

## Article

# Research on the Influence of Government-Guided VC Funds on Regional Economic Development

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**Abstract:** Using data from the Qingsike Private Equity Database, in this paper, we systematically examine how government policy-guiding funds impacted regional economic development in China from 2010 to 2021. An empirical analysis confirms that government-guided funds have a significant positive effect on regional economic growth, particularly in less affluent areas. Additionally, we found that the level of venture capital marketization and industrial structural upgrading mediate the relationship between policy-guiding funds and regional economic growth. These findings suggest that government policy-guiding funds foster regional economic advancement by enhancing market dynamism in the venture capital sector and optimizing industrial structures. A further analysis of moderating effects reveals that the effectiveness of policy-guiding funds is significantly influenced by government intervention and regional marketization levels. In highly marketized regions, government-guided funds demonstrate a stronger economic stimulus effect. However, excessive government intervention can disrupt efficient market operations, thereby weakening the positive impact of the funds. These findings underscore the importance for policymakers to design and implement policy-guiding funds while carefully balancing the interplay between marketization and government intervention to achieve optimal outcomes.

**Keywords:** government-guided funds; regional economic development; industry structure; risk investment market



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## 1. Introduction

Government-guided equity investment funds, often referred to as guidance funds, are policy-driven financial instruments designed to support strategic economic goals. These funds primarily channel investments into venture capital institutions, with the government taking a leading role or actively participating in the fundraising process.

In China's policy framework, the earliest formal definition of guidance funds dates to the 2008 *Guiding Opinions on the Standardized Establishment and Operation of Venture Capital Guidance Funds*, jointly issued by the National Development and Reform Commission, the Ministry of Finance, and the Ministry of Commerce. This document defines guidance funds as government-initiated, policy-driven investment vehicles that operate according to market principles.

Broadly speaking, government investment funds are not solely focused on promoting innovation, entrepreneurship, and the growth of small and medium-sized enterprises. Their objectives extend to include industrial upgrading and transformation, infrastructure development, and the provision of public services.

Government-guided funds mainly have the following characteristics:

**Market-Oriented Operation:** Although the government plays a leading role in establishing guidance funds, government-guided funds usually adopt a market-driven operational strategy. The government does not directly manage the operations of venture capital management. Instead, it participates as a limited partner and refrains from interfering in the fund's investment decision-making processes.

**Policy-Focused Objectives:** Unlike conventional funds that primarily pursue economic returns, government-guided venture capital (VC) funds prioritize the implementation of policy objectives. These funds aim to achieve broader economic benefits that align with policy goals while ensuring reasonable financial returns.

**Risk and Benefit Sharing:** Government-guided funds adhere to the principle of shared risks and shared benefits. While they fall under the category of private equity investment funds, they are fundamentally different from traditional private equity funds in terms of their objectives and operational principles.

In China's current economic landscape, government-guided funds have become a crucial instrument for spurring economic growth and advancing industrial transformation. As of the end of 2023, China had established 2086 government-guided funds, with a target scale of approximately CNY 12.19 trillion and a subscribed scale of around CNY 7.13 trillion. This impressive growth highlights the expanding influence and importance of these funds, underscoring their pivotal role in supporting regional economic development and fostering long-term economic sustainability.

As China's venture capital industry matures under increasingly sophisticated regulations, a central focus is understanding how government-guided venture capital (VC) funds can maximize their economic impact. These funds, through market-oriented operations, allow the government to actively engage with the venture capital sector. They not only provide financial support but also foster innovation, entrepreneurship, and the commercialization of scientific and technological advancements.

Additionally, with the rapid development of China's venture capital industry and the strong backing of government policies, government-guided VC funds serve a dual mission: driving economic growth and facilitating industrial upgrading. These funds highlight the market's pivotal role in resource allocation while underscoring the government's active involvement in guiding and regulating the market to ensure sustainable development.

In this paper, we empirically examine the impact of government-guided venture capital funds on regional economic development, with a particular focus on their moderating mechanisms. Specifically, we investigate how marketization processes and the degree of government intervention influence the effectiveness of these funds. Through an in-depth analysis, this study aimed to uncover the unique value and operational mechanisms of government-guided VC funds, providing insights into their role in regional economic growth.

Our findings not only enhance the understanding of the complex role government-guided funds play in a market economy but also offer policymakers practical guidance for crafting more precise and effective policy measures. In doing so, we aim to ensure that government-guided funds strike an optimal balance between market autonomy and government intervention, ultimately fostering high-quality and sustainable economic development.

The remainder of this paper is organized as follows: Section 2 offers a review of the relevant literature, Section 3 outlines the data and variables used in the analysis, Section 4 presents the empirical findings, and Section 5 concludes with the key findings and their implications.

## 2. Literature Review

In this chapter, we review the relevant literature from three key perspectives: the operational model of government-guided funds, their performance, and their economic effects.

### 2.1. The Operation Mode of Government-Guided Funds

In the early years of the United States, the Small Business Innovation Research (SBIR) Program primarily utilized long-term, low-interest loans and financing guarantees to support the development of start-ups. [Lerner \(1999\)](#) emphasized that the program played a pivotal role in fostering the growth of small businesses in the U.S. However, [Koppel \(1999\)](#) argued that the management framework for small business innovation investment companies required further strengthening from a government oversight perspective.

In addition to long-term, low-interest loans, the government has implemented various other forms of venture capital market intervention. Notable examples include the U.S. Small Business Investment Company (SBIC) following its 1994 reform, Israel's YOZMA program established in 1993, and Australia's Innovation Investment Fund (IIF) introduced in 1997. [Cumming \(2007\)](#) noted that the Australian IIF program differs from other government intervention models in Canada, the United Kingdom, and the United States by emphasizing a strong partnership between the government and the private sector. The study also found that the Australian IIF program effectively promotes investment in start-ups, early-stage companies, and high-tech ventures, offering both regulatory support and value-added advice to investees.

