automobile Company for the production of Peugeot 504 and 505 vehicles. Peugeot's technical documents, drawings, records, reports (including management methods, computer application information) relating to the design, manufacture, testing, quality control and inspection of the contracted products, as well as all patents, registered drawings and trademarks for the contracted products.	01/03/1984	09/07/1985	NA	Joint venture
84BMSJ-4701730MR、84BMSJ-4701047MR、84BMSJ-4701048MR、84BMSJ-4701420LL	计算机辅助设计与制造合同（4个合同）	Computer-aided design and manufacturing contracts (4 contracts)	First Automobile Manufacturing Plant	IBM Corporation, USA; Control Data Corporation, Minneapolis, Minnesota, USA; GERBER Scientific Instruments, USA; DEA, Italy	USA/Italy	Central processing machine systems and related software, personnel training, interactive image display systems, large plotter systems, coordinate measuring machines	24/11/1984	17/12/1984	NA	Technical services, import of key equipment
NA	轻型汽车许可证转让和技术援助合同	Light vehicle licence transfer and technical assistance contracts	Nanjing Automobile Industry Joint Venture Company	Fiat Group Iveco Turin	Italy	Technical data and manufacturing equipment for Fiat Group S-Class vehicles with SOFIM diesel and petrol engines	27/03/1985	27/03/1985	NA	Licensing trade
85EEFZ/401155	大客车制造技术及设备合同	Bus manufacturing technology and equipment contract	Wuhan Bus Production and Assembly Plant	Imbrex Group De Simone Bus Engineering	Italy	The Italian side has provided 23 types of bus manufacturing technology and personnel training and manufacturing equipment to De Simone Bus Engineering I240	28/11/1985	28/11/1985	7	Import of complete sets of equipment, technology transfer
CUC-81013	NH和K发动机许可证合同	Bus manufacturing technology and equipment contracts	Chongqing Auto Engine Plant	Cummins Engine Company	USA	Product drawings, design information, test methods and performance standards, process inspection standards, sales and maintenance information for NH and K series engines	25/01/1981	26/03/1981	120	Licensing trade
83NFNC361001CO	生产斯太尔发动机设备	Production of Steyr engine equipment	Heavy Duty Automobile Industry Joint Venture, Weifang Diesel Engine Plant	Steyr-Daimler-Puch	Austria	Production of 13 sets of Steyr engine equipment	17/12/1983	15/03/1984	NA	Import of complete sets of equipment
85BMO/40062CK	引进意大利大客车生产专用设备	Introduction of special equipment for bus production in Italy	Changsha Bus Repair and Production Plant	Bus Engineering, Italy	Italy	13 sets of special equipment for the production of Italian buses	18/12/1985	18/12/1985	NA	Import of complete sets of equipment
CGC-81021	轻型汽车变速器制造技术许可证合同	Technical licence contract for the manufacture of light vehicle transmissions	Beijing General Gear Factory	ZF Corporation	Germany	Product drawings, technical documentation and drawings of manufacturing processes and non-standard equipment for three types of light vehicle transmissions; personnel training; technical guidance for production	25/05/1981	10/07/1981	120	Licensing trade
CMICJ-81011(A）	汽车灯具技术许可证协议	Technical licence agreement for automotive luminaires	Shanghai Auto Lamps Factory, Hubei Auto Lamps Factory	Small Series Production House	Japan	Design, manufacturing and testing technology and know-how for automotive "light assemblies", 14 sets of main production equipment	02/12/1981	03/02/1982	84	Licensing trade
CMICU-81012A	节温器产品专有技术合同	Technical licence agreement for automotive luminaires	First Automobile Manufacturing Plant	Thomson International Corp.	USA	Design, manufacture and inspection technology of the three thermostats of the engine cooling system and all related technical data	10/12/1981	09/03/1982	96	Licensing trade
83BMSJ/200117CE	汽车驾驶室涂装线技术合作合同	Technical cooperation contract for car cab painting line	The First Automobile Manufacturing Plant, The Second Automobile Manufacturing Plant, Jinan General Automobile Manufacturing Plant	Haden Drysys	UK	Joint design and manufacture of a vehicle cab painting line and introduction of major equipment	31/03/1983	29/10/1983	36	Technical Services

Table III.

Contract number	Import contract title (mandarin)	Import contract title	Importer	Supplier company	Country of origin	Content	Signature date	Due date	Duration (months)	Tech Introduction Form
83BMSJ-2100130CD	汽车仪表技术转让许可证合同	Automotive Instrumentation Technology Transfer License Contract	Second Automobile Manufacturing Plant Instrument Factory, Wuhu Instrument Factory	VDO	Germany	Automotive instrumentation and sensor technology	08/07/1983	30/12/1983	120	Licensing trade
AC83-013	"卡农"聚氨酯高压发泡生产设备及工艺技术合同	Contract for "Kanon" polyurethane high-pressure foam production equipment and process technology	Second Automobile Manufacturing Plant (Chassis)	Kanon	Italy	H41/Z high-pressure foaming machine and related mould and mould frame drawings	04/11/1983	04/11/1983	NA	Import of technical services and key equipment
83NFNC-361005MR	联合改进散热器设计及制造合同	Joint Improvement Radiator Design and Manufacturing Contract	Radiator Plant of the First Automobile Manufacturing Plant	Parkers Branch, McQuay-Parkers	USA	Joint improvement of the design of radiators, technical data and personnel training, import of some equipment	15/12/1983	15/12/1983	18	Technical Services
83NFNC-361003CD	汽车聚氨酯泡沫零件制造技术和关键设备合同	Contract for technology and key equipment for the manufacture of automotive polyurethane foam parts	First Automobile Manufacturing Plant	BASF, ELASTOGRAN Maschinenfabrik, EMB Plant	Germany	Manufacturing technology and key equipment for automotive polyurethane foam parts (vacuum forming machines, high-pressure foaming machines, etc.)	17/12/1983	11/02/1984	36	Key equipment imports come with manufacturing technology
83NFNC-361007CN	活塞环技术合作合同	Technical cooperation contract for piston rings	Wuhan Auto Parts Factory	Riken Corporation,	Japan	Joint design, chrome plating technology and import of corresponding equipment	22/12/1983	28/01/1984	96	Technical Services
84DMAA/24125CN	合作引进生产铃木微型汽车技术合同	Contract for cooperation in the introduction of technology for the production of Suzuki microcars	Ministry of Aviation, China National Aviation Technology Corporation, Changhe Aircraft Manufacturing Plant, Harbin Aircraft Manufacturing Company, State Dongan Machinery Factory	Suzuki Motor Co., Ltd.	Japan	Product drawings, manufacturing technology, inspection standards and inspection technology and personnel training and technical guidance for ST90K and ST90VT microcars with F8A engines	25/07/1984	24/09/1984	60	Licensing trade
84NFNC-361016CE	汽车试验场技术咨询合同	Technical consultancy contract for automotive test site	Second Automobile Manufacturing Plant	Motor Industry Research Association (MIRA)	UK	Automotive test site size, design, budget, technology, standards for EAC	31/08/1984	27/11/1984	24	Consultancy
84BMHR/37108CN	发动机质量咨询	Engine quality advice	Beijing Internal Combustion Engine General Factory	Kobe Friendship Trading Corporation, Komatsu Manufacturing	Japan	Provide guidance on the Chinese 4115 engine improvement design, suggest improvements and provide guidance on total quality management methods	01/09/1984	01/11/1984	30	Consultancy
84NFNC-361019CE	对第二汽车制造厂110系列柴油机性能与设计评定的技术咨询合同书	Technical consultancy contract for the performance and design evaluation of the 110 series diesel engines of the Second Automobile Manufacturing Plant	Technical Centre of the Second Automobile Manufacturing Plant	Ricardo Consulting	UK	Ricardo Consulting commissioned to evaluate the 6110 diesel engine design	29/10/1984	29/10/1984	NA	Consultancy
85AORL-361002CE	英国铸铁研究会和解放汽车进出口公司第一汽车制造厂铸造技术合同	Casting Technology Contract between the British Institute of Cast Iron Research and the First Automobile Manufacturing Plant of the Jiefang Automobile Import and Export Corporation	First Automobile Manufacturing Plant	British Cast Iron Research Association (BCIRA)	UK	BCIRA to advise on improvements and enhancements to casting technology at First Automotive Manufacturing	12/11/1984	11/01/1985	NA	Consultancy
84NFNC361022CE	锻件精化技术咨询合同	Technical consultancy contract for forging refinement	First Automobile Manufacturing Plant	GKNF Forgings Ltd	UK	Improve the accuracy of forgings, reduce the scrap rate of forgings, and send experts to the factory to guide the quality of forgings to meet the contract requirements	11/12/1984	01/05/1985	24	Consultancy

Table IV.

Contract number	Import contract title (mandarin)	Import contract title	Importer	Supplier company	Country of origin	Content	Signature date	Due date	Duration (months)	Tech Introduction Form
84NFNC361026MR	清洗机联合设计技术合作合同	Technical cooperation contract for the joint design of cleaning machines	Second Automobile Manufacturing Plant (Mobility Division)	CENTRY-SPRAY		The Chinese side sent personnel for training in the form of technical cooperation with the US side, and through the joint design of a cylinder block cleaner and an engine crankshaft cleaner, the Chinese side was able to independently design a future cleaner for its own use	12/12/1984	20/07/1985	24	Technical Services
84NFNC-361029MR	委托美国玫灵公司开发产品设计交互程序系统和产品结构分析	Product design interaction system and product structure analysis commissioned from Mae Ling USA	First Automobile Manufacturing Plant	MAY-LYNN CO.	USA	The U.S. side carried out design improvements and provided design solutions for the contract products (using computer calculations and computer-aided design), carried out structural strength analysis of the contract products and provided analysis reports (using computer systems), and the Chinese side sent staff to the U.S. for training and proficiency in computer-aided design.	15/12/1984	15/12/1984	NA	Technical Services
CJ-7537(Technical），CJ-6108c(Equipment)，CJE-5067c(Equipment), CCE-6093(Equipment）	摩擦材料制造技术	Friction material manufacturing technology	Hangzhou Brake Material Factory	Mitsubishi Cement Building Materials Corporation; Nagwa Simcoe	Japan/Germany	Introduced five friction material formulations, production processes, product performance testing and raw material test methods from Mitsubishi Cement Building Materials Co. And imported 4 sets of testing equipment.	15/12/1984	27/12/1975	240	Licensing trade
CBC-7615(Belgium）、CSC-7616(Sweden)、CFFC-7617（Finland）	汽车玻璃制造技术与设备引进合同	Contract for the introduction of technology and equipment for the manufacture of automotive glass	Hangzhou Brake Material Factory	Kobelco Aes; Ringoz; Tamglass	Belgium/Sweden/Finland	Introduction of automotive glass manufacturing technology and equipment.	01/03/1976	01/03/1976	36	Production line import (with production technology)
CEC-78439	发动机改进设计咨询和技术合作	Design consultancy and technical cooperation for engine improvement	Second Automobile Manufacturing Plant	Ricardo Consulting	UK	Improvement and test work on the 6105 engine, the British side proposed improvements and suggestions to meet the standards.	18/11/1978	18/11/1978	24	Technical Services
CEC-79037	活塞镶槽技术	Piston grooving technology	Wuhan Auto Parts Factory	International Engineering Associates, Inc.	USA	Introduction of technology for embedding wear-resistant cast iron rings in pistons up to 150 mm in diameter and import of 5 machines	10/03/1979	10/03/1979	96	Licensing trade
CJC-790012LT	化油器改进设计	Carburettor improvement design	Second Automobile Manufacturing Plant (Carburator factory)	Japan, Hitachi Automotive Division Sales Corporation, Yamafuku Corporation	Japan	Commissioned Japanese side to improve the design of two carburetors and provided summary information on the improved design and imported related equipment	29/10/1979	01/02/1980	42	Technical Services
CEC-79066	火花塞制造设备和制造技术合同	Contract for spark plug manufacturing equipment and manufacturing technology	Nanjing Electric Porcelain Factory	Crikle-wood, Smiths Industries Ltd.	UK	Imported sets of equipment for the production of 14mm spark plugs, the introduction of British manufacturing technology for the production of 14mm spark plugs (design information, process technology, inspection standards) and equipment installation and use instructions.	27/01/1980	27/01/1980	120	Import of complete sets of equipment
80LMGM/36301MR	电动轮汽车技术转让合同	Technology Transfer Contract for Electric Wheeled Vehicles	Changzhou Machine Shop, Ministry of Metallurgy	Lonitrig Equipment	USA	Introduction of electric wheel vehicle manufacturing technology, manufacturing products are all returned to the United States	29/05/1980	24/02/1980	84	Trade compensation
	建立经营丰田汽车技术服务站协议	Agreement for the establishment and operation of a Toyota Technical Service Station	Guangdong Automotive Industry Corporation, Guangdong Machinery Industry Department	BANZAI	Japan	Established the Toyota Vehicle Repair Technology Service Department in Guangzhou, and the Japanese side provided 373 items of vehicle repair equipment free of charge	29/05/1980	20/03/1982	60	Technical Services
84NFNC-361011CD	重型汽车转向机、转向油泵制造技术转让合同	Heavy vehicle steering machine, steering oil pump manufacturing technology transfer contract	Sichuan Automobile Manufacturing Plant nufacturing Plant	ZF Corporation	Germany	Design data, manufacturing data and service data for contract products	28/08/1984	13/10/1984	120	Licensing trade
84NFNC361020CN	三菱中型载货车（FK)驾驶室技术转让合同	Technology Transfer Contract for Mitsubishi Medium Duty Truck (FK) Cabs	First Automobile Manufacturing Plant	Mitsubishi Motors Corporation	Japan	The Japanese side provides all technical documents, drawings, diagrams, data and calculation formulas for the design, testing, processing, assembly and quality control of the cabs of medium goods vehicles and trains the Chinese personnel	31/10/1984	28/01/1985	48	Trade collaboration, Technical Services

Table V.

