

## *Original Paper*

# The Impact of Government Subsidies on Enterprise Innovation Ability

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### ***Abstract***

*With the global environmental pollution problem increasingly serious, green development has become a general trend. Under this kind of background, new energy vehicles, as an important tool to promote sustainable transportation and facilitate the transformation of the energy structure, have become an important development direction of the global automobile industry. In the initial stage of development, new energy vehicle enterprises are unable to open the consumer market due to their high research and development cost and limited technology. However, since 2009, China's central finance has given subsidies and support for the production to the promotion and application of new energy vehicles. This paper analyzes the positive and negative effects of Chinese government subsidies on the innovation ability of new energy vehicle enterprises, and thus I put forward relevant suggestions.*

### ***Keywords***

*New energy vehicle enterprises, Government subsidies, Innovation ability*

## **1. Introduction**

Innovation ability is the embodiment of an enterprise core competitiveness. In the initial stage of the development of new energy vehicles, due to the limited funds and some technology patents stolen, enterprise development was prevented. Government subsidies support new energy automobile enterprises, which have enough research and development funds to promote the development of the industry. At the same time, they enjoy more preferential, but also it may cause too much reliance on government funding. Once the government's subsidies for new energy vehicle enterprises are weakened, it is likely to lead to the weakening of the innovation ability of enterprises.

## 2. Different Types of Government Subsidies

There are many ways of government subsidies for new energy vehicle enterprises, including direct subsidies and indirect subsidies. Direct subsidy refers to that the government indirectly stimulates the sales of new energy vehicles by purchasing subsidies to consumers, improving charging pile facilities, tax cuts and other measures, so as to boost the confidence of new energy vehicle enterprises. On the other hand, the government directly promotes the innovation of new energy vehicle enterprises by giving new energy vehicle enterprises research and development subsidies, achievement rewards and low-interest loans, so as to create a better platform for technological development and innovation for the development of the industry.

## 3. The Development Process of New Energy Vehicle Enterprises under the Government Subsidies

In the first stage, one of the important part of the new energy vehicles 'hydrogen fuel cell' has become the focus of the world research object. China's new energy automobile industry technical route planning is still in a more fuzzy state in this stage and government support policy is also basic in the macro strategic guidance level, just introduced related subsidies for new energy vehicles and opened some new energy vehicles demonstration project.

In the second stage, after a period of exploration, the production technology level of China's new energy vehicle enterprises has been greatly improved, and the new energy vehicles were officially launched. At this stage, the policy of supporting the new energy automobile industry were continuously introduced and more detailed subsidy policies and means targeted into the new energy automobile industry chain. Wherein, the more representative policy is <Implementation of energy saving and new energy vehicle demonstration promotion pilot notice>, which gradually formed a complete industrial policy system and laid a good foundation for the vigorous development of the industry.

In the third stage, this period is the adjustment period of government-related subsidy policy. Since 2015, the subsidy standard of the new energy vehicle industry has been constantly adjusted, showing a changing trend of increasing the technical threshold and decreasing the amount of subsidy. For example, adjusting the special vehicle and passenger car subsidies according to the specific situation, effectively controlling car companies' cheating behavior, trying to decrease subsidies gradually, which guide the long-term healthy development of new energy automobile industry and eliminate backward production capacity and improve the level of technology, thus accelerating industry integration as well as technological innovation. These policies increased requirements for power batteries, and they are expanded to infrastructure construction and other aspects. The representative policy of the policy is the <Notice on Financial Support Policies for the Promotion and Application of New Energy Vehicles from 2016 to 2020>, which is jointly issued by the four departments of the Central Government of China. The release of this policy marks that the new energy vehicle industrial policy has entered a new stage. The subsidy policy for the promotion and application of new energy vehicles will continue to be implemented in 2016 to 2020, and the subsidy will decline year by year.