Subsequently, Chinese scholars joined the discussion, with empirical analysis emerging as the dominant approach. For example, [C. Zhao et al. \(2005\)](#) compared the models of government-guided funds in China with those in the United States. They found that, initially, the integration of government capital and social capital in China's government-guided funds lacked flexibility and close coordination. However, this situation improved over time with the introduction of a limited partnership system. The authors argued that China's government-guided funds had learned from international experiences and evolved into a more diversified operational model.

In contrast, [Pang and Zeng \(2011\)](#) argued that the diversified operational model might hinder professional management, suggesting a shift toward a more streamlined and unified approach. Similarly, [Guo and Zhao \(2007\)](#) identified several issues with China's government-guided funds when compared to their foreign counterparts, including flaws in the design of the mechanisms, excessive government intervention, and insufficient fund management capabilities.

### 2.2. Performance of Government-Guided Funds

[Koppel \(1999\)](#) evaluated the management mechanisms of the U.S. Small Business Administration (SBA) and examined the performance of the Small Business Investment Company (SBIC) program across three dimensions: the appointment of supervisors, supervision and coordination, and audit reports. They argued that U.S. regulatory agencies, such as the National Development Council, need to strengthen the oversight of government-guided funds used for venture capital. Additionally, they emphasized the need to continually improve the management system and legal framework related to these funds, and to establish more effective supervision and incentive mechanisms.

[Org \(2004\)](#) stressed that the guiding role of government-guided funds should be incorporated into the performance evaluation index system when assessing Israel's YOZMA Fund. He developed a performance index system that includes factors such as the guiding role of the fund, the involvement of the leading institution, the exit strategy for the fund, the listing of investment projects, and the total size of the guidance fund.

Schilder (2006) argued that government-guided funds, being policy-oriented, differ from regular venture capital firms in their project screening, operational management, and investment decision-making processes. He suggested that German government-guided funds should provide more post-investment value-added services, such as helping enterprises plan their development trajectories, offering legal and financial consulting services in a timely manner, and utilizing government resources to support enterprises when necessary.

Munari et al. (2015), in his study of the UK's Enterprise Investment Scheme (EIS) and Venture Capital Trust (VCT), noted that an important purpose of government-guided funds is to promote the development of key regional industries. He argued that the local investment aspect should be a key criterion in evaluating fund performance. Munari further suggested that the regional development factor should be incorporated into performance evaluations and that regional disparities should be considered when establishing and investing in government-guided funds.

In China's market, L. Sun (2018) highlighted that government-guided funds often prioritize policy guidance and support for industrial upgrading, innovation, and regional entrepreneurship, but they do not give sufficient attention to economic returns. B. Zhao (2020) argued that the positioning of government-guided funds plays a crucial role in how their performance is evaluated, leading to varying evaluation outcomes that lack comparability. Cai (2020) discussed strategies for optimizing the management of government-guided funds in terms of policy implementation and economic development. He emphasized that the establishment and management of these funds should align with regional development plans, economic development levels, and characteristics to avoid the misallocation of financial resources. Yu (2021) found that in the mid- and late-stage investments of enterprise development, government-guided funds had no significant impact on improving innovation performance. As a result, Yu argued that these funds should focus on investing in the early stages of enterprise development to better support technological innovation and achieve policy goals.

### 2.3. *The Impact of Government-Guided VC Funds on the Economic Development*

As an important means for the government to participate in economic development, the impact of government-guided funds on economic growth has been a focal point of academic research. Existing studies have explored the role and effects of government-guided funds from various perspectives. For example, Lerner (2002) provides the theoretical foundation for the positive impact of government-guided funds on economic growth, arguing that these funds can promote innovation and economic development by stimulating private capital participation. This view is supported by the empirical research of Cheng et al. (2021), who demonstrate that government-guided funds can effectively boost venture capital activities, contributing to economic growth. However, they also highlight that competition between local governments may reduce the vitality of the local venture capital market, thereby weakening the overall effect of government-guided funds on regional development.

From the perspective of regional development, Q. Zhang (2021) emphasizes the importance of regional differences in scientific and technological innovation levels for the policy effectiveness of government-guided funds. Their research suggests that the successful implementation of government-guided funds requires alignment with the specific regional context, particularly in terms of innovation capabilities, to ensure the effectiveness and adaptability of the policy. Y. Li and Li (2023) argues that in western regions of China, government-guided funds have been particularly effective in fostering the development of the Guanzhong Plain and Chengdu–Chongqing urban agglomerations. The strengthening of urban agglomerations has further amplified the impact of these policies.

[Bottazzi et al. \(2008\)](#) argue that the primary goal of government-guided funds is to implement government industrial policies, rather than solely pursue financial returns. This policy-driven investment strategy may lead government-guided funds to be less proactive than private venture capital institutions in providing value-added services to the enterprises they invest in. Consequently, while promoting industrial development, government-guided funds should also focus on improving the operational efficiency and market competitiveness of the enterprises they support. [Alperovych et al. \(2015\)](#) conducted a comprehensive analysis of the operational efficiency of 515 Belgian venture capital institutions that received investments from various types of government investments. Their findings revealed that the productivity of companies invested by government-backed venture capital institutions significantly declined within three years after receiving investment, suggesting that government-guided funds may face limitations in enhancing corporate operational efficiency. This underscores the need for government-guided funds to refine their investment strategies and service models.