Contract number	Import contract title (mandarin)	Import contract title	Importer	Supplier company	Country of origin	Content	Signature date	Due date	Duration (months)	Tech Introduction Form
CGHQ-4073	汽车驾驶室软内饰生产线合同	Contract for soft interior trim line for car cabs	Qingdao Automobile Manufacturing Plant	Hennecke Construction Machinery GmbH Hannecke Maschinenfabrik	Germany	Introduction of three production lines of equipment and all manufacturing technology for soft interior trim of car cabs	26/11/1984	26/11/1984	NA	Production line import (with production technology)
85RMEW/402137	购买三菱L100型微型汽车车身制造设备及制造技术	Purchase of Mitsubishi L100 miniature car body manufacturing equipment and manufacturing technology	Guangxi Liuzhou Micro Automobile Factory	Mitsubishi Motors Corporation	Japan	Technical data for contract products and 75 sets of stamping dies	02/12/1984	05/05/1986	60	Leasing
85ADRL361004CD	汽车滚压车轮制造技术合作合同	Technical cooperation contract for the manufacture of rolled wheels for automobiles	First Automobile Manufacturing Plant	Mannesmann Handel	Germany	Through technical cooperation between the two parties in product manufacturing processes, tooling, equipment and quality inspection, the seller's technology and experience were used to build an automotive rolled wheel production line for FAW. The seller is responsible for technical training and plant services, and the buyer purchases some of the equipment.	18/12/1985	18/12/1985	60	Technical Services
86NFNC/363001MR	PEPSET工艺专有技术合同	PEPSET Know-how Contracts	Chongqing Engine Plant	Ashland Chemical, Ashland Oil Company	USA	Introduction of Ashland Chemical's chemical products for PEPSET resins for casting and transfer of technical information related to the process	03/03/1986	01/08/1986	36	Licensing trade
85NFNC-361053MR	汽车膜片弹簧离合器技术转让合同	Automotive Diaphragm Spring Clutch Technology Transfer Contract	Nanjing Automobile Industry Joint Venture Company	BorgWarner Automotive, Troy, Michigan	USA	Contract products: clutches for Beijing Jeep/AMC Jeep, Cherokee XJ-8600, Shanghai Volkswagen Santana cars, introduction of the complete manufacturing technology for the above contract products	17/12/1986	22/05/1986	24/03/1900	Licensed trade
85WMHN/37061CN	M14PG-1A化油器许可证合同	M14PG-1A Carburettor Licence Contract	Fuling Carburetor Plant	TK Gasifier Co.	Japan	Drawings, standard design calculations, latest JIS standards, manufacturing processes, tooling, inspection standards and methods, test, service, quality and production management information for licensed products	16/12/1986	28/02/1986	29/02/1900	Licensed trade
85BMS-11511	聚氨酯塑料成型技术和关键设备合同	Contract for polyurethane plastic moulding technology and key equipment	Shanghai Yanfeng Machine & Mould Factory	ELASTOGRAN Maschinenfabrik,	Germany	13 sets of technologies and key equipment for the manufacture of instrument panels and components for Santana, AMC, Iveco and Peugeot vehicles	15/12/1986	20/02/1986	05/02/1900	Import of complete sets of equipment, technology transfer
86NAXP-STO2011CN	商业用车车身设计技术服务合同	Technical service contract for the design of commercial vehicle bodies	Beijing Supply and Marketing Machinery Factory	Fuji Iron Works	Japan	The Japanese side undertook the design of the commercial vehicle BJ432 and provided design technical documents, drawings, diagrams, data, standards, design software	04/12/1986	06/02/1986	NA	Consultancy
86NAXP-3612012CN	日本富士铁工所承担北京供销机械厂商用车设计后模型和样车制造合同	Fuji Iron Works undertakes contract for the manufacture of post-design models and prototypes of commercial vehicles for Beijing Supply and Marketing Machinery Factory	Beijing Supply and Marketing Machinery Factory	Fuji Iron Works	Japan	Undertake the manufacture of post-design models and prototypes and provide process equipment and technical data for trial production, and train Chinese personnel	04/12/1985	04/12/1986	NA	Consultancy
85NFNC-361332NC-B	新工厂初步设计技术咨询合同	Technical consultancy contract for the preliminary design of the new plant	Second Automobile Manufacturing Plant	Hino Auto Industry Co.	Japan	Preliminary design of the new plant for the contracting company (IIAC)	27/08/1985	27/08/1987	NA	Consultancy
85NFNC-361044MR	气体渗碳技术援助联合生产合同	Gas Carburising Technical Assistance Co-Production Contract	Second Automobile Manufacturing Plant	NOLCROFT LOFTUS	USA	Jointly designed by the US and China, the buyer has part of the design technology and information and receives training, two production lines are introduced	15/08/1985	15/08/1985	NA	Technical services and line imports

Table VI.

Contract number	Import contract title (mandarin)	Import contract title	Importer	Supplier company	Country of origin	Content	Signature date	Due date	Duration (months)	Tech Introduction Form
85NFNC-361043MR	气体渗碳技术援助联合生产合同	Gas Carburising Technical Assistance Co-Production Contract	First Automobile Manufacturing Plant	NOLCROFT LOFTUS	USA	Jointly designed by the US and China, the buyer is in possession of part of the design technology and materials and receives training, and introduces a production line	05/08/1985	05/08/1985	NA	Technical services and line imports
85NFNC-361041CN	LF06S变速器总成许可证合同	LF06S Transmission Assembly Licence Contract	First Automobile Manufacturing Plant, Engine branch	Hino Auto Industry Co.	Japan	LF06S transmission design, manufacturing, testing and quality management technical data, factory management quality, 6 sets of sample contract product parts and assemblies in kind	28/02/1985	28/02/1985	NA	Licensed trade
	引进美国伊顿公司双副轴福勒变速器技术	Introduction of dual countershaft Fowler transmission technology from Eaton Corporation	Shaanxi Auto Gear Factory	Aton Corporation	USA	Introduction of Eaton's proprietary dual countershaft Fowler transmission technology	01/02/1985	01/02/1985	NA	Licensed trade
BMD84/1220C	引进汽车锁机构专有技术合同	Contract for the introduction of proprietary technology for automotive locking mechanisms	Wuhan Auto Lock Factory	KIEKERT-TAGAAG	Germany	Introduction of a complete set of know-how and patents for automotive locking mechanisms from Deggitt-Takka GmbH	20/12/1984	20/12/1984	NA	Licensed trade
84NFNC361023MR	阿什兰工艺的专有技术合同	Proprietary technology contract for the Ashland process	First Automobile Manufacturing Plant, Foundry Branch	Ashland Chemical Co.	USA	Introduction of core sand formulation technology, inspection technology, core box design and coating and other manufacturing technology for cold core box and self-hardening sand core making, and import of some key equipment and instruments.	12/12/1985	25/03/1985	NA	Licensed trade
85NFNC361034CN	橡胶密封件技术转让合同	Rubber Seals Technology Transfer Contract	Jinan Automobile Manufacturing General Factory Seals Plant	CNDK	Japan	Introduction of oil seal, O-ring and other rubber seal production technology and import of 5 sets of production equipment	13/01/1985	13/01/1985	29/02/1900	Licensed trade
85NFNC-361003MR	阿里逊变速器的技术援助和许可证合同	Technical assistance and licensing contracts for Arison Transmissions	Qijiang Gear Factory	Detroit Diesel Allison Division (DDAD), General Motors Corporation	USA	Assembly and supply of 3 models of the Arison transmission range in China	02/02/1985	05/06/1985	29/04/1900	Licensed trade
CAHO-5011	SY.492Q型四缸直列汽油机改进技术合同	SY.492Q four-cylinder inline gasoline engine improvement technology contract	Shenyang Automobile Engine Plant	AVL Engine Research and Development Centre	Austria	Improvement of the SY.492Q petrol engine on request and provision of a feasibility study, technical design and prototype test report	14/03/1985	14/03/1985	NA	Technical Services
85NFNC-361010CN	CA141五吨载货汽车试验评价合同	CA141 five-tonne goods vehicle test and evaluation contract	First Automobile Manufacturing, Changchun Automobile Research Institute	Hino Auto Industry Co.	Japan	Hino to provide a test evaluation report with suggestions and recommendations for improvement within one month of completing the CA141 five-ton truck test	25/02/1985	26/04/1986	06/01/1900	Consultancy
NA	广东省阳江汽车电子总厂与香港文利高电子有限公司、日本卡那利昂公司联合成立汽车电子研究中心的协议	Agreement between Yangjiang Automotive Electronics General Factory of Guangdong Province, Hong Kong Manliko Electronics Limited and Kanalion Corporation of Japan to jointly establish an Automotive Electronics Research Centre	Guangdong Yangjiang Automotive Electronics General Factory	Hong Kong, Manliko Electronics Limited; Japan, Kanalion Corporation	Japan/Hong Kong	The three parties jointly set up an Automotive Electronics Research Centre, with Hong Kong and Japan regularly sending technical experts to exchange technical training staff and provide US$500,000 in research equipment, testing equipment and teaching facilities.	04/04/1985	04/04/1985	NA	Technical Services
85NFNC361013CD	汽车电器技术转让合同	Automotive electrical technology transfer contract	Changsha Auto Electric Factory	ROBERT BOSCH	Germany	Technical documentation on the design, workmanship and serviceability of the specified type of alternator, crystal regulator and ignition distributor, as well as machine tables for the manufacture of the products and equipment tables for testing machines	30/04/1985	12/11/1985	29/04/1900	Licensed trade

Table VII.

