# Government Venture Capital and Regional Entrepreneurship: Evidence from China

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**Abstract**

Government venture capital funds (GVCs) are a global phenomenon. GVCs are central players in China's VC market, now the second largest globally. This paper explores GVC statutory initiatives and examines their effects on entrepreneurship, as proxied by the formation of new businesses. Using a hand-collected 20-year dataset covering GVC investments and new firm formation in 280 prefectural cities and employing difference-in-differences and event study methodologies, I find that Chinese GVCs are associated with a decrease in overall new firm formation. The triple-differences analysis by industry suggests that this result may be driven by stringent investment restrictions imposed by GVC statutory initiatives, which absorb private sector capital into GVC funds targeting specific industries, thereby discouraging new firm formation in other sectors. These findings offer a cautionary note to global policymakers regarding the complexities of public finance strategies aimed at boosting entrepreneurship.

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## I. Introduction[1]

Governments worldwide have launched publicly funded venture capital funds, with China being particularly active. Recent scholarship has highlighted the global impact of China's venture capital (VC) market, especially on entrepreneurship in developing countries (Lerner et al., 2024). China's government venture capital funds (GVCs) have grown over thirtyfold in the past decade, helping its VC market grow to become the second largest globally (Colonnelli et al., 2024).

Despite their size and prominence, the broader impact of GVCs on entrepreneurship remain unclear. This study investigates the impact of GVC funds on entrepreneurial activity in 280 Chinese cities, using a hand-collected 20-year panel dataset that measures GVC creation, investment, and new firm formation at the prefectural city level. While existing research has concentrated primarily on effects at the portfolio firm level, this paper studies how the adoption of GVC statutory initiatives by prefectural cities influences city-level entrepreneurial activity.

Entrepreneurial firms play a key role in creating new jobs, fostering innovation, and driving productivity growth (see, for e.g., Acs et al., 2012; Audretsch et al. 2006; Glaeser et al. 1992). However, nascent ventures often face significant financial challenges that can hinder their expansion and threaten their survival (Rajan and Zingales, 1998; Carpenter and Petersen, 2002). VC accordingly plays a valuable social role by providing external financing to young, innovative firms. Existing literature highlights the instrumental role of VCs in fostering entrepreneurial endeavors (see, for e.g., Hellmann, 1998; Gompers and Lerner, 1998; Bottazzi and Rin, 2002). Lawmakers and policymakers worldwide have therefore endeavored to replicate Silicon Valley's successful model of entrepreneurship and venture capital finance through GVCs (Gilson, 2002; Bai et al, 2021).

China offers a promising setting for studying the effects of GVCs. By 2022, Chinese GVCs had committed more than $400 billion in capital. To put this number in context, in 2020

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the private VC sector in the United States had $694 billion in assets under management.[2] China's VC market is now the second largest globally, with GVCs playing a dominant role (Lin, 2017; Li, 2022; Colonnelli et al., 2024).

Governments create GVCs to supplement rather than supplant private sector VC (Armour and Cumming, 2006). Private VC investment may be insufficient because of positive externalities or information asymmetries (for e.g. Leland and Pyle, 1977; Carpenter and Petersen, 2002; Lerner et al., 2012). If so, GVCs may promote additional entrepreneurship, job creation, and growth (Colombo et al., 2016; Lerner, 1999). On the other hand, GVCs might simply replace private sector financing with no net effect (MacIntosh and Cumming, 2006; Da Rin et al., 2006; Colombo et al., 2016).

Several papers accordingly ask whether GVC crowds out private investment. Fei (2023) examines the central government's InnoFund GVC Program in China as a case study and finds that the program appears to complement rather than displace private investment. The study shows that this effect is particularly evident in the early stages of VC sector development, where GVCs may serve a signaling role.

GVCs could also fail to achieve their objectives if the government uses its control rights in portfolio companies ineffectively, leading them to underperform. Colonnelli et al. (2024) find that top-performing firms often avoid investors with government ties due to political interference, which hampers performance. Ge et al. (2024) show that GVCs tend to invest in early-stage firms in government-targeted industries, promoting firm-level innovation and industry development, though their portfolio firms often exhibit weaker financial performance compared to those backed by private VCs.

Finally, even if GVCs produce more investment and better performance in portfolio companies, they could still lead to less, rather than more, entrepreneurship overall. This would be so if GVCs focus on a limited number of "strategic" firms or industries and cause private VCs to do the same. If so, GVCs could produce excessive investment in some firms and industries and insufficient investment in others. Potential entrepreneurs in disfavored industries may then anticipate a dearth of financing and be discouraged from starting companies. Recent coverage by *the Economist* shows that the number of unicorn firms in China doubled within five years in

[2] See pp. 13, NVCA 2023 Yearbook. https://nvca.org/wp-content/uploads/2023/03/NVCA-2023-Yearbook_FINALFINAL.

government policy-supported industries, with the government holding significant equity stakes (Economist 2023). This raises questions about whether capital is less available for firms in non-supported industries, potentially limiting broader entrepreneurial growth.

This paper considers the last of these possibilities. Rather than study GVCs' effects on private VC or portfolio companies, it asks whether entrepreneurship, as proxied by new firm formation, rises in prefectural cities that create GVCs compared to those that do not. Using new firm formation as a proxy aligns with existing literature, where business creation is often used to measure VC's impact on entrepreneurship (e.g., Zingales and Mollica, 2007; Samila and Sorenson 2011; Popov and Roosenboom 2012).

I manually collect a 20-year city-level panel dataset covering 280 prefectural cities. Most GVC in China is established and managed by city governments and funded from their own budgets (Zhang, 2024; Colonnelli et al., 2024).[3] In my sample, 183 of the 280 prefectural cities enacted GVC statutory initiatives during the period from 2000 to 2019.[4] The dataset accordingly enables a comparison between cities that have adopted and funded GVC statutory initiatives and those that have not.

I employ difference-in-differences and event study methodologies to estimate the impact of GVC on entrepreneurial activity. As a preliminary matter, I verify that there are more early-stage VC investments (round A or A+) after creation of a GVC. While this may seem obvious given the large sums of money that city governments have committed to GVCs, some commentators raise concerns that, due to their bureaucratic nature and lack of expertise, GVCs may inherently favor "safer" investments in later-stage firms (round B and later) over early-stage startups (Luong et al, 2021). By contrast, Ge et al. (2024) find that GVCs are more likely than private VCs to invest in early-stage firms. I find that early stage investing increases after

[3] The number and size of GVCs are most substantial at prefectural city level. The 2022 GVC Funds Special Research Report released by the China Venture Institute shows that, as of the end of 2022, the proportions of GVC funds at the national, provincial, city, and district/county levels were 1.50%, 24.31%, 53.40%, and 20.78% respectively, while the proportions of their fund sizes were 7.47%, 38.44%, 42.69%, and 11.40% respectively. Prefectural city level GVCs are central in both quantity and size, thus should be the focal point in studying the impacts of GVCs. Chinese tittle:《2022 年政府引导基金专题研究报告》

[4] In China, the term "cities" generally refers to urban areas within the country's administrative hierarchy, encompassing various levels such as prefectural-level cities, county-level cities, and provincial capitals. A "prefectural-level city" is an administrative unit situated directly below a province, covering a large geographic area that includes both urban districts, rural territories and sometimes county-level cities. These cities are pivotal for regional governance and economic development, integrating urban centers with surrounding rural regions under a unified administrative framework. For the purposes of this paper, "cities" specifically refers to prefectural-level cities. A detailed explanation of these cities is provided in Appendix C.

adoption of a GVC statutory initiative. This is a necessary but not a sufficient condition for GVCs to encourage entrepreneurship.

I then turn to new incorporations, the principal variable of interest. A decrease in new incorporations after establishment of a GVC would not, by itself, establish causation because cities with poor economic performance might be more likely to establish a GVC. I therefore control for local economic and demographic conditions and find that fewer new businesses are established after creation of a GVC. I use an event study to show that cities with and without GVCs display similar trends in new firm formation prior to the implementation of these initiatives, supporting the parallel trends assumption. I further analyze potential endogeneity through propensity-score matching and placebo tests. Finally, I test the robustness of these findings to the use of an alternative outcome measure and alternative difference-in-differences models.

This paper's findings align with firm-level observations by Colonnelli et al., which suggest that the costs of government-tied capital, including political interference, may outweighing the benefits. To further explore this issue, I examine the implementation of GVCs in China. A review of the legal and regulatory framework reveals that GVCs impose strict industry restrictions and are mandated to "absorb and redirect" private VC investments, encouraging co-investment in policy-supported sectors.[5] Private VCs, which might otherwise distribute their investments across a broader range of sectors, tend to invest alongside GVCs.[6] Using a triple difference-in-differences model, I find that GVCs have a significant positive effect on new firm formation in supported industries but a negative effect in non-supported industries.

GVCs in China may therefore divert resources from a wider spectrum of industries to those favored by local governments. Assuming that entrepreneurs observe this and anticipate that it will be difficult to obtain funding for non-favored ventures, GVCs will chill entrepreneurial activity in non-supported industries. It is possible that the overall impact on entrepreneurship will be negative, as this paper finds.

[5] CVSource, GVC Report 2022, "nearly all GVC policies at the prefectural level mandate local investment, stipulating that the majority of their capital must be invested in enterprises that are incorporated and operating within the sponsoring city".
[6] For example, the GVC Report 2022 shows that GVCs often aim to "absorb and redirect the flow of private sector VC investments.

The government might have objectives other than encouraging entrepreneurship. For example, GVCs might stabilize the economy during downturns (Li, 2022). In the Chinese context, they may also serve as a means for government to surveil or control firms in strategically sensitive industries (Zhang, 2024). To the extent the purpose is to increase entrepreneurship, however, this paper suggests that GVCs have not achieved their goal.

The subsequent sections of this paper are structured as follows: Section 2 reviews the existing literature and identify empirical gap. Section 3 details data sources and descriptive statistics. Section 4 outlines the empirical design and results. Section 5 explores the possible mechanism using both quantitative and qualitative data. Section 6 addresses the potential endogeneity problem, and Section 7 conducts several robustness checks to verify the findings. Section 8 provides a conclusion.

