

Research on the Effect of Government Subsidy on the Value Creation Ability of Listed Companies

Changping Chen^{1,2}, Chia-Ching Cho^{1,*}

¹*Department of Accounting and Information Technology, National Chung Cheng University, Chiayi, Taiwan, Republic of China*

²*Business School, Yango University, Fuzhou, Fujian, China*

**corresponding author*

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Abstract: Fiscal subsidies are often used for economic recovery in special periods and to support specific industries or enterprises. But whether financial subsidies can play a substantial role for industry development and enterprise value enhancement has been questioned. In view of this, based on the research object of China's listed agricultural, forestry, animal husbandry and fishery companies, this paper discusses whether the government subsidy has a real and effective influence on the value creation ability of listed companies. Based on the setting of relevant control variables and constructed a multiple linear regression model, this paper uses multiple linear regression model to analyze the relationship between government subsidies and the value of listed companies. The results of the research are that the government subsidy has a significant negative correlation effect on the value creation ability of listed companies. However, the classification of government subsidies based on whether they are related to business activities does not affect the value creation ability of listed companies. It can be concluded from the research results that the state financial subsidy policy cannot play an effective role in improving the value creation ability of listed companies.

1. Background

According to the quarterly report for the first quarter of 2020, due to the impact of the COVID-19 epidemic, the performance of listed companies generally declined significantly. Many industries have been unprecedented impact, agriculture, forestry, animal husbandry and fishery are more severely damaged industries. In the process of social and economic recovery, the government used financial subsidies and other policies to support enterprises to resume work and production, in order to help enterprises overcome difficulties. The use of financial subsidy policy to help enterprises has

always been an important means of economic and industrial development in various countries. Except for special periods, the government supports the development of the industry by providing financial subsidies to specific industries, such as subsidies in the field of new energy vehicles and the photovoltaic industry, in accordance with national development strategies, industrial structure adjustment, or other specific purposes. Since 2005, China has provided huge subsidies to the new energy vehicle industry every year. The high subsidy policy has finally promoted the rapid development of the industry and the substantial increase in production capacity. China has also implemented a strong subsidy policy in the photovoltaic industry. In order to alleviate the adverse effects of the financial crisis that broke out in 2008, the Chinese government launched a subsidy project for the photovoltaic industry, thereby accelerating the rapid development of the photovoltaic industry. Subsidies can indeed promote the rapid development of the industry in the short term, but subsidies cannot control the pace and quality of the company's development. Subsidies can easily promote blind expansion and cause overcapacity. Enterprises are also prone to develop dependence on government subsidies, which results in the inability of enterprises to form core competitiveness. Therefore, whether the huge government subsidies can really play a positive role in promoting and enhancing the industry has caused people to think deeply.

At present, it is an important period for China's economic restructuring and industrial strategy upgrade. To complete the transformation and upgrading of the overall industry, the government must implement the cultivation of enterprises in the industry, especially the cultivation of listed companies that represent leaders in various industries. On July 30, 2019, the political bureau of the central committee of the communist party of China (CPC) proposed that improving the quality of listed companies should be given priority during a discussion on capital market work. By September 2019, the number of listed companies in China had reached 3,708, ranking among the top in the world. However, the overall quality of listed companies is not high and the development level lags behind that of European and American countries with developed capital markets. The quality evaluation system of listed companies is mainly composed of value creation ability, value management ability and value distribution ability. Value creation ability is the most important of the three abilities, and it is the cornerstone of the subsequent value management and value distribution. The value creation ability of listed companies is the ability to improve the business performance and capital appreciation of listed companies. In order to improve the quality of listed companies, the value creation ability of listed companies must be improved first.

Agriculture, forestry, animal husbandry and fishery are the basic industries related to the national economy and people's livelihood. Agriculture, forestry, animal husbandry and fishery are also key pillar industries supported by the state. The earliest subsidy policy of the country to agriculture started from the allowance for loss of fixed amount of machine farming in the 1950s. Since then, in different forms, the country has continued to provide the industry with continuous policy subsidies to implement the country's policies on agriculture, rural areas and farmers. In view of this, this article will take listed companies in agriculture, forestry, animal husbandry and fishery as research samples. This article attempts to explore whether government subsidies have a real and effective impact on the value creation ability of listed companies by using the government subsidies and related data of the sample companies in the past five years.