The literature also examines the impact of government-guided funds on the upgrading of industrial structures. For instance, [Colombo et al. \(2016\)](#) found that government-guided funds can effectively expand financing channels for enterprises and optimize the government's investment model. Unlike traditional direct government investments, government-guided funds create a diversified investment structure by attracting financial institutions, private capital, and overseas investments. [Gu \(2014\)](#) further emphasized the fiscal capital leverage effect of government-guided funds in the rationalization and upgrading of industrial structures. This effect is particularly significant when startup technology companies face insufficient capital supply. In such cases, government-guided funds can provide the necessary financial support to drive industrial transformation and innovation. [Shi et al. \(2016\)](#) analyzed the guiding effect of government-guided funds from a macro perspective, focusing on their ability to attract social capital into the venture capital field. [Cheng and Wang \(2018\)](#) took a micro-perspective, exploring how government-guided funds promote corporate innovation by providing financial support and fostering an environment conducive to innovation. [Dong et al. \(2018\)](#) found that government-guided funds leverage their government endorsement and informational advantages to help venture capital institutions identify and select companies with high innovation capabilities and development potential. Additionally, [S. Li et al. \(2020\)](#) discovered that government-guided funds tend to invest in companies with high levels of information asymmetry, rather than merely pursuing high-risk investments. This indicates a more strategic investment approach that focuses on addressing market failures and supporting long-term growth.

The empirical research conducted by [L. Wang and Dang \(2008\)](#) demonstrates a positive correlation between government venture capital investment and both the export volume of high-tech products and the total industrial output value of high-tech industries. This finding highlights the significant role equity investment funds, particularly government-guided funds, play in fostering the growth of high-tech industries. Similarly, [Lv and Zhao \(2017\)](#) identified a positive relationship between the scale of private equity capital and the business income of strategic emerging industries, further underscoring the importance of equity investment funds in driving industrial development. [F. Chen et al. \(2015\)](#) examined the relationship between industrial investment funds and industrial structure adjustment from the perspectives of capital structure optimization and industrial balance. Their study argued that industrial investment funds not only raise capital to support industrial growth but also contribute to optimizing capital structures and enhancing industrial frameworks by targeting specific sectors. Through an empirical analysis using the Probit model, they found that mergers and acquisitions (M&A) funds promote industrial structure adjustment by encouraging specialization, while financing funds facilitate industrial diversification.



#### 2.4. Research on the Marketization of Government-Guided Funds and Government Intervention

The literature has also explored government intervention as a crucial tool for promoting economic development and industrial upgrading. For instance, [Lerner \(1999\)](#) studied the role of the government as a venture capitalist, particularly focusing on the long-term impact of the Small Business Innovation Research Program (SBIR). His research provided an important perspective for understanding how government-guided funds foster innovation and enterprise growth. [Koppel \(1999\)](#) analyzed the challenges faced by the government in managing venture capital funds and offered preliminary insights into the role and effects of government intervention in the venture capital market.

In China, [W. Zhang et al. \(2010\)](#) examined the influence of local government investment behavior on long-term economic growth, providing a theoretical foundation for understanding the role of government-guided funds in fostering regional development. Their study emphasized that government-led investment can serve as a catalyst for economic expansion, particularly in underdeveloped regions. Similarly, [Ma and Sun \(2005\)](#) analyzed the impact of government spending on economic growth, highlighting the significant contribution of government-guided funds in stimulating economic activity and addressing market inefficiencies. [Chao and Ren \(2008\)](#) conducted an empirical study on the interplay between private and government investment during periods of economic transition. Their findings suggest that government-guided funds play a critical role in adapting to market-oriented reforms, facilitating the shift from a state-dominated economy to one driven by private capital and entrepreneurship.

[Yan et al. \(2016\)](#) investigated the agency problem and the unique nature of venture capital, emphasizing how government-guided funds can support small and medium-sized high-tech enterprises in overcoming financing constraints. Their research highlights the role of these funds in addressing information asymmetry and reducing financing risks faced by early-stage enterprises. [L. Sun \(2018\)](#), through a case study of Shandong Province's guidance funds, identified imbalances between government intervention and market mechanisms. He argued that the establishment of guidance funds could mitigate these imbalances by enhancing the efficiency of fiscal fund allocation and promoting the sustainable development of the venture capital market. Similarly, [S. Chen et al. \(2017\)](#) analyzed the historical background and evolutionary trajectory of government-guided funds, outlining their two core functions: facilitating the matching of factor resources—such as capital, technology, and talent—and serving as a risk-prevention mechanism to stabilize the venture capital ecosystem.

However, most of the existing literature primarily focuses on qualitative analysis, and there is a relative scarcity of quantitative studies on government-guided funds. Additionally, there are few studies that directly explore whether guidance funds can effectively promote economic growth. This paper aims to bridge this gap in the literature by providing a detailed and systematic analysis of how government-guided funds contribute to regional economic development. Using panel data covering 31 provinces and cities in China, we conducted an empirical study to investigate the impact of government-guided funds on regional economic growth, considering various moderating factors such as marketization levels and government intervention.

### 3. Hypotheses

We argue that government-guided funds have a significant positive impact on promoting regional economic development. By establishing these funds in economically underdeveloped regions or areas with unique industrial advantages, the government can effectively facilitate the concentration of capital, technology, and talent, thereby fostering balanced regional growth. Collaborating with local governments enables government-guided funds

to gain a deeper understanding of local economic characteristics and development potential. This collaboration facilitates the formulation of tailored investment strategies that align with regional needs, thereby ensuring the optimal allocation of resources and maximizing economic outcomes.

Moreover, government-guided funds can significantly enhance the local investment environment by attracting external capital and promoting the diversified development of regional economies. These funds achieve this by directing investments toward local infrastructure projects and public services, thereby creating a more conducive environment for business and innovation. Such regional economic stimulation not only boosts employment and raises residents' income levels but also drives the economic growth of surrounding areas. This process is further amplified through the extension and spillover effects of the industrial chain, fostering a virtuous cycle of sustained economic growth (Cumming & Johan, 2013).

We believe that the core purpose of government-guided fund policies is to channel private capital into key sectors and emerging industries through government financial support, thereby stimulating overall economic growth. These funds assist high-growth enterprises that may lack sufficient initial financial resources, enabling them to thrive by lowering their financing costs. As Bergemann and Hege (2005) highlight, venture capital is essential for initiating and sustaining innovation, and government-guided funds play a crucial bridging role in this process. By effectively connecting social capital with innovation-driven projects, these funds facilitate the transformation of ideas into viable, growth-oriented enterprises.