## II. Existing Literature and Empirical Gap

### 1. Literature Review

Entrepreneurial firms are critical drivers of job creation, innovation, and productivity growth (Acs et al., 2012; Audretsch et al., 2006; Glaeser et al., 1992). However, early-stage ventures often face significant financial constraints that threaten their ability to grow and survive (for e.g., Rajan and Zingales, 1998; Carpenter and Petersen, 2002). Venture capital plays a pivotal role in alleviating these financial challenges by providing external financing to high-potential, innovative firms. Studies have consistently demonstrated the importance of VC in fostering entrepreneurship and business dynamism (Hellmann, 1998; Gompers and Lerner, 1998; Bottazzi and Rin, 2002).

Governments worldwide have sought to replicate the U.S. VC model, resulting in publicly financed initiatives. An OECD report notes that venture capital investment began as a publicly financed activity in nearly all OECD countries.[7] Examples include Germany's WFG (1975), Quebec's Labour Sponsored Venture Capital Corporation (1983), and Israel's Yozma program (1993). More recent initiatives include the Dutch Good Growth Fund (2014), India's Fund of Funds for Startups (2016), Singapore's Startup SG Equity scheme (2017), the UK's

[7] See more details of the OECD report, see pp.20: https://www.oecd.org/industry/ind/28881195.pdf.

Future Fund (2020), the HKIC in HK SAR (2022) and Israel's Yozma 2.0 (2024) illustrate the trend of direct governmental participation in the VC and entrepreneurial space.

Despite global enthusiasm for GVCs as a tool for promoting entrepreneurship, empirical findings on their effectiveness remain mixed. Some studies focus on the firm-level impact of GVCs, highlighting how these funds can improve the performance of portfolio companies. For instance, research on the U.S. Small Business Innovation Research (SBIR) program finds that GVC-backed firms benefit from increased investment and growth, particularly among financially constrained startups (e.g., Lerner, 2000; Howell, 2017; Zhao et al., 2020). Cumming et al. (2017) report that in Europe, firms supported by a combination of government and private venture capital have higher chances of successful exits. However, other studies challenge these results. Da Rin et al. (2006) suggest that GVCs do not significantly boost innovation in European firms, and Grilli and Murtinu (2014) find that GVC-backed firms do not experience stronger growth compared to firms without public funding.

A second stream of literature investigates whether GVCs complement or displace private sector venture capital. Some studies suggest that GVCs may crowd in private investors by reducing market inefficiencies and attracting additional funding (Lerner, 2000). However, there is also concern that GVCs could crowd out private capital. For instance, MacIntosh and Cumming (2006) argue that in Canada, government intervention might displace private VC, leading to a reduction in overall investment. Leleux and Surlemont (2003) find that public venture capital in Europe neither directly crowds in nor crowds out private VC. Instead, GVCs signal government commitment and the social value of venture capital, boosting confidence in the industry.

Empirical studies on Chinese GVCs largely focus on portfolio firm impacts and their dynamics with private VCs.[8] These findings are equally mixed. Colonnelli et al. (2024) report that high-performing private firms tend to avoid capital from government-linked investors, citing concerns about political interference. Ge et al. (2023) find that while GVCs invest more capital at earlier stages and hold investments longer, this often leads to weaker financial performance compared to private VC-backed firms. In contrast, Li (2022) finds that GVCs invest more in

[8] There are also other terms used in describing these funds in China, such as government investment funds, guiding investment funds, government-sponsored industry investment funds. Although these funds may have names that have some variations, but they are of the same nature, that is, they are established by governments using public sector capital.

local and early-stage firms compared to private VCs, and highlights their resilience during economic downturns, showing their potential role in stabilizing the economy. Fei (2023), focusing on the national-level InnoFund program, finds evidence of crowding in, where government investment attracts additional private capital. Mallick et al. (2024) further show that firms backed by Chinese GVCs before their IPOs are more likely to secure additional equity financing in the early stages of listing. Suchard et al. (2021) investigated provincial and central GVCs, discovering that the discretionary and heavily regulated IPO process in China allows government-owned VCs to facilitate firms' access to IPO markets. In contrast, Yang et al. (2014) use a simultaneous equations model to show that provincial GVCs crowd out private investment in developed regions but foster growth in less developed ones.[9]

## 2. The Role of GVC Statutory Initiatives and Entrepreneurship

While much of the existing literature focuses on GVCs from a firm-level perspective, fewer studies examine the legal and regulatory framework surrounding GVCs or explore their broader impact on entrepreneurship at the regional level. This study shifts the focus from individual GVCs to the effect of GVC statutory initiatives across prefectural cities on entrepreneurial activity, as proxied by new firm formation.

Prefectural cities in China host the majority of GVC funds. With an average population of 5 million across 280 cities, these local economies represent a critical context for studying GVCs. The Chinese central government defines GVCs as statutory initiatives funded by public-sector capital and adopted by local governments to promote entrepreneurial ventures (Lin, 2021). Local governments are authorized to establish GVCs at the prefectural level by creating programs that use sponsoring government budgets and issuing formal legal measures to set up GVC funds and outline their governance structure.[10] Once a city government decides to adopt a

[9] GVCs in China operate at various governmental levels: state, provincial, city, and county. But prefectural cities hold a predominant position in terms of both the quantity and scale of GVC funds. Therefore, in this paper, I focus on the prefectural level GVC funds and their impacts on entrepreneurial activities.

[10] Local governments are authorized to establish GVC funds and use government budgets to "attract and guide" private-sector capital in a market-oriented manner. These initiatives aim to fill financing gaps for emerging firms by providing equity investments. See, Guiding Opinions on the Establishment and Operation of Guiding Investment Funds. See details of the Guidance Opinions at: https://www.gov.cn/gongbao/content/2016/content_5051233.htm

Article 2 of the Interim Measures for the Administration of Government Investment Funds. Chinese tittle: 《政府投资基金暂行管理办法》

Article 2 of Interim Measures for the Administration of Government-Sponsored Industry Investment Funds by the National Development and Reform Commission. Chinese tittle: 《政府出资产业投资基金管理暂行办法》

GVC statutory initiative, it typically drafts and circulates a set of regulations to formally launch the program. These regulations detail how the GVC will operate, including its objectives, funding sources, and investment focus. The discretionary nature of adopting these statutory initiatives allows for an assessment of their impact on entrepreneurship, as cities enact policies tailored to their local contexts.

Focusing on the impact of GVC statutory initiatives offers several advantages. First, the existing literature highlights the difficulty of distinguishing between GVC funds and private VCs due to the integration of private-sector capital. GVCs frequently serve as both limited and general partners, establish multiple layers of sub-funds, and co-invest alongside private capital, which complicates efforts to classify and quantify these funds accurately (Colonnelli et al., 2024). This complexity also contributes to discrepancies in data regarding the total number and scale of GVC funds. For instance, while some reports indicate that there were over 4695 GVC funds by 2022, other estimates place the total between 258 and 2000 funds. Similarly, estimates of total capital committed vary widely, ranging from 2 trillion to 5 trillion RMB.[11] The integration of private capital into GVC programs exacerbates these reporting inconsistencies.[12]

Firm-level datasets also frequently suffer from missing or misclassified data. For instance, Ge et al. (2024) report that 20% of firm-level data is incomplete. Suchard et al. (2021) use various measurements for the definition of GVCs. This issue is not unique to China. Grilli et al. (2017) find similar classification challenges in Canada and Australia, where over 50% of funds are incorrectly labeled as GVCs. By examining the adoption of GVC statutory initiatives across prefectures, this study addresses some of the classification issues and provides an alternative approach for evaluating GVCs' impact on entrepreneurial activity. This method aligns with Cumming and Johan's (2019) recommendation to incorporate both pre-adoption and post-adoption data, allowing for a more accurate evaluation of GVC effects while accounting for existing trends that might influence outcomes.

[11] For the large discrepancies, see, for example, Xinhua News, "China's Government Venture Capital Funds," March 1, 2023, http://www.xinhuanet.com/finance/2023-03/01/c_1129405637.htm; The Paper, "Government Funds and Their Impact," March 2023, https://www.thepaper.cn/newsDetail_forward_22639301; Securities Times, "Analysis of Government Venture Capital Funds," March 2023, http://www.stcn.com/article/detail/792364.html.

[12] In Chinese policy statements, non-governmental capital from individuals, banks, insurance companies or securities are referred to as "social capital". It is crucial for a US audience to understand that this term, when directly translated from the Chinese context, diverges from the traditional understanding of "social capital." In this context, it means capital that it is not directly sourced from specific government entities such as financial bureaus. It includes contributions from private firms and may also include contributions from State-Owned Enterprises (SOEs).

I manually collected data on the adoption timelines of GVC statutory initiatives across 280 Chinese cities from 2000 to 2019. As shown in Figure 2, over 183 cities had implemented GVC initiatives by 2020, with a peak of adoption year in 2015 and 2016. The dataset accordingly enables a comparison between cities that have adopted and funded GVC statutory initiatives and those that have not.

Instead of studying GVCs' effects on private venture capital or portfolio companies, this paper examines whether entrepreneurship, proxied by new firm formation, increases in cities that implement GVC statutory initiatives. Using new firm formation as a proxy for entrepreneurship aligns with existing VC and entrepreneurship literature, which often employs business creation as a measure of venture capital's impact on entrepreneurial activity (e.g., Zingales and Mollica, 2007; Samila and Sorenson, 2011; Popov and Roosenboom, 2012). This approach links GVC research with broader studies on venture capital's role in fostering entrepreneurship, which often rely on business incorporation as a key indicator.

Furthermore, GVC legal and regulatory framework explicitly aim to promote entrepreneurship and stimulate new venture creation. By assessing the impact of GVC statutory initiatives on new firm formation, this study directly examines whether GVCs achieve their intended outcomes. Entrepreneurship is widely recognized as a driver of economic development, contributing to job creation, innovation, and overall economic growth. Numerous studies highlight the critical role that entrepreneurial firms play in fostering employment, disseminating knowledge, and generating broader societal benefits (Acs et al., 2012; Audretsch et al., 2006). Therefore, understanding how GVC statutory initiatives influence entrepreneurship is essential for evaluating their impact.

To evaluate the role of GVC statutory initiatives, I examine two key questions:

1. Activation of GVCs: Do GVC statutory initiatives lead to more early-stage venture capital investments (round A or A+)?

While this may seem obvious given the large sums of money that city governments have committed to GVCs, some commentators raise concerns that, due to their bureaucratic nature and lack of expertise, GVCs may inherently favor "safer" investments in later-stage firms (round B and later) over early-stage startups (Luong et al, 2021). However, firm-level studies, such as Ge et al. (2024), suggest that GVCs are more likely to invest in early-stage firms than private VCs. I therefore first verify whether statutory initiatives result in increased early-stage investment.