Contract number	Import contract title (mandarin)	Import contract title	Importer	Supplier company	Country of origin	Content	Signature date	Due date	Duration (months)	Tech Introduction Form
85AORL-361003CE	汽车膜片弹簧离合器许可证及技术援助合同	Automotive diaphragm spring clutch licence and technical assistance contract	Jiefang Automobile Industry Import & Export Corporation (FAXX)	Motor Vehicle Products Ltd (AP)	USA	Design data, manufacturing data and service data for contract products and other production support data	19/05/1985	19/05/1985	NA	Licensed trade
NFNC36108CN,85NFNC-361254CN	变截面弹簧技术及关键设备	Variable section spring technology and key equipment	Liaoyang Auto Spring Factory	Nippon Clockwork Co.		Introduction of CA-141 variable section steel plate spring, fj621 variable section steel plate spring design and manufacturing technology and 3 sets of imported manufacturing equipment	30/05/1985	30/05/1985	NA	Licensed trade
85NFNC361046CD	汽车气制动原件技术转让合同	Technology transfer contract for automotive air brake components	Chongqing Automobile Parts Factory	Westinghouse Automotive Brake Co	Germany	Introduction of technologies for the design, manufacture, process and quality control of contract products for automotive air brake components	20/07/1985	01/02/1986	17/04/1900	Licensed trade
85OKJSZX-RJ001CD	在中国使用条件下的汽车零部件疲劳强度优化设计项目协议	Project agreement for optimal design of fatigue strength of automotive components under Chinese conditions of use	Second Automobile Manufacturing Plant	Institute for Fatigue Strength, Franhofer Institute, Franhofer Association	Germany	Introduction of design methods for the optimal design of fatigue strength of automotive components as well as a full set of computer programs and related equipment	20/07/1985	20/07/1985	24/01/1900	Technical Services
85DMAA/741099CN-1、2	引进密封胶条制造技术及设备合同	Contract for the introduction of sealant manufacturing technology and equipment	Ministry of Aviation State-owned Hongyang Machinery Factory	Tokai Kogyo Co.	Japan	Introduction of sealing tape manufacturing technology and a production line, training of Chinese personnel	01/08/1985	03/09/1985	NA	Licensed trade
NA	建立南方丰田汽车维修保养技术培训中心的协议	Agreement for the establishment of the Southern Toyota Technical Training Centre for Vehicle Repair and Maintenance	China Automotive Industry Southern Trading Corporation, Guangdong Machinery Industry Department	BANZAI	Japan	The Japanese side provided 419 items of teaching materials, teaching equipment, teaching tools and test equipment and trained Chinese personnel free of charge	09/08/1985	01/05/1985	24/01/1900	Technical Services
85OKPSP-RJ003USA	制造中型载货汽车转向机专有技术转让合同	Contract for the transfer of know-how in the manufacture of steering machines for medium goods vehicles	Second Automobile Manufacturing Plant	TRW Corporation	USA	Technical data on the manufacture of steering machines and parts for medium tonnage vehicles of the HFB52 and HFB64 series from TRW,	24/11/1985	24/11/1985	NA	Licensed trade
85DMAA/121186CN,85DMAA/491112CN,85DMAA/121187(1-7)7个	引进日本化油器技术及加工测试设备合同	Contract for the introduction of Japanese carburettor technology and processing and testing equipment	Ministry of Aviation State-owned Hongyang Machinery Factory	Hino Auto Industry Co.	Japan	Technical documentation for automotive carburetors, personnel training and import of related equipment	01/12/1985	01/06/1986	NA	Licensed trade, key equipment
85WMHN/37062CN	UK-0601型磁电机许可证合同	Variable section spring technology and key equipment	Fuling Carburetor Plant	apan Ikeda Mechatronic	Japan	Introduction of UK-0601 magneto drawings, design, manufacturing, tooling, inspection standards, quality management and other technical documentation	16/12/1985	28/02/1986	29/02/1900	Licensed trade
NA	引进英国贝利克公司渗碳生产线	Introduction of carburising line from British company Belleek	Shaanxi Auto Gear Factory	Belleek	UK	One imported carburising line, with relevant technical information and technical training guidance	25/05/1905	25/05/1905	NA	Import production line
CEC-78739	内燃机技术咨询合同	Technical consultancy contract for internal combustion engines	Shanghai Institute of Internal Combustion Engines	Ricardo Consulting,	UK	Access to British technical information, advice on design improvements and guidance on staff training	01/11/1978	01/11/1978	24/01/1900	Consultancy
CEC-79057	活塞环镀硬铬技术许可证协议	Technical licence agreement for hard chrome plating of piston rings	Changsha Zhengyuan Power Accessories Factory	United Engineering International (AEI)	UK	The British side provides all technical information on several chrome plating processes and is responsible for the training of personnel	27/08/1979	27/08/1979	05/04/1900	Licensed trade
CAC-79095	6135柴油机技术评定	6135 diesel engine technical rating	Shanghai Diesel Engine Plant	Lister Institute for Internal Combustion Engines (AVL), Austria	Austria	Through the technical evaluation of the 6135 diesel engine, the performance and durability of the whole engine and components were tested, problems were pointed out, suggestions for improvement were made and sketches were drawn to meet the technical requirements.	12/12/1979	12/12/1979	12/01/1900	Consultancy

B.3 Key personages in China's automobile industry development

Table I.

Name pinying	Name Mandarin	Nationality	Bio	Party member	Expertise	Company 1	Position co. 1	Company 2	Position co. 2	Company 3	Position co. 3	Foreign Assistance/JV contract
Ai Biyao	艾必瑶 *	China	1933-	no	designer	FAW	Interior designer for Dongfeng and Hongqi cars					
An Qingheng	安庆衡	China	1944-	yes	engineer	Beijing General Gear Factory	Deputy Plant Manager, Chief Engineer.	BAIC	Director, Deputy General Manager & Chief Engineer, General Manager	BAIC	Chairman and Secretary of the Party Committee	
Cai Shiqing	蔡诗晴	China	na	no	engineer	CNAIC	General Manager and Chairman					
Carl H.Hahn	卡尔 哈恩	Germnay	1926-2023	no	engineer	Volkswagen Group	President					FAW, STAC-VW
Chen Guangzu	陈光祖	China	1933-	no	specialist	China Auto Parts Industry Corporation	Deputy General Manager	China Automotive Industry Engineering Consulting Corporation	General Manager			
Chen Qingtai	陈清泰	China	1939-	yes	engineer	SAW	Chief Engineer,	Dongfeng	General Manager, Chairman	National Economic and Trade Commission	Deputy Director	
Chen Xianglin	陈祥麟	China	1944-	yes	economist	STAC	Vice Chairman and General Manager	SAIC Group	Chairman and Secretary of the Party Committee			STAC-VW
Chen Zhutao	陈祖涛	China	1928-2022	yes	engineer	FAW	Head of Preparation Division, Process Division	SAW	Chief Engineer	CNAIC	Chief Engineer、Depu tyGeneral Manager、Gene ral Manager	

Sources: Author's own elaboration based on official reports and journals of FAW and SAW; Oral compilation by Ge Banning (1993); Corporate Archives; Culture, History and Study Committee of the Chinese People's Political Consultative Conference (2007), and other primary sources.

Notes: "na", data not available; "*" woman.

Table II.

Name pinying	Name Mandarin	Nationality	Bio	Party member	Expertise	Company 1	Position co. 1	Company 2	Position co. 2	Company 3	Position co. 3	Foreign Assistance/JV contract
Dong Changzheng	董长征	China	1963-	no	engineer	Mercedes-Benz Beijing	Former Executive Vice President	Toyota China	Deputy General Manager			
Duan Junjie	段俊杰	China	1924	no	economist	FAW	Director of Finance					
Fan Hengguang	范恒光	China	1930	yes	na	FAW Car Factory	Plant Manager	FAW	Plant Manager	FAW Audi	Project Leader, FAW-Audi	FAW Audi
Fang Jier	方劼	China	1921-2003	yes	na	FAW	Deputy secretary	Sinotruck	Secretary of the Party Group			
Feng Ke	冯克	China	1922-2012	yes	na	FAW Car Factory	Plant Manager	FAW Car Factory	Party Secretary	CNAIC	Deputy General Manager	
Geng Zhaojie	耿昭杰	China	1935-	yes	engineer and designer	FAW	Plant Manager, General Manager, Chairman, Party Secretary					
Gu Yaotian	顾尧天	China	1933-2017	no	na	NAC	Plant Manager	CNAIC	General Manager			
Gu Xun	顾循	China	1916-1986	yes	na	FAW	Party Secretary	National Machinery Industry Bureau	Deputy Director			
Guo Li	郭利	china	1916-1976	yes	yes	Ministry of Heavy Industry	Director of Preparatory Group	FAW	Director, Plant Manager, Chief Engineer	Deputy Minister		
Hang Yulin	韩玉麟	China	1929-2023	yes	engineer	FAW	Deputy Plant Manager and Chief Engineer					FAW-VW
Hang Yunling	韩云岭	China	na	no	engineer	D & R Institute of Machinery Industry	Engineering Designer					FAW-VW
Hans Joachim Paul	na	Germnay	na	no	technitian	China Volkswagen Group	Deputy General Manager	Audi	Board of Management for Technical Development			
He Guangyuan	何光远	China	1930-	yes	engineer	FAW	Plant Manager	Chanchun Truck Works	Plant Manager	Ministry of National Machinery Industry	Minister	
He Shiyue	赫世跃	China	1930-	no	engineer	FAW	Deputy Plant Manager					
Heinz Bauer	na	Germnay	1939-	no	managering	Volkswagen Group	Head of Overseas Cooperation	Volkswagen AG	Board Member			STAC-VW, FAW-VW

Table III.

Name pinying	Name Mandarin	Nationality	Bio	Party member	Expertise	Company 1	Position co. 1	Company 2	Position co. 2	Company 3	Position co. 3	Foreign Assistance/JV contract
Hermann Stübig	na	Germnay	1933-2019	no	no	Audi	Director of Production					FAW-Audi
Hu Liang	胡亮	China	1916-1995	no	engineer	First Ministry of Machinery Industry	Director, Deputy Chief Engineer, Deputy Director and Senior Engineer	FAW	Construction and organization of the seventh production plant of FAW	se Society of Automotive Engineering	President	
Hu Maoyuan	胡茂元	China	1951-	yes	economist	STAC	Plant Manager	SAIC Group	Chairman	SAIC General Motors	General Manager	SAIC-GM
Hu Xinmin	胡信民	China	1926-2020	yes	project manager	First Industrial Machinery	Planning Department					
Hua Fulin	华福林	China	1933-2010	yes	designer	FAW	Chassis Designer of Hongqi car					
Huang Jinhe	黄金河	China	na	yes	na	FAW	Plant Manager, Deputy Plant Manager	FAW-VW	Deputy General Manager			FAW-VW
Huang Yiran	黄一然	China	na	yes	na	FAW	Deputy Plant Manager					
Huang Zhaoluan	黄兆銮	China	1924-2015	yes	managering	FAW	Director of Equipment and Tool Division, Plant Manager of Tools Branch					
Huang Zhengxia	黄正夏	China	1921-2009	yes	na	SAW	Plant Manager	Dongfeng	Chairman			
Ji Kegang	李克刚	China	na	yes	economist	NAC	Trade Union President	FAW	Head of Production Division Deputy			
Ji Xueqing	纪学溦	China	na	yes	managering	Tianjin Automotive Industry Corporation	General Manager, Party Secretary					Tianjin Daihatsu
Jia Yanliang	贾延良	China	1940-	no	designer	FAW	Car designer					
Jiang Zeming	江泽民	China	1926-2022	yes	engineer	Stalin Automobile Factory	Engineer in practice	FAW	Deputy Chief Power Officer	First Industrial Machinery	Deputy Director	
Jiang Zeming (elder)	江泽民（老）	China	1903-1957 (?)	yes	engineer	Sinotruck	Director of Planning Division	First Industrial Machinery	Deputy Director General			
Jiangtao	蒋涛	China	1921-	na	na	STAC	Chairman	STAC-VW	Member of delegation for STAC and VW negotiation			STAC-VW
Jiu Ke	仇克	China	na	na	na	STAC	Deputy manager, manager	SAIC	Vice chairman	SAIC-VW	Chairman	STAC-VW
Li Gang	李刚	China	1926-2022	no	no	FAW	Plant Manager	CNAIC	General Manager、Chairman			

Table IV.

Name pinying	Name Mandarin	Nationality	Bio	Party member	Expertise	Company 1	Position co. 1	Company 2	Position co. 2	Company 3	Position co. 3	Foreign Assistance/JV contract
Li Lanqing	李岚清	China	1932-	yes	Technitian	Likhachev Automobile Plant and	Intership	FAW	Head of Planning Section, Party Secretary	Sinotruck	Head of Planning Office	
Li Long Chang	李龙长	China	na	na	na	NAC	Plant Manager					NAC-Iveco
Li Lvxiang	李启祥	China	na	no	engineer	FAW	Plant Manager, Deputy Chief Engineer					
Li Wenbo	李文波	China	na	no	managering	Volkswagen Group China	First Chief Representative of Volkswagen in Beijing, Head of Volkswagen China and Asia					
Li Zhiguo	李治国	China	1934-	na	na	FAW	Deputy Plant Manager,Deputy Chairman, Deputy General Manager					
Li Zizheng	李子政	China	1921-2013	yes	na	FAW	Plant Manager of FAW Foundary Branch	SAW	Member of Planning Division, Party Secretary			
Lin Dangwei	林敢为	China	na	no	engineer	FAW	Chief Engineer	FAW-VW	General Manager			
Liu Renwei	刘人伟	China	na	no	yes	FAW	Translator of Engineer Kirov	SAW	Head of Research Team	NAC	Director of the foreign economic department	
Liu Shouhua	刘守华	China	1920-1999	no	na	FAW	Director					
Lu Ji'an	陆吉安	China	1933-	no	na	SAIC	Deputy Chairman、General Manager					
Lv Fuyuan	吕福源	China	1946-2004	yes	engineer	FAW	Deputy Plant Manager, Economist	CNAIC	Deputy General Manager			FAW-VW
Ma Chengzai	马诚斋	China	1916-1978	yes	na	FAW	Deputy Plant Manager					
Ma Wenxin	马文兴	China		yes	yes	FAW	Chief Engineer, Plant Manager, FAW Engine Plant	FAW	Deputy General Manager of FAW Group, Chairman of FAW Car			
Ma Yue	马跃	China	1942-	yes	na	Dongfeng	General Manager、Party Secretary					

Table V.

