

The Influence of Consumption Subsidy Policy on China's Domestic Electric Vehicle Market

—Take BYD as Example

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Abstract: China's consumption subsidy policy is considered as a dominant factor in promoting the development of the domestic electric vehicle (EV) market, and companies like BYD have benefited from this policy. BYD, one of the leading EV manufacturers in China, has seen significant growth in EV sales since introducing the subsidy policy. This paper examines the influence that China's EV subsidy policy brings to BYD, highlighting the pros and cons of the policy and the challenges and opportunities faced by EV manufacturers in China. Specifically, the policy has helped to make EVs more affordable and accessible to consumers, but it has also led to overcapacity and intense competition among manufacturers. The policy has also been criticized for being too heavily focused on subsidies and insufficient on other measures, such as infrastructure development, necessary for the EV market's growth. By examining the subsidy policies and market performance of BYD, this paper highlights the effectiveness as well as drawbacks of the subsidy policy and the challenges and opportunities faced by EV manufacturers in China.

Keywords: electric vehicles (EVs), China, consumption subsidy policy, BYD

1. Introduction

1.1. Research Background

The domestic electric vehicle (EV) market in China is the world's largest and has seen significant growth in recent years. The Chinese government has been promoting EV adoption by implementing various policies—for example, consumer subsidies. As a result, EV sales have surged, with China accounting for around 50% of global EV sales in 2020 [1]. As shown in Figure 1

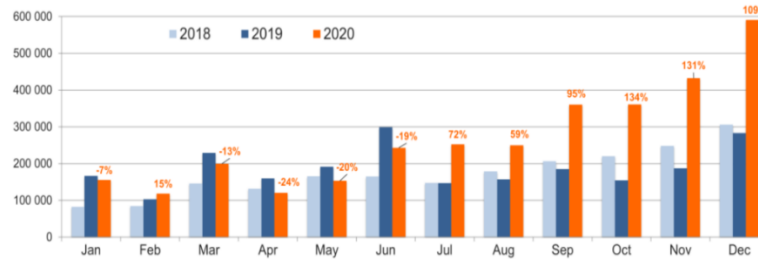


Figure 1: the table of the sale volume of EVs in Europe [1].

(Source: EV volumes.com <https://www.ev-volumes.com/country/china/> last accessed 2021)

BYD Auto Co., Ltd. (BYD), a leading Chinese automaker specializing in EV production, is a notable example of a company China's consumption subsidy policy has significantly influenced. With the government's support, BYD has become one of the top EV manufacturers in China and a major player in the global EV market [2]. As shown in Table 1.

Table 1: The output and sales volume of BYD in 2022.

Project Categories:	Output					Sales volume				
	This month	Same period last year	Current year's accumulation	Last year's accumulation	Cumulative year-on-year	This month	Same period last year	Current year's accumulation	Last year's accumulation	Cumulative year-on-year
New Energy Vehicles	235,215	92,030	1,877,034	607,119	209.17%	235,197	93,945	1,863,494	603,783	208.64%
- Passenger Cars	234,616	90,908	1,870,919	597,081	213.34%	234,598	92,823	1,857,379	593,745	212.82%
- Pure Electric	109,577	46,588	917,118	322,983	183.95%	111,939	48,317	911,140	320,810	184.01%
- Plug-in Hybrid	125,039	44,320	953,801	274,098	247.98%	122,659	44,506	946,239	272,935	246.69%
- Commercial Vehicles,	599	1,122	6,115	10,038	-39.08%	599	1,122	6,115	10,038	-39.08%
- Passenger Buses	335	783	4,870	5,772	-15.63%	335	783	4,870	5,772	-15.63%
- Other	264	339	1,245	4,226	-70.82%	264	339	1,245	4,226	-70.82%

Table 1: (continued).

Fuel Vehicles	0	5,244	4,635	140,421	-96.70%	0	5,167	5,049	136,348	-96.30%
-sedan	0	1,915	1,458	35,302	-95.87%	0	1,771	1,544	33,401	-95.38%
-SUV	0	3,147	3,177	93,728	-96.61%	0	3,214	3,505	93,012	-96.23%
-MPV	0	182	0	11,391	-100.00%	0	182	0	9,935	-100.00%
In total	235,215	97,274	1,881,669	747,540	151.71%	235,197	99,112	1,868,543	740,131	152.46%

(Source: Shenzhen stock exchange, <http://www.szse.cn/disclosure/listed/bulletinDetail/index.html?d5ca1309-9220-41ee-861a-fc49dbdfb174> last accessed 2023/01/03)