Furthermore, government-guided funds play a crucial role in enhancing the innovation capabilities and market competitiveness of enterprises. In addition to financial support, these funds provide valuable non-financial resources, such as policy consultation, market analysis, and technical guidance. This holistic support significantly boosts the quality and efficiency of economic growth. By helping enterprises navigate their early stages and overcome challenges, government-guided funds ensure that these businesses not only survive but also thrive in the long term, fostering sustainable and high-quality economic development.

In addition, we argue that government-guided funds can effectively promote the optimization and upgrading of the industrial structure by strategically investing in key industries and high-tech fields. This optimization not only involves the technological transformation and efficiency improvements of existing industries but also includes fostering the growth of emerging industries. By supporting crucial links in the industrial chain—such as core technology research and development, standard setting, and market development—government-guided funds can enhance the competitiveness of the entire industrial chain. This, in turn, facilitates the formation of industrial clusters and provides a solid foundation for sustainable economic growth.

By investing in these critical areas, government-guided funds stimulate the development of high-tech industries, ensuring that not only are industries upgraded, but they are also aligned with future economic trends. Through such strategic investments, these funds play a crucial role in shaping a more innovative, competitive, and sustainable industrial structure.

In addition to optimizing the industrial structure, government-guided funds drive the coordinated development of related industries, promoting balanced regional economic growth. By focusing resources on specific industries, these funds encourage the concentration of capital and expertise in key sectors, accelerating the agglomeration effect. This, in turn, helps form competitive industrial clusters that enhance industry efficiency and inno-

vation capacity, while facilitating the rapid dissemination of knowledge and technology through collaboration and mutual support across industries.

Moreover, government-guided funds play a pivotal role in reducing regional economic disparities. Through targeted investments in the central and western regions, as well as rural areas, these funds help narrow the development gap between regions. This strategic approach not only supports the growth of key industries but also contributes to the economic revitalization of underdeveloped regions, promoting more inclusive growth and ensuring comprehensive, sustainable economic development nationwide.

Based on the above argument, we propose the following hypotheses:

**Hypothesis 1.** *Government-guided fund policies have a positive impact on economic growth.*

**Hypothesis 2.** *Government-guided fund policies promote economic growth through market guidance effects.*

**Hypothesis 3.** *Government-guided fund policies promote economic growth through industrial structure optimization.*

The degree of marketization refers to the extent to which market forces influence resource allocation, reflecting both the strength of market mechanisms and the maturity of market regulations within an economic system. In a highly marketized environment, government-guided funds can operate more effectively, leveraging market mechanisms to identify and support promising investment opportunities. These environments typically feature well-developed legal frameworks, mature financial systems, and efficient resource allocation, all of which provide favorable conditions for the operation of government-guided funds.

For example, a mature capital market offers government-guided funds greater exit channels, improving investment liquidity. This enhances the efficiency of fund utilization and boosts returns on investment. Regions with a high degree of marketization also tend to have more active venture capital activities, helping government-guided funds identify and nurture innovative enterprises. This dynamic interaction fosters economic development by promoting the growth of startups, encouraging technological innovation, and contributing to a more vibrant and competitive economy.

Improved marketization plays a crucial role in enhancing the effectiveness of government-guided funds by strengthening the connection between these funds and private capital. In highly marketized economies, businesses and investors are more adept at obtaining and processing market information, enabling government-guided funds to identify investment opportunities with greater accuracy and avoid resource misallocation. This, in turn, improves the success rate of the funded projects and contributes to achieving the policy goals of government-guided funds.

Moreover, the competitive incentives inherent in market-oriented environments drive enterprises to continually improve their innovation and management capabilities, making them more adaptable to market demands. This creates a dynamic and responsive business landscape, benefiting government-guided funds by increasing the likelihood of successful investments.

Greater marketization also enhances the adaptability and flexibility of the economy, enabling it to respond more quickly to external shocks and internal changes. This adaptability is vital for the stability of government-guided funds, ensuring that these funds can operate effectively even during macroeconomic fluctuations, contributing to sustained economic development.



While government intervention is critical in guiding economic development through government-guided funds, it is important that such intervention remains moderate. Excessive government involvement can distort resource allocation, reducing the funds' operational efficiency and their return on investment. Over-intervention may hinder market forces, which are essential for efficient resource distribution, thereby limiting the economy's ability to innovate and respond to changes.

For example, excessive government influence in investment decision making could lead to the selection of projects that do not align with market realities or economic priorities. This misalignment can undermine economic efficiency, slow growth, and reduce the competitiveness of the economy.

Additionally, too much government intervention can reduce transparency and accountability in the management of government-guided funds, creating opportunities for corruption and rent-seeking behavior. This damages the credibility of the funds and erodes trust in economic policies. To ensure the long-term success of government-guided funds, it is essential to strike a balance between government guidance and market autonomy, fostering an environment where both the public and private sectors collaborate effectively.

Excessive government intervention can also discourage private investors from participating and innovating, ultimately crowding out private investment and stifling market vitality. Concerns over policy uncertainty may reduce the willingness of private investors to engage in venture capital, and an over-reliance on government funding may dampen enterprises' innovation incentives. As businesses become more dependent on government support than on market forces, their responsiveness to market changes diminishes, hindering their long-term growth and negatively affecting the overall development of the economy.

Based on this, the following hypotheses are proposed:

**Hypothesis 4.** *The degree of marketization positively moderates the impact of government-guided funds on economic development.*

**Hypothesis 5.** *The degree of government intervention negatively moderates the impact of government-guided funds on economic development.*

#### 4. Data and Variables

In this chapter, we describe the data sources and variables used in our analysis.

Our response variable is the regional composite economics development index, which is created from the various macroeconomics variables as detailed in Section 4.1. We obtained the provincial economics data from various sources, including National Bureau of Statistics of China, "China Statistical Yearbook", and the "China Science and Technology Statistical Yearbook".

