

Research on the government guide fund to promote local economic growth in China

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Abstract: The government guidance fund is an important measure to promote regional innovation and economic development. In order to analyze the role of government guidance funds on regional economic development, this paper uses the data of 30 provinces in China from 2010 to 2020, and uses the DID model to analyze the impact of GGF on local economy. The results show that GGF has a significant effect on regional economic growth and passes parallel trend test and placebo test. Secondly, it analyzes the operating mechanism of GGF and its three stages of development from 2008 to now. In addition, this study also analyzes the significance of GGF and the current difficulties. In general, this study analyzes the government guidance fund and provides reference opinions and suggestions for its development.

1. Introduction

Starting from around 2000, the Chinese government guidance Fund has grown rapidly in scale and continuously enhanced its support for innovative enterprises. According to the "Special Research Report on Government Guidance Funds in 2021" released by the China Investment and China Research Institute, by the end of 2021, the cumulative scale of China's government guidance funds has reached 2,466.6 billion yuan, accounting for 2.2% of the national GDP that year. In theory, government guidance funds have two characteristics that make it possible to have a positive impact on the innovation of key core technologies. First, the government guidance fund can guide social funds to flow to strategic emerging industries and key core technology fields, so as to alleviate the financing constraints faced by the invested enterprises in the process of key core technology innovation; Second, the risk of failure of key core technology innovation is greater than that of general technology innovation, but the government-guided fund is non-profit, generally supporting the risk compensation of private capital and the government profit transfer mechanism, which makes it more likely to tolerate the risk of innovation failure than the general venture capital fund [1-3].

A government guide fund is a fund funded or guaranteed by the government to promote the development of a specific field or industry. These funds are usually used to support scientific and technological innovation, promote economic growth, attract investment, improve industrial competitiveness and other goals. Different countries and regions may have their own government guidance fund programs [4-5].

Apart from the operation mechanisms of GGFs, extant studies focus on exploring the opportunities

and challenges associated with the establishment of the GGFs [6]. Through the empirical analysis of the pilot of GGF to regional economic development, this study studies how GGF can promote regional economic development and urban innovation. The innovation of this study is mainly in two aspects: First, the relevant research only makes theoretical analysis of GGF, and lacks empirical analysis. Second, a large number of studies only analyzed a single GGF, while this study summarized and analyzed GGF microscopically and macroscopically in general. This study aims to explore how the inconsistencies of GGF subjects lead to conflict [7], and further study the corresponding issues in the investment process. Therefore, this essay aims to answer the following research questions:

- (1) Operation mechanism and development history of GGF
- (2) What is the effect of GGF on local economy?
- (3) The possible effects of GGF on enterprises and cities and the difficulties they face.

2. Introduction to GGF

2.1 GGF Operating mechanism

The existence of market failure in the financing market creates a reasonable rationale for the GGFs [8-9]. GGF has six operating mechanisms: (1) Sources of funds: The sources of funds of GGF mainly include government grants, state-owned capital injection, issuance of bonds, introduction of social capital and other ways. The government usually allocates funds as initial capital, followed by the introduction of additional funding sources to ensure the operation and development of the GGF. (2) Government guidance: The GGF's name contains "government guidance", which means that the government plays an important role in the establishment and operation of the GGF. The government is responsible for establishing the guiding document of GGF, clarifying GGF's investment direction, key areas, etc., and providing policy and legal support for GGF. (3) Investment scope: GGF mainly invests in projects in strategic emerging industries, high-tech industries and other important fields. These projects are generally considered important for national economic development and technological progress, but it is difficult to attract pure market investment due to high risks or insufficient funds. (4) Investment management: The operation of GGF is usually responsible for professional management institutions or fund management companies. These agencies are responsible for screening investment projects, conducting due diligence, developing investment plans, and overseeing the implementation and operation of projects. (5) Long-term investment: GGF's investment strategy is generally long-term oriented, focusing on the long-term development of strategic industries and key technology areas. This is different from traditional short-term speculative investment. (6) State-owned background: GGF is usually established or participated in by the government, so it has a state-owned background to a certain extent. This also means that GGF may consider national strategy and industrial policy factors when making investment decisions.

2.2 Development stages of the GGFs in China

The GGFs in China have experienced three stages. Began in twenty century which was an established stage with all policies forming (Stage 1: Establishment stage). From 2008 to 2016, it experienced a period of rapid development stage (Stage 2: Rapid development stage), and a large number of GGFs are being established to involve in investments. In addition, a continued development stage started in 2016 until now (Stage 3: Continued development stage).