1.2. Literature Review

This policy has significantly boosted the sales of BYD's NEVs, contributing to the company's rapid growth and expansion. As a result, BYD has increased its market share and competed with leading automakers in China's EV market, such as Tesla, NIO, and Xiao Peng. However, the effectiveness and sustainability of consumption subsidies as a policy tool remain controversial, as some argue that such policies may distort market competition and create inefficiencies. Nonetheless, the influence of consumption subsidies on BYD and other Chinese EV manufacturers cannot be denied. These policies were important to drive the growth and advancement of China's NEV industry. Some relevant articles also describe this issue. For instance: Masiero et al. analyzed that government support in the form of subsidies combined with effective strategies for BYD contributed a lot to the successful expansion of China's electronic vehicle industry. And China's heavy investment in electric vehicle development reduced the opportunity cost of certain companies and helped them become the largest car producer and a strong investor in EV manufacturing [3]. Also, Sun Zhang and Su proposed the different influences that various types of government subsidies can impact the market differently. The findings point out that by putting in every unit of investment in research, development, and publicity which falls below 0.574 in region X, consumption-side subsidies prove more effective in enhancing R&D and advertising investments, increasing revenue, and promoting public welfare compared to production-side subsidies. However, when the investment was less than 1.414 in Y region. It is the production-side subsidy that more likely comes with a superior performance [4]. Also, Jin has proposed the old and new criteria of government relevant subsidy policies for the new energy automotive industry in China, along with the accounting approaches for government subsidies and financial discounts under updated standards, are being examined. The paper proposed the necessity to improve and reform the domestic accounting system to cover international standards and develop a sustainable subsidy policy, making enterprises independent instead of relying on government subsidies excessively to remain competitive in the global market [5].

Most of the papers focused on BYD and governmental subsidies and discussed the importance of government support in the success of the company and the new energy automobile industry in China. These papers analyze the effect of government subsidies in accelerating the industry's growth, as well as the impact of changes in subsidy policies on companies like BYD. Many of the papers focus on

the accounting methods for government subsidies and financial discounts and the impact of these factors on BYD's financial performance. Additionally, some of the papers examine the role of government subsidies in supporting BYD's research and development efforts and its expansion into other new energy sectors. Most of these papers focused on the importance of government subsidies, their impact on BYD's financial performance, and the changes in government policies related to subsidies. Only a few of the papers focused on other aspects of BYD's business, such as its strategies for market competition or its expansion into other new energy sectors. Overall, the papers provide a detailed analysis of BYD's reliance on government subsidies and the impact of these subsidies on the company's success.

1.3. Research Framework

First, the paper will provide an overview of China's inland electric vehicle market and how important government policies are to the market, particularly consumption subsidies, in promoting the industry's growth.

Second, the paper will analyze the impact of the consumption subsidy policy on BYD, one of China's largest electric vehicle manufacturers. This analysis will examine BYD's sales performance, financial performance, and market share before and after the implementation of the consumption subsidy policy.

Thirdly, this paper will address the possible challenges and constraints of the consumption subsidy policy in fostering long-term expansion and stability within the domestic electric vehicle market. The analysis will encompass topics like the policy's effectiveness in lowering emissions and encouraging innovation, as well as the likelihood of the policy causing market imbalances and reliance on government assistance.

Fourth, the paper will conclude by summarizing the key findings of the research and offer some recommendations for policymakers, businesses, and other stakeholders in China's domestic electric vehicle market. These recommendations would include suggestions for changes to government policies related to consumption subsidies and strategies that companies like BYD can use to ensure their long-term success in the rapidly evolving electric vehicle market.

2. Methods: Case Study

Case study is a research approach employed to thoroughly examine a phenomenon or a topic of interest. It involves examining a particular case or situation to gather and analyze data, conclude, and make recommendations. The first step is defining the research question, or problem the case study will address. The research question should be clear, specific, and relevant to the field. And then select the case that will be studied. The case can be found in an individual, a group, an organization, a community, or a specific event. The third stage is to collect the data by gathering information about the case through various methods such as interviews, observations, surveys, and document analysis. The data collected should then be analyzed to identify their patterns, themes, and relationships among them. These procedures help us to understand the case and develop insights. Fifthly, based on the analysis, conclusions can be drawn that help us to answer the research question. The conclusions should also be based on collected evidence and supported by logical reasoning. This paper will first focus on the current situation of China's EV market by analyzing the data searched on the internet. And then, it focused on the consumption subsidy policy on the domestic electric vehicle market, using BYD as a case study. The paper will then discuss the potential problems with the policy, unequal distribution of subsidies, and inadequate support for long-term industry development. The paper concludes by suggesting that the government should address the problems with the subsidy policy while continuing to support the advancement of the electric vehicle industry through furthered

alternative methods, including enhancing charging infrastructure and fostering research and development.

