

# The Incentive Effect of Government Subsidies on the Development of Corporate Performance of New Energy Vehicle Enterprises

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**Abstract:** In the case of economic and trade globalisation, from the point of view of the economic development of each country, the government is involved in the intervention between various industries, the current transition economic period, new energy vehicles as a future development trend, not only to meet the national requirements for innovation and green environmental protection, in the economic aspects of the same by the government's strong support. Subsidies are regarded as an important economic intervention tool that can solve many problems of market failure [1]. But for the size of the government subsidy amount can significantly affect the performance of enterprises? Based on the panel data of China's new energy vehicle (NEV) enterprises from 2018 - 2021, this paper investigates the impact of government subsidies on enterprise performance. It is found that the performance of enterprises and the amount of government subsidies are positively correlated; the impact of government subsidies on the solvency and operating capacity of enterprise performance is small; and the profitability of enterprises is greatly and significantly affected by the amount of subsidies.

**Keywords:** New Energy Vehicle Enterprises, Government Subsidies, Corporate Performance.

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## 1. Introduction

Since the 1990s, the promotion of new energy industries and the promotion of a low-carbon economy have become a consensus for the economic development of various countries. Energy shortages and environmental pollution can be considered to have restricted the development of human society. In this context, humanity has to address environmental and survival challenges, including global warming [2]. Government subsidies are a very common phenomenon and government industrial policy plays an important role in China's economic development. New energy vehicles, as a future trend, meet the national requirements for innovation and green environmental protection, and are strongly supported by the government in terms of economy. However, it should be pointed out that new energy vehicle enterprises themselves have certain differences in business performance, so the impact of government subsidies on business performance is complex. Some foreign scholars believe that government subsidies will have a positive impact on enterprise performance, and their research on the Irish national situation found that the Irish government level is more willing to provide financial subsidies to the national strategic support industry. These subsidies can promote the independent innovation of enterprises. Help them to relieve financial pressure and ultimately improve firm performance. Found that government subsidies have no crowding out effect and can promote R&D and increase firms' output rates in the current as well as subsequent periods. Further confirmed Hua's findings, they also believe that government subsidies can promote R&D to ensure that firms are well-funded and help them to prevent business risks. The promotion and development of NEVs in China has expanded rapidly in recent years. The government regards the growth of the NEV industry as an essential means of reducing energy use, carbon emissions, and smog. The New Energy Vehicle Pilot City

(NEVPC) policy launched in 2009 is a landmark move by the Chinese government to elevate the strategic importance of the country's NEV industry at a national level. [3] But there are also scholars who have pointed out that the more government subsidies do not necessarily have a better impact on enterprise performance, according to the data disclosed by BYD, from 2013 to the third quarter of 2018, the amount of government subsidies has reached 5.495 billion yuan, and the financial report of the third quarter of 2018, the net interest rate for the first three quarters of the year after the deduction of government subsidies was only 16.43%, which was lower than the level of the same period in previous years, which shows that BYD is likely to have excessive reliance on government subsidies. In summary, it can be seen that although government subsidies are currently the biggest booster for the development of China's new energy automobile enterprises, but at present there has been an enterprise's over-reliance on government subsidies, which leads to a more significant change in the net profit of the enterprise in the absence of government subsidies, thus affecting the profitability of the enterprise. Most countries, including China, the United States, the European Union, and others, are subsidizing the development of NEVs. In recent years, a large body of literature has discussed how to subsidize NEV enterprises and evaluated the impact of subsidies on NEV development [4]. Regarding the impact of government subsidies on enterprises, most of the research is on traditional industries, relatively less research on industries involving higher technology and new energy enterprises that are less mature in the demand market. Therefore, this paper attempts to produce some exploration in this area, and traditional industries and comparison from the overall analysis of enterprise performance by the impact of government subsidies, more indirectly from the three aspects of the impact of enterprise performance by the effect of the response, and then finally aggregated the data derived from

the comparison of the use of a more reliable and comprehensive analysis of the policy effect of the measure, in order to draw a relatively reliable and consistent conclusions.