Our explanatory variable government-guided funds data are sourced from the Qingke Private Equity database and CVSource, covering the period from 2010 to 2021. This dataset includes all government-guided funds in China, which entered the "rules and regulations" phase in 2008 and began to develop more comprehensively after 2010. The study period facilitates an examination of the evolution of government-guided funds and their subsequent impact on the macroeconomy.

We then created a regional composite economic development index for each province of China from the various macroeconomic variables as detailed in Section 4.1.

Our mediating variable venture capital market data are obtained from the ZeroIPO database.

4.1. Explanatory Variable

Our explanatory variable is the regional economic development level, a multifaceted concept that encompasses various dimensions. Following the methodology outlined by H. Sun et al. (2020), we developed an index to represent regional economic development levels, as detailed in Table 1. Based on the relationship between each indicator and economic development, we categorize them into positive, moderate, and negative indicators.

**Table 1.** Descriptions of the indicators for Regional Economic Development Index construction.

		Name of Indicator	Description
Regional Economic Development Index	Innovation	GDP growth (+)	Regional GDP growth rate
		R&D investment intensity (+)	R&D expenditure of industrial enterprises above designated size/GDP
		Investment efficiency (−)	Investment rate/regional GDP growth rate
		Technology transaction activity (+)	Technology transaction volume/GDP
	Balanced Development	Demand structure (+)	Total retail sales of consumer goods/GDP
		Urban–rural structure (+)	Urbanization rate
		Government debt burden (−)	Government debt balance/GDP
		Industrial structure (+)	The growth rate of the proportion of tertiary industry output value to regional GDP
	Green Development	Energy consumption elasticity coefficient (−)	Energy consumption growth rate/GDP growth rate
		Wastewater (−)	Wastewater discharge/GDP
		Exhaust gas (−)	Sulfur dioxide emissions/GDP
	Open Development	Foreign trade dependence (+)	Total imports and exports/GDP
		Foreign investment ratio (+)	Total foreign investment/GDP
		Marketization (+)	Regional marketization index
	Shared Development	Workers’ remuneration ratio (+)	Labor compensation/Regional GDP
		Resident income growth elasticity (+)	Growth rate of the per capita disposable income of residents/regional GDP growth rate
Urban–rural consumption gap (−)		Per capita consumption expenditure of urban residents/per capita consumption expenditure of rural residents	
Proportion of fiscal expenditure on people’s livelihood (+)		The proportion of housing security expenditure, medical and health expenditure, local fiscal education expenditure, social security and employment expenditure in the local fiscal budget expenditure	

Note: The “+” in the brackets in the third column indicates that the indicator is a positive indicator, and the “−” indicates that the indicator is a negative indicator.

Positive indicators are those that show a positive correlation with regional economic development, meaning that higher values correspond to higher levels of economic development. Negative indicators, on the other hand, are negatively correlated with development, meaning that lower values are associated with higher levels of economic development. Moderate indicators suggest that larger deviations from the mean are linked to higher levels of regional economic development.

Once these indicators were defined, we employed the Stata software (version 16) package to perform entropy analysis, which allowed us to construct the Regional Economic Development Index. The following section outlines the specific process:

Step 1: De-dimensionalize the indicators. Following the improved efficacy coefficient method of Q. Wang et al. (2003), we standardize all the third-level indicators to be within the range of 40–100, as shown in the following formula: (1) for a positive indicator and (2) for a negative indicator.

$$X_{ij,positive} = 40 + 60 * \frac{X_{ij} - X_{ijmin}}{X_{ijmax} - X_{ijmin}} \quad (1)$$

$$X_{ij,negative} = 40 + 60 * \frac{X_{ijmax} - X_{ij}}{X_{ijmax} - X_{ijmin}} \quad (2)$$

where  $i$  represents the indicator,  $j$  represents each province of China,  $X_{ij}$  is the real data of the province  $j$  with the indicator  $i$ , and  $X_{ijmin}$  and  $X_{ijmax}$  are the minimum and maximum values of  $X_{ij}$  respectively.

Step 2: Determine the weights of each indicator: Given the equal importance of the dimensions of innovation, coordination, greenness, openness, sharing, and others, we assign equal weights to each indicator.

Step 3: Calculate the comprehensive index as the equal weighted indicators as indicated in Formula (3).

$$Q_j = \sum_{i=1}^{i=20} (X_{ij} * w_i) \quad (3)$$

where  $Q_j$  is the economic development index for province  $j$ , and  $w_i$  is the weights for each indicator.

This table provides a detailed description of the indicators used to construct the Regional Economic Development Index, with (+) indicating a positive indicator and (–) indicating a negative indicator.

#### 4.2. Independent Variables

Our main explanatory variable is labelled Government-Guided Fund (GGF), sourced from the Qingke Private Equity Database and CVSource. Following the methodology of Fang and Bao (2016), we create independent variable  $\ln\_GGF\_S$ , which is calculated as the logarithm of the average annual establishment scale of government-guided funds in each province of China over the past three years. This metric serves as an effective proxy for assessing the extent of government intervention in promoting regional economic development through financial support mechanisms. We also use the logarithm of the average number of government-guided funds ( $\ln\_GGF\_N$ ) in each province for the past three years as an alternative measure in our robustness check.

#### 4.3. Mediating Variables

A key mechanism through which government-guided funds drive economic growth is their influence on the venture capital market. To explore this relationship, we incorporate venture capital-related data, including the scale (variable:  $VT\_S$ ) and number of venture capital investments (variable:  $VT\_N$ ), as mediating variables in our analysis. These data, sourced from the Zero2IPO database, help capture the extent to which government intervention stimulates private investment activity.