3. Results

3.1. Analysis of the Current Situation of China's EV Market

China's electric vehicle (EV) market had experienced significant growth in last few years. In accordance with a report from the International Energy Agency (IEA), China's EV market became one of the biggest in the world in 2020, accounting for more than 40% of global sales. The report also notes that China aims to have 50% of new car sales electric by 2035, which is predicted to drive further rise in the electric vehicle market [6]. However, the Chinese EV market has also faced some challenges. One issue is the decrease in government subsidies for EVs, which has led to a decline in sales. According to the China National information center, EV sales in China fell by 63.8% in 2017, the first decline in over a decade, largely attributed to decreased subsidies [6]. Despite these challenges, the Chinese EV market is expected to grow in the coming years, driven by government policies promoting EV adoption and investment in charging infrastructure. A report by McKinsey & Company predicts that China will account for around 60% of global EV sales by 2030. In summary, the Chinese EV market has experienced significant growth in recent years but faces challenges such as decreased government subsidies and a lack of charging infrastructure. However, the market is expected to grow in the coming years.

3.2. The Influence of Consumer Subsidy Policy on the Market—Take BYD as Example

The consumer subsidy policy, including companies like BYD, has significantly impacted the Chinese electric vehicle market. According to a report by the China Association of Automobile Manufacturers, the subsidy policy has helped promote the adoption of electric vehicles in China, leading to significant growth in the market and boosting the success of companies like BYD. For example, BYD saw a significant increase in sales of its electric vehicles following the introduction of the subsidy policy. In 2020 BYD's sales of electric vehicles in China increased by over 200% compared to the previous year [7]. As shown in Table 2 and Table 3

Table 2: Consolidated Statement of Profit or Loss of BYD in 2019.

	Notes	2019 RMB'000	2018 RMB'000
Revenue	5	121,778,117	121,790,925
Cost of sales		(103,702,124)	(103,724,161)
Gross profit		18,075,124	18,066,764
Other incomes and gains	5	1,974,993	2,138,163
Government grants and subsidies	7	1,707,657	2,332,863
Selling distribution expenses		(4,345,897)	(4,729,481)
Research and development costs		(5,629,327)	(4,989,360)
Administrative expenses		(4,232,316)	(3,826,379)

Table 2: (continued).

Impairment losses on financial and contract assets		(477,031)	(332,080)
Loss on disposal of financial assets measured at amortized cost		(519,134)	(361,765)
Other expenses		(213,536)	(568,610)
Financial costs	8	(3,487,407)	(3,118,751)
Share if profits and losses of:			
Joint ventures		(435,311)	(277,602)
Associations		12,535	52,878
Profit before tax	6	2,431,131	4,385,640
Income tax expense	11	(312,274)	(829,447)
Profit for the year		2,118,857	(3,556,193)
Attributable to:			
Owners of parent	13	1,614,450	2,780,194
Non-controlling interests		504,407	775,999
		2,118,857	3,556,193
Earning per share attributable to ordinary equity holders of the parent Basic and diluted. -For profit for the year	13	RMB 0.50	RMB 0.93

(Source: BYD, Investor relations periodic reports)

Table 3: Consolidated Statement of Profit or Loss of BYD in 2020.

	Notes	2020 RMB'000	2019 RMB'000
Revenue	5	153,469,184	121,778,117
Cost of sales		(126,225,593)	(103,702,124)
Gross profit		27,243,591	18,075,124
Other incomes and gains	5	1,700,078	1,974,993
Government grants and subsidies	7	1,688,142	1,707,657
Selling a distribution expenses		(5,055,613)	(4,345,897)
Research and development costs		(7,464,861)	(5,629,327)
Administrative expenses		(4,395,630)	(4,232,316)
Impairment losses on financial and contract assets		(1,166,268)	(477,031)

Table 3: (continued).