## **2. Theoretical Analysis and Research Hypotheses**

### **2.1. Government grants and enterprise performance**

Government subsidy is a kind of financial support provided by the government to the economic activities of enterprises through direct or indirect ways to help each new energy enterprise to occupy an advantageous position in the fierce competition, so as to influence the direction and goal of the development of the enterprise; Government subsidy is fairly important to alleviate the funding dearth of new energy vehicles (NEVs) industry, and mainly includes production-side and consumption-side subsidies [5] and enterprise performance refers to the operating efficiency of the enterprise and the performance of the operator during a certain period of operation. The level of business efficiency is mainly manifested in profitability, operating capacity, solvency and subsequent development ability, so it is also the most important indicator that can reflect whether the enterprise is sustainable development. Appropriate amount of government subsidies can effectively promote enterprise innovation, so it can be basically assumed that although government subsidies will certainly have a positive effect on enterprise performance, government subsidies encourage enterprises to expand the scale of investment, and economies of scale can further promote enterprises to continuously improve the level of productivity [6]. But too high government subsidies may also affect the enthusiasm of enterprises, and the development and investment of new energy enterprises need funds to develop, and based on the new energy industry in China's market is still unstable, there is no stable capital income; so the government subsidies are very helpful but should be in the appropriate range of enterprise incentives, through the above analysis, this paper puts forward hypothesis 1.

Hypothesis 1: There is a positive correlation between the corporate performance of new energy vehicles and the amount of government subsidies.

### **2.2. Impact of government grants on solvency, operating capacity in firm performance**

Solvency is an important management indicator of an enterprise's financial management, which refers to the enterprise's ability to repay its debts as they fall due. It contains many indicators, this paper selects the more important two indicators to explain it; they are gearing ratio and quick ratio, gearing ratio = total assets/total liabilities, quick ratio = (current assets - inventories)/current liabilities; and government subsidies in new energy vehicles compared to the total assets accounted for a relatively small amount of this paper, so this paper speculates that government subsidies on the enterprise's gearing ratio impact is small Similarly, government subsidies have basically no impact on current assets and inventories, so it is also presumed that the impact on quick ratio is also small; and for the operating capacity, he refers to the operating capacity of the enterprise, i.e., the enterprise's ability to use various assets to earn profits. It reveals the situation of the enterprise's capital operation turnover, and reflects the efficiency of the enterprise's

management and application of economic resources. This paper selected the accounts receivable turnover rate (times), inventory turnover rate (times) to illustrate its research, this paper speculates that the impact of government subsidies should be more significant, the reason is that the formula basically coincides with the operating income/average accounts receivable or average inventory balances, at this time, the government subsidies are divided into two kinds, one is the new energy subsidies to the vehicle enterprises, and the other one is the other automobile subsidies to automobile parts and components enterprises. Subsidies; and most of the data in this paper comes from new energy vehicle companies, such as: BYD, Dongfeng Motor, SAIC, Foton, etc.; and for BYD's new energy vehicles, as an example, the price of one of its cars is 400,000 yuan, customers, if purchased, in addition to the amount paid by the customer, the government may provide the customer with 100,000 yuan of policy subsidies, and the 100,000 yuan according to BYD's internal basis will be made into operating income. According to BYD, this 100,000 yuan will be included in operating income in BYD's annual income statement, but this is equivalent to a quarter of the overall selling price, so the impact of government subsidies on the operating income of new energy vehicle enterprises is very huge. Therefore, this paper proposes research hypothesis 2.

Hypothesis 2: The impact of government grants on the solvency of an enterprise is small and the impact on its operating capacity is large.

### **2.3. The effect of government grants on profitability in firm performance**

Whether an enterprise can operate for a long time, not only depends on his solvency and operating ability, but also depends on his profitability, ability for profits, is stable and long time to maintain in a relatively optimistic level, is also one of the most important ability to respond to the comprehensive strength of the enterprise. This paper has selected the net interest rate, the return on net assets (deduction/weighted) (%) two indicators to illustrate its research. Net profit margin = net profit / main business income, and government subsidies for new energy automobile enterprises are mostly directly through other income directly into the net profit, the size of the subsidy amount directly affects the size of the net profit of the enterprise, and most of the new energy automobile enterprises are also through this provision will be their own company's net profit margin to improve; return on net assets is an important indicator, it reflects the The return on net assets is an important indicator, which reflects the level of income received by shareholders and the operation of the enterprise, is a key factor in evaluating the comprehensive strength of the enterprise, the deduction refers to the deduction of non-recurring income, and the vast majority of government grants belong to the non-recurring income, and the return on net assets = net profit / average net assets, according to the above government grants directly affect the net profit, so this paper puts forward the research hypothesis 3.