If GVCs actively invest in early-stage firms without significantly crowding out private capital, this should increase the capital pool available to nascent companies, leading to a rise in early-stage VC activity. Conversely, if GVCs face bureaucratic inefficiencies or risk aversion, they may fail to stimulate early-stage investments, undermining their role in fostering entrepreneurship.

2. Influence on New Business Formation: Do GVC statutory initiatives encourage entrepreneurial activity by reducing the cost of capital for entrepreneurs and promoting the formation of new firms?

Having more investment in early-stage firms is a necessary but not a sufficient condition for GVCs to encourage entrepreneurship. I therefore turn to new firm formation. If GVCs address early-stage financing challenges and generate positive externalities, we should observe a rise in new firm formation in cities with GVC statutory initiatives. However, if GVCs make suboptimal investment decisions or inadvertently harm the entrepreneurial ecosystem, we may not observe any substantial increase in new business creation following the adoption of these initiatives.

## III. Data Construction

A detailed description of data sources and construction is provided in Appendix B: Variable Definitions.

### 1. GVC Statutory Initiatives

Prefectural cities in China host the majority of GVC funds, making them an ideal context for studying the impact of GVC statutory initiatives on entrepreneurship. These GVCs are defined as statutory initiatives funded by local government budgets to promote entrepreneurial ventures through structured, government-backed venture capital programs (Lin, 2021). While the central government sets the overall framework, local governments have the discretion to establish these initiatives by issuing formal legal measures to create GVC funds and define their governance structures. The adoption of these initiatives allows for an analysis of their effect on new firm formation, providing insight into how locally enacted policies influence entrepreneurial activity.

Despite their role in China's entrepreneurial ecosystem, timelines for the adoption of GVC statutory initiatives are not readily available. To address this gap, I manually collected data from multiple sources to track when and where GVC statutory initiatives were implemented

across 280 Chinese prefectural cities. Data were manually collected from widely recognized sources, including the China City Statistical Yearbook (Wang et al., 2022), CVSource (Fei, 2024), Tianyancha Enterprise Information Datasets (Wang et al. 2022), and archival documents I found from the National Library of China. The China Venture Capital Reports, found in the National Library archives, were published yearly by the Economic Management Press from 2002 to 2019. Authored by the China Science and Technology Development Research Center, these reports compile contributions from official data by Science and Technology Bureaus and Financial Management Centers across various cities. Each report includes a directory listing GVC funds in each city, providing their names and establishment dates, which helps trace the timelines of statutory initiative adoption.

I began the data collection by identifying limited partners categorized as "Government Authority" in CVSource and tracing their investments overtime. By establishing the year of the earliest investments made by these authorities, I constructed an initial timeline. I then used the Tianyancha dataset to identify the ownership structures of firms receiving these investments, pinpointing the "core funds" ultimate source for channeling public capital. Following a similar approach by Colonnelli et al. (2024), the establishment year of these core funds was treated the adoption year for GVC statutory initiatives.

I validated this data against GVC documents issued by local governments, sourced from each city's government website and the directory list in the China Venture Capital Reports. This process enabled the categorization of cities into two groups: a "treated group" consisting of cities where public-sector capital has been allocated through government authority agencies, and a "control group" of cities that have not engaged government budget in venture capital industry and entrepreneurial firms.

According to the Administrative Division Statistics of the People's Republic of China (2020 edition), China has 333 prefecture-level administrative units: 293 cities, 7 regions, 30 autonomous prefectures, and 3 leagues, along with 4 municipalities directly under central government control. Between 2000 and 2019, 57 prefecture-level cities underwent administrative changes, such as mergers, splits, and status alterations, affecting the consistency of data (e.g., GDP, population). Consequently, these cities are excluded from the sample; their list is provided in Appendix C. The final sample includes 280 cities, with 183 adopting GVC initiatives between

2000 and 2019, while 97 did not allocate government budgets for VC venture capital industry and entrepreneurial firms.

**2. Entrepreneurial activity**

Following the methodology of Samila and Sorenson (2011), I first assess the impact of GVC establishment on early-stage VC investment by analyzing the count of round A and A+ investment events. The creation of GVCs increases the available capital pool for entrepreneurial ventures. If GVCs are actively investing rather than existing as "laws on paper" and do not disproportionately focus on later-stage firms (such as round B and later), an increase in early-stage VC investments (round A and A+) is expected post-establishment, holding all else constant.

I then examine new incorporations, the primary variable of interest, to assess whether entrepreneurship increases in cities adopting GVC statutory initiatives. Using new firm formation as a proxy is consistent with prior research, where the creation of new businesses is frequently employed as an indicator of VC's impact on entrepreneurship (e.g., Zingales and Mollica, 2007; Samila and Sorenson, 2011; Popov and Roosenboom, 2012). I quantify entrepreneurial activity by counting the annual number of new business formations in each city, using data collected from the Tianyancha dataset.

**3. Local economic and demographic controls**

Since GVC adoption may be influenced by pre-existing economic conditions, isolating the direct impact on entrepreneurship requires controlling for time-varying local variables. Following prior research (Popov & Roosenboom, 2013; Huang, 2008; Wang et al., 2022; Samila & Sorenson, 2011; Rao et al., 2022), I include controls such as GDP, population, government revenue, FDI, number of educational institutions, and patent authorizations. Incorporating these variables helps mitigate endogeneity concerns and enhances the precision of estimates linking GVC adoption to new firm formation.

In line with standard practice, I natural log-transform early-stage VC investment events, new firm formations, and control variables for the estimations.

**4. Summary Statistics**

Table 1 provides summary statistics. The first column provides the variables utilized in the empirical research. The complete dataset comprises 5600 observations spanning 280 cities in China from 2000 to 2019. Table 2 and 3 provides summary statistics for the treated group and

control group separately. The control group consists of 1940 observations that represent cities that have never adopted a GVC statutory initiatives. The treated group includes 3660 observations representing cities that adopted the GVC statutory initiatives during the period of study. The treated group generally demonstrated higher levels of economic activity compared to the control group. It displays higher GDP, FDI, patent authorizations and government revenue. It also had a higher number of educational institutions and population size, indicating a possibly higher level of human capital.

Figure 10 contrasts the average log-transformed figures of early-stage VC investment events and new firm formation between treated and control cities. Panel A shows the trends over the 2000–2019 period, while Panels B and C compare averages for select treatment years (2008, 2013, 2015, and 2017). Before more robust empirical analyses, Panel A reveals a widening gap in early-stage investments between treated and control groups, with a narrowing divergence in new firm creation. The visual patterns in Panels B and C show that, prior to policy adoption, both the control and treated groups demonstrate parallel trends in their averages. Cities adopting GVC initiatives showing higher growth in early-stage investment events, though new firm formation appears to stagnate or slightly decrease in treatment years.

## IV. Empirical Design and Results

To more rigorously evaluate the effects of GVC statutory initiatives, this section employs two empirical methodologies: a difference-in-differences (DiD) analysis and an event study. Using a 20-year panel dataset of annual observations across Chinese cities, both methods leverage geographic and temporal variations in the implementation of GVCs. The methodologies align with approaches taken by Honigsberg et al. (2017), Kong & Qin (2021), Eldar & Garber (2022), Grennan (2023), and Miller (2022).

### 1. Difference-in-differences

To assess the impact of GVC statutory initiatives on entrepreneurial activity, difference-in-differences methodology estimates the following specification:

$$Entrepreneurship_{c,t} = \alpha_0 + \beta_1 GVCTreat_c * GVCPost_t + \lambda CV_{c,t-1} + \mu_c + \theta_t + \varepsilon_{c,t} \quad (1)$$

In this specification, $Entrepreneurship_{c,t}$ is the entrepreneurial activities in prefectural city *c* in time *t*. These initiatives are quantified via two metrics: the number of VC early-stage

investment events and the count of newly established firms. *CV* is a vector of control variables, including lagged values of patent authorizations, GDP, FDI, government revenue, number of educational institutions, and population to mitigate reverse causality.

The binary variable $GVCTreat_c$ captures whether city *c* has implemented the GVC statutory initiatives, taking the value 1 if so and 0 otherwise. Similarly, if a city in time *t* has adopted the GVC statutory initiatives, then the $GVCPost_t$ equals 1, otherwise 0. The variable of interest $GVCTreat_c * GVCPost_t$is an interactive dummy variable that measures the impact of the GVC statutory initiatives (GVC-SI).

I further include $\mu_c$ and $\theta_t$ as city fixed effects and time fixed effects. City fixed effects account for persistent, unobserved city-specific factors, such as ingrained preferences or cultural inclinations toward entrepreneurial activities. Time fixed effects control for temporal shocks shared across all cities in the nation. Examples include the 2014 revision to the PRC Company Law and the 2009 inception of the Chinext board in the Shenzhen stock exchange.

As with other law and policy studies, true random policy adoption is rare. Cities with weaker economic performance may be more inclined to establish GVCs, potentially introducing bias. I therefore control for local economic and demographic conditions identified in the literature. I also include propensity-score matching and placebo tests to address potential endogeneity. Finally, I apply alternative estimation techniques (Roth, 2023; Callaway & Sant'Anna, 2021; Sun & Abraham, 2021; Goodman-Bacon, 2021; Miller, 2022) to address biases in TWFE DiD estimates. I conduct several other additional robustness checks to ensure the reliability of results.

**2. Event study analyses**

For the event study analysis, Equation (1) is augmented to estimate separate lead and lag coefficients; the key dependent variable is replaced with a series of time dummies denoting the 10 years before to the 10 years after the implementation of a GVC statutory initiatives:

$$Entrepreneurship_{c,t} = \alpha_0 + \beta \sum_{j=-10}^{10} \beta_j \, GVC_{c,t+j} + \lambda CV_{c,t-1} + \mu_c + \theta_t + \varepsilon_{c,t} \qquad (2)$$

Where $\beta_j$(j= -10 to j= -1) are a series of dummy variables denoting the 10 years before the adoption of GVC statutory initiatives and $\beta_j$(j= 1 to j= 10) are a series of dummy variables denoting the 10 years after the GVC statutory initiatives is adopted. Analogous to Equation (1),

the event study analysis includes city fixed effects, time fixed effects, and a vector of control variables. As is standard in the literature, the coefficients of interest, $\beta_j$, are estimated relative to the year before the adoption of GVC statutory initiatives (j= -1).