Another important channel through which government-guided funds impact economic development is the promotion of industrial structure upgrades. In our analysis, we measure industrial upgrading (variable:  $ISU$ ) by calculating the ratio of GDP generated

by the tertiary industry to that of the secondary industry within a given region. This ratio reflects the transition from manufacturing-focused economies toward service-oriented sectors, providing insight into how government interventions influence long-term structural changes in regional economies.

#### 4.4. Moderating Variables

Government intervention can address market failures like monopolies and information asymmetries, improving economic efficiency (Feng, 1994). However, excessive interference may disrupt markets and lead to inefficient resource allocation. Following J. Li et al. (2022), we measure government intervention through the ratio of local fiscal budget expenditure to GDP and create variable Gov.

We also consider marketization as a key moderating factor, as higher marketization levels create a conducive environment for government-guided funds to drive economic growth. Using the comprehensive marketization index of each province (variable: Market), based on China’s provincial marketization index (referred to as the “marketization index”) we assess how regional market maturity impacts the effectiveness of these funds.

#### 4.5. Control Variables

Following the previous literature, we also include several control variables in our analysis to account for regional differences in economic outcomes. These include the (1) urbanization level (Urban), measured by the ratio of urban population to total population; (2) degree of openness to the outside world (FDI), measured by the ratio of total investment from foreign-invested enterprises to gross national product; (3) tax burden level (Tax), measured by the ratio of local fiscal revenue to gross national product; (4) log of the number of domestic patent applications accepted (Tech); and (5) natural population growth rate (PGR), measured by the local population growth rate.

Table 2 provides a detailed description of the variables used in our analysis.

**Table 2.** Descriptions of the variables in our analysis.

Types	Variable Name	Symbol	Description
Dependent Variable	Regional Economic Development Index	Ecoy	Regional Economic Development Index, which is created following H. Sun et al. (2020)
Explanatory Variable	Government-Guided Fund	ln_GGF_S	Logarithm of the average scale of provincial government guidance funds in the past three years, following Cheng et al. (2021)
Mediating variables	Marketization level of venture capital	VT_S and VT_N	Venture capital market fund size and number of established funds
	Industrial structure upgrade	ISU	GDP of tertiary industry/GDP of secondary industry
Moderating variables	Level of government intervention	Gov	Local fiscal expenditure/GDP
	Marketization level of the regional economy	Market	Marketization index obtained from WIND database
Control Variables	Urbanization level	Urban	Urban population/total urban and rural population
	Degree of openness	FDI	Foreign direct investment/GDP
	Tax burden level	Tax	Local fiscal revenue/GDP
	Level of scientific and technological innovation	Tech	Log of the number of domestic patent applications accepted
	Growth rate of the population	PGR	Local population growth rate

## 5. Empirical Analysis

### 5.1. Baseline Analysis

In this chapter, we present the empirical results. We first present the descriptive statistics in Table 3.

**Table 3.** Descriptive statistics of variables.

Variable	Obs	Mean	Std. Dev.	Min	Max
ecoy	372	0.295	0.129	0.140	0.786
ln_GGF_S	372	4.495	2.658	0	9.717
VT-S	372	8.823	1.678	2.302	13.157
VT-N	372	4.806	1.721	0	8.854
ISU	372	1.325	0.715	0.527	5.244
Gov	372	0.168	0.056	0.068	0.397
Market	372	7.131	5.605	−0.7	30.97
Urban	372	0.58	0.134	0.227	0.896
FDI	372	1.857	1.534	0.01	7.96
Tech	372	9.381	1.603	4.331	12.399
Tax	372	0.081	0.029	0.044	0.2
PGR	372	5.325	1.494	0.893	8.275

Table 3 shows significant variation in economic development across regions in China, with the variable *ecoy* averaging 0.295, ranging from a minimum of 0.119 to a maximum of 0.786. Similarly, the variable *ln\_GGF\_S* also displays a wide range, with a mean of 4.495 and a maximum of 9.717, and a minimum of 0, indicating substantial differences in government-guided fund activity across regions as well.

We then perform a regression analysis of the Regional Economic Development Index on the government-guided fund variables, with the results summarized in Table 4.

**Table 4.** Regression of results of Reginal Economic Development on Government-Guided Fund.

	Ecoy (Model 1)	Ecoy (Model 2)
ln_GGF_S	0.003 (0.001 ***)	0.003 (0.011 **)
FDI		−0.005 (0.008 ***)
Tech		−0.008 (0.073 *)
Tax		0.22 −0.232
PGR		−0.141 (0.006 ***)
Intercept	0.276 (0.001 ***)	1.084 (0.001 ***)
Sample size	372	372
Time fixed effect	Control	Control
Individual effect	Control	Control
R2	0.44	0.485

The numbers in the parenthesis are *p* values, and \*\*\*, \*\*, and \* represent significance level at 1%, 5%, and 10%, respectively.

Table 4 shows that in both models, the coefficients for the variable *ln\_GGF\_S* are positive and significant, confirming the positive impact of government-guided funds on regional economic development.

We further examine whether the impact of government-guided funds on regional economic development differs across regions. To do this, we categorize the 31 provinces, municipalities, and autonomous regions in China into two groups—developed and underdeveloped regions—based on their regional GDP levels. We then conduct separate regression analyses for each group, with the results presented in Table 5.

**Table 5.** Regression analysis of regions with different levels of development.

	Developed Regions	Underdeveloped Regions
	ecoy	ecoy
ln_GGF_S	0.002	0.003
	−0.894	(0.01 **)
FDI	−0.021	−0.004
	(0.001 ***)	(0.07 *)
Tech	0.018	−0.014
	−0.474	(0.001 ***)
Tax	−0.018	0.233
	−0.955	−0.274
PGR	0.645	−0.15
	(0.007 ***)	(0.005 ***)
Intercept	−4.043	1.061
	(0.006 ***)	(0.001 ***)
Sample	72	300
Time effect	Control	Control
Individual effect	Control	Control
R2	0.845	0.503

The numbers in the parenthesis are *p* values, and \*\*\*, \*\*, and \* represent significance level at 1%, 5%, and 10%, respectively.