Loss on disposal of financial assets measured at amortized cost		(299,523)	(519,134)
Other expenses		(2,056,691)	(213,536)
Financial costs		(3,123,801)	(3,487,407)
Share if profits and losses of:	8		
Joint ventures		(198,955)	(435,311)
Associations		12,118	12,535
Profit before tax	6	6,882,587	2,431,131
Income tax expense	11	(868,624)	(312,774)
Profit for the year		6,013,963	2,118,857
Attributable to:			
Owners of parent	13	4,234,267	1,614,450
Non-controlling interests		1,779,696	504,407
		6,013,963	2,118,857
Earing per share attributable to ordinary equity holders of the parent	13	RMB 1.47	RMB 0.50
Basic and diluted. -For profit for the year			

(Source: Investor relations periodic reports)

With many of these sales being in the small and medium-sized passenger vehicle segment, the company has also invested heavily in research and development of electric vehicle technology and has been recognized as a Chinese electric vehicle market leader. However, there have also been problems with the consumer subsidy policy, including fraud and unequal distribution of subsidies. A report by the people's Daily indicated that some companies were cheating the subsidy system by misrepresenting their vehicles' performance, which has reduced the number of subsidies available [8]. Additionally, some analysts have criticized the policy for focusing too much on short-term sales growth and not enough on supporting long-term industry development. Overall, the consumer subsidy policy has significantly impacted the Chinese electric vehicle market, including companies like BYD. While there have been some problems with the policy, it has helped promote the adoption of electric vehicles and boost the success of companies like BYD [9].

3.3. Imperfect Aspect of Consumer Subsidy Policy and Existing Problems

The consumer subsidy policy for electric vehicles (EVs) in China has faced criticism due to its imperfect aspects and existing problems, which have affected the sale volume of EVs, including those produced by BYD.

One of the issues with the subsidy policy is the unequal distribution of subsidies, which has led to the concentration of sales in small and medium-sized passenger vehicles. As a result, larger EVs have struggled to gain market share, even if they offer better performance or are more affordable than subsidized models. This has impacted BYD, whose sales of larger electric vehicles have been lower than expected due to the subsidy policy's focus on smaller vehicles

Furthermore, the subsidy policy has also been criticized for promoting short-term sales growth rather than supporting long-term industry development. This has led to concerns about the sustainability of the EV market in China. A report by the China association of automobile Manufacturers notes that the subsidy-dependent market created by the policy is vulnerable to government policy fluctuations, which can negatively affect EV sales [10].

In summary, the consumer subsidy policy for EVs in China has faced criticism due to its imperfect aspects and existing problems, including unequal distribution of subsidies, lack of long-term planning, and fraud. These issues have impacted the sale volume of EVs, including those produced by BYD.

4. Discussion

To improve China's electric vehicle (EV) consumer subsidy policy and promote the development of the EV industry, several measures could be considered. The government could adjust the subsidy structure to promote the development of larger and higher-performance EVs, which have struggled to gain market share due to the current subsidy policy's focus on small and medium-sized passenger vehicles. This could include offering higher subsidies for larger EVs and adjusting the criteria for subsidy eligibility to reflect performance and affordability better. Also, the government could introduce long-term planning and policy stability to support the sustainable growth of the EV industry. This could include setting clear targets and policies for developing EVs and related infrastructure and establishing stable subsidy policies that promote industry growth while avoiding dependency on government support. Thirdly, the government could consider offering subsidies for EV charging infrastructure development, which could help to address one of the major barriers to EV adoption in China. This could include subsidies for the installation of public charging stations or the development of EV battery-swapping networks. Lastly, the government could work to address fraud-related issues and the unequal distribution of subsidies, which have undermined the effectiveness of the subsidy policy. This could include increasing the transparency and accountability of the subsidy system, as well as cracking down on fraudulent behavior by EV manufacturers and dealers. Overall, by implementing measures such as adjusting the subsidy structure, introducing long-term planning and policy stability, offering subsidies for charging infrastructure development, and addressing issues related to fraud and unequal distribution of subsidies, China has the potential to enhance its electric vehicle consumer subsidy policy, thereby fostering the sustainable growth of the EV sector.

One important consideration in improving China's EV consumer subsidy policy is balancing the goals of improving the EV industry with ensuring the subsidy program's sustainability. While subsidies can be effective in encouraging EV adoption, However, such measures can be expensive for the government and may not be viable over an extended period. Therefore, it's important to balance promoting the EV industry and ensuring the stability and sustainability of the subsidy program.

It is also essential to take the influence of the subsidy policy on the environment into consideration. While EVs are generally considered more environmentally friendly than traditional gasoline-powered vehicles, producing EV batteries and the electricity used to charge them can still have significant environmental impacts. Therefore, the government should consider incorporating environmental goals into the subsidy policy, for instance, encouraging the use of renewable energy sources to power EVs and promoting the recycling and responsible disposal of EV batteries.

Considering the significance of innovation and competition is also crucial in promoting the development of the EV industry. While subsidies can encourage the adoption of existing EV models, they may not be as effective in promoting innovation and competition in the industry. Therefore, the government could consider other policy tools, such as research and development funding, tax incentives, or regulatory reforms, to promote innovation and competition in the EV industry. The