All the standard errors in the regressions described in this research are clustered at the city level (Abadie et al. 2023; Miller, 2022).

## 3. Empirical results

### 1) Difference-in-differences analysis

Table 4 presents the effects of GVC statutory initiatives on entrepreneurial activity. Panel A reports results for early-stage VC investment events, while Panel B examines new firm formation. The first model in each panel includes only fixed effects, while the second model incorporates control variables to provide a more nuanced analysis.

Expanding on Panel A, the coefficients for the effect of the GVC-SI are 0.471 and 0.317, both significant at the 1% level. This indicates a significant increase in early-stage VC investment events following the adoption of GVC initiatives. Panel B shows the coefficients for GVC-SI are -0.076 and -0.068, both significant at the 5% level, suggesting that GVC-SI adoption is associated with a decrease in new firm formations.

### 2) Event study analysis

I use an event study to show that cities with and without GVCs display similar trends in early-stage VC investment event and new firm formation prior to the implementation of these initiatives, supporting the parallel trends assumption. Following standard practice in event study methodology I set the year immediately preceding the adoption of the GVC statutory initiatives as the baseline (pre1) and drop it from the analysis. This allows the coefficients for all other periods to be interpreted relative to this baseline year.

Figure 12 reports the results of event study analysis. Panel A shows results for the VC early-stage investment events and Panel B shows results for new firm formation. The analysis confirms the parallel trends assumption: coefficients of interests ( $\beta_j$ for j = - 10 to j = -1) are not statistically different from zero, indicating no differential trends between treated and control cities before the adoption of GVC statutory initiative.

Panel A shows that there is an increasing trend in the post-policy coefficients, which suggests that the impact of the policy intensifies over time. Specifically, the results suggest that

the policy has an immediate positive effect (the “current” variable coefficient is 0.292 with p value of 0), which continues to grow over the subsequent years. The coefficients for post1 through post 10 indicate the additional impact of the policy in each year following its implementation. As we move further away from the implementation year, these coefficients generally increase, which indicates that the policy's impact is not only sustained but also grows over time. For instance, one year after the policy (post1), the coefficient is 0.381, meaning the policy effect increases compared to the implementation year. Two years after the policy (post2), the coefficient is 0.405, suggesting the effect of the policy increases by an additional amount. This pattern continues, with post 10 showing an effect of 1.208, which is much higher than the initial effect in the policy's implementation year.

Panel B shows that the post coefficients are negative and are statistically significant, indicating that after the policy was implemented, there is a statistically significant decrease in the number of new companies registered. For example, two years after the policy (post2), the number of new registrations decreases by an additional 0. 069 units, with p-value of 0.014. This negative trend continues and generally intensifies over the years, with the post10 coefficient at -0. 265. The results of the model suggest there is a one-year lag effect in the policy effect on new firm formation. The coefficients of current and post1 are negative but not statistically significant ($P > 0.05$), implying that in the policy was first implemented, there wasn't a statistically significant change in the number of newly registered companies. However, starting from the second year (post2) onward, the coefficients are both negative and statistically significant ($P < 0.05$). This suggests that the policy began to exert a statistically significant negative influence on the number of newly registered businesses from the second year onwards, indicating an approximate one-year lag effect.

It is reasonable not to anticipate an immediate impact of the GVCs on new firm formation, considering potential entrepreneurs require time to comprehend this information and make necessary adjustments. This information acquiring process includes understanding the details of the policy, its implications for different players in the market, and the opportunities or challenges it might present. Given the complexity and novelty of such initiatives, this learning process can take considerable time.

## V. Mechanism

### 1. Triple difference-in-differences

The empirical results demonstrate a positive effect of GVC statutory initiatives on early-stage VC investment events, suggesting an increase in VC investment targeting early-stage entrepreneurial firms. This finding aligns with firm-level studies by Ge et al. (2024), which finds that GVCs are more likely than private VCs to invest in early-stage ventures. Additionally, the results mitigate concerns that GVC statutory initiatives are merely "laws on paper" with limited practical impact or that GVCs might prefer safer, later-stage investments due to governmental oversight (Luong et al., 2021). While the increase in early-stage investment is necessary for fostering entrepreneurship, it is not sufficient on its own.

Turning to new incorporations—the principal proxy of entrepreneurial activity—the findings reveal a decline in new firm formations following the establishment of a GVC. This outcome is consistent with the firm-level observations of Colonnelli et al. (2024), suggesting that the costs associated with government-tied capital, including political interference, may outweigh potential benefits. To explore this issue further, I analyze the legal framework governing GVCs in China. These statutory initiatives come with stringent regulations on eligible industries and regions for investment and are mandated to "absorb and redirect" private VC investments, thereby encouraging co-investment in policy-supported sectors.[13] Consequently, private VCs, which might otherwise distribute investments across a broader range of sectors, tend to co-invest alongside GVCs.

A possible mechanism underlying the observed decline in new firm formation is the restrictive focus of GVC statutory initiatives on a narrow set of industries and regions prioritized by local governments. Similar effects have been observed in other countries. For example, Feldman (2003) reports that 47 out of 50 U.S. states implemented biotechnology public sector finance programs without considering local suitability, potentially discouraging activity in other industries and resulting in suboptimal public capital allocation. In China, the GVCs may similarly channel resources toward politically prioritized industries, limiting funding

[13] CVSource, GVC Report 2022, "nearly all GVC policies at the prefectural level mandate local investment, stipulating that the majority of their capital must be invested in enterprises that are incorporated and operating within the sponsoring city". The GVC Report 2022 also shows that GVCs often aim to "absorb and redirect the flow of private sector VC investments.

opportunities for ventures in non-supported sectors and potentially stifling overall entrepreneurial activity.

To explore this further, I conduct a triple difference-in-differences (DDD) analysis of new firm formation. Appendix A provides the legal definitions of GVC-targeted industries, including new energy, new materials, energy conservation, advanced manufacturing (e.g., semiconductors), environmental protection, and information technology. However, the existing dataset on firm formation categorizes firms into 20 broad sectors per the China Securities Regulatory Commission (CSRC) standards, limiting the granularity of analysis.[14] To address this limitation, I use the CSRC industry guidelines to align GVC-targeted sub-industries with the 20 CSRC sector categories.

This alignment enables a pragmatic classification of sectors into "supported" and "non-supported" categories. For instance, the CSRC classifies new materials (industry code 7512) and new energy (7515) under the Scientific Research and Technical Services Industry (Sector M). The chip-making industry is classified under Information Technology (industry code 65) within the Information Transmission, Software, and IT Services Industry (Sector I). These sectors align with GVC-related legislation and governmental strategic priorities.

In contrast, several sectors and their sub-industries are never explicitly mentioned by GVC-related laws, regulations, and policies. These include Agriculture, Forestry, Animal Husbandry, and Fishing (Sector A); Mining (Sector B); Real Estate and Construction (Sectors K and E); Retail and Wholesale (Sector F); Leasing and Business Services (Sector L); Accommodation and Catering (Sector H); Entertainment (Sector R); Education-related industries (Sector P); and Social Organization Management (Sector S).

Using this classification, I sort new firm formation data from the Tianyancha dataset into "supported" and "non-supported" categories across 280 cities between 2000 and 2019.[15] To

[14] The CSRC follows the "Industrial Classification for National Economic Activities" by the Standardization Administration of China. See "Industrial Classification for National Economic Activities", accessed May 26, 2024, https://www.mca.gov.cn/images3/www/file/201711/1509495881341.pdf. New business formation registration and new company listings often adhere to these industry categorization standards.

[15] The Manufacturing Industry (C) is more complex, encompassing both supported sectors like aerospace equipment (industry number 374), semiconductors and chip manufacturing (industry numbers: 3562, 3972, 3871), and advanced medical and biotech equipment (industry number 358), as well as numerous unsupported low-end manufacturing sectors (industry numbers 13 to 30), such as textile, food and beverage industry and timber process industry. Other industry categories, such as the finance industry category (J), the Electricity, Heat, Water Production industry (category D), the public transportation industry (category G), the public hygiene and service industry

analyze the impact of GVC statutory initiatives on new firm formation by industry, I adopt a triple difference-in-differences approach, following Lerner et al. (2024), applying the following specification:

$$Entrepreneurship_{i,c,t} = \alpha_0 + \beta_1 GVCTreat_c * GVCPost_t * Support_i + \lambda CV_{c,t-1} + \mu_c + \theta_t + \varepsilon_{c,t} \quad (3)$$

Where, $Entrepreneurship_{i,c,t}$ is the dependent variable, representing the new firm formation in industry i, city c, and year t. $Support_i$ is a dummy variable that takes the value of 1 if the sector is a supported sector, and 0 otherwise. The interaction of $GVCTreat_c * GVCPost_t * Support_i$ captures the triple difference effect, i.e., how the GVCs affect new firm formation in supported industries compared to non-supported industries, before and after the statutory initiative adoption.

As shown in Table 5, regression analysis using the model specified in Equation (3) reveals a significant positive impact of GVCs on supported industries but a markedly negative effect on non-supported sectors. This indicates a possible "sectoral crowding out effect," providing insight into why GVC statutory initiatives may have an overall negative impact on new firm formation. The concentration of investment in government-favored industries likely discourages entrepreneurship in a broad range of sectors that are disfavored by governments.

**2. Qualitative Evidence**

To complement the DDD findings, I collect qualitative evidence from the Ministry of Finance and the *China Venture Capital Reports*. Both sources highlight the over-concentration of capital in supported industries. Survey data from the *China Venture Capital Reports* reveal that VCs investment decisions are often driven by government connections rather than market-based considerations, consistent with Colonnelli et al.'s (2024) findings at the firm level. The reports indicate that VC funds in China primarily rely on "government recommendation" as their main deal source, suggesting a potential bias towards politically favored industries.

(category Q), and the public facilities management industry (category N) are primarily under state control. Due to this state dominance, these industries are excluded from the two groups that focus more on private sector activities. Therefore, the supported group contains industry category M and I, and the non-supported group contains industry category A, B, E, F, H, K, L, R and S.