2. Literature Storing

In many studies on the impact of government subsidies on corporate R&D capabilities, there are mainly two positive and negative impact results. The positive effects are as follows. Bloom et al. pointed out through empirical analysis that government subsidies significantly increased the R&D investment of enterprises [1]. Hussinger pointed out that government subsidies are beneficial to enterprises' innovative R&D activities [2]. The negative and negative effects are as follows. Thomson used data from 25 OECD countries as a sample and found that government subsidies cannot increase corporate R&D investment [3]. Wu et al. empirically found that government R&D subsidies have no significant direct impact on strategic emerging industry product and process innovation [4]. Gong and Lu believe that government subsidies have no significant effect on the efficiency of technological innovation of enterprises [5].

In terms of the impact of government subsidies on company performance, most scholars believe that government subsidies will not have a positive effect on company performance, but a negative effect, or cannot have a long-term positive effect. Lin and Zhang believe that government fiscal and tax support has no significant impact on the company's operating performance [6]. Laursen and Salter look at the effect of subsidizing corporate debt. Subsidies improve the company's own solvency, but they cannot improve profitability [7]. Demir believes that the impact of government subsidies on company performance is different in the first and second years [8]. Yan et al. have empirically found that government subsidies make it easy for companies to rely on subsidy policies [9]. Lin believes that government subsidies have no significant impact on the export of enterprises [10]. Fan et al. believe that government subsidies can significantly increase the total factor productivity of agricultural enterprises [11].

In terms of the factors influencing the enterprise value creation ability, scholars at home and abroad believe that there are many factors influencing the enterprise value creation ability, and different factors have different positive or negative influences on the enterprise value creation ability. Xuan and Craig believe that there is a negative correlation between corporate capital structure and corporate value [12]. In the evaluation of enterprise value creation ability, domestic and foreign scholars have also carried out a wealth of research.

3. Theoretical Analysis and Research Hypothesis

3.1 The Mechanism of Government Subsidies' Influence on the Value Creation Capability of Listed Companies

Regarding whether government subsidies have a positive or negative impact on the company's business performance, research and development capabilities, and financing capabilities, the article has introduced the basic situation in the literature research, and there is no more authoritative or unified conclusion so far. The value creation ability of listed companies belongs to the comprehensive evaluation of multi-factors of enterprises and is restricted by many factors. The article mainly based on the following considerations on the impact of government subsidies on the value creation ability of listed companies. First, in terms of industry characteristics, subsidized industries generally have industries with weak basic investment construction or insufficient technological innovation capabilities or poor performance. Such industries have low starting points

and difficult development, so the government will provide policy support. Second, government subsidies are often used as subsidies for companies to make up for costs, the return of over-negative taxes, shortfalls in investment, and shortfalls in profits. Their use determines that the amount of the subsidy to the enterprise in practice is limited. Third, government subsidies, especially long-term government subsidies, in the development of industries and enterprises, will cause some enterprises to have a certain degree of dependent behavior, which cannot promote the promotion of industries and enterprises. Therefore, the article proposes the following assumptions.

Hypothesis 1: Government subsidies have a negative impact on the value creation capabilities of listed companies.

3.2 The Mechanism of the Impact of the Types of Government Subsidies on the Value Creation Ability of Listed Companies

China's early government subsidy accounting standards were the 16th accounting standard issued in 2006. In the original guidelines, government subsidies were uniformly classified, and all government subsidies received by the enterprise were included in the non-operating income of the enterprise. In recent years, many industry personnel and experts and scholars in academia have reported that non-operating income is an income item that an enterprise obtains from occasional activities and has nothing to do with the business activities of the enterprise. In reality, some government subsidies are items that are not related to the business activities of the enterprise. However, some government subsidies are closely related to the business activities of enterprises, such as cost expense subsidies, tax refunds, and research and development activity subsidies. Some subsidies and tax law support have continuous characteristics. In order to better reflect the different types of government subsidies and their economic characteristics in enterprises, the Chinese Ministry of Finance revised the accounting standards for government subsidies in 2016. Since 2017, government subsidies received by enterprises need to be in accordance with government subsidies. According to the actual characteristics, the government subsidies related to the business activities of the enterprise are included in "other income"; the government subsidies not related to the business activities of the enterprise are included in non-operating income. This division is nominally divided into two activities, one for business activities and the other for non-business activities. Does this type of classification of government subsidies based on the nature of the activity affect the value creation capabilities of listed companies? The article believes that the distribution of government subsidies among accounting subjects will cause the adjustment of the company's profit structure, especially between the operating profit generated in the daily activities that represent the operating capacity of the enterprise and the non-operating profit realized in the occasional activities that have nothing to do with the operating capacity. Adjustment of the company's structural relationship, but this adjustment of the structural relationship has little effect on the value creation capabilities of listed companies. Therefore, based on the above analysis, the article proposes the following assumptions.