Name pinying	Name Mandarin	Nationality	Bio	Party member	Expertise	Company 1	Position co. 1	Company 2	Position co. 2	Company 3	Position co. 3	Foreign Assistance/JV contract
Meng Shaonong	孟少农	China	1915-1988	yes	engineer	Sinotruck	Planning Division Deputy Director	FAW	Deputy Plant Manager, Deputy Chief Engineer	Shaanxi Automobile Manufacutring Plant	Head of Technical Division, Deputy Director of Production Plant	
Miao Wei	苗圩	China	1955-	yes	na	Dongfeng	General Manager、Party Secretary					
Nikola, Yakovlevich Kirev	基列夫	URSS		no	yes	Stalin Automobile Factory	Engineer					Soviets -FAW
Pang Gan	彭淦	China	1918-1967	yes	na	First Ministry of Machinery Industry	Deputy General Director	CNAIC	Deputy General Manager, Party Secretary			
Rao Bin	饶斌	china	1913-1987	yes	no	FAW	Director	SAW	Director	Changchun Auto Tractor Academy	Director	STAC-VW
Roland Gumpert	na	Germnay		no	yes	Audi	Head of Overseas Technical Department					FAW-VW
Shao Qihui	邵奇惠	China	1934-	yes	na	National Machinery Industry Bureau	Director, Party Secretary					
Song Minzhi	宋敏之	China	1909-2007	yes	na	FAW	Deputy Director					
Sun Min	孙敏	China	1936	no	na	Jiangling Automobile Group Company	General Manager, Chairman					
Teng Bole	滕伯乐	China	1935-2010	no	economist	FAW	Plant Manager Secretary	SAW	Head of Section	NAC	Director of Deputation, Chief Economist of Deputation,	
Wang Chuanfu	王传福	China	1966-	yes	Metallurgical Physical Chemistry	BYD	Chairman of the Board and President					
Wang Hao Liang	王浩良	China	1944-	yes	na	NAC	Chairman、Party Secretary					

Table VI.

Name pinying	Name Mandarin	Nationality	Bio	Party member	Expertise	Company 1	Position co. 1	Company 2	Position co. 2	Company 3	Position co. 3	Foreign Assistance/JV contract
Wang Jinren	王进仁	China	1920-2012	yes	na	SAW	Deputy Plant Manager, Party Secretary					
Wang Rongjun	王荣钧	China	1932-	yes	na	SAIC-VW	General Manager					
Wang Shaolin	王少林	China	na	no	na	FAW	Deputy Plant Manager					
Wang Shengluan	汪声銮	China	1929-1999	yes	engineer	FAW	Deputy Chief Engineer	Tianjin Automotive Industry Corporation	DeputyGeneral Manager, Chief Engineer			
Wang Shujin	王淑静*	China		yes	na	BAIC	Party Secretary of the BAIC Body Plant					
Wang Zhaoguo	王兆国	China	1941-	yes	na	SAW	Deputy Plant Manager,Party Secretary					
Wei Jianjun	魏建军	China	1964-	yes	na	Great Wall	Chairman					
Weng Jianxin	翁建新	China			na	Shanghai Automobile Factory	Plant Manager、Chief Engineer					STAC-VW
Wu Qing Shi	吴庆时	China	1930-2019		na	Sinotruck	DeputyGeneral Manager	CNAIC	Deputy General Manager			
Xu Xingyao	徐兴尧	China	1938	no	na	SAIC - VW	Chariman					
Xu Yuancun	徐元存	China	na	yes	na	FAW	Party Secretary					
Yang Jianzhong	杨建中	China	1933-2016	no	engineer	FAW	Hongqi car engine					
Yu Jianwei	俞建伟	China	na	na	na	NAC	General Manager					
Zeng Qinghong	曾庆洪	China	1961-	yes	na	GAC	Chairman,General Manager					
Zhang Changmou	张昌谋	China	na	no	na	SAIC-VW	General Manager					STAC-VW
Zhang Deqing	张德庆	China	1909-1977	no	na	Changchun Automobile Research Institute	Director					
Zhang Fangyou	张房有	China	1956-	yes	na	GAC	Chairman	GAC-Toyota	Chariman	GAC Mitsubishi	Chairman	
Zhang Xiaoyu	张小虞	China	1945-2014	yes	economist	Ministry of National Machinery Industry	Director	CNAIC	General Director, Chief Economist			
Zhang Yupu	张玉浦	China	1943-	no	economist	Shaanxi Automobile	Economist, Plant Manager，Chairman					
Zhao Mingxin	赵明新	China	1914-1967	yes	na	FAW	Party Secretary					

C. Appendices to Chapter 3

C.1 Major National Science and Technology Policies and Programmes

Policy/program	Agency	Year started	Main goals
Key Technologies R&D	Ministry of Science and Technology	1982	To solve critical, direction-related, and comprehensive problems in national and social development, covering agriculture, electronic information, and energy resources among others. This program engages thousands of researchers and research centers nationwide.
National Hi-tech R&D program (863 Program)	Ministry of Science and Technology	1986	To set 20 themes in biology, space flight, information, laser, automation, energy, new material and oceanography for international research and new research activities.
Torch Program	Ministry of Science and Technology	1988	Being national China's most important hi-tech guideline industry program, focuses on the commercialization of new technologies, developing of hi-tech products, and establishment hi-tech development zones nationwide.
Spark Program	Ministry of Science and Technology	1986	To revitalize the rural economy through S&T popularization of science and technology to improve the lives of the rural population.
973 Program (basic research program)	Ministry of Science and Technology	1997	Like '863 program', '973' focuses on multi-disciplinary research issues such as agriculture, energy, information, environment of resources, population and health, and materials, providing theoretical basis and scientific foundation for enabling China's S&T capabilities to catch up with those of the OECD countries during the 21st century.
Medium to Long-term Plan for the Development of S&T (2005-2020)	State Council	2006	To develop key high technology and engineering projects with commercial applications through subsidies for industry, procurement policies, financial support for enterprises' international expansion, and large-scale investments.
'Strategic Emerging Industries' program	State Council	2010	To fund and promote investment in new industries in seven key areas of technology which related to energy-saving and environmental protection, the new generation of IT, biology high-end equipment, new energy, new materials, and NEVs.
'Made in China 2025' plan	State Council	2015	The plan proposes a 'three-step' strategy of transforming China into a leading manufacturing power by the year 2049. Nine tasks have been identified as priorities: improving manufacturing innovation, integrating technology and industry, strengthening the industrial base, fostering Chinese brands enforcing green manufacturing, promoting breakthroughs in ten key sectors, advancing restructuring of the manufacturing sector, promoting service-oriented manufacturing and manufacturing-related service industries, and internationalization manufacturing.

Sources: Authors' own elaboration based on www.china.org.cn/english/features/Brief/193304.htm; "China's Program for Science and Technology Modernisation: Implications for American Competitiveness": Report for the U.S.- China Economic and Security Review Commission (2011); www.gov.cn/policies/latest_releases/2015/05/19/content_281475110703534.htm (accessed 16 March 2021).

C.2 Industrial policies and regulations in China's automobile industry

Policy or regulation	Year in force	Agency	Main goals
Indicative Plans for the auto industry.	1986	State Development and Planning Commission	To set FAW, SAW and Shanghai as "Big Threes" and Tianjin Xiali, Beijing Jeep and Guangzhou Peugeot as "Small Threes". They are the Chinese Big Three's and Big Smalls. To strengthen the dominance of SOEs in the industry after first joint ventures.
Strict controls of sedans production plants communication by State Council and control of import.	1987	State Council	Control of sedan production plants in China to protect domestic industry.
Measures for the Implementation of Industrial Policies in the Auto Industry	1990	China National Automobile Industry Company (following State Council guidelines)	To promote developing large automobile companies, set the production of sedans and SUVs as main categories. Strict control of light duty trucks, medium duty trucks and light passenger cars to eliminate duplicity of models.
Communication on selecting a group of large enterprises for pilot projects	1991	State Development and Planning Commission	Formation of large companies: Second Automotive Works became Dongfeng and First Automotive Works Group, China National Heavy-Duty Truck Group, Yuejin Automotive Group, Shanghai Automotive Industry Company, Beijing Automotive Industry Company, and Tianjin Automotive Industry Corporation.
Automobile Industry Development Policy	1994	State Development and Planning Commission	To open up markets (domestic and foreign); promotion of large scale-production; industry concentration (elimination of dispersed production and small-scale manufacturing plants) in order to exploit economies of scale, i.e., getting ready for WTO membership.
Automobile Industry Development Policy	2004	State Council	Replace 1994 Policy. Eliminate exchange rate balance, requirement on national content level and export share to total output ratio. Domestic industry shall enforce own-brand creation oriented toward international market, i.e., updated its guidance according to WTO negotiations agreed.
Planning for the Restructuring and Revitalization of the Automobile Industry (2009-2011)	2009	National Development Commission	Stabilise automobile consumption, fasten restructuration, strengthen innovation capacity, increase value added upgrade during 2009-2011.
Energy-saving and new energy auto industry development plan (2012-2020)	2012	State Council	Within the 12th FYP, technological and innovation strategies: develop electrical and hybrid vehicles, improve general automobile technological level; production goal: 500.000 units of NEVs in 2015, 2 million in 2020, 5 million accumulated.

Sources: Author's own elaboration based on *Zhongguo qiche gongyeshi 1901-1990* [China's Automobile Industry History] (1996) and *Zhongguo qiche gongyeshi 1991-2010* [China's Automobile Industry History] (2014); CAIYs (various issues); Chinese Government policy repository: www.gov.cn/zhengce/content (accessed October 22, 2019).

C.3 Ranking by sedans sales volume in China, 2008-2018

Year	Ranking Top 10	1st	2nd	3rd	4th	5th	6th	7th	8th	9th	10th
2008	Model	Jetta	Santana	Excelle	Accord	Corolla	Camry	QQ	F3	Xiali	Elantra
	Company	FAW-VW	SAIC-VW	SAIC-GM	GAC-Honda	FAW-Toyota	GAC-Toyota	Chery	BYD	FAW	BAIC Hyundai
2009	Model	F3	Excelle	HDC	Jetta	Santana	Accord	Elantra	QQ	Corolla	Camry
	Company	BYD	SAIC-GM	BAIC Hyundai	FAW-VW	SAIC-VW	GAC-Honda	BAIC Hyundai	Chery	FAW-Toyota	GAC-Toyota
2010	Model	F3	Lavida	HDC	Jetta	Excelle	Santana	Xiali	Cruze	Fengyun	Bora
	Company	BYD	SAIC-VW	BAIC Hyundai	FAW-VW	SAIC-GM	SAIC-VW	FAW	SAIC-GM	Chery	FAW-VW
2011	Model	Excelle	Lavida	Cruze	Jetta	Bora	Santana	Sail	Xiali	HDC	Focus
	Company	SAIC-GM	SAIC-VW	SAIC-GM	FAW-VW	FAW-VW	SAIC-VW	SAIC-GM	FAW	BAIC Hyundai	Changan Ford
2012	Model	Focus	Sail	Excelle	Lavida	Jetta	Passat	Cruze	Bora	HDC	Verna
	Company	Changan Ford	SAIC-GM	SAIC-GM	SAIC-VW	FAW-VW	SAIC-VW	SAIC-GM	FAW-VW	BAIC Hyundai	BAIC Hyundai
2013	Model	Focus	Lavida	Excelle	Sail	Sagitar	Jetta	Sylphy	Cruze	Santana	New Bora
	Company	Changan Ford	SAIC-VW	SAIC-GM	SAIC-GM	FAW-VW	FAW-VW	Dongfeng- Nissan	SAIC-GM	SAIC-VW	FAW-VW
2014	Model	Focus	Lavida	Santana	Sagitar	Sylphy	Jetta	Excelle	Cruze	Sail	Elantra3
	Company	Changan Ford	SAIC-VW	SAIC-VW	FAW-VW	Dongfeng- Nissan	FAW-VW	SAIC-GM	SAIC-GM	SAIC-GM	BAIC Hyundai
2015	Model	Sylphy	Lavida	Elantra	Excelle	Verna	Corolla	Cruze	Accord	Sail	Sagitar
	Company	Dongfeng- Nissan	SAIC-VW	BAIC Hyundai	SAIC-GM	BAIC Hyundai	FAW-Toyota	SAIC-GM	GAC-Honda	SAIC-GM	FAW-VW
	Sales (thousd. units)	418	397	357	347	315	304	296	280	277	271
2016	Model	Lavida	Excelle	Sylphy	Jetta	Sagitar	Passat	Magotan	Mistra	Accord	BMW X5
	Company	SAIC-VW	SAIC-GM	Dongfeng- Nissan	FAW-VW	FAW-VW	SAIC-VW	FAW-VW	BAIC Hyundai	GAC-Honda	Brilliance BMW
	Sales (thousd. units)	479	370	368	348	341	188	171	148	143	144
2017	Model	Lavida	Excelle	Sylphy	Corolla	Sagitar	Magotan	Passat	Accord	Audi A6	Mistra
	Company	SAIC-VW	SAIC-GM	Dongfeng- Nissan	FAW-Toyota	FAW-VW	FAW-VW	SAIC-VW	GAC-Honda	SAIC-VW	BAIC Hyundai
	Sales (thousd. units)	458	417	406	333	333	211	160	150	142	135
2018	Model	Excelle	Lavida	Corolla	Jetta	Sagitar	Magotan	Passat	Accord	Audi A4	Camry
	Company	SAIC-GM	SAIC-VW	FAW-Toyota	FAW-VW	FAW-VW	FAW-VW	SAIC-VW	GAC-Honda	SAIC-VW	GAC-Toyota
	Sales (thousd. units)	481	468	374	328	310	229	179	177	168	163

Sources: Author's own elaboration based on CAIYs (various issues) Notes: a) Top sales by models indicates the popularity and brand recognition in China, import units are included; Chinese own-brand models assembled by domestic manufacturer use pinying instead of translation to English; Designed only for Chinese market used English name. b) Company name as brand, car model used here to study the brand popularity in the domestic market.