Figure 11 illustrates a 15-year trend (2004–2019) in the sources of VC deals in China, breaking down percentages from entrepreneur pitches, financial advisers, government recommendations, shareholder suggestions, and friend referrals. A persistent dependence on government recommendations emerges, with a concurrent decline in deals originating from entrepreneur pitches—from 19.5% in 2004 to merely 8% in 2019. This trend indicates a shift in the VC ecosystem toward ventures with governmental supporting, potentially at the expense of more diverse, entrepreneur-driven projects.

If GVC statutory initiatives primarily aim to support certain industries, only firms within those sectors are likely to receive "government recommendations", while firms in non-supported industries may find it challenging to secure such backing. Furthermore, to the extent that private VCs are influenced by government recommendations, as the sources of VC deals data suggests, capital may be channeled predominantly into supported industries, further reinforcing resource concentration. GVCs often source capital from non-governmental entities like securities firms, banks, and corporations, which could diversify across industries but instead align with GVC statutory initiative preferred industries. As shown in Figures 8 and 9, this structure reinforces resource concentration in government-supported sectors.

The Ministry of Finance's 2020 notices confirm this over-concentration issue.[16] In 2020, the Ministry circulated a series of internal notices criticizing GVCs for "overlapping industrial objectives and capital misuse," pointing out their failure to consider the long-term sustainability of investments and the tendency to allocate large sums of capital to certain industries without a clear path for future exits. This over-concentration limits capital access for entrepreneurs in non-supported sectors and can discourage new firm formation in those areas.

If entrepreneurs expect challenges in securing funding outside policy-supported industries, this could discourage entrepreneurial activity in those sectors. Since most industries are not supported, GVCs in China may redirect resources from a diverse range of sectors to those favored by local governments, potentially leading to an overall negative impact on entrepreneurship, as suggested by this paper's findings.

[16] Notice by the Ministry of Finance of Strengthening the Management of Government Investment Funds and Improving the Benefits of Fiscal Contributions, Ministry of Finance, Document Number: Caiyu [2020] No. 7, Promulgated: February 12, 2020. Chinese tittle: 财政部关于加强政府投资基金管理提高财政出资效益的通知

## VI. Addressing Endogeneity

### 1. Propensity Score Matching-Difference-in-Differences

Policy adoption in real-life contexts often faces non-randomness, making it challenging to identify causal effects. To address this, I employ the PSM-DiD method proposed by Heckman et al. (1997) to reassess the impact of GVC statutory initiatives on entrepreneurial activity. This approach uses propensity score matching (PSM) to identify control cities with characteristics comparable to those in the treatment group, helping mitigate biases from non-random treatment assignment and endogeneity. By ensuring treated and control groups have similar observable characteristics, the analysis yields more reliable comparisons.

Table 6, Panel A reports the balance check results. To verify that the PSM process effectively balances covariates across treated and control groups, I use control variables from Equation (1) as covariates, this is consistent with the existing literature (Wang et al., 2022; Si & Cao, 2021). Before matching, the Mean Bias across variables is considerable, indicating differences between the groups. Post-matching, the Mean Bias is reduced by an average of 91%, indicating successful balancing and ensuring a valid basis for further impact analysis.

Table 6, Panel B examines the effects of GVC statutory initiatives using the PSM-DiD model. Column 1 presents the impact on VC early-stage investment events, showing a policy coefficient of 0.285, significant at the 1% level. This suggests that cities adopting the policy experienced a statistically significant increase in early-stage VC investments relative to non-adopting cities, after accounting for other factors. Column 2 assesses new firm formation, with a policy coefficient of -0.074, significant at the 5% level, indicating a significant negative effect. Therefore, cities that have adopted GVC statutory initiatives saw a relative decrease in new firm formation compared to control cities. The consistency of PSM-DiD results with the main findings confirms that the results are robust and not sensitive to the matching methodology.

### 2. Placebo Tests

To further validate the robustness and credibility of the treatment effect estimates, I conduct a placebo test by randomly assigning GVC adoption to different cities. The placebo test serves as a tool to distinguish genuine treatment effects from potential biases or spurious correlations. The purpose of the placebo tests is to examine if our observed GVC effects on VC early-stage investment events and new firm formation could have been due to random chance. I do so by assigning the GVC statutory initiatives randomly among the sample cities and then re-estimating

the treatment effects. I implemented this test through 500 simulations, each time randomly assigning treatment status across the sample and subsequently running the Equation (1) as the primary analysis. This simulation-based approach essentially constructed an empirical null distribution of treatment effects under the assumption of no true effect, facilitating a comparison of the actual observed treatment effect to what might be expected due to random chance alone. Upon completion of all simulations, I include t-values and p-values for each of the 500 estimated treatment effects. The distribution of these placebo treatment effects served as the empirical null distribution, against which I compared the actual observed treatment effect.

Figure 14 is scattering plots that present each placebo treatment effects (the estimated coefficients) against their corresponding p-values. Both plots show that most of the p-values in the placebo tests are above 0.05. The vertical line at 0.317 in the first plot and the vertical line at -0.068 in the second plot represent the actual observed treatment effect in our main analysis. The actual effects are significantly different than the placebo effects. This result strengthens our confidence that the observed effects in the main analysis are not due to random chance, but indeed attributable to the GVC statutory initiatives treatment.

## VII. Robustness Checks

### 1. Robustness to staggered DiD methodology

The staggered difference-in-differences (DiD) approach used in this study offers several advantages over traditional single-period treatment models. While conventional DiD designs risk conflating treatment effects with concurrent trends, staggered DiD—by introducing treatments at different times across units—controls for temporal confounders and mitigates biases from simultaneous events. However, recent research has highlighted potential limitations of this approach. Contributions from Goodman-Bacon (2021), Callaway and Sant'Anna (2021), Baker et al. (2022), de Chaisemartin and D'Haultfoeuille (2020), Sun and Abraham (2021), Roth (2023), Xu et al. (2024) have identified possible biases in DiD designs. Following the methodology proposed by Miller (2022), this section addresses those concerns through various alternative methodologies.

#### 1) Shortened observation period

While the event study results show statistically insignificant effects prior to treatment, there may be concerns about treatment effect heterogeneity due to the 20-year GVC statutory initiative

adoption period and multiple treatment events. To address this, I include a shortened event treatment period analysis (2007 to 2017), during which most statutory initiatives adoptions occurred. Removing early and late adopters reduces bias from extended treatment events, limiting the sample from 280 to 249 cities. As seen in Table 9, Panel A, the reduced sample shows that GVC statutory initiatives increases early-stage VC investment events but decreases new firm formation, consistent with our previous analysis.

**2) Alternative difference-in-differences model**

Goodman-Bacon's 2021 research shows that the TWFE DiD estimations are weighted averages of comparisons across control and treated groups during different treatment events. In this study, the treatment periods span from 2000 to 2019. Two potential sources of bias arise: comparisons using cities treated earlier as controls for cities treated later, and comparisons between cities already treated and those undergoing treatment. This data set includes 19 distinct timing groups (k=19). Such variability can skew results, though the bias is minimal in this study.

Out of 280 cities, 97 remain unaffected by GVC statutory initiatives, providing a substantial number of untreated cities thus limiting the potential bias. Nevertheless, I follow Goodman-Bacon's approach to address any lingering concerns. Panel B of Table 9 shows the weights for comparisons of later treated versus earlier treated are 0.100 and 0.120 across two models, with average difference-in-differences estimates of -0.302 and 0.053, respectively. Comparisons between cities undergoing treatment and those already treated have weights of 0.040 and 0.036. The Goodman-Bacon decomposition confirms that 85% of the estimated effects are driven by comparisons between treated and untreated cities.

Panel C of Table 9 integrates alternative methodologies to address potential biases from staggered treatments. The first row presents results from Goodman-Bacon’s approach. The second row shows results using Callaway and Sant’Anna's method, which calculates group-time average treatment effects for each timing cohort. The aggregated ATT (average treatment effect on the treated) confirms that GVC statutory initiatives positively influences early-stage VC investment events while negatively affecting new firm formations. The third row uses De Chaisemartin and D’Haultfoeuille's 2020 method, which focuses on group-time cells witnessing treatment transitions. All approaches align with the main results, indicating that biases from staggered treatments are minimal.

### 3) Alternative parallel trend test

Recent econometric scholars call for attention in using traditional parallel trend tests (Roth, 2023). For example, Sun and Abraham's (2021) research indicate that in cases where there are heterogeneous treatment events across cohorts, the pre-period coefficients, $\beta j$ for $j < 0$, might not always gravitate towards zero. Likewise, the post-period coefficients, $\beta j$ for $j > 0$, may not precisely mirror the weighted averages of cohort-specific treatment effects. To address this, I incorporate Sun and Abraham's methodology, which calculates group-specific dynamic effects relative to either never-treated or last-treated counties as benchmarks. The results, illustrated in Figure 13, closely mirror those of the conventional event study plot in Figure 12, thereby supporting the validity of the parallel trends assumption and confirming no significant differential trends between treatment and control cities before GVC adoption.

## 2. Bias due to mega cities

Municipalities directly under the central government, which surpass general prefecture-level cities in economic development, technological advancement, and human capital, could introduce biases into the study. To address this, I exclude four municipalities from the sample and proceed with the regression as detailed in Equation (1). This practice is consistent with standard approaches in Chinese policy evaluations (Wang et al., 2022). Table 8 confirms that excluding these cities does not alter the main results. To further address concerns about outlier influence, I conduct an additional unreported analysis excluding the top and bottom 20 economically developed cities, with results consistent across all specifications.

## 3. Alternative measurements

New firm formation is widely used as a proxy for entrepreneurship in VC research (e.g., Zingales & Mollica, 2007; Samila & Sorenson, 2011; Popov & Roosenboom, 2012). However, there might still be lingering concerns, as business incorporation can be influenced by factors beyond entrepreneurial intent, such as tax strategies or the creation of subsidiary entities. use may raise concerns. Historical examples, like the limited use of corporate forms in Imperial China despite the early adoption of modern corporate law in 1904, show potential disconnects between business incorporation and active entrepreneurial engagement (Morley & Zhang, 2022). To address these concerns, both city and year fixed effects are incorporated into the analysis to control for invariant city characteristics and common temporal trends, thereby reducing biases from factors like regional "shell company" registrations or local entrepreneurial culture.