Hypothesis 2: The types of government subsidies in accounting will not affect the value creation ability of listed companies.

4. Research Design

4.1. Sample Data Source

The article focuses on the following two points for data collection and collation.

First, the topic of the article is based on the empirical experience of listed companies in agriculture, forestry, animal husbandry and fishery, and discusses the impact of government subsidies on the value creation ability of listed companies; Whether the type of impact and government subsidies will affect the value creation ability of listed companies. Therefore, the article first collected and collated relevant data of 43 listed companies from China Agriculture, Forestry, Animal Husbandry and Fisheries (according to the 2012 industry classification standards of the CSRC) from the last five years of 2014-2018 from CSMAR (Guotai'an Financial Database).

Secondly, after the disclosure of the classification of government subsidies in the 2017 annual report, we manually collected the relevant data in the notes of the 43 annual financial statements of agriculture, forestry, animal husbandry and fishery from 2017 to 2018. After deducting the sample data with incomplete data, the final research sample was determined to be 205 data from 42 listed companies in agriculture, forestry, animal husbandry and fishery.

4.2. Models and Variables

In order to test Hypothesis 1, on the basis of drawing on existing research results, this article establishes a multiple linear regression model, as shown in Model 1 below.

$$\begin{aligned} EVA_TA_R_{it} = & \beta_0 + \beta_1 LnGS_{it} + \beta_2 LnAS_{it} + \beta_3 ROE_{it} + \beta_4 TAT_{it} \\ & + \beta_5 ALR_{it} + \beta_6 RGR_{it} + \beta_7 IA_TA_R_{it} + \varepsilon_{it} \end{aligned} \quad (1)$$

In Model 1, β_0 is the intercept term, β_i ($i = 1, 2, \dots, n$) is the model regression coefficient, i is the individual of the listed company in agriculture, forestry, animal husbandry and fishery; t is the time dimension. ε_{it} is the random interference term, where $i = 1, 2, \dots, n$; t is the time dimension.

The variables of Model 1 are shown in Table 1.

In order to test Hypothesis 2, on the basis of drawing on existing research results, this article establishes a multiple linear regression model, as shown in Model 2 below.

$$\begin{aligned} EVA_TA_R_{it} = & \lambda_0 + \lambda_1 LnOI_S_{it} + \lambda_2 LnNOI_S_{it} + \lambda_3 LnAS_{it} \\ & + \lambda_4 ROE_{it} + \lambda_5 TAT_{it} + \varpi_{it} \end{aligned} \quad (2)$$

In Model 2, λ_0 is the intercept term, λ_i ($i = 1, 2, \dots, n$) is the model regression coefficient, i is the individual of the listed company in agriculture, forestry, animal husbandry and fishery; t is the

time dimension. ϖ_{it} is the random interference term, where $i = 1, 2, \dots, n$; t is the time dimension.

The variables of Model 2 are shown in Table 2.

Table 1: Model 1 variable explanation.

Variable category	Variable name	Explanation
Explained variable	EVA_TA_R	Economic value added per unit of assets = EVA / average total assets
Explanatory variables	LnGS	Natural log of government subsidies = Ln (total annual government subsidies of the company)
Control variable	LnAS	Asset size = Ln (total assets at the end of the period)
	ROE	Return on net assets = net profit / average net assets
	TAT	Turnover of total assets = operating income / average total assets
	ALR	Asset-liability ratio = total liabilities at the end of the period / total assets at the end of the period
	RGR	Operating income growth rate = operating income growth amount / previous operating income
	IA_TA_R	Proportion of intangible assets = net intangible assets at the end of the period / total assets at the end of the period

Table 2: Model 2 variable explanation.