C.4 Interviews

Ambas entrevistas se llevaron a cabo presencialmente en la sede de SEAT Martorell el 15 de marzo de 2022. Las preguntas se estructuran en cuatro bloques principales:

Parte I. Presentación e introducción de la entrevistada

Parte II. Cuestiones generales sobre el presente y futuro del sector de la automoción.

Parte III. Vinculo histórico SEAT y sector de la automoción en China

Parte IV. Actividades de I+D, y retos futuros

Nota técnica: Transcripción natural, en castellano.

Entrevista 1. SEAT - IT Governance

Entrevistadora: Yuan Jia Zheng

Entrevistada: Bei Wu Mi

Entrevistadora: ¿Cuál es tu posición y cargo dentro del Grupo SEAT? ¿Cuáles son las funciones principales que desempeñas?

Entrevistada: Trabajo en el departamento de IT, y dentro del departamento estoy a cargo de la parte de Governance. Ésta se encarga del Tracking Financiero y de IT, asimismo en cuanto a la parte de operaciones, incluye Licencias, y transición entre proyecto y servicios.

Entrevistadora: ¿Cuánto tiempo llevas en este cargo?

Entrevistada: Desde 2020, justo con la pandemia, comencé el 1 de marzo de 2020.

Entrevistadora: ¿Cuántos años llevas trabajando en la compañía?

Entrevistada: 10 años.

Entrevistadora: ¿Me podrías compartir cuál ha sido la decisión o cuáles han sido las decisiones más difíciles que has tenido que tomar?

Entrevistada: Hay dos temas aquí a considerar. Primero, el tema de conciliación familiar. La primera decisión importante fue hasta qué punto sacrificar mi carrera profesional por ser madre. Esta es una empresa bastante par, no considero que haya discriminación de género, pero sí dependiendo de qué roles hay trabajos más adaptados para madres y otros no tanto. Yo tenía una posición de asistente de vicepresidente, aprendía muchísimo, me gustaba muchísimo pero también hacía muchísimas horas. Por tanto, como madre consideraba que no era el puesto ideal para la conciliación. Para mí no fue un sacrificio como tal, porque tomé la decisión de ser madre, por tanto, no podía seguir cumpliendo ese rol por el bienestar de mi hijo mayor. Segundo, el cambio de la mentalidad con la pandemia. El reto de la pandemia con un equipo nuevo de 10 personas y en un puesto totalmente nuevo para mí. Tener que gestionar un equipo del que no conoces demasiado, requiere tiempo, dedicación, y establecer ese vínculo de confianza que, es vital para que para que las cosas funcionen, entre responsable y colaboradores. Además de la complejidad añadida que supuso la virtualidad debido a la pandemia. Fue un reto muy grande. Cómo gestionar un equipo nuevo y cómo gestionar la crisis que se nos viene encima, fue una sorpresa para todos. No fue nada fácil balancear el desempeño de tu equipo con la salud mental (emocional). Fue realmente complicado.

Entrevistadora: Los europeos tenemos una gran industria de automoción, pero hay marcas que tienen mayor desarrollo del vehículo eléctrico e híbrido. ¿Cómo evolucionará el futuro a nivel de equilibrios entre continentes (países, regiones)? Hablamos del viejo continente, pero no es lo mismo hablar de la industria en Europa Occidental que el Sur de Europa.

Entrevistada: Voy a dar mi opinión dado que estoy en IT Governance, luego Natalia puede darte una visión panorámica desde la óptica SEAT. Aquí hay varias cosas a tener en cuenta. Por un lado, la consciencia medioambiental. Por ejemplo, el Grupo Volkswagen lo tiene muy interiorizado. La política "Go to Zero", la idea del grupo pueda contribuir a bajar un grado centígrado la temperatura del planeta. ¿Por qué tiene sentido? Es un grupo tan grande que tiene fábricas en todos los continentes del mundo, por tanto, si todas las fábricas del grupo bajaran las emisiones, la contribución será significativa. Ese es el compromiso del Grupo Volkswagen.

Volkswagen es una compañía de Europa occidental, y como tal, los ageste occidentales dan mucha importancia a los aspectos medioambientales. Creo que eso se debe a que otros aspectos de nuestra vida están solventados. No es comparable la industria aquí que, en la industria en África, u otras regiones aún en desarrollo. En este sentido, vamos un poco a la cabeza de esta tendencia. Hemos comenzado a fabricas coches eléctricos antes, pero eso no quiere decir que hagamos los mejores coches. En cuanto a la tecnología, no es quién empieza antes sino quién tiene la mejor idea. Todos sabemos que el coche híbrido por excelencia que todo el mundo tiene es un Toyota. Este coche lleva en el mercado 10 años o más, cuando realmente nadie apostaba por esa tecnología. Ahora todos estamos con el coche eléctrico, pero ese coche que funciona como un dinamo pero requiere cierta infraestructuras. Eso sí, contamina menos. Ahora con lo que está pasando (crisis medioambiental), tenemos mayor consciencia.

Por otro lado, creo que es una mezcla entre política económica y política medioambiental. Luego hay que tener en cuenta los intereses de la industria. Desde el grupo Volkswagen queremos bajar las emisiones y esto es un compromiso de la empresa. Otras empresas tienen otros objetivos, sería absurdo que una empresa o fabricante de coche de carreras piensen en términos medioambientales. La estrategia o visión de la empresa dependerá del público objetivo o consumidor potencial. Por eso tienes estudios para ver cuál es el perfil de tu comprador (estudios de mercado). El consumidor occidental da cada vez más importancia a los coches eléctricos e híbridos de cero emisiones, pero a lo mejor, el consumidor de Dubai prefiere coches grandes independientemente de su consumo en gasolina. Y en cuanto al consumidor medio chino también le gustan los coches grandes, amplias pantallas, detalles que denoten cierto estatus social, etc. Por tanto, todo depende de la oferta y demanda. Nosotros, los europeos, damos mucha importancia al tema medioambiental.

Entrevistadora ¿Cómo percibe SEAT sobre la entrada de IDE china en la industria auto europea? ¿Qué opinas sobre la entrada de coches eléctricos chinos en el viejo continente? ¿Será competencia para SEAT?

Entrevistada: la entrada de competidores es aire fresco y sano, y te hace más competitivo. Otra cuestión es cómo entran a competir, ver cómo actúan estos nuevos competidores, ya que las empresas chinas tienen otro tipo de patrón de comportamiento. A título personal, puedo decir que la creencia general sobre productos "made in china" se caracteriza por ser de precios muy competitivos, y cada vez más, productos con más valor tecnológico. Por ejemplos, los móviles, tablets, electrodomésticos, etc. En este caso, las empresas chinas o los coches eléctricos de marcas chinas no lo van a tener nada fácil, el mercado europeo está dominado por fabricantes muy consolidados. Habrá filtros de calidad, muchos requisitos, si los coches chinos son capaces de pasar todos estos controles, para mí, es bueno que haya competencia porque te empuja a mejorar.

Entrevistadora: ¿Crees por tanto que la entrada de coches eléctricos chinos será una competencia sana para SEAT y CUPRA?

Entrevistada: Sí, lo será, hay que ver en qué nicho competirán los coches chinos. El segmento CUPRA es más premium. Siempre se dice que la entrada al grupo es con un

SEAT. Entras con un SEAT y vas subiendo en función de tu poder adquisitivo. De SEAT, a CUPRA, Volkswagen, Audi, y si eres muy rico, finalmente llegas a un Bentley. Por tanto, el coche eléctrico que entre al mercado europeo o español, no competirá directamente con un Audi. Un Audi está establecido, incluso un cliente chino prefiere antes un Audi que a un Geely o JAC. SEAT ya tiene su nicho y será difícil romper la reticencia a romper este "tabú" de que el producto chino es de menor calidad, la gente no juega con su seguridad. Por eso SEAT pasa muchos controles de seguridad, el Euroncap. En caso de accidente que el coche te pueda proteger. En este sentido, el coche eléctrico chino ha de ofrecer esas garantías de seguridad.

Entrevistadora: Por lo que me cuentas Bei, falta todavía cierto recorrido y trabajo por hacer para los fabricantes chinos, estaremos al tanto. Ahora voy a formular una pregunta más específica sobre las estrategias de inversión, y es sobre la joint venture entre JAC y Volkswagen (SEAT). La inversión directa de SEAT a través de Volkswagen se materializó, aunque después no participó en el accionariado. Sobre todo, en cuanto al centro I+D ubicado en la ciudad de Hefei, donde SEAT contribuyó a través de las transferencias de know-how en el desarrollo del SOL E20X (suv eléctrico). No obstante, SEAT no participó finalmente en el accionariado. ¿Crees que ese hecho repercutió a la imagen o presencia de SEAT en China?

Entrevistada: El "señor Volkswagen" sería la persona idónea para contestar. Finalmente somos un grupo y hay muchas decisiones.

(Antecedentes: en mayo de 2019 el que fuera CEO de SEAT, Luca de Meo, y Herbert Diess, máximo responsable del Grupo Volkswagen, firmaron un acuerdo de colaboración con JAC que sentaba las bases del regreso de SEAT a China en un plazo de dos o tres años, pero el regreso de SEAT a China de la mano de una gama eléctrica (previsto para 2021-2022) se retrasó por la crisis del COVID.)

Entrevistadora: En los medios de prensa se rumorea que puede haber otro intento de entrada de SEAT a China, a pesar del poco éxito en los intentos anteriores. Se ha pospuesto un lanzamiento de un coche eléctrico, pequeño, low cost en China, en 2020-2021 por COVID. Esto se debe a dos motivos. Primero, el gobierno está retirando ayudas y subvenciones por la adquisición de coches eléctricos. Segundo, la demanda de coches eléctricos está cayendo. ¿Crees que hay algún motivo más?

Entrevistada: Es un motivo más que suficiente. El gobierno chino se caracteriza por inyectar capital en aquellos sectores de mayor interés. La ciudad de Hefei es un claro ejemplo de ello, hay puesto de carga eléctrica por todas partes, pero claro esto no es comparable ni extrapolable a otras grandes ciudades de China. Hefei no deja de ser una ciudad relativamente pequeña en China si lo comparas con Shanghái o Beijing. Es muy complicado. Los coches que se puedan vender ahí no son directamente proporcionales a los que se puedan vender en China. Si el gobierno chino ya no da tantas subvenciones, el consumidor medio se lo pensará más. Si la infraestructura no acompaña al producto, los compradores dudarán. En especial, para aquellos que hacen viajes de gran distancia, hay cierta incertidumbre sobre el nivel o acceso a los puestos de carga. Para el uso urbano está claro que todo son ventajas. Lo mismo que en China, para vender coches hay que ir a ciudades grandes, con vender en Hefei no es suficiente.

Entrevistadora: ¿Tuviste alguna dificultad a la hora de gestionar las transferencias de know-how en el centro de I+D en Hefei?