To further mitigate concerns, I introduce alternative measures of entrepreneurial activity. The measurement of entrepreneurial activity is limited by the availability of high-quality data across 280 cities over 20 years. One best available metric is the "Business Activity Score," sourced from the Index of Regional Innovation and Entrepreneurship in China (IRIEC) by Peking University. The IRIEC compiles data from various sources to form a comprehensive index that assesses innovation and entrepreneurship performance across Chinese regions (Dai et al., 2021). A second metric is the "Scale Enterprise Production Value" from the *China City Statistical Yearbook*, reflecting output from larger enterprises and adding economic weight beyond micro-enterprises. Although this measure primarily captures the activities of scale enterprises—not early-stage firms—it remains relevant for analyzing GVCs' broader economic impact. GVCs might influence larger enterprises indirectly by reallocating capital to policy-supported sectors, shifting market signals, and affecting the competitive landscape.

As shown in Table 7, GVC statutory initiatives are associated with a decrease in the business activity score by approximately 3.382 units (significant at the 1% level), suggesting a reduction in entrepreneurial activities in cities with GVC initiatives. Similarly, Column 2 indicates a significant decline in scale enterprise production value by about 0.117 units (also significant at the 1% level), implying that cities with GVC statutory initiatives experience lower enterprise production value compared to those without. These alternative metrics align with the main findings, confirming that GVC statutory initiatives negatively impact entrepreneurial activities.

## VIII. Conclusion

Governments worldwide have established GVCs to promote the development of entrepreneurial firms. In China, 183 out of 280 prefectural cities, with an average population of 5 million, have adopted GVC statutory initiatives aimed at supporting entrepreneurship through government-funded venture capital. This paper examines whether these initiatives influence entrepreneurship, as measured by new firm formation, in cities that implement GVCs compared to those that do not. While GVC adoption increases early-stage VC investments, it is also associated with a decrease in new business formation. This outcome likely stems from the restrictive investment focus of GVCs and their structural design, which channels private capital into targeted sectors. Private VCs, which might otherwise diversify their investments, are drawn to co-invest with

GVCs, concentrating resources in favored industries and diverting them from non-supported sectors.

This paper empirically links GVCs to entrepreneurial activity across a large city-level sample. As governments increasingly use public funds to boost VC and entrepreneurship, these findings shed light on the complexities of public sector investments. By focusing on China, whose investment landscape is both significant and multifaceted, this study begins to unpack the structure and implications of GVCs on entrepreneurship, inviting further academic exploration into their role and impact.

**Reference**


Abadie, Alberto, Susan Athey, Guido W Imbens, and Jeffrey M Wooldridge. "When Should You Adjust Standard Errors for Clustering?" *The Quarterly Journal of Economics* 138, no. 1 (February 1, 2023): 1–35. https://doi.org/10.1093/qje/qjac038.

Acs, Zoltan J, David B. Audretsch, Pontus Braunerhjelm, and Bo Carlsson. "Growth and Entrepreneurship." *Small Business Economics* 39, no. 2 (September 2012): 289–300. https://doi.org/10.1007/s11187-010-9307-2.

Acs, Zoltan J., Pontus Braunerhjelm, David B. Audretsch, and Bo Carlsson. 2009. "The Knowledge Spillover Theory of Entrepreneurship." *Small Business Economics* 32 (1): 15–30. https://doi.org/10.1007/s11187-008-9157-3.

Audretsch, David B. "Innovation, Growth and Survival." *International Journal of Industrial Organization*, The Post-Entry Performance of Firms, 13, no. 4 (December 1, 1995): 441–57. https://doi.org/10.1016/0167-7187(95)00499-8.

Audretsch, David B., Max C. Keilbach, and Erik E. Lehmann. *Entrepreneurship and Economic Growth*. 1st edition. Oxford ; New York: Oxford University Press, 2006.

Alperovych, Yan, Georges Hübner, and Fabrice Lobet. "How Does Governmental versus Private Venture Capital Backing Affect a Firm's Efficiency? Evidence from Belgium." *Journal of Business Venturing* 30, no. 4 (July 2015): 508–25. https://doi.org/10.1016/j.jbusvent.2014.11.001.

Armour, J. and D.J. Cuming "The Legislative Road to Silicon Valley." *Oxford Economic Papers* 58, no. 4 (June 12, 2006): 596–635. https://doi.org/10.1093/oep/gpl007.

Bai, Jessica, Shai Bernstein, Abhishek Dev, and Josh Lerner. 2021. "The Dance Between Government and Private Investors: Public Entrepreneurial Finance around the Globe." Working Paper. Working Paper Series. National Bureau of Economic Research. https://doi.org/10.3386/w28744.

Bartlett, Robert P III. "Venture Capital, Agency Costs, and the False Dichotomy of the Corporation." *UCLA LAW REVIEW*, 2006.

Baker, Andrew C., David F. Larcker, and Charles C.Y. Wang. "How Much Should We Trust Staggered Difference-in-Differences Estimates?" *Journal of Financial Economics* 144, no. 2 (May 2022): 370–95. https://doi.org/10.1016/j.jfineco.2022.01.004.

Bernstein, Shai, Xavier Giroud, and Richard R. Townsend. "The Impact of Venture Capital Monitoring: The Impact of Venture Capital Monitoring." *The Journal of Finance* 71, no. 4 (August 2016): 1591–1622. https://doi.org/10.1111/jofi.12370.

Beatty, Randolph P., and Jay R. Ritter. "Investment Banking, Reputation, and the Underpricing of Initial Public Offerings." Journal of Financial Economics 15, no. 1–2 (January 1986): 213–32. https://doi.org/10.1016/0304-405X(86)90055-3.

Black, Bernard S., and Ronald J. Gilson. "Venture Capital and the Structure of Capital Markets: Banks versus Stock Markets." *Journal of Financial Economics* 47, no. 3 (1998): 243–77.

Bottazzi, L., and M. Da Rin. "Venture Capital in Europe and the Financing of Innovative Companies." *Economic Policy* 17, no. 34 (April 1, 2002): 229–270. https://doi.org/10.1111/1468-0327.00088.

Brander, James A., Qianqian Du, and Thomas Hellmann. "The Effects of Government-Sponsored Venture Capital: International Evidence." *Review of Finance* 19, no. 2 (March 1, 2015): 571–618. https://doi.org/10.1093/rof/rfu009.

Buzzacchi, Luigi, Giuseppe Scellato, and Elisa Ughetto. "The Investment Strategies of Publicly Sponsored Venture Capital Funds." *Journal of Banking & Finance* 37, no. 3 (March 2013): 707–16. https://doi.org/10.1016/j.jbankfin.2012.10.018.

Callaway, Brantly, and Pedro H. C. Sant'Anna. "Difference-in-Differences with Multiple Time Periods." *Journal of Econometrics*, Themed Issue: Treatment Effect 1, 225, no. 2 (December 1, 2021): 200–230. https://doi.org/10.1016/j.jeconom.2020.12.001.

Carpenter, Robert E., and Bruce C. Petersen. "Is the Growth of Small Firms Constrained by Internal Finance?" *Review of Economics and Statistics* 84, no. 2 (May 2002): 298–309. https://doi.org/10.1162/003465302317411541.

Chaisemartin, Clément de, and Xavier D'Haultfœuille. "Two-Way Fixed Effects Estimators with Heterogeneous Treatment Effects." *American Economic Review* 110, no. 9 (September 2020): 2964–96. https://doi.org/10.1257/aer.20181169.

Colombo, Massimo G., Douglas J. Cumming, and Silvio Vismara. 2016. "Governmental Venture Capital for Innovative Young Firms." *The Journal of Technology Transfer* 41 (1): 10–24. https://doi.org/10.1007/s10961-014-9380-9.

Colonnelli, Emanuele, Bo Li, and Ernest Liu. 2024. "Investing with the Government: A Field Experiment in China." *Journal of Political Economy* 132 (1): 248–94. https://doi.org/10.1086/726237.

Cumming, Douglas J, Luca Grilli, and Samuele Murtinu. "Governmental and Independent Venture Capital Investments in Europe: A Firm-Level Performance Analysis." *Journal of Corporate Finance*, 2017.

Cumming, Douglas J., and Jeffrey G. MacIntosh. "Crowding out Private Equity: Canadian Evidence." *Journal of Business Venturing* 21, no. 5 (September 2006): 569–609. https://doi.org/10.1016/j.jbusvent.2005.06.002.

Cumming, Douglas, and Sofia Johan. "Government Venture Capital Research: Fake Science and Bad Public Policy." *Venture Capital* 21, no. 1 (January 2, 2019): 121–31. https://doi.org/10.1080/13691066.2018.1558508.

Da Rin, Marco, Giovanna Nicodano, and Alessandro Sembenelli. "Public Policy and the Creation of Active Venture Capital Markets." *Journal of Public Economics* 90, no. 8 (September 1, 2006): 1699–1723. https://doi.org/10.1016/j.jpubeco.2005.09.013.

Davis, Steven J., John Haltiwanger, Kyle Handley, Ron Jarmin, Josh Lerner, and Javier Miranda. "Private Equity, Jobs, and Productivity." *American Economic Review* 104, no. 12 (December 1, 2014): 3956–90. https://doi.org/10.1257/aer.104.12.3956.

Dai, Ruochen, Zhu, Zhongkun, and Zhang, Xiaobo. "Construction of China's Regional Innovation and Entrepreneurship Index and its Spatial Pattern: 1990-2020." Working Paper of Peking University Enterprise Big Data Research Center, 2021.

*The Economist*. n.d. "China's Tech Unicorns: What Does the New Stampede Reveal?, China's Tech Unicorns: What Does the New Stampede Reveal?" Accessed September 22, 2024. https://www.economist.com/podcasts/2023/05/23/chinas-tech-unicorns-what-does-the-new-stampede-reveal.

Eldar, Ofer, and Jillian Grennan. "Common Venture Capital Investors and Startup Growth." *The Review of Financial Studies* 37, no. 2 (2024).

Eldar, Ofer, and Chelsea Garber. 2022. "Opportunity Zones: A Program in Search of a Purpose Symposium: Law, Markets, and Distribution." *Boston University Law Review* 102 (4): 1397–1440.

Engel, Dirk, and Max Keilbach. "Firm-Level Implications of Early-Stage Venture Capital Investment — An Empirical Investigation." *Journal of Empirical Finance* 14, no. 2 (March 1, 2007): 150–67. https://doi.org/10.1016/j.jempfin.2006.03.004.

Engberg, Erik, Patrik Gustavsson Tingvall, and Daniel Halvarsson. "Direct and Indirect Effects of Private- and Government-Sponsored Venture Capital." *Empirical Economics* 60, no. 2 (February 2021): 701–35. https://doi.org/10.1007/s00181-019-01770-w.