Table 5 shows that government-guided funds have a stronger positive impact on economic growth in underdeveloped regions compared to developed ones. This difference likely reflects regional priorities: in developed areas, funds focus on fostering innovation and supporting SMEs, which may yield long-term but delayed effects. In contrast, underdeveloped regions channel these funds into industries that drive immediate economic growth, resulting in a more direct and significant boost to regional development.

### 5.2. Robustness Check Analysis

To ensure the robustness of our findings, we conducted several checks. First, we replaced the scale of government-guided funds with the number of these funds as the explanatory variable. Second, to account for potential omitted variables, we included the urbanization rate (the ratio of urban population to total population) as a control variable. Finally, to address potential endogeneity, we employed the system GMM estimation method and added the first-order lag term of the dependent variable (L.ecoy) to mitigate concerns about causal relationships. The results of these robust checks are presented in Table 6.

Table 6 confirms the robustness of our findings. Both the coefficients for the scale of government-guided funds (ln\_GGF\_S) and the number of government-guided funds (ln\_GGF\_N) are positive and statistically significant. This supports our hypothesis that government-guided funds have a positive impact on local economic development.



**Table 6.** Robustness check analysis.

	ecoy	ecoy	ecoy
L.ecoy			0.21 (0.003 ***)
ln_GGF_S	0.004 (0.025 **)		0.006 (0.006 ***)
ln_GGF_N		0.011 (0.019 **)	
Urban	0.495 (0.008 ***)	0.479 (0.01 **)	0.444 (0.001 ***)
FDI	−0.005 (0.1 *)	−0.006 (0.047 **)	0.001 −0.953
Tech	−0.01 (0.055 *)	−0.012 (0.026 **)	0.009 (0.029 **)
Tax	0.17 −0.462	0.251 −0.282	1.105 (0.001 ***)
PGR	−0.04 −0.689	−0.037 −0.714	0.004 −0.257
Intercept	0.306 −0.55	0.307 −0.548	−0.268 (0.001 ***)
Sample size	371	371	310
Time effect/AR (1)	Control	Control	0.000
Individual effect/AR (2)	Control	Control	0.150
R2/Hansen	0.584	0.6	0.203

The numbers in the parenthesis are *p* values, and \*\*\*, \*\*, and \* represent significance level at 1%, 5%, and 10%, respectively.

## 6. Mediating and Moderating Mechanism Analysis

### 6.1. The Mediating Effect of Venture Capital Market Development Level

In this section, we explore the role of the venture capital market as a key mechanism through which government-guided funds influence economic growth. To analyze this, we construct a three-step mediating effect regression model, as indicated in Equations (4) to (6), with two mediating variables, VC\_S (venture capital market fund scale) and VC\_N (number of venture capital funds), sourced from the Zero2IPO database.

$$Ecoy_{it} = \alpha_0 + \alpha_1 \ln\_X\_GM + \alpha_n X_{it} + \lambda_t + \epsilon_{it} \tag{4}$$

$$\ln\_GGF\_S_{it} = \beta_0 + \beta_1 VC + \beta_n X_{it} + \lambda_t + \epsilon_{it} \tag{5}$$

$$Ecoy_{it} = \gamma_0 + \gamma_1 \ln\_GGF\_S + \gamma_2 VC + \gamma_n X_{it} + \lambda_t + \epsilon_{it} \tag{6}$$

To address endogeneity concerns from the observed factors of each province or each year which might affect the relationship between economic development and government-guided fund, we employ a fixed-effect model of time and individual province in our panel analysis. The results are presented in Table 7.

From models 2 and 4 in Table 7, we observe that the establishment of government-guided funds has a significant positive effect on venture capital market activity, both in terms of market scale and the number of funds. Furthermore, in models 3 and 5, where we include the level of the venture capital market alongside government-guided funds in the regression, the coefficient of the mediating variable remains significantly positive at the 5% level. This suggests that the venture capital market plays a significant mediating role in how government-guided funds contribute to regional economic development.

**Table 7.** Regression results of mediating effect of venture capital market development level.

	(1)	(2)	(3)	(4)	(5)
	ECOY	VC-S	ECOY	VC-N	ECOY
ln_GGF_S	0.005 (0.005 ***)	0.128 (0.014 **)	0.004 (0.025 **)	0.078 (0.014 **)	0.004 (0.031 **)
VC-S			0.004 (0.065 *)		
VC-N					0.008 (0.01 ***)
FDI	−0.006 (0.001 ***)	0.021 −0.685	−0.006 (0.001 ***)	−0.012 −0.709	−0.006 (0.001 ***)
Tax	0.283 (0.127 ***)	−4.083	0.268	6.745 (0.036 **)	0.197 −0.287
PGR	−0.166 (0.001 ***)	−0.433 −0.756	−0.159 (0.001 ***)	0.548 −0.523	−0.165 (0.001 ***)
Intercept	1.145 (0.001 ***)	10.115 −0.175	1.082 (0.001 ***)	0.341 −0.941	1.116 (0.001 ***)
Sample size	371	371	371	371	371
Time effect	Control	Control	Control	Control	Control
Individual effect	Control	Control	Control	Control	Control
R2	0.48	0.41	0.48	0.7	0.49

The numbers in the parenthesis are *p* values, and \*\*\*, \*\*, and \* represent significance level at 1%, 5%, and 10%, respectively.

### 6.2. The Mediating Effect of Industry Structure Upgrade

In this section, we examine the mediating effect of industry structure upgrades on the relationship between government-guided funds and regional economic development. To measure the upgrade in industry structure, we use the variable ISU, which is calculated as the ratio of GDP from the tertiary industry to GDP from the secondary industry. We then conduct a similar three-step mediating analysis. The results of this analysis are presented in Table 8.