Entrevistada: Actualmente no hay nadie del IT trabajando ahí, pero sí es cierto que hace años teníamos gente de SEAT en Hefei, y no tuvimos ningún problema.

Entrevistadora: ¿El Centro de Diseño e I+D de SEAT es competitivo a nivel europeo? ¿Dentro del grupo Volkswagen? ¿Y a nivel mundial?

Entrevistada: Hemos hecho muchos proyectos para el grupo, como todo grupo grande tiene sus pros y contras. En este caso, el hecho de tener diferentes centros de investigación en diferentes países te permite diversificar a la vez con personas y equipos muy competentes. El centro de I+D ha realizado proyectos para Volkswagen, Audi, y otras marcas, y esto es un signo de confianza. Si aún hoy en día se asignan proyectos aquí es porque hay confianza y porque hay un know-how importante. El coche de SEAT ha evolucionado mucho. Los modelos tienen líneas más suaves, siguen las tendencias actuales, y todo esto es producto del centro tecnológico de SEAT. El centro está bien valorado y tiene mucho trabajo. A nivel internacional se habla más Volkswagen y no tanto de SEAT. En este sentido, Volkswagen gracias a los centros de I+D, es considerado uno de los grupos automovilísticos más competentes. Se habla de mucha tecnología alemana, pero parte de esa tecnología viene de aquí (Martorell).

Entrevistadora: Para concluir, una panorámica muy general sobre el futuro de la automoción. Cuando la situación se normalice, ¿volveremos a ver campas llenas de vehículos o comenzaremos a trabajar con producción sólo bajo pedido?

Entrevistada: Lo que nos ha enseñado la pandemia es que no hay nada seguro ni nada escrito en piedra. Para sobrevivir hay que adaptarse rápido, esto es aplicable a la industria del auomóvil. Observo que cada vez más los clientes están menos dispuestos a esperar (son más impacientes, lo quieren para ya) y el proceso de compra será cada vez más digitalizado, y esto tiene, naturalmente, impacto directo en los procesos de producción.

Entrevista 2. SEAT - Product Planning (GX-P)

Entrevistadora: Yuan Jia Zheng

Entrevistada: Natalia Turón Aznar

Entrevistadora: ¿Cuál es tu posición o cargo dentro del Grupo SEAT? ¿Cuáles son las funciones principales que desempeñas?

Entrevistada: Soy actualmente responsable del área de estrategia de producto de la compañía. Realizo la estrategia de portfolio, el *cicle plan* que es la periodificación de los lanzamientos de los nuevos productos, es decir, control y decisión junto con el comité ejecutivo los siguientes lanzamientos de productos de la marca en perspectiva de 10 y 15 años. Además, somos responsables de los proyectos que se van a ser fabricados en los próximos 4 y 5 años, y yo soy responsable de la fase inicial (el anteproyecto). En otras palabras, llevo estos proyectos ante los gremios definidos por el Grupo Volkswagen para obtener la liberación (la inversión total inclusive el gasto de desarrollo que vayan a necesitar los diferentes centros del grupo) que hace posible la realización del desarrollo e industrialización de esos vehículos. Entrego los proyectos a los responsables en diferentes áreas dentro de la compañía. Además, llevo la estrategia de CO2 y descarbonización dentro de la empresa porque va muy ligado al portfolio de producto (vehículos) que planificamos a 10 años vista.

Entrevistadora: ¿Cuántos años llevas trabajando en la compañía?

Entrevistada: Empecé en el año 2006, ya había estado trabajando anteriormente en el sector automovilístico cuatro años en Alemania. De formación soy ingeniera de telecomunicaciones. Durante los primeros años, trabajé en desarrollos (2006-2008) en el centro técnico, luego ya pasé a la parte de Product Management, en el área de Project Leader. En cuanto a la visión general de la compañía llevo 14 años pasando por diferentes proyectos. Por ejemplo, SEAT Exeo y SEAT Ateca. En este último proyecto hice la fase completa.

Entrevistadora: ¿Cuál ha sido la decisión más difícil tomada hasta ahora?

Entrevistada: Más que difícil, *challenging* ha sido todo el proceso de cambio de movilidad con motores de combustión interna hacia la electrificación. Es decir, la electrificación del portfolio a futuro porque es una tecnología muy nueva y demandante en todos los sentidos. A nivel tecnológico, a nivel de costes e industrialización para lograr proyectos rentables. Mantener unos márgenes rentables en la electrificación de proyectos no es fácil ya que conlleva tomar decisiones sobre estrategias de futuro que tiene un impacto directo en tu previsión de resultados de compañía a 10 años vista. Saber cuándo tomar esas decisiones de transformación de proyectos hacia la electrificación, ir al mismo ritmo que la sociedad y cumplir con los objetivos de sostenibilidad marcados por la empresa. Por un lado hay que tener en cuenta la normativa de la comunidad europea, a la vez asegurando la sostenibilidad, rentabilidad de los modelos, y la expectativas de los clientes.

Entrevistadora: ¿Qué supone la irrupción del vehículo eléctrico a nivel de producción? Me interesa especialmente saber a nivel de producción.

Entrevistada: Cada marca se organiza de una manera diferente. Nosotros (el Grupo Volkswagen) nos organizamos con la lógica de plataformas o la base. La introducción de una nueva base y plataforma supone reorganizar toda la lógica de producción. En el caso del vehículo eléctrico supone un cambio muy significativo a nivel de fábrica, integración de procesos, la red de suministros, todo se tiene que reestructurar entorno a la electrificación.

Entrevistadora: ¿Cuán dependiente es SEAT de China a nivel de suministro de piezas y partes? Por ejemplo, semiconductores. ¿Ha sido siempre así?

Entrevistada: No sabría decirte qué tanto por ciento de las piezas que utilizamos en

Martorell son dependientes de China, pero sí hay cierta dependencia porque no solamente viene piezas de China, sino utillaje, componentes electrónicos. Cuán exactamente somos dependientes de China es difícil de decir, pero viendo el valor de las partes del coche, la batería será la parte más costosa y el Grupo Volkswagen tiene la estrategia de localizar las gigafactorías de baterías en Europa. Producir celdas para montar luego las baterías para los vehículos en nuestros centros de Europa. Localizar también los puntos de extracción de litio dentro de Europa. En aras de sostenibilidad puede ser que una parte muy importante del valor del coche se quede en Europa, en cuanto a la producción de las baterías se localiza aquí.

Entrevistadora: ¿Crees que el fenómeno es nuevo?

Entrevistada: En cuanto a la importación de piezas y utillaje, no, de hecho, llevamos años y nuestros proveedores también comprando de China. Lo que sí es un fenómeno muy nuevo es la irrupción de coches chinos, especial, coches eléctricos a nivel de mercado. Están empezando ahora (2022, tras la pandemia) a lanzar coches eléctricos en Europa pero en el mercado doméstico el recorrido es un poco más largo.

Entrevistadora: ¿Es posible que la producción de vehículos haya tocado techo?

Entrevistada: Creo que va a haber un cambio de concepto de movilidad, y este cambio es lo que va a marcar la transición en la forma de producción. La movilidad va a seguir, pero las nuevas generaciones entienden la movilidad bastante diferente a las generaciones pasadas. Por ejemplo, en las anteriores, la propiedad del vehículo era importante, pero en el futuro la necesidad quedará por encima del sentido de la propiedad.

Entrevistadora: Entonces, el *car sharing* puede ser una alternativa.

Entrevistada: Es difícil predecir cómo evolucionará el parque público, y lo que va seguir esa demanda y necesidad. Lo que va a cambiar seguro es el uso del coche. Por ejemplo, la conducción autónoma también puede cambiar mucho la concepción de movilidad.

Entrevistadora: la movilidad seguirá siempre, el transporte colectivo es más sostenible que el transporte individual. Es cierto que hay mayores medidas en diseñar coches más sostenibles. Los coches eléctricos son coches de emisión cero. Habrá movilidad siempre, incluso más en un futuro. Se trata de transformar, quizá, de vendedor de coches a proveedor de movilidad.

Entrevistadora: Los europeos tienen una gran industria de automoción, pero hay marcas que tienen mayor desarrollo del vehículo eléctrico e híbrido. ¿Como evolucionará el futuro a nivel de equilibrios entre continentes (países, regiones)?

Entrevistadora: La normativa medioambiental europea es muy exigente, mucho más que en otras regiones del mundo y esto ha hecho que los fabricantes europeos se hayan adelantado en cumplimiento con esas leyes. Nuestro parque de vehículos eléctricos es importante debido al push en los últimos 5-10 años, y no solamente Volkswagen sino todos los fabricantes europeos. Por tanto, no nos preocupa quedarnos atrás de las industrias automovilísticas emergentes como la China (vamos por delante en cuanto al cumplimiento de la política medioambiental).

Entrevistadora: ¿El factor institucional ha sido una ayuda?

Entrevistada: Ha sido un acelerador para un *boost* hacia la transición. Estamos dando pasos en la transformación, no como Tesla que venía de "nada", este fabricante nace produciendo coches eléctricos. Nosotros, en cambio, tenemos un legado que es la base industrial de combustión. El punto de partida es diferente.

Entrevistadora: Como Product Manager has visto el nacimiento de CUPRA como nueva marca (gama deportiva) de la casa, ¿por qué SEAT decidió lanzar al mercado esta marca hace cuatro años?

Entrevistada: Había un gap de cliente progresivo que el grupo no cubría, sin llegar a la canibalización. Este nicho de mercado con un rol de *new player* puede sentirse atraído por un Tesla, ¿yo puedo atacar a ese cliente? Yo tengo el potencial de hacerlo, siendo la marca más joven del grupo. El mejor ejemplo es el modelo Formentor, es único. No hay otro modelo dentro del consorcio alemán con esa progresividad, diseño, y esa emocionalidad. La gente progresiva es el perfil de cliente. La manera de hablar con el cliente es importante. Hemos abandonado el concepto tradicional de venta, sino apostamos por el CUPRA Garage donde un experto ejerce de asesor de compras. En otras palabras, la manera de venta también cambia.

Entrevistadora: ¿Cómo percibe SEAT sobre la entrada de IDE china en la industria auto europea? ¿Crees que China tiene intención de adquirir una industria entera?

Entrevistada: La industria china tenía suficiente con el mercado doméstico al inicio, pero la forma de hacerse fuerte es intentar vender en el extranjero, por tanto, es lógico ese proceso de aperturismo. Si soy capaz de fabricar millones de coches y ser el líder mundial, por qué no dar ese paso y vender en el mundo.

Entrevistadora: ¿Crees que la forma más rápida de vender es a través de la inversión directa?

Entrevistada: La estrategia de China es diversificar y cuenta con ese pulmón financiero para hacerlo. Seguramente, la expansión en el sector de la automoción no es un caso aislado. Necesita reinvertir los beneficios generado en el mercado doméstico en el exterior. Es un paso natural la apertura de mercado y la salida al exterior.

Entrevistadora: ¿Qué opinas sobre la entrada de coches eléctricos chinos en el viejo continente? ¿Será competencia para SEAT y CUPRA?

Entrevistada: Está claro que será una competencia para todo el sector. Necio el que no ve que los fabricantes chinos están y pueden fabricar coches eléctricos competitivos con los europeos. China está poniendo cada vez más a la par de cualquier economía industrializada. La revolución eléctrica puede ser la oportunidad para que China pueda alcanzar a los consolidados, ante una tecnología, y más en la sociedad que vivimos hoy, cualquiera con una buena base con capacidad, puede llegar a ofrecer productos competitivos. Por cuestiones de *heritage* los chinos no han sido capaces de posicionarse en la delantera, pero con la electrificación sí.

Entrevistadora: ¿Hay alguna novedad sobre la joint venture JAC Volkswagen (SEAT, Volkswagen Group China y JAC) creada en 2017? El regreso de SEAT a China de la se retrasó por la crisis del COVID, ¿esta fue la única razón o hay otras causas?

Entrevistada: Puede ser. Hay una política del gobierno chino de dinamizar el mercado, el grupo ha definido una estrategia para China, la idea de SEAT es focalizarse en una estrategia de globalización y no China.

Entrevistadora: ¿Crees que CUPRA puede ser una buena opción para China?

Entrevistada: Why not? El tiempo dirá.

Entrevistadora: ¿Crees que a corto medio plazo pueda establecerse algún tipo de colaboración a nivel tecnológico entre SEAT y algún fabricante chino? Sea a nivel estatal o privado.