Hypothesis 3: Firms' profitability and the amount of government grants are positively correlated and highly influential

For the traditional industry, the government subsidies to their support relative to the new energy is much less, because each traditional industry in the market is basically stable, and if the government suddenly a large number of subsidies to an

industry, then it is likely to break the balance between the market; and this paper will be relative to the new energy enterprises and traditional enterprises to analyse and compare the data, the author initially deduced that the government's subsidies to its with and with the The whole traditional industry is basically accounted for the total amount of its net profit and very small, so its profitability as well as other ability ability does not have a greater impact. Therefore, this paper proposes research hypothesis 4.

Hypothesis 4: The profitability, operating and debt-servicing capacity of traditional industries are less affected by the amount of government subsidies and not higher than that of new energy vehicle enterprises.

### 3. Research Design and Data Sources

#### 3.1. Research Modelling and Variable Design

The relationship between corporate performance and government subsidies in China is as follows.

$$ROE = \alpha + \beta_1 \text{Sub} + \beta_2 \text{TDR} + \beta_3 \text{NPM} + \beta_4 \text{QR} + \beta_5 \text{RTR} + \beta_6 \text{IT} + \xi \quad (1)$$

$$\text{TDR} = \alpha + \beta_1 \text{Sub} + \beta_2 \text{ROE} + \beta_3 \text{NPM} + \beta_4 \text{QR} + \beta_5 \text{RTR} + \beta_6 \text{IT} + \xi \quad (2)$$

$$\text{QR} = \alpha + \beta_1 \text{Sub} + \beta_2 \text{ROE} + \beta_3 \text{NPM} + \beta_4 \text{TDR} + \beta_5 \text{RTR} + \beta_6 \text{IT} + \xi \quad (3)$$

$$\text{RIR} = \alpha + \beta_1 \text{Sub} + \beta_2 \text{ROE} + \beta_3 \text{NPM} + \beta_4 \text{QR} + \beta_5 \text{TDR} + \beta_6 \text{IT} + \xi \quad (4)$$

$$\text{IT} = \alpha + \beta_1 \text{Sub} + \beta_2 \text{ROE} + \beta_3 \text{NPM} + \beta_4 \text{QR} + \beta_5 \text{TDR} + \beta_6 \text{RIR} + \xi \quad (5)$$

where  $\alpha$  is the intercept,  $\beta$  is the coefficient, and  $\xi$  is the residual, because in order to make the values more accurate, the control variables are all selected in this paper; their variables are described as follows.

##### 3.1.1. Explanatory variable: firm performance

The indicators of corporate performance are usually TDR

= gearing ratio, ROE1 = return on equity (weighted) NPM = net profit margin, RTR = accounts receivable turnover (times), QR = quick ratio, and IT = inventory turnover (times); among them, this paper selects the return on equity (haircut/weighted) as the core indicator of corporate performance, which is a core indicator to reflect the company's profitability.

It is a core indicator of profitability, which is highly representative and can fully reflect the comprehensive strength of the Company and the profitability of shareholders.

##### 3.1.2. Explanatory variables: Government grants (Sub)

The amount of government grants is derived from the publicly disclosed income statement of listed companies in the new energy industry in the other income line item "government grants". Due to the large amount of government grants, this paper measures the government grant variable in billions for the amount of government grants.

#### 3.2. Sample selection and data sources

This paper takes the A-share new energy listed companies listed on the Shanghai and Shenzhen stock exchanges in 2018-2021 as the research object, and excludes the following types of companies when determining the final statistical samples: (1) Some of the new energy listed companies and traditional enterprises that are missing and can't find the data of the indicator data on the Internet, the model needs to use the data of the government subsidies, accounting indicators, etc., but Some companies have missing data, so these sample companies are excluded; (2) To avoid the influence of outliers, ST listed companies are excluded; (3) In this paper, B-share and H-share new energy listed companies are excluded, and A-share listed companies are mainly selected. After screening, a total of 151 sample companies and 462 traditional enterprises are obtained. The data come from Flush website, Oriental Fortune website and GuotaiAn database, and are manually collated.