2.2.1 Establishment stage (beginning of twenty century)

In the 21st century, the Chinese government has increased investment in the guidance fund, which

has become an important tool to promote innovation, develop strategic emerging industries and improve the national level of science and technology. In 2000, China set up a national key research and development program and launched a series of large-scale scientific and technological research and development projects [10-11].

2.2.2 Rapid development stage (2008-2016)

During this period, the Chinese government established a number of industry guidance funds to support strategic emerging industries such as new energy, new materials, biomedicine, energy conservation and environmental protection. For example, in 2014, China established a RMB1 billion "Industrial Innovation Guidance Fund" to support the development of strategic emerging industries. In addition, government guidance funds have increased support for start-ups and high-tech enterprises and set up a number of venture capital funds to support innovative enterprises. For example, China has established a RMB100 billion "National SME Development Fund" to support smes' innovation and development [12].

2.2.3 Continued development stage (2016-)

The Chinese government has made clear the strategic positioning of innovation-driven development in the 13th Five-Year Plan, and the guidance fund is an important financial tool to support innovation and industrial upgrading. During the 13th Five-Year Plan period, the Chinese government increased funding for scientific and technological innovation, and promoted the implementation of a number of major scientific and technological projects [13-15].

3. Research methods

3.1 DID Model

We built a DID model to analyze the role of government-guided fund reform. The model is shown as follows:

$$GDP_{i,t} = a + \beta_1 GGF_{i,t} + \gamma Controls_{i,t} + u_t + \lambda_i + \varepsilon_{i,t} \quad (1)$$

The reform province is assigned a value of 1 in the implementation year and later. Otherwise, it is assigned a value of 0. $Controls_{i,t}$ is a series of control variables. u_t and λ_i represent the fixed effects of year and province respectively, and $\varepsilon_{i,t}$ is the disturbance term. The subscripts i and t represent provinces and years, respectively.

3.2 Description of Variables

The explained variable. This paper uses the GDP level of each province to measure its economic development.

Explanatory variables. According to the People's Bank of China in Shanghai, Jiangsu and other 11 provinces (municipalities) to promote the credit asset pledge reloan pilot as a policy variable, of which Shandong and Guangdong in 2014 to implement the pilot, the other 9 provinces (municipalities) in 2015 to carry out the pilot.

Control variables. This paper uses total factor productivity (TFP) to measure regional productivity. Clean energy as a share of energy production (CE) measures the regional energy mix; Local financial expenditure on science and technology (ST) measures the level of regional science and technology; The ratio of total imports and exports to GDP (IE) measures the degree of opening-up.

3.3 Data Sources

The study used data from 30 provinces and cities in China from 2010 to 2019. Data are from the National Bureau of Statistics, CSMAR, China Environmental Statistical Yearbook, China Energy Statistical Yearbook and provincial statistical yearbooks.

4. Empirical results

4.1 Basic Regression

First, the model passes the Hausmann test, indicating that fixed effects should be used. Model (1) in Table 1 is the regression result of GGF on GDP under the dual fixed effect of individual and time point, which is significant at the significance level of 1%. In order to avoid endogeneity caused by missing variables, control variables were added to model (2) for regression, and the regression results were still significant.

Table 1: GGF regression results

VARIABLES	GDP	
	(1)	(2)
GGF	0.7181*** (0.1179)	0.3411*** (0.0785)
TFP		0.0246 (0.0669)
CE		0.8080*** (0.2906)
ST		0.0059*** (0.0003)
IE		0.5192** (0.2178)
Constant	1.4014*** (0.0909)	0.7509*** (0.1453)
id	yes	yes
year	yes	yes
Observations	300	300
R-squared	0.604	0.853

4.2 Parallel trend test

From Fig. 1, we can clearly see that there was no significant difference between the experimental group and the control group before the reform, which satisfied the quasi-natural experiment hypothesis, and the reform still had a strong effect after many years.