Entrevistada: La industria está dando muchas vueltas, la prensa esta semana ha comunicado que se ha firmado un acuerdo estratégico entre el Grupo Volkswagen y Ford para futuros modelos Ford con la plataforma MEB de Volkswagen. En el marco de globalización, lo que hemos hecho con Ford tampoco es algo muy novedoso, en el pasado ya firmamos alianzas con otros fabricantes. El mercado chino es el más potente a nivel mundial, y hay que estar al tanto de cuáles son los requisitos de ese cliente, y quién mejor que el propio fabricante chino.

D. Appendices to Chapter 4

D.1 Internationalization of Chinese companies in the EU (ranking by investment value, 2005-2018)

Ranking	Ownership	Investor	Investment (million USD)	Share EU (%)
1st	non-SOE	Geely Auto	15.200	43,64
2nd	SOE	ChemChina (China National Chemical Corporation), SAFE	7.860	22,56
3rd	SOE	Beijing Automotive Industry Corporation (BAIC)	1.460	4,19
4th	non-SOE	Ningbo Dongfang Yisheng	1.113	3,20
5th	SOE	Dongfeng Motor	1.100	3,16
6th	non-SOE	Luxshare Precision Industry	1.000	2,87
7th	non-SOE	Great Wall Motor	700	2,01
8th	SOE	Aviation Industry Corp. (AVIC)	640	1,84
9th	SOE	Weichai Power	617	1,77
10th	non-SOE	Ningbo Joyson Electronic	587	1,69
		Total	30.476	87,49
		Total EU	34.834	100,00

Source: Author’s own elaboration based on Zephyr and CGIT.

D.2 Foreign Investment and Sino-Foreign Joint Venture Law and Policies

Policy/Regulation	Year effective	Institution	Main goals
Law on Sino-Foreign Equity Joint Ventures	1979	State Council	General measures for the establishment of joint venture between Chinese and foreign company. Portion of foreign investor should not be less than 25 percent, investment cant be in cash, in king or in industrial property. Thechnology and equipment contributed must advanced technology that suits China's needs.
Law on Sino-Foreign Equity Joint Ventures (revised)	1990	State Council	General conditions of Sino-Foreign joint venture of 1979 mantained.
Law of the people's Republic of China on Chinese-Foreign Contractual Joint Ventures	1988	State Council	To expand economic cooperation and technological exchange with foreign countries and to promote the joint establishment by foreign enterprises and other economic organizations or individuals and Chinese enterprises or other economic organizations of Chinese-foreign contractual joint ventures within the territory of China.
Income Tax Law of the People's Republic of China for Enterprises with Foreign Investment and Foreign Enterprises	1991	State Council	The exemption or reduction of local income tax on any enterprise with foreign investment which operates in an industry or undertakes a project encouraged by the state shall (Investment Catalogue).
Decision of the State Council on Reforming the Investment System [Partially Invalid]	2004	NDRC	To further deepen the reform of investment system. To formulate and timely adjust the Fixed-Asset Investment Guidance Catalogue and the Foreign-Invested Industry Guidance Catalogue and specify investment projects encouraged, restricted and prohibited by the state. For foreign investment projects encouraged or permitted, the NDRC has the right to authorize any project with a total investment amount above US$100 million. Restrictive projects each with a total investment of US $50 million or above are subject to the approvals of NDRC.
Administrative Measures for the Confirmation and Recordation of Foreign-Funded Projects	2014	State Council	To further deepen the reform of the foreign investment management system. The encouraging projects in the Catalogue of Industries for Guiding Foreign Investment with a total investment (including capital increase) of 300 million US dollars or more and requiring that the Chinese party has a controlling share and the restricted projects in the same catalogue with a total investment (including capital increase) of 50 million US dollars or more shall be subject to confirmation by the NDRC.
Notice of the State Council on Issuing the Catalogue of Investment Projects Subject to Government Confirmation (2016)	2016	State Council	To invest in the construction of fixed-asset investment projects listed in the Catalogue, enterprises must report the relevant projects to the project confirmation authorities for confirmation in accordance with the relevant provisions. Where enterprises invest in the construction of projects beyond this Catalogue, such projects shall be subject to recordation administration.
China's Company Law and the Partnership Enterprise Law	2018	State Council	All Foreign Invested Enterprises shall be governed by PRC Company Law or the Partnership Enterprise Law.

Sources: Author's own elaboration based on policy and law archives of Chinese Government, the State Council of PRC (www.gov.cn/archive)

D.3 Bilateral Investment Treatment

Country	Year	Lenght 2018
Austria	1985	33
Belgium	1984	34
Bulgaria	1989	29
Croatia	1993	25
Cyprus	2001	17
Czech Republic	1991	27
Denmark	1985	33
Estonia	1993	25
Finland	1984	34
France	1984	34
Germany	1983	35
Greece	1992	26
Hungary	1991	27
Ireland	na	na
Italy	1985	33
Latvia	2004	14
Lithuania	1993	25
Luxembourg	1984	34
Malta	2009	9
Netherlands	1985	33
Poland	1988	30
Portugal	1992	26
Romania	1994	24
Slovakia	1991	27
Slovenia	1993	25
Spain	1992	26
Sweden	1982	36
United Kingdom	1986	32

Source: UNCTAD (Investment Policy HUB, 2022)

D.4 International Sino-Foreign Joint Ventures, 2002-2018

Partners			Joint Venture	Year		Participation	
Domestic	Foreign	Foreign country			Location	Domestic (%)	Foreign (%)
BAIC	Hyundai	Japan	Beijing Hyundai Motor Company	2002	Beijing	50	50
FAW	Toyota	Japan	Tianjing FAW Toyota Motor	2002	Changchun (Jilin)	50	50
Dongfeng	Hyundai-Kia	South Korea	Dongfeng Yueda-Kia Motor	2002	Yancheng (Jiangshu)	50	50
SAIC Wuling	GM	USA	Wuling	2002	Shanghai	56	44
Dongfeng	Honda	Japan	Dongfeng Honda	2003	Wuhan (Hubei)	50	50
GAC	Toyota	Japan	Guangzhou Toyota	2003	Guangzhou (Guangdong)	55	45
Dongfeng	Nissan	Japan	Dongfeng Nissan	2003	Guangzhou (Guangdong)	50	50
Brilliance	BMW	Germany	Brilliance BWM or CBA	2003	Shengyang (Liaoning)	50	50
SAIC	GM	USA	SAIC GM	2003	Yantai (Shangdong)	50	50
BAIC	Mercedes Benz	Germany	Beijing Benz Automotive	2005	Beijing	51	49
FAW	MAZDA	Japan	FAW Mazda	2005	Changchun (Jilin)	75	25
Chery	Quantum	Israel	Qoros Auto	2007	Wuhu (Anhui)	50	50
BAIC, Fujian Motors	Daimler	Germany	Fujian Benz Automotive	2007	Fuzhou (Fujian)	50	50
GAC	Hino	Japan	GAC Hino	2007	Guangzhou	50	50
FAW	GM	USA	FAW GM Light Duty Commercial Vehicle	2009	Changchun (Jilin)	50	50
Changan	Peugeot Citröen (PSA)	France	Changan Peugeot Citröen	2010	Chongqing	50	50
BYD	Daimler	Germany	Denza (Shenzhen BYD Daimler New Technology)	2010	Shenzhen (Guangdong)	50	50
Dongfeng	Yulon	Taiwan	Dongfeng Yulon	2010	Hangzhou (Zhejiang)	50	50
BAIC Foton	Daimler Chrysler	Germnay	Beijing Foton Daimler Automotive	2010	Beijing	50	50
GAC	Daimler Fiat Chrysler	Italy /Germany	GAC Fiat Chrysler	2010	Guangzhou (Guangdong)	50	50
Changan	Mazda	Japan	Changan Mazda	2012	Nanjing	50	50
GAC	Mitsubishi	Japan	GAC Mitsubishi	2012	Guangzhou (Guangdong)	50	50
Chery	Jaguar Land Rover	India	Chery Januar Land Rover	2012	Changshu (Jiangshu)	50	50
Daqing	Volvo (Geely)	Sweden (China)	Daqing Volvo Automotive Manufacturer	2013	Chengdu (Sichuan)	70	30
Dongfeng	Renault	France	Dongfeng Renault	2013	Wuhuan (Hubei)	50	50
Great Wall	BMW	Germany	Great Wall BMW	2018	Jiangsu	50	50

Source: Author’s own elaboration based on CAIY (Various issues), CATARC and CAAM (2014), Qiao (2004) and Wang (2011) and open corporate online sources.

D.5 Patent grants by technology: (world Top 10 applicants)

Japan	Accum. by sector	Share (%)	Germany	Accum. by sector	Share (%)
1 - Electrical machinery, apparatus, energy	395920	7.7	32 - Transport	54658	9.1
9 - Optics	287998	5.6	1 - Electrical machinery, apparatus, energy	44678	7.5
2 - Audio-visual technology	286795	5.6	31 - Mechanical elements	41717	7.0
6 - Computer technology	268701	5.3	10 - Measurement	38326	6.4
10 - Measurement	242509	4.7	27 - Engines, pumps, turbines	32358	5.4
8 - Semiconductors	236417	4.6	35 - Civil engineering	31234	5.2
32 - Transport	215779	4.2	26 - Machine tools	31025	5.2
35 - Civil engineering	202220	4.0	29 - Other special machines	26492	4.4
29 - Other special machines	179980	3.5	25 - Handling	25930	4.3
25 - Handling	174536	3.4	28 - Textile and paper machines	19659	3.3
United States	**Accum. by sector**	**Share (%)**	**Russian Federation****	**Accum. by sector**	**Share (%)**
6 - Computer technology	645689	10.8	10 - Measurement	58172	7.2
1 - Electrical machinery, apparatus, energy	369634	6.2	35 - Civil engineering	54320	6.7
8 - Semiconductors	310487	5.2	13 - Medical technology	53864	6.6
2 - Audio-visual technology	308789	5.2	18 - Food chemistry	53732	6.6
13 - Medical technology	289578	4.9	29 - Other special machines	48152	5.9
10 - Measurement	284899	4.8	20 - Materials, metallurgy	46709	5.8
9 - Optics	273673	4.6	26 - Machine tools	38786	4.8
4 - Digital communication	242659	4.1	32 - Transport	35736	4.4
32 - Transport	236446	4.2	27 - Engines, pumps, turbines	35324	4.4
3 - Telecommunications	231017	3.9	23 - Chemical engineering	35285	4.3
China*	**Accum. by sector**	**Share (%)**	**United Kingdom**	**Accum. by sector**	**Share (%)**
1 - Electrical machinery, apparatus, energy	231189	6.5	35 - Civil engineering	31719	7.6
6 - Computer technology	201077	5.7	1 - Electrical machinery, apparatus, energy	26350	6.3
10 - Measurement	190493	5.4	32 - Transport	26018	6.2
4 - Digital communication	166311	4.7	10 - Measurement	24626	5.9
20 - Materials, metallurgy	134117	3.8	31 - Mechanical elements	24188	5.8
26 - Machine tools	125013	3.5	25 - Handling	17986	4.3
16 - Pharmaceuticals	111711	3.1	29 - Other special machines	17690	4.2
19 - Basic materials chemistry	111461	3.1	27 - Engines, pumps, turbines	16502	3.9
35 - Civil engineering	110524	3.1	2 - Audio-visual technology	16272	3.9
2 - Audio-visual technology	110517	3.1	26 - Machine tools	15099	3.6
Korea, Rep.	**Accum. by sector**	**Share (%)**	**France**	**Accum. by sector**	**Share (%)**
8 - Semiconductors	139256	7.6	32 - Transport	53796	9.8
1 - Electrical machinery, apparatus, energy	138999	7.6	1 - Electrical machinery, apparatus, energy	37751	6.9
2 - Audio-visual technology	113377	6.2	31 - Mechanical elements	33437	6.1
6 - Computer technology	109669	6.0	35 - Civil engineering	32938	6.0
32 - Transport	88891	4.8	29 - Other special machines	28479	5.2
3 - Telecommunications	78795	4.3	10 - Measurement	26970	4.9
35 - Civil engineering	78733	4.3	27 - Engines, pumps, turbines	25079	4.6
9 - Optics	74138	4.0	25 - Handling	24981	4.5
4 - Digital communication	73387	4.0	14 - Organic fine chemistry	21433	3.9
10 - Measurement	60226	3.3	26 - Machine tools	18769	3.4
Canada	**Accum. by sector**	**Share (%)**	**India**	**n.d.**	**n.d.**
13 - Medical technology	37917	5.7			
35 - Civil engineering	37226	5.6			
14 - Organic fine chemistry	35715	5.4			
16 - Pharmaceuticals	34453	5.2			
1 - Electrical machinery, apparatus, energy	34104	5.1			
19 - Basic materials chemistry	30023	4.5			
29 - Other special machines	29663	4.5			
25 - Handling	26454	4.0			
10 - Measurement	26393	4.0			
23 - Chemical engineering	25934	3.9			

Source: Author's elaboration based on World Intellectual Property Organization (WIPO). 'Patent Applicants Statistics' (accessed 21 September 2020). Notes: accumulated 1980 to 2018. * Data available since 1993. ** Data available since 1992. Technology classification for country comparisons according to WIPO (2008), grant 32, covers all types of transport technology and applications with a predominance of automotive technology.