**Table 8.** The mediating effect of industry structure upgrade.

	(1)	(2)	(3)
	ECOY	ISU	ECOY
ln_GGF_S	0.003 (0.022 **)	0.022 (0.001 ***)	0.002 (0.098 *)
ISU			0.037 (0.001 ***)
FDI	−0.008 (0.001 ***)	−0.094 (0.009 ***)	−0.009 (0.001 ***)
Tech	−0.014 (0.001 ***)	4.272 (0.001 ***)	−0.01 (0.018 **)
Urban	0.436 (0.001 ***)	5.012 (0.001 ***)	0.622 (0.001 ***)
Intercept	0.188 (0.001 ***)	4.272 (0.001 ***)	0.029 −0.686
Sample size	371	371	371
Time effect	Control	Control	Control
Individual effect	Control	Control	Control
R2	0.76	0.5	0.51

The numbers in the parenthesis are *p* values, and \*\*\*, \*\*, and \* represent significance level at 1%, 5%, and 10%, respectively.

From Table 8, we observe that government-guided funds have a significant impact on the upgrade of the industry structure. When the mediating variable (ISU) is included in the regression along with  $\ln\_GGF\_S$ , the coefficients for ISU remain significant. This suggests that government-guided funds promote regional economic development through their influence on industry structure upgrades, thereby confirming the mediating role of industry structure in this process.

6.3. The Moderating Effect of Local Economy Marketization Level and Government Intervention

In this section, we examine the mediating effects of local government intervention and the level of marketization on the impact of government-guided funds on regional economic development. The marketization index, denoted as “Market”, measures the development of market intermediaries and the legal system in various regions, while Gov, calculated as the ratio of government expenditure to GDP, gauges the level of government intervention. We then create interaction terms,  $\ln\_GGF\_S * Market$  and  $\ln\_GGF\_S * Gov$ , and include them in the regression models. The results of these analyses are presented in Table 9.

Table 9. Regression results with local economy marketization level and government intervention.

	(1)	(2)	(3)
	ecoy	ecoy	ecoy
$\ln\_GGF\_S$	0.005 (0.004 ***)	0.003 (0.073 *)	0.005 (0.001 ***)
Market			0.004 (0.004 ***)
GOV		0.047 −0.206	
$\ln\_GGF\_S * Gov$		−0.039 (0.001 ***)	
$\ln\_GGF\_S * Market$			−0.0004 (0.008 ***)
FDI	−0.006 (0.002 ***)	−0.007 (0.001 ***)	−0.006 (0.004 ***)
Tech	−0.008 (0.093 *)	−0.006	−0.009 (0.05 *)
Tax	0.329 (0.084 *)	0.265	0.195
PGR	−0.143 (0.005 ***)	−0.158 −0.153 (0.002 ***)	−0.286 −0.111 (0.039 **)
Intercept	1.109 (0.001 ***)	1.149 (0.001 ***)	0.922 (0.001 ***)
Sample size	372	372	372
Time effect	control	control	control
Individual effect	control	control	control
R2	0.506	0.49	0.498

The numbers in the parenthesis are *p* values, and \*\*\*, \*\*, and \* represent significance level at 1%, 5%, and 10%, respectively.

From Table 9, the coefficients for the variable  $\ln\_GGF\_S$  are positively significant, indicating that government-guided funds have a positive effect on local economic development. However, the coefficients for the interactive variables ( $\ln\_GGF\_S * Market$  and  $\ln\_GGF\_S * Gov$ ) are significantly negative. This suggests that both the level of government intervention and the degree of marketization weaken the impact of government-guided funds on local economic development.

One explanation for this is that excessive intervention by government-guided funds may limit the effectiveness of market-oriented mechanisms, thereby hindering economic

growth. Additionally, the interaction between government-guided funds and marketization could create an environment that undermines economic performance, such as suppressing free competition due to excessive policy intervention.

## 7. Conclusions

In this paper, we conducted a comprehensive analysis to investigate the impact of government-guided funds on the development of the local economy. Our results show that the scale and quantity of government guidance funds can effectively promote economic development, and this effect is particularly significant in economically underdeveloped areas, which confirms Hypothesis 1.

A further mediating analysis reveals that government-guided funds foster economic growth through their effects on market guidance and industrial structure optimization. These funds provide financial support to innovative enterprises by activating the venture capital market, thereby contributing to the high-quality development of the regional economy. Additionally, government-guided funds play a role in transforming and upgrading the industrial structure by supporting the growth of emerging and high-tech industries, offering new momentum for economic growth. This supports our Hypotheses 2 and 3.

Regarding the moderating role of government intervention and marketization level, we found that a higher level of marketization enhances the effectiveness of government-guided funds in promoting economic development. In contrast, excessive government intervention can hinder free market competition and restrict the proper functioning of market-oriented mechanisms, weakening the positive impact of government-guided funds. Thus, Hypotheses 4 and 5 are supported.

Our study contributes both theoretically and practically to the understanding of government-guided funds' role in economic development. Theoretically, our study bridges the gap between market autonomy and government intervention perspectives. We show that well-designed government-guided funds can balance these approaches, stimulating market-driven growth while addressing market imperfections, particularly in regions where private capital is reluctant to invest.

Practically, our research offers insights for policymakers, advocating for a differentiated approach that considers regional disparities in economic conditions and innovation potential. Tailored strategies are more likely to maximize the impact of government intervention. Additionally, establishing a governance framework with transparency and accountability is crucial to mitigate risks like inefficiency and misallocation.

Our study contributes to the ongoing discourse on balancing market autonomy with government intervention. It emphasizes the importance of data-driven policymaking that respects market efficiency while addressing market gaps. Government-guided funds, when properly implemented, can promote sustainable economic development, benefiting both public and private sectors and fostering long-term prosperity.

While our study focuses on the short-term effects, future research could explore the long-term impact of government-guided funds on innovation, industrial restructuring, and regional competitiveness. Additionally, investigating how these funds interact with other macroeconomic policies could provide a more coordinated framework for sustainable economic growth.

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