### 4. Regression Analysis of Government Subsidies and Solvency in The Performance of New Energy Firms

**Table 1.** Regression results of government subsidies and firm performance

VARIABLES	ROE	ROE2 2
Sub	0.417**(2.02)	4.563(0.49)
TDR	-0.430***(-3.00)	0.191***(-4.78)
RTR	0.235***(-2.88)	-0.003***(-9.29)
IT	-0.270(-0.39)	0.001*(1.88)
NPM	0.599***(-3.48)	1.681***(-13.99)
QR	-2.273**(-2.19)	0.110(0.81)
Constant	19.287**(-2.30)	-8.355***(-7.49)
Observations	151	461
R-squared	0.302	0.824
F test	6.01e-06	0
r <sup>2</sup> <sub>a</sub>	0.272	0.821
F	6.348	158.8

ROE = new energy vehicle companies ROE2 2 = traditional industries

Robust t-statistics in parentheses \*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Using the formula (1) to get Table 1; from the regression results in Table 1, we can see that for the new energy automobile enterprises, gearing ratio, quick ratio, accounts receivable turnover, net interest rate has a significant impact on enterprise performance and the impact of subsidies is also

more significant: government subsidies are significantly positively correlated with the government subsidies at the 5% level, which indicates that in general the more subsidies received by the sample enterprises, the better the performance will be; for the traditional industry, it is more significantly

affected by gearing, accounts receivable turnover, net interest rate but not significantly affected by the government subsidies. This shows that the more government subsidies the sample enterprises receive, the better the enterprise performance, which supports hypothesis 1 and also supports hypothesis 3; for the traditional industry, it is affected by the gearing ratio, accounts receivable turnover, net interest rate is more

significant but not by the government subsidies, which shows that the traditional industry is more stable compared to new energy automobile enterprises, and the subsequent development is basically guaranteed by its own comprehensive strength, which partially proves the hypothesis 4.

**Table 2.** Results of regressions of government subsidies on solvency in firm performance

VARIABLES	TDR	TDR 2	QR	QR 2
Sub	0.140(1.00)	14.051(1.00)	-0.000(-0.03)	0.908(0.49)
RTR	0.171*** (3.67)	0.003** (2.38)	-0.001(-0.31)	0.000(1.09)
IT	1.433*** (4.61)	0.002(1.29)	0.030*** (2.70)	-0.000(-0.55)
ROE2	-0.139(-1.46)	0.663(1.62)	-0.006(-1.45)	0.019(0.57)
TDR			-0.045*** (-4.01)	-0.114*** (-6.95)
NPM	-0.216** (-2.26)	-1.534*** (-2.77)	0.007(0.90)	-0.043(-0.75)
QR	-5.351*** (-2.63)	-2.247*** (-4.48)		
Constant	48.083*** (13.82)	47.161*** (18.82)	3.420*** (5.59)	7.241*** (9.09)
Observations	151	461	151	461
R-squared	0.556	0.454	0.326	0.299
F test	0	0	0.00279	0
r2_a	0.537	0.447	0.298	0.289
F	35.65	26.34	3.520	17.63

TDR, QR = new energy vehicle companies TDR 2, QR 2 = traditional industries  
Robust t-statistics in parentheses \*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Used the formula (2) (3) came up with table 2; from table 2 we can conclude that the solvency of new energy automobile enterprises comprehensively (combined with the TDR and QR, to the same indicators of the star sum/2 as a reference, for example: on the new energy automobile enterprises of RTR for 3 stars and 0 stars, so it is  $(3 + 0)/2 = 1.5$  stars, to three stars as significant, greater than 1 to less than 2.5 stars as Less significant, other than the case for non-significant; the same below) only and inventory turnover was

a significant relationship, may be with the accounts receivable turnover rate of the significant relationship is not so obvious, by the influence of other control variables smaller, so partially confirms the hypothesis 2; and the traditional industry comprehensively its relationship with all the control variables is not significant; but both new energy automobile enterprises and traditional industry for government grants are performance as insignificant, further confirming hypothesis 4;