#### **4. The Impact of Government Subsidies on the Innovation Ability of New Energy Vehicle Enterprises**

##### *4.1 Positive Incentive*

###### **4.1.1 Ease the Financial Pressure of Enterprises**

In the market with imperfect capital, when the financing cost is too high or the financing channel is too single, enterprises will face serious capital pressure, which will hinder the enthusiasm of innovation activities. There is no doubt that adequate funding is an important guarantee to ensure the smooth progress of relevant activities, especially for small and medium-sized enterprises. If the funds are insufficient in the relevant process, the innovation will be suspended, and the capital chain is difficult to maintain, and they will be eliminated by the market, leading to the redistribution of relevant resources. The support of relevant subsidies can not only effectively alleviate the financial problem, but also be withdrawn in advance as income. In this way, it can directly mobilize the enthusiasm of enterprises for R & D and innovation to invest more funds into research and development activities, which will reduce the risk of insufficient funds or capital fracture in innovation activities, and also have certain significance for improving their success rate.

###### **4.1.2 Conducive to the Establishment of the Innovation Mechanism**

When the government issues R & D subsidies to enterprises, it also requires enterprises to have a certain technology research and development foundation and have the corresponding support funds. In the initial stage of innovation activities, the government needs to conduct strict screening and project evaluation of innovation subsidy applications. Therefore, the subsidized enterprises are not only supported by the official R & D investment, but also recognized and certified by the government agencies for the comprehensive evaluation of various risks and information factors in the enterprise's innovation activities. In the middle and later stages of relevant activities, with the arrival of relevant subsidy funds, adequate funds are sufficient to increase the investment of human resources and property to create a better innovation environment for the subsequent innovation activities of enterprises, which is conducive to the benign operation of enterprise innovation activities, and to create favorable conditions for the formation of enterprise innovation activities mechanism.

###### **4.1.3 Send Good Signals to the Outside**

When the majority of investors pay positive attention to new energy automobile industry development, new energy automobile enterprise announces to disclose the received government subsidies, which passes the good signal to the world to ease the pressure of the enterprise research and development activities. It is advantageous to the long-term development and represents that the enterprises actively response to the government policy to engage in high innovative as well as expected earnings research and development projects, which may cause the positive feedback of the market and help enterprise performance.

#### 4.1.4 Reduce Innovation Risk

Innovation activities are also a venture capital for enterprises, and their uncertainty and unpredictability lead to risks. Firstly, the early and middle stages of enterprise innovation activities need a large amount of research and development funds. To some extent, government R & D subsidies absorb the sunk costs of enterprise risk loss, helping R & D and innovation enterprises to spread risks, improving the probability of success of enterprise innovation activities, so as to encourage enterprises to produce more positive external benefits through innovation activities.

Secondly, the flow of core R & D personnel in enterprises increases the possibility of confidential leakage of enterprise innovation achievements, which is not conducive to the development of enterprise innovation activities. Moreover, it is difficult to unify the opinions of major shareholders and their agents. The latter, based on their own interests, will consciously avoid the highly uncertain research and development when making relevant decisions, which will also restrict the progress of relevant activities to a certain extent.

#### 4.2 Negative Extrusion Effect

##### 4.2.1 Reduce Enthusiasm for Independent Innovation

Excessive government intervention will lead to the excessive reliance on government subsidies, and will also aggravate the government's excessive intervention in the market. Take BYD as an example, from 2016 to 2021, the change trend of BYD's total asset turnover was unstable. It decreased and then increased from 2016 to 2018, and gradually increased from 2019 to 2021. Moreover, the total asset turnover rate in these three years was basically consistent with the change trend of government subsidies, indicating that BYD has a certain degree of dependence on government subsidy policy. After deducting the government subsidies, the total asset turnover rate is slightly higher than that before the deduction, but the change range is very small, indicating that the government subsidies inhibit the operating capacity of enterprises, but the effect is not obvious.