Fan, Jennifer S. "Woke Capital: The Role of Corporations in Social Movements." *Harvard Business Law Review* 9, no. 2 (2019): 441–94.

Feldman, Maryann. "The Locational Dynamics of the Us Biotech Industry: Knowledge Externalities and the Anchor Hypothesis." *Industry and Innovation* 10, no. 3 (September 1, 2003): 311–29. https://doi.org/10.1080/1366271032000141661.

Fei, Celine Yue. "Can Governments Foster the Development of Venture Capital?" SSRN Scholarly Paper. Rochester, NY, July 29, 2019. https://doi.org/10.2139/ssrn.3221997.

Ge, Guoqing, Jian Xue, and Qian Zhang. 2024. "Industrial Policy and Governmental Venture Capital: Evidence from China." *Journal of Corporate Finance* 84 (C). https://ideas.repec.org//a/eee/corfin/v84y2024ics0929119923001815.html.

Gilbert, Brett Anitra, David B. Audretsch, and Patricia P. McDougall. 2004. "The Emergence of Entrepreneurship Policy." *Small Business Economics* 22 (3/4): 313–23.

Gilson, Ronald J. "Engineering a Venture Capital Market: Lessons from the American Experience." *Stanford Law Review* 55, no. 4 (2002): 1067–1104.

Gilson, Ronald J., and Curtis J. Milhaupt. "Shifting Influences on Corporate Governance: Capital Market Completeness and Policy Channeling." *Harvard Business Law Review* 12, no. 1 (2022): 1–54.

Glaeser, Edward L., Hedi D. Kallal, José A. Scheinkman, and Andrei Shleifer. "Growth in Cities." *Journal of Political Economy* 100, no. 6 (December 1992): 1126–52. https://doi.org/10.1086/261856.

Gompers, Paul, and Josh Lerner "Venture Capital Distributions: Short-Run and Long-Run Reactions." *The Journal of Finance* 53, no. 6 (December 1998): 2161–83. https://doi.org/10.1111/0022-1082.00086.

Goodman-Bacon, Andrew. "Difference-in-Differences with Variation in Treatment Timing." *Journal of Econometrics* 225, no. 2 (December 2021): 254–77. https://doi.org/10.1016/j.jeconom.2021.03.014.

Griliches, Zvi. "The Search for R&D Spillovers." *The Scandinavian Journal of Economics* 94 (1992): S29. https://doi.org/10.2307/3440244.

Grilli, Luca, and Samuele Murtinu. "Government, Venture Capital and the Growth of European High-Tech Entrepreneurial Firms." *Research Policy* 43, no. 9 (November 2014): 1523–43. https://doi.org/10.1016/j.respol.2014.04.002.

Guerini, Massimiliano, and Anita Quas. "Governmental Venture Capital in Europe: Screening and Certification." *Journal of Business Venturing* 31, no. 2 (March 2016): 175–95. https://doi.org/10.1016/j.jbusvent.2015.10.001.

Heckman, James J., Hidehiko Ichimura, and Petra E. Todd. "Matching as an Econometric Evaluation Estimator: Evidence from Evaluating a Job Training Programme." *The Review of Economic Studies* 64, no. 4 (1997): 605–54. https://doi.org/10.2307/2971733.

Hellmann, Thomas. "The Allocation of Control Rights in Venture Capital Contracts." *The RAND Journal of Economics* 29, no. 1 (1998): 57–76. https://doi.org/10.2307/2555816.

Hellmann, Thomas, and Manju Puri. "Venture Capital and the Professionalization of Start-Up Firms: Empirical Evidence." *The Journal of Finance* 57, no. 1 (2002): 169–97. https://doi.org/10.1111/1540-6261.00419.

Honigsberg, Colleen, Robert J. Jackson, and Richard Squire. “How Does Legal Enforceability Affect Consumer Lending? Evidence from a Natural Experiment.” *The Journal of Law and Economics* 60, no. 4 (November 2017): 673–712. https://doi.org/10.1086/695808.
Howell, Sabrina T. “Financing Innovation: Evidence from R&D Grants.” *American Economic Review* 107, no. 4 (April 2017): 1136–64. https://doi.org/10.1257/aer.20150808.
Huang, Yasheng. *Capitalism with Chinese Characteristics: Entrepreneurship and the State*. Cambridge University Press, 2008.
Huang, Xiaoxia, Yanchen Jiang, and Sushanta Mallick. 2024. “Endorsement and Firm Financing: Evidence from Government Venture Capital Market in China.” *The British Accounting Review*, August, 101471. https://doi.org/10.1016/j.bar.2024.101471.
Islam, Mazhar, Adam Fremeth, and Alfred Marcus. “Signaling by Early-Stage Startups: US Government Research Grants and Venture Capital Funding.” *Journal of Business Venturing* 33, no. 1 (January 2018): 35–51. https://doi.org/10.1016/j.jbusvent.2017.10.001.
Jia, Mark. “AUTHORITARIAN PRIVACY.” *University of Chicago Law Review* 91 (n.d.).
Jiang, Kun, and Di Guo. 2013. “Venture Capital Investment and the Performance of Entrepreneurial Firms:Evidence from China.” *Journal of Corporate Finance* 22:375–95. https://doi.org/10.1016/j.jcorpfin.2013.07.001.
Klausner, Michael, and Kate Litvak. “What Economists Have Taught Us About Venture Capital Contracting,” August 15, 2001. https://doi.org/10.2139/ssrn.280024.
Karsai, Judit. “Government Venture Capital in Central and Eastern Europe.” *Venture Capital* 20, no. 1 (January 2, 2018): 73–102. https://doi.org/10.1080/13691066.2018.1411040.
Kong, Dongmin, and Ni Qin. “China’s Anticorruption Campaign and Entrepreneurship.” *The Journal of Law and Economics* 64, no. 1 (February 2021): 153–80. https://doi.org/10.1086/711313.
Kortum, Samuel, and Josh Lerner. “Assessing the Contribution of Venture Capital to Innovation.” *The RAND Journal of Economics* 31, no. 4 (2000): 674. https://doi.org/10.2307/2696354.
Leland, Hayne E., and David H. Pyle. 1977. “Informational Asymmetries, Financial Structure, and Financial Intermediation.” *The Journal of Finance* 32 (2): 371–87. https://doi.org/10.2307/2326770.
Leleux, Benoît, and Bernard Surlemont. “Public versus Private Venture Capital: Seeding or Crowding out? A Pan-European Analysis.” *Journal of Business Venturing* 18, no. 1 (January 2003): 81–104. https://doi.org/10.1016/S0883-9026(01)00078-7.
Lerner, Josh. “The Government as Venture Capitalist: The Long-Run Impact of the SBIR Program.” *The Journal of Private Equity* 3, no. 2 (2000): 55–78.
Lerner, Josh, Ann Leamon, and Felda Hardymon. 2012. *Venture Capital, Private Equity, and the Financing of Entrepreneurship: The Power of Active Investing*. 1st edition. Hoboken, NJ: John Wiley & Sons Inc.
Lerner, Josh, and Brian Watson. “The Public Venture Capital Challenge: The Australian Case.” *Venture Capital* 10, no. 1 (January 2008): 1–20. https://doi.org/10.1080/13691060701605538.
Lerner, Joshua. *Boulevard of Broken Dreams: Why Public Efforts to Boost Entrepreneurship and Venture Capital Have Failed and What to Do about It*. The Kauffman Foundation Series on Innovation and Entrepreneurship. Princeton: Princeton University Press, 2009.
Lerner, Josh, Junxi Liu, Jacob Moscona, and David Y. Yang. “Appropriate Entrepreneurship? The Rise of China and the Developing World.” Working Paper. Working Paper Series. National Bureau of Economic Research, March 2024. https://doi.org/10.3386/w32193.

Levine, M. E., and J. L. Forrence. "Regulatory Capture, Public Interest, and the Public Agenda: Toward a Synthesis." *Journal of Law, Economics, and Organization* 6, no. special (January 1, 1990): 167–98. https://doi.org/10.1093/jleo/6.special_issue.167.
Li, Jinlin. "Government as an Equity Investor: Evidence from Chinese Government Venture Capital through Cycles." SSRN Scholarly Paper. Rochester, NY, March 17, 2022. https://doi.org/10.2139/ssrn.4221937.
Lin, Lin. *Venture Capital Law in China*. Cambridge, United Kingdom; New York, NY: Cambridge University Press, 2021.
Lin, Lin. "Engineering a Venture Capital Market: Lessons from China." *Columbia Journal of Asian Law* 30, no. 2 (2017): 160–220.
Lin, Li-Wen, and Curtis J. Milhaupt. "We Are the (National) Champions: Understanding the Mechanisms of State Capitalism in China." *Stanford Law Review* 65, no. 4 (2013): 697–759.
Link, Albert N., and John T. Scott. "Government as Entrepreneur: Evaluating the Commercialization Success of SBIR Projects." *Research Policy*, Special Section on Government as Entrepreneur, 39, no. 5 (June 1, 2010): 589–601. https://doi.org/10.1016/j.respol.2010.02.006.
Luong, Ngor, Zachary Arnold, and Ben Murphy. Understanding Chinese Government Guidance Funds: An Analysis of Chinese-Language Sources. March 2021. https://cset.georgetown.edu/publication/understanding-chinese-government-guidance-funds/.
Mahoney, Paul G. "The Public Utility Pyramids." *The Journal of Legal Studies* 41, no. 1 (January 2012): 37–66. https://doi.org/10.1086/662994.
Manigart, Sophie, Katleen Baeyens, and Wim Van Hyfte. "The Survival of Venture Capital Backed Companies." *Venture Capital* 4, no. 2 (April 2002): 103–24. https://doi.org/10.1080/13691060110103233.
Mao, Wenfeng, and Lu, Jun. "How Does Land Element Mismatch Affect the Quality of Urban Innovation and Entrepreneurship in China?—Empirical Evidence from the Prefecture-Level City Perspective." Industrial Economic Research, no. 3 (2020): 17-29.
Mazzucato, Mariana. The Entrepreneurial State: Debunking Public vs. Private Sector Myths. New York: Public Affairs, 2015.
Megginson, William L, and Kathleen A Weiss. "Venture Capitalist Certification in Initial Public Offerings," Journal of Finance, Vol. 46 (1991): 879-903
Miller, Michelle M. "The Impact of Paid Sick Leave Laws on Consumer and Business Bankruptcies." *Journal of Empirical Legal Studies* 19, no. 4 (December 2022): 844–96. https://doi.org/10.1111/jels.12329.
Mollica, M., Zingales, L., 2007. The Impact of Venture Capital on Innovation and the Creation of New Businesses. University of Chicago Working paper.
Owen, Robyn. "Lessons From Government Venture Capital Funds to Enable Transition to a Low-Carbon Economy: The U.K. Case." *IEEE Transactions on Engineering Management* 70, no. 3 (March 2023): 1040–54. https://doi.org/10.1109/TEM.2021.3094992.
Owen, Robyn, and Colin Mason. "Emerging Trends in Government Venture Capital Policies in Smaller Peripheral Economies: Lessons from Finland, New Zealand, and Estonia." *Strategic Change* 28, no. 1 (January 2019): 83–93. https://doi.org/10.1002/jsc.2248.
Pollman, Elizbeth, and Jordan M. Barry. "Regulatory Entrepreneurship." *Southern California Law Review* 90, no. 3 (2016): 383–448.
Pollman, Elizabeth. "Startup Failure." *Duke Law Journal*, November 1, 2023, 327.