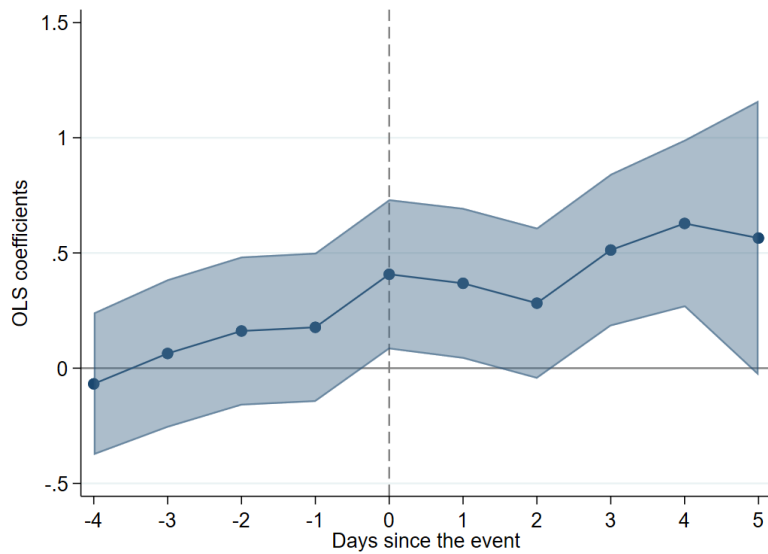


Figure 1: GGF parallel trend results

4.3 Placebo Test

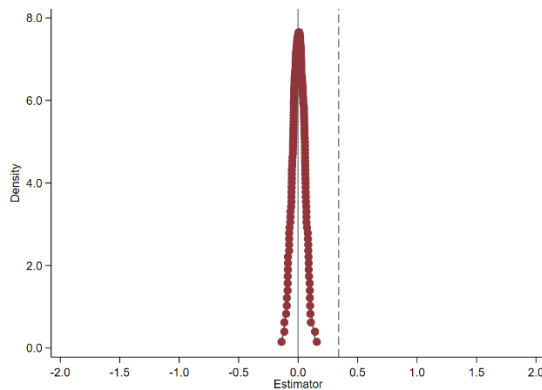


Figure 2: Placebo Test

In order to ensure that the experiment was a natural randomized experiment, we also used the placebo test, which was repeated for a total of 200 times. The results were shown in Fig 2, and the T-value of almost no regression was greater than that of the true regression coefficient in Figure 2.

5. Function analysis of GGF

5.1 Meaning of GGF

First, we will promote scientific and technological innovation. The government guidance fund provides financial support for scientific and technological innovation and encourages enterprises and research institutions to invest more resources in research and development and technological innovation. This will help promote the development and application of new technologies, improve the country's scientific and technological level, and enhance economic competitiveness. Second, we will support strategic emerging industries. Government guidance funds have played a key role in the cultivation and development of strategic emerging industries. By investing funds and resources, the government can help emerging industries overcome difficulties in development, speed up

development, promote the formation of related industrial chains, and promote industrial upgrading. Third, support for entrepreneurship and innovation. Government-guided funds have provided financing channels and support for entrepreneurs and innovative enterprises, reduced start-up risks and encouraged more people to engage in entrepreneurship and innovation. This will help foster an innovative and entrepreneurial ecosystem and promote the development of an entrepreneurial culture. Fourth, economic restructuring. The government guidance fund can play a guiding role in economic restructuring, encourage the transfer of resources to high value-added industries and technology-intensive industries, and help China's economy achieve sustainable development .

5.2 GGF faces difficulties

Capital size and efficiency. Government-guided funds usually require huge capital investments, and efficiency and return on investment are not always guaranteed. Managing large funds requires efficient enforcement and supervision to ensure transparency and rationality in the use of funds.

Market distortion. The intervention of government guidance funds may lead to market distortions and affect the efficiency of resource allocation. Investment decisions of government guided funds may be influenced by policy and political factors, rather than solely based on market needs and commercial logic.

Risk management. Investment risks are high because government-guided funds tend to invest in high-risk, high-tech sectors. It is necessary to manage risks properly to avoid financial losses caused by investment failures.

Excessive competition in the industry. The investment of government-guided funds may lead to excessive competition in some industries, resulting in overcapacity and falling prices, affecting the healthy development of the industry.

Potential corruption risks. Government-guided funds involve large amounts of money and projects, which can be exposed to the risk of corruption and improper transfer of benefits. Supervision and preventive measures need to be strengthened to ensure the lawful and compliant operation of the fund.

Balance with market mechanisms. The intervention of government-guided funds should be balanced with the market mechanism, avoid over-reliance on government intervention, and rely on the innovation ability of the market and enterprises to encourage market competition and promote the optimal allocation of resources.

Strategic adjustment and long-term planning: The development of government-guided funds requires long-term planning and strategic adjustment, because the economy and industrial development are constantly changing, and policies need to be timely adjusted to meet new challenges and opportunities .

5.3 Related problems in the investment process

Project selection. The government guide fund needs to choose among many projects, so the scientificity and accuracy of project selection is particularly important. The government should establish a scientific project evaluation and screening mechanism to ensure that projects with good prospects and sustainable development potential are selected.

Investment criteria. The government guidance fund needs to clarify the criteria and direction of investment. Investment projects should be consistent with the national economic and industrial policies, in line with the national development strategy and planning.

Transparency and fair competition. The government guide fund should establish transparent decision-making and investment procedures to ensure fair competition and prevent the transfer of benefits and corruption.