**Table 3.** Results of regressions of government subsidies on operating capacity in firm performance

VARIABLES	RTR	RTR 2	IT	IT 2
Sub	0.180*** (2.82)	-497.918(-0.31)	0.193*** (4.23)	-480.921** (-2.27)
RTR			0.009(0.37)	0.002(0.45)
IT	0.096(1.66)	0.035(0.44)		
ROE2	0.066(0.41)	-142.214* (-1.66)	-0.007(-0.35)	2.647* (1.76)
TDR	0.042(1.26)	39.862* (1.84)	0.109*** (4.97)	1.453(1.05)
NPM	0.026(1.31)	234.897* (1.77)	0.043*** (3.71)	-6.011** (-2.32)
QR	-0.065(-0.32)	32.573(1.20)	0.273(1.44)	-1.407(-0.57)
Constant	0.436(0.22)	-1,476.623* (-1.83)	-0.818(-0.75)	60.383(1.11)
Observations	151	461	151	461
R-squared	0.078	0.419	0.362	0.019
F test	1.86e-06	0.419	0	0.0764
r2_a	0.0391	0.411	0.335	0.00612
F	6.900	1.009	15.73	1.918

RTR, IT = new energy vehicle companies RTR 2, IT 2 = traditional industries  
Robust t-statistics in parentheses \*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Using equations (4) and (5), Table 3 is derived; from Table 3, we can conclude that the operational capacity of new energy automobile enterprises in general (combined with RTR and IT, and the following is the same) may not be particularly significant in relation to the gearing ratio and net interest rate, and is not significant for the rest of the variables; and the traditional industry may not be significant for all the control variables; however, the new energy automobile enterprises have a significant relationship with government subsidies, and government subsidies Sub is significantly positive at the

1% level, which indicates that in general, the more government subsidies the sample enterprises receive, the better the performance of enterprises will be. And government subsidies Sub is significantly positively correlated at the 1% level, which indicates that the more government subsidies the sample enterprises receive, the better the operating capacity of enterprise performance, which fully supports Hypothesis 2; at the same time, the traditional industry is not significant for government subsidies, which also fully confirms Hypothesis 4.

## 5. Conclusion of the Paper

This paper is based on the panel data of new energy automobile enterprises and traditional industries in China's Shanghai and Shenzhen cities in 2018-2021, and adopts the multiple linear regression model to not only study the main effect of government subsidies on enterprise performance, but also test the effect of government subsidies on three different aspects of enterprise performance, and the empirical results are as follows: From the overall point of view, the enterprise performance of new energy automobile enterprises is more affected by government subsidies, which is significantly positively correlated at the 5% level, on the contrary, the traditional industries are not significantly correlated. From a general point of view, the enterprise performance of new energy automobile enterprises is affected by government subsidies, which is significantly positively correlated at 5% level, on the contrary, the traditional industry performance is not significant, indicating that at this stage, new energy automobile enterprises have a greater demand for government subsidies compared with the old enterprises, which shows that the new energy industry is not very stable nowadays, and also explains that the traditional industry is basically already deep-rooted in the development of our country, and has a small demand for subsidies. The same government subsidies for new energy automobile enterprise profitability and operating capacity of the government subsidies performance is

significant, the value of 5% and 1% of the following significant, while for the traditional industry for its performance is not significant; the two in the solvency of the unity of the performance of the non-significant.

## References

- [1] Yu F, Wang L, Li X. (2020) The effects of government subsidies on new energy vehicle enterprises: The moderating role of intelligent transformation. *Energy Policy*, 141:1-8.
- [2] Shen N, Deng R, Liao H, et al. (2020) Mapping renewable energy subsidy policy research published from 1997 to 2018: A scientometric review. *Utilities Policy*, 64:1-11.
- [3] Jiang Z.S., Xu C.H., (2023) Policy incentives, government subsidies, and technological innovation in new energy vehicle enterprises: Evidence from China. *Energy Policy*, 177: 1-8.
- [4] Shi L., Lin B., (2023) The dual-credit policy effectively replaces subsidy from the perspective of R&D intensity. *Environmental Impact Assessment Review*, 102.
- [5] Sun Y., Zhang Y., Su B., (2022) Impact of government subsidy on the optimal R&D and advertising investment in the cooperative supply chain of new energy vehicles. *Energy Policy*, 164:1-9.
- [6] Fan H.B., Xu C.Y. (2018) A study of the impact of government subsidies on firm performance. *Journal of Macro-Quality Research*, 7:1-6.