D.6 List of yangi (classification by industry sector)

Table I.

Yangi	name Mandarin	Name English	Economy Sector	Year foundation	Auto related
1	中国核工业集团有限公司	China National Nuclear Corporation	Manufacturing industry	1999	0
2	中国航天科技集团有限公司	China Aerospace Science and Technology Corporation	Manufacturing industry	1999	2
3	中国航天科工集团有限公司	China Aerospace Science and Industry Co., Ltd	Manufacturing industry	1956	0
4	中国航空工业集团有限公司	Aviation Industry Corporation of China	Manufacturing industry	2008	2
5	中国船舶集团有限公司	China State Shipbuilding Co., Ltd	Manufacturing industry	1950	0
6	中国兵器工业集团有限公司	China North Industries Group Corporation	Manufacturing industry	1999	1
7	中国兵器装备集团有限公司	China South Industries Group Corporaiton	Manufacturing industry	1999	1
8	中国电子科技集团有限公司	China Electronics Technology Group Corporation	Information transfer, computer service and software industry	2002	0
9	中国航空发动机集团有限公司	Aero Engine Corporation of China	Traffic, storage and mail business	2016	0
10	中国融通资产管理集团有限公	China Rong Tong Asset Management Group Co., Ltd	Finance industry		0
11	中国石油天然气集团有限公司	China National Petroleum Corporation	Mining industry	1998	0
12	中国石油化工集团有限公司	Sinopec Group	Mining industry	1983	0
13	中国海洋石油集团有限公司	China National Offshore Oil	Mining industry	1982	0
14	国家石油天然气管网集团有限	PipeChina	Traffic, storage and mail business	2019	0
15	国家电网有限公司	State Grid Corporation of China	Production and supply of electric power, gas and water	2002	0
16	中国南方电网有限责任公司	China Southern Power Grid Co., Ltd	Production and supply of electric power, gas and water	2002	0
17	中国华能集团有限公司	China Huaneng	Construction industry	1985	0
18	中国大唐集团有限公司	China Datang Corporation	Production and supply of electric power, gas and water	2002	0
19	中国华电集团有限公司	China Huadian Corporation	Production and supply of electric power, gas and water	2002	0
20	国家电力投资集团有限公司	State Nuclear Power Technology Corporation	Production and supply of electric power, gas and water	2015	0

Source: Author's own elaboration based on State-owned Assets Supervision and Administration Commission of the State Council : www.safe.govn.cn (2022); Notes: a) Classification of National Economy Industries based on China State Council www.stats.gov.cn; b) Automotive related: "0" no relation, "1" OEM, "2" filial producing auto parts or accessories.

Table II.

Yangi	name Mandarin	Name English	Economy Sector	Year foundation	Auto related
21	中国长江三峡集团有限公司	China Three Gorges Corporation	Production and supply of electric power, gas and water	1993	0
22	国家能源投资集团有限责任公	China Energy Investment	Mining industry, Production and supply of electric power, gas and water	2017	0
23	中国电信集团有限公司	China Telecom	Information transfer, computer service and software industry	1995	0
24	中国联合网络通信集团有限公	China Unicom	Information transfer, computer service and software industry	2009	0
25	中国移动通信集团有限公司	China Mobile Communications Group Co.,Ltd	Information transfer, computer service and software industry	2000	0
26	中国卫星网络集团有限公司	China Satellite Network Group Co., Ltd	Information transfer, computer service and software industry	2021	0
27	中国电子信息产业集团有限公	China Electronics Corporation	Information transfer, computer service and software industry	1989	0
28	中国第一汽车集团有限公司	First Automotive Works	Manufacturing industry	1953	1
29	东风汽车集团有限公司	Donfeng Motor Corporation	Manufacturing industry	1969	1
30	中国一重集团有限公司	China first heavy industries	Manufacturing industry	1954	2
31	中国机械工业集团有限公司	China National Machinery Industry Corporation	Manufacturing industry	1997	2
32	哈尔滨电气集团有限公司	Harbin Electric Corporation	Manufacturing industry	1953	0
33	中国东方电气集团有限公司	Dongfang Electric Corporation	Manufacturing industry	1958	0
34	鞍钢集团有限公司	Angang Steel Group Co., Ltd	Mining industry, Manufacturing industry	2010	0
35	中国宝武钢铁集团有限公司	China Baowu Steel Group Co., Ltd	Mining industry	2016	0
36	中国矿产资源集团有限公司	China Mineral Resources Group Co., Ltd	Mining industry	2022	0
37	中国铝业集团有限公司	Aluminum Corporation of China	Manufacturing industry	2001	0
38	中国远洋海运集团有限公司	China Cosco Shipping Group	Traffic, storage and mail business	2016	0
39	中国航空集团有限公司	China National Aviation Holding Company	Traffic, storage and mail business	2002	0
40	中国东方航空集团有限公司	China Eastern	Traffic, storage and mail business	1986	0
41	中国南方航空集团有限公司	China Southern Airlines	Traffic, storage and mail business	1991	0
42	中国中化控股有限责任公司	Sinochem Holdings Co., Ltd	Manufacturing industry	1950	2
43	中粮集团有限公司	COFCO Corporation	Manufacturing industry; Foodstuff manufacturing industry; Food industry	1949	0
44	中国五矿集团有限公司	China Minmetals Corporation	Mining industry	1950	0
45	中国通用技术（集团）控股有	China General Technology Group Holding	Medicine manufacturing industry	1998	0

Table III.

Yangi	name Mandarin	Name English	Economy Sector	Year foundation	Auto related
46	中国建筑集团有限公司	China State Construction Engineering Group Co., Ltd	Construction industry	1982	0
47	中国储备粮管理集团有限公司	China Grain Reserves Group Co., Ltd	Food industry	2000	0
48	国家开发投资集团有限公司	State Development & Investment Co., Ltd	Finance industry	1995	0
49	招商局集团有限公司	China Merchants Group	Traffic, storage and mail business; Finance industry	1872	0
50	华润（集团）有限公司	China Resources Holdings Co., Ltd	Manufacturing industry; Production and supply of electric power, gas and water	1938	0
51	中国旅游集团有限公司[香港中	China Tourism Group	Cultural, physical and entertainment industry	1987	0
52	中国商用飞机有限责任公司	Commercial Aircraft Corporation of China Limited	Transport and communication facilities manufacturing industry	2008	
53	中国节能环保集团有限公司	China Energy Conservation and Environmental Protection Group	Water conservancy, environment and public institution management	2010	0
54	中国国际工程咨询有限公司	China International Engineering Consulting Corporation	Scientific research, technical service and geologic examination industry	1982	0
55	中国诚通控股集团有限公司	China Chengtong Group Co., Ltd	Finance industry	1992	0
56	中国中煤能源集团有限公司	China National Coal Group Corporation	Mining industry	1982	0
57	中国煤炭科工集团有限公司	China Coal Technology Engineering Group	Scientific research, technical service and geologic examination industry	2008	0
58	中国机械科学研究总院集团有	China Academy of Machinery Science and Technology	Scientific research, technical service and geologic examination industry	1956	
59	中国中钢集团有限公司	Sinosteel Group Co., Ltd	Manufacturing industry	1993	0
60	中国钢研科技集团有限公司	China Iron & Steel Research Institute Group	Scientific research, technical service and geologic examination industry	2006	0
61	中国化学工程集团有限公司	China National Chemical Engineering Group Corp.	Manufacturing; Construction industry	1984	2
62	中国盐业集团有限公司	China National Salt Industry Corporation	Manufacturing industry; Foodstuff manufacturing industry; Food industry	1950	0
63	中国建材集团有限公司	China National Building Materials Group Corporation	Construction industry	1984	0
64	中国有色矿业集团有限公司	China Nonferrous Metal Mining (Group) Co., Ltd	Construction industry; Mining industry	1983	0
65	中国稀土集团有限公司	China Rare Earth Group Co., Ltd	Scientific research, technical service and geologic examination industry	2021	0

Table IV.

Yangi	name Mandarin	Name English	Economy Sector	Year foundation	Auto related
66	有研科技集团有限公司	China Grinm GroupCo., Ltd	Manufacturing industry; Scientific research, technical service and geologic examination industry	1952	0
67	矿冶科技集团有限公司	Beijing General Research Institute of Mining &Metallurgy	Scientific research, technical service and geologic examination industry	1956	0
68	中国国际技术智力合作集团有	China International Intellectech Group Co., Ltd	Leasehold and business service industry	1987	0
69	中国建筑科学研究院有限公司	China Academy of Building Research	Scientific research, technical service and geologic examination industry	1953	0
70	中国中车集团有限公司	CRRC Co., Ltd	Traffic, storage and mail business	2015	0
71	中国铁路通信信号集团有限公	China Railway Signal&Communication Corporation	Information transfer, computer service and software industry	2017	0
72	中国铁路工程集团有限公司	China Railway Engineering Group Limited	Construction industry	1950	0
73	中国铁道建筑集团有限公司	China Railway Construction Corporation Limited	Construction industry	1948	0
74	中国交通建设集团有限公司	China Communications Construction	Construction industry	2005	0
75	中国信息通信科技集团有限公	China Information Communication Technologies Group Corporation	Information transfer, computer service and software industry	2018	0
76	中国农业发展集团有限公司	China National Agricultural Development Group Co., Ltd	Farming, forestry, animal husbandry and fishery	2004	0
77	中国林业集团有限公司	China Forestry Group Limited	Farming, forestry, animal husbandry and fishery	1984	0
78	中国医药集团有限公司	China National Pharmaceutical Group Corporation	Manufacturing industry	1987	0
79	中国保利集团有限公司	Poly Group	Wholesale and retail trade; Manufacturing industry	1983	0
80	中国建设科技有限公司	China Architecture Design & Research Group	Scientific research, technical service and geologic examination industry	1996	0
81	中国冶金地质总局	China Metallurgical Geology Bureau	Scientific research, technical service and geologic examination industry	1952	0
82	中国煤炭地质总局	China National Administration of Coal Geology	Scientific research, technical service and geologic examination industry	1953	0
83	新兴际华集团有限公司	Xinxing Cathay International Group Co., Ltd	Manufacturing industry	1952	0
84	中国民航信息集团有限公司	Travelsky	Traffic, storage and mail business	2002	0
85	中国航空油料集团有限公司	China National Aviation Fuel Group	Traffic, storage and mail business; Manufacturing industry	2002	0

Table V.

Yangi	name Mandarin	Name English	Economy Sector	Year foundation	Auto related
86	中国航空器材集团有限公司	China Aviation Supplies Holding Company	Manufacturing	2002	0
87	中国电力建设集团有限公司	Power Construction Corporation of China	Scientific research, technical service and geologic examination industry	2011	0
88	中国能源建设集团有限公司	China Energy Engineering Group Co., Ltd	Scientific research, technical service and geologic examination industry	2011	0
89	中国安能建设集团有限公司	China Anneng Construction Group Co., Ltd	Water conservancy, environment and public institution management	1981	0
90	中国黄金集团有限公司	China National Gold Group Co.,Ltd.	Mining industry	2003	0
91	中国广核集团有限公司	China General Nuclear Power Group	Manufacturing industry	1994	0
92	中国华录集团有限公司	China Hualu Group Co., Ltd	Manufacturing industry	1992	0
93	华侨城集团有限公司	Overseas Chinese Town Holdings Company	Realty business	1985	0
94	南光（集团）有限公司[中国南	Nam Kwong (Group) Co., Ltd	Wholesale and retail trade	1949	0
95	中国电气装备集团有限公司	China Electric Equipment Group Co., Ltd	Manufacturing	2021	0
96	中国物流集团有限公司	China Logistic Group Co., Ltd	Traffic, storage and mail business; Manufacturing industry	1987	0
97	中国国新控股有限责任公司	China Reform Holdings Co. Ltd.	Public administration and social organization	2010	0
98	中国检验认证（集团）有限公	China Certification & Inspection Group Co., Ltd	Public administration and social organization	1980	0

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