**Table 1. The Impact of Government Subsidies on BYD's Operating Capacity in 2016-2021**

| Year | Turnover of total capital | Total asset turnover rate after deducting government subsidies | The rate of change before and after the deduction |
|------|---------------------------|--|---|
| 2016 | 0.7942                    | 0.7982   | 0.0040  |
| 2017 | 0.6555                    | 0.6595   | 0.0041  |
| 2018 | 0.6980                    | 0.7043   | 0.0063  |
| 2019 | 0.6547                    | 0.6607   | 0.0060  |
| 2020 | 0.7896                    | 0.7959   | 0.0063  |
| 2021 | 0.8701                    | 0.8771   | 0.0070  |

#### 4.2.2 Lead to Corporate Rent-Seeking Behavior

Rent-seeking theory refers to the government in the use of industrial policy intervention in enterprise activities, to a certain extent, inhibit the competition in the market, cause some enterprises in order to obtain excess non-productive earnings to make a series of policy close to the market competition behavior, namely rent-seeking behavior. It not only destroyed the reasonable distribution of economic resources, but also has a larger deviation from government's intention.

Due to the support of new energy automobile industry, automobile enterprises also appear the phenomenon of "rent-seeking", embodied in: management let the business toward the national government subsidy policy requirements, to get a lot of subsidy funds, then put into the expansion of production scale, profit turnaround or other aspects. As we all know, technology research and development is the fundamental for the long-term development of enterprises. Government subsidies may be unable to promote the innovation of enterprises under the rent-seeking behavior and lead to the wrong allocation of social resources. As a result, the government subsidy policy needs to be further improved.

#### 4.2.3 Innovation Spillover

Scholar Arthur Cecil Pigou believes that in order to guide the economic behavior of economic subjects and realize the internalization of external economy, it is necessary to provide corresponding government subsidies, so as to realize the allocation of the whole social resources.

Government subsidies have an external economic impact on the distribution process of new energy vehicle enterprises, and the output benefits of innovation activities of new energy vehicle enterprises will also affect other enterprises in the same industry, so that enterprises engaged in innovative research and development can not enjoy all the economic benefits, which hit their enthusiasm for technology research and development.

In conclusion, the positive influence of government subsidies is greater than the negative impact. It is the government's strong support that new energy automobile enterprises will have more sufficient research and development funds to technological breakthrough.

### 5. Suggestions

#### 5.1 Government Angle

##### 5.1.1 Improve the Mechanism for Training and Introducing Talents

The improvement of innovation ability needs a lot of high-quality talents. The government implements talent introduction projects, and strives to build a high-level innovation team to provide a steady stream of talent reserve force for the development of the industry.

##### 5.1.2 Strengthen International Cooperation and Break through Technological Difficulties

Some "stuck neck" technical difficulties require China to cooperate internationally with other countries to solve these problems, so that new energy vehicle enterprises can better develop. For example, the price of "lithium resources" depends on the overseas market, and close international cooperation can

ensure the healthy development of the power battery industry.

#### 5.1.3 Strengthen the Management and Supervision of Subsidies

The government should have a certain basis for financial subsidies to each enterprise, not blindly support. It can set up the government subsidies information disclosure network which publish subsidies spending details and involving related documents of the electronic information for check and supervision. It will facilitate the management of government subsidies, in case of enterprise “cover arbitrage” phenomenon.

### 5.2 Enterprise Angle

#### 5.2.1 Disclose the Whereabouts of the Subsidy

Enterprises should clearly disclose the details of government subsidies and the whereabouts of these funds under each project to prevent corruption and other behaviors that are not conducive to the benign development of enterprises.

#### 5.2.2 Build Core Competitiveness

As a strategic emerging industry, new energy vehicles need high-quality innovative output, and various enterprises should also build their own unique technologies and advantages to form core competitiveness.

#### 5.2.3 Integrated Development with other Industries

In the context of global green development, the replacement of fuel vehicles by electric vehicles has become a key link in the low-carbon development of transportation, and even determines a link in the decarbonization of the transportation field. New energy vehicle enterprises can integrate their development with other enterprises, forming new models such as “electric vehicles + accelerated application of green materials” and “electric vehicles + new infrastructure”.

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