Popov, Alexander, and Peter Roosenboom. "Venture Capital and New Business Creation." *Journal of Banking & Finance* 37, no. 12 (December 2013): 4695–4710. https://doi.org/10.1016/j.jbankfin.2013.08.010.
Puri, Manju, and Rebecca Zarutskie. "On the Life Cycle Dynamics of Venture-Capital- and Non-Venture-Capital-Financed Firms." *The Journal of Finance*, 2023.
Rao, Pinggui, Tang, Cheng, and Li, Xiaoxi. "Crowding Out Effect of Local Government Debt: Evidence Based on Corporate Leverage Manipulation." China Industrial Economy, no. 1 (2022): 151–69.
Rajan, Raghuram G., and Luigi Zingales. "Financial Dependence and Growth." *The American Economic Review* 88, no. 3 (1998): 559–86.
Rajan, Raghuram, and Luigi Zingales. "Financial Dependence and Growth." Cambridge, MA: National Bureau of Economic Research, September 1996. https://doi.org/10.3386/w5758.
Sanga, Sarath, and Eric L. Talley. "Don't Go Chasing Waterfalls: Fiduciary Duties in Venture Capital Backed Startups." SSRN Scholarly Paper. Rochester, NY, October 31, 2020. https://doi.org/10.2139/ssrn.3721814.
Si, Lijuan, and Cao, Haoyu. "Can green credit policies improve corporate environmental and social responsibility" China Industrial Economy, no. 4 (2022): 137–54.
Smith, D. Gordon, Brian Broughman, and Christine Hurt, eds. *The Cambridge Handbook of Law and Entrepreneurship in the United States*. New edition. Cambridge, United Kingdom New York, NY, USA Port Melbourn, VIC, Australia: Cambridge University Press, 2022.
Strezhnev, Anton. 2023. "Decomposing Triple-Differences Regression under Staggered Adoption." arXiv. https://doi.org/10.48550/arXiv.2307.02735.
Reilly, Devin, D. Daniel Sokol, and David Toniatti. "The Importance of Exit via Acquisition to Venture Capital, Entrepreneurship, and Innovation." *Minnesota Journal of International Law* 32, no. 1 (2023): 159–94.
Roth, Jonathan, Pedro H. C. Sant'Anna, Alyssa Bilinski, and John Poe. "What's Trending in Difference-in-Differences? A Synthesis of the Recent Econometrics Literature." *Journal of Econometrics* 235, no. 2 (August 1, 2023): 2218–44. https://doi.org/10.1016/j.jeconom.2023.03.008.
Samila, Sampsa, and Olav Sorenson. "Venture Capital, Entrepreneurship, and Economic Growth." *Review of Economics and Statistics* 93, no. 1 (February 2011): 338–49. https://doi.org/10.1162/REST_a_00066.
Sant'Anna, Pedro H. C., and Jun B. Zhao. "Doubly Robust Difference-in-Differences Estimators." arXiv, May 5, 2020. http://arxiv.org/abs/1812.01723.
Soleimani Dahaj, Arash, and Brian Paul Cozzarin. "Government Venture Capital and Cross-Border Investment." *Global Finance Journal* 41 (August 2019): 113–27. https://doi.org/10.1016/j.gfj.2019.03.001.
Suchard, Jo-Ann, Mark Humphery-Jenner, and Xiaping Cao. 2021. "Government Ownership and Venture Capital in China." *Journal of Banking & Finance* 129 (August):106164. https://doi.org/10.1016/j.jbankfin.2021.106164.
Sun, Liyang, and Sarah Abraham. "Estimating Dynamic Treatment Effects in Event Studies with Heterogeneous Treatment Effects." *Journal of Econometrics*, Themed Issue: Treatment Effect 1, 225, no. 2 (December 1, 2021): 175–99. https://doi.org/10.1016/j.jeconom.2020.09.006.
Vogelaar, Jan Jacob, and Erik Stam. "Beyond Market Failure: Rationales for Regional Governmental Venture Capital." *Venture Capital* 23, no. 3 (July 3, 2021): 257–90. https://doi.org/10.1080/13691066.2021.1927341.

Wallsten, Scott. "The Role of Government in Regional Technology Development: The Effects of Public Venture Capital and Science Parks." In *Building High-Tech Clusters*, edited by Timothy Bresnahan and Alfonso Gambardella, 1st ed., 229–79. Cambridge University Press, 2004. https://doi.org/10.1017/CBO9780511802911.010.

Wang, Jinmin, Jing Wang, Hua Ni, and Shaowei He. "How Government Venture Capital Guiding Funds Work in Financing High-Tech Start-Ups in China: A 'Strategic Exchange' Perspective." *Strategic Change* 22, no. 7–8 (November 2013): 417–29. https://doi.org/10.1002/jsc.1948.

Wang, Linhui, Jiang, Hao, and Dong, Zhiqing. "Will Industrial Intelligence Reshape the Geographic Layout of Enterprises?" China Industrial Economy, no. 2 (2022): 137–55.

Xu, Yiqing, Anqi Zhao, and Peng Ding. 2024. "Factorial Difference-in-Differences." arXiv. https://doi.org/10.48550/arXiv.2407.11937.

Yang Minli, Li Xinfang, and Wu Yongheng. "Study on the Guiding Effect of Government Venture Capital Guidance Funds." Science Research Management 35, no. 11 (2014): 8–16.

Zhao, Bo, and Rosemarie Ziedonis. "State Governments as Financiers of Technology Startups: Evidence from Michigan's R&D Loan Program." *Research Policy* 49, no. 4 (May 1, 2020): 103926. https://doi.org/10.1016/j.respol.2020.103926.

Zhang, Jing, Yueqi Fan, and Ye Liu. "The Effects of Government Venture Capital: New Evidence from China Based on a Two-Sided Matching Structural Model." *Journal of Corporate Finance* 84 (February 1, 2024): 102521. https://doi.org/10.1016/j.jcorpfin.2023.102521.

Zhang, Taisu, and John D. Morley. "The Modern State and the Rise of the Business Corporation." *Yale Law Journal* 132, no. 7 (2023): 1970–2047.

Zhang, Isabelle. "Beyond ByteDance." *Virginia Law & Business Review*, forthcoming 2025.

Zhang, Yuejia, and David Geoffrey Mayes. 2018. "The Performance of Governmental Venture Capital Firms: A Life Cycle Perspective and Evidence from China." *Pacific-Basin Finance Journal* 48 (C): 162–85.

## Figures

### Figure 1 Global VC, US VC, and Chinese government VC Capital Raised in Comparison

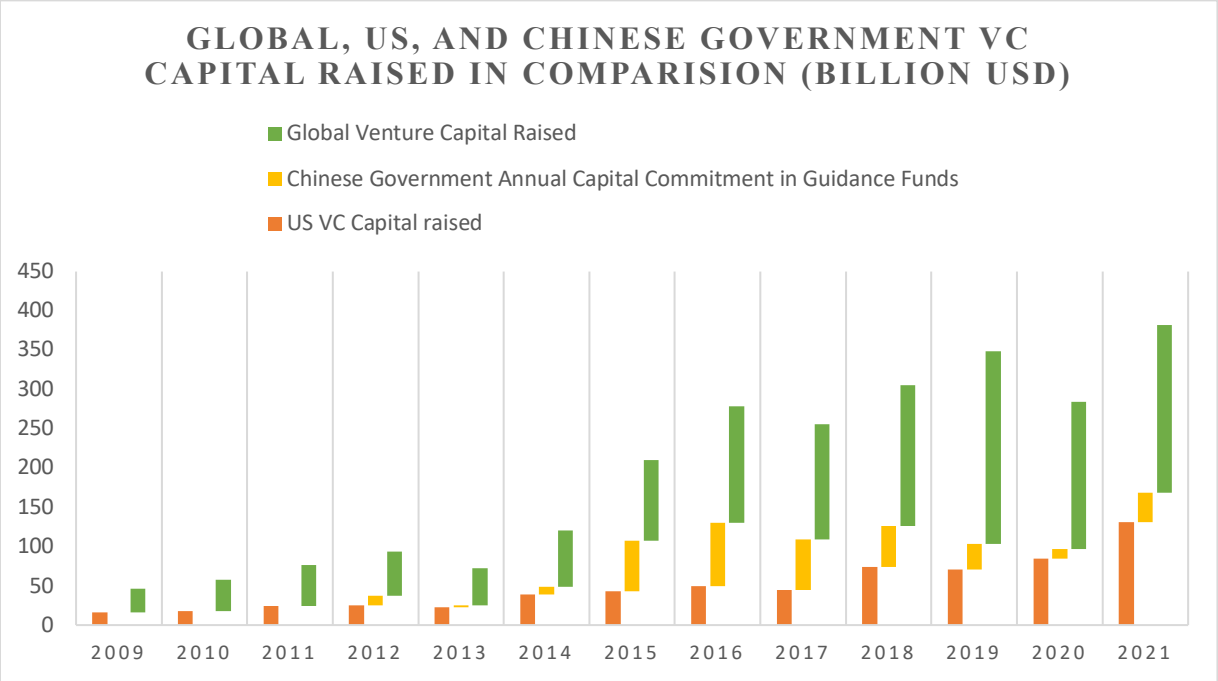