Variable category	Variable name	Explanation
Explained variable	EVA_TA_R	Economic value added per unit of assets = EVA / average total assets
Explanatory variables	LnOI_S	Natural log of other income (government subsidies)
	LnNOI_S	Natural log of non-operating income (government subsidies)
Control variable	LnAS	Asset size = Ln (total assets at the end of the period)
	ROE	Return on net assets = net profit / average net assets
	TAT	Turnover of total assets = operating income / average total assets

5. Empirical Results and Analysis

5.1. Descriptive Statistical Results and Analysis

The descriptive statistical results of Model 1 are shown in Table 3. Due to the overall deviation of the economic added value (EVA) of listed companies in agriculture, forestry, animal husbandry and fishery in China, most companies have negative values, resulting in an average economic value added of unit assets of -0.0357. In the industry, the government subsidies received by the company are unevenly distributed, so the maximum and minimum natural logarithm of the company's annual government subsidies is relatively large. 1.3285. Among the indicators of agriculture, forestry, animal husbandry and fishery, it is also worth noting that in the ROE, the average ROE is -0.0378, which means that the overall profitability of the industry is not good. The index of operating income growth rate is also wide in the industry. The minimum growth rate is -0.6192, while the maximum growth rate is as high as 2.4844, indicating that the development capabilities of listed companies in the industry are uneven. The average value of the proportion of intangible assets is 0.0561, indicating that China's listed companies in agriculture, forestry, animal husbandry and fishery are deficient in R&D investment, and the industry's R&D innovation ability is weak. Overall, due to the poor performance of the industry and the impact of R&D capabilities, the economic added value of unit assets in the industry is low.

Table 3: Descriptive statistics of Model 1.

Variable	N Statistic	Minimum Statistic	Maximum Statistic	Mean	Std. Error
EVA_TA_R	205	-1.8789	0.2888	-0.0357	0.1557
LnGS	205	9.9523	19.8781	16.6225	1.3285
LnAS	205	19.4777	24.7113	21.7876	0.9935
ROE	205	-6.8500	0.6236	-0.0378	0.5410
TAT	205	0.0828	1.6005	0.5204	0.3129
ALR	205	0.0539	1.2490	0.4380	0.2102
RGR	205	-0.6192	2.4844	0.1049	0.3782
IA_TA_R	205	0.0000	0.3736	0.0561	0.0601

The descriptive statistical results of Model 2 are shown in Table 4. A comparison of the natural logarithm of government subsidies related to business activities and government subsidies not related to business activities shows that government subsidies related to business activities have a larger change in maximum and minimum, but are less discrete than business Government subsidies unrelated to activities. From the average point of view, the company received government subsidies related to business activities higher than government subsidies not related to business activities. Several other variables have changed slightly with the adjustment of sample data, but the overall trend is the same as that of model one.

Table 4: Descriptive statistics of Model 2.

Variable	N Statistic	Minimum Statistic	Maximum Statistic	Mean	Std. Error
EVA_TA_R	84	-1.8789	0.1379	-0.0407	0.2159
LnOI_S	84	9.9523	19.8699	16.3698	1.5381
LnNOI_S	84	9.0503	17.7116	14.1064	2.0049
LnAS	84	19.5028	24.7113	21.9231	1.0574
ROE	84	-6.8500	0.4088	-0.0966	0.7913
TAT	84	0.0862	1.2303	0.5063	0.3114

5.2. Multiple Linear Regression Results and Analysis

The multiple linear regression results of Model 1 are shown in Table 5. The adjusted goodness of Model 1 after adjustment is 0.883, indicating that the overall model has a good fit, and the selected explanatory variables explain the explained variables to a higher degree. In the significance test of the regression equation, sig = 0.000, which shows that the linear relationship between the explained variable and the explanatory variable in Model 1 is significantly established on the whole. In terms of sequence correlation, the Durbin-Watson value = 1.410, which indicates that the sequence correlation between random error terms is relatively light.

Table 5: Summary of Model 1.

Model	R ²	Adjusted R ²	Std. Error of the Estimate	Change Statistics					Durbin-Watson
				R ² Change	F Change	df1	df2	Sig. F Change	
1	0.887	0.883	0.054	0.887	210.641	7	187	0.000	1.410

The variable test results in Model 1 are shown in Table 6. The collinearity statistics VIF of all variables are less than 2, indicating that the multicollinearity between the explanatory variables selected in the model is small, and the variable selection is more scientific. The explanatory factor of government subsidies is in t test, Prob. = 0.001, t test is significant at 0.01 level, and the regression coefficient is negative, which shows that there is a negative correlation between government subsidies and the value creation ability of listed companies. Research hypothesis 1 is established. Among the control variables, the last three variables failed the t test, indicating that the asset-liability ratio, operating income growth rate, and the proportion of intangible assets did not have a significant impact on the value creation ability of listed companies in agriculture, forestry, animal husbandry and fishery. The three control variables of enterprise size, return on net assets and total asset turnover rate have a higher significance in the t test.