Risk management: The projects that the government guides the fund to invest in May involve high

risks and uncertainties, so it is necessary to establish an effective risk management mechanism to reduce potential risks and ensure the safety and robustness of the fund.

Monitoring and evaluation. The government guidance fund needs to establish an effective supervision and evaluation mechanism to monitor the use of funds and the progress of projects, find problems in time and take measures to solve them.

Industrial policy impact. The investment of government-guided funds should be coordinated with industrial policies to avoid frequent changes in policies and inconsistent investment directions, leading to inefficiency of fund investment.

6. Conclusion

In this study, we explore the development of GGF in China. Firstly, the dual attributes of "policy" and "marketization" of GGF are demonstrated theoretically, and then the development path of GGF from the immature stage with limited regulation to a series of mature stages is clearly explained. The second is the impact of GGFs on local economy. Third, study the potential challenges and how these challenges manifest themselves in the specific operation of the GGF. Based on this, this study provides some reference opinions and suggestions for the policy formulation of GGF.

First, risk sharing. Government guidance funds usually involve the investment of government funds, so risk sharing is inevitable. The government attaches great importance to the project through capital investment, and at the same time, it shares risks with the enterprise to balance the interests of the government and the enterprise.

Second, we need to promote cross-departmental cooperation. GGF's operation involves the cooperation of multiple government departments and agencies, which promotes coordination and cooperation among governments. Government guidance funds need to be coordinated across departments to ensure policy consistency and effectiveness.

Third, establish an evaluation mechanism. Establish GGF's performance evaluation mechanism, regularly evaluate GGF's investment effect, timely find problems and deficiencies, and provide reference for future improvement.

Fourth, encourage innovation. The GGF can encourage the development of innovative projects, especially in strategic emerging industries and high-tech fields, and promote scientific and technological innovation and industrial upgrading.

References

- [1] Shen, T. (2022) *Research on the development status and thinking direction of Chinese Government Guide Fund*. 36, pp 23-25.
- [2] Li, J. (2017). *Research on financing guiding role of government in venture capital based on economic analysis model*, 28, pp. 1219–1222.
- [3] Gao, X. (2018). *Research on Local government industry guidance Fund -- Take City X as an example*. [online]. Available at: <https://www.wanfangdata.com.cn> [Assessed 2018]
- [4] Zhang, Y., Mayes, D. (2018). *The performance of governmental venture capital firms: A life cycle perspective and evidence from China*, 48, pp. 162-185.
- [5] Brander, A., Du, Q., Hellmann, T. (2015). *The Effects of Government-Sponsored Venture Capital: International Evidence*, 19, pp. 571–618.
- [6] Yang, S., Ma, S., Lu, J. (2021). *Can government venture capital guidance funds promote urban innovation? Evidence from China*. *Growth and Change*, 53, pp. 753-770.
- [7] Gong, Y., Li, P., Shen, Z. (2020). *Research on operating efficiency of government-industry guidance fund*. [online]. Available at: https://www.scirp.org/html/6-1502048_98123.htm [Assessed 2020]
- [8] Xu, J., Yu, L., Gupta, R. (2020). *Evaluating the performance of the government venture capital guiding fund using the intuitionistic fuzzy analytic hierarchy process*. 12, 6908.
- [9] Lv, B. (2021). *Development course and direction of government guide fund*. [online]. Available at: <https://www.cnki.net> [Assessed 2021]

- [10] Jiang, D., Wang, T., Jiang, S., Dong, R., Zhang, Z. (2021). *Research on regional equity market helping government guide fund withdrawal*. [online]. Available at: <https://www.cnki.net> [Assessed 2021]
- [11] Cao, J. (2011). *Research on Risk Management of Chinese government guide Fund*. [online]. Available at: <https://www.cnki.net> [Assessed 12. 4. 2011]
- [12] Wang, Y. T., Wang, R. J., Zhang, Y. (2021). *Research on Government Guide Fund Supporting the development of strategic Emerging Industries—Taking Foton Guide Fund as an example*, 23, pp. 73-77.
- [13] Bertoni, F., Týkvová, T. (2015). *Does governmental venture capital spur invention and innovation? Evidence from young European biotech companies*. *Research Policy*, 44, pp. 925-935.
- [14] Li, X. (2016). *The research of operation mode of inner mogolia government guiding fund*. [online]. Available at <https://www.cnki.net> [Assessed 2016].
- [15] Lu, Y., Tian, Z. Buitrago, G. (2020). *Evaluation and selection of Chinese government venture capital investment projects: A research based on analytic hierarchy process and intuitionistic fuzzy set–technique for order of preference by similarity to ideal solution method*. [online]. Available at: wileyonlinelibrary.com/journal/mde [Assessed 22 .11. 2020]