The multiple linear regression results of Model 2 are shown in Table 7. The adjusted goodness of fit is 0.789, which shows that the overall model has a good fit, and the selected explanatory variables explain the explained variables to a higher degree. In the significance test of the regression equation, sig = 0.000, which shows that the linear relationship between the explained variable and the explanatory variable in Model 2 is significantly established overall. In terms of sequence

correlation, the Durbin-Watson value = 1.705, which shows that the sequence correlation between random error terms is very small.

Table 6: Coefficients of Model 1.

Items	Unstandardized Coefficients		standardization coefficients	T	Sig.	Collinearity Statistics	
	B	Standard error	β			Tolerance	VIF
Constant	-0.223	0.094		-2.380	0.018		
LnGS	-0.012	0.004	-0.103	-3.376	0.001	0.646	1.548
LnAS	0.017	0.005	0.100	3.338	0.001	0.670	1.492
ROE	0.269	0.008	0.938	33.765	0.000	0.780	1.283
TAT	0.028	0.014	0.054	2.015	0.045	0.843	1.187
ALR	0.033	0.022	0.041	1.519	0.130	0.808	1.237
RGR	0.002	0.011	0.006	0.214	0.830	0.884	1.131
IA_TA_R	-0.045	0.070	-0.016	-0.647	0.519	0.953	1.049

Table 7: Summary of Model 2.

Model	R ²	Adjusted R ²	Std. Error of the Estimate	Change Statistics					Durbin-Watson
				R ² Change	F Change	df1	df2	Sig. F Change	
2	0.810	0.789	0.032	0.810	37.603	5	44	0.000	1.705

Table 8: Coefficients of Model 2.

Items	Unstandardized Coefficients		standardization coefficients	T	Sig.	Collinearity Statistics	
	B	Standard error	β			Tolerance	VIF
Constant	-0.277	0.101		-2.747	0.009		
LnOI_S	-0.006	0.004	-0.128	-1.590	0.119	0.665	1.503
LnNOI_S	-0.002	0.003	-0.057	-0.774	0.443	0.796	1.256
LnAS	0.017	0.005	0.257	3.214	0.002	0.672	1.488
ROE	0.254	0.021	0.895	12.364	0.000	0.822	1.217
TAT	0.008	0.014	0.038	0.552	0.584	0.923	1.083

The variable test results in Model 2 are shown in Table 8. The collinearity statistics VIF of all variables are less than 2, which shows that the multicollinearity between the explanatory variables selected in the model is small, and the variable selection is more scientific. Two types of government subsidies, whether it is government subsidies for other income related to operating activities or government subsidies for non-operating income that are not related to operating activities, have not passed the t test, which shows that this classification of government subsidies

will not affect listed companies. Value creation ability has an impact, so research hypothesis 2 also holds. The three control variables are consistent with the first model, but in the new model, due to the adjustment of the explanatory variables and the adjustment of the sample size, the two control variables of the company's asset size and net asset return rate remain significant, but the total asset turnover failed to pass the t test.

6. Conclusions

Ecological-economic from China listed companies from 2014 to 2018 in the study of the data can be found that the government subsidies to the listed company value creation ability exists significant negative correlation, but in 2017 began to implement the government subsidy according to related to whether the business activities and a category will not affect the listed company value creation ability. From the empirical results of the control variables, the natural logarithm of total assets representing the size of the company, the return on equity representing the profitability of the company and the turnover rate of total assets representing the operating ability of the company have significant effects on the value creation ability of the listed company, which further validates the previous studies. However, according to the empirical research results of the data of agriculture, forestry, animal husbandry and fishery in recent five years, the asset-liability ratio representing the company's solvency, the operating income growth rate representing the company's development ability and the proportion of intangible assets representing the company's r&d ability cannot have a significant impact on the value creation ability of listed companies.

About government subsidies in the contribution of the article, other aspects of the listed companies (such as performance, research and development ability, the ability of financing and so on), the influence of domestic and foreign scholars study more, but less study on the influence of the listed company value creation ability, especially based on the research of ecological-economic, this paper studies further enrich the research content of this field. After the revision of China's accounting standards in 2016, there is little discussion on the impact of government subsidies on listed companies according to their economic nature. In this paper, the discussion on the impact of government subsidies on the value creation ability of listed companies can be supplemented to some extent. However, due to the influence of industry characteristics and sample data, this paper only makes the above conclusions on the impact of government subsidies on the value creation ability of listed companies based on the empirical experience of China's agricultural, forestry, animal husbandry and fishery data from 2014 to 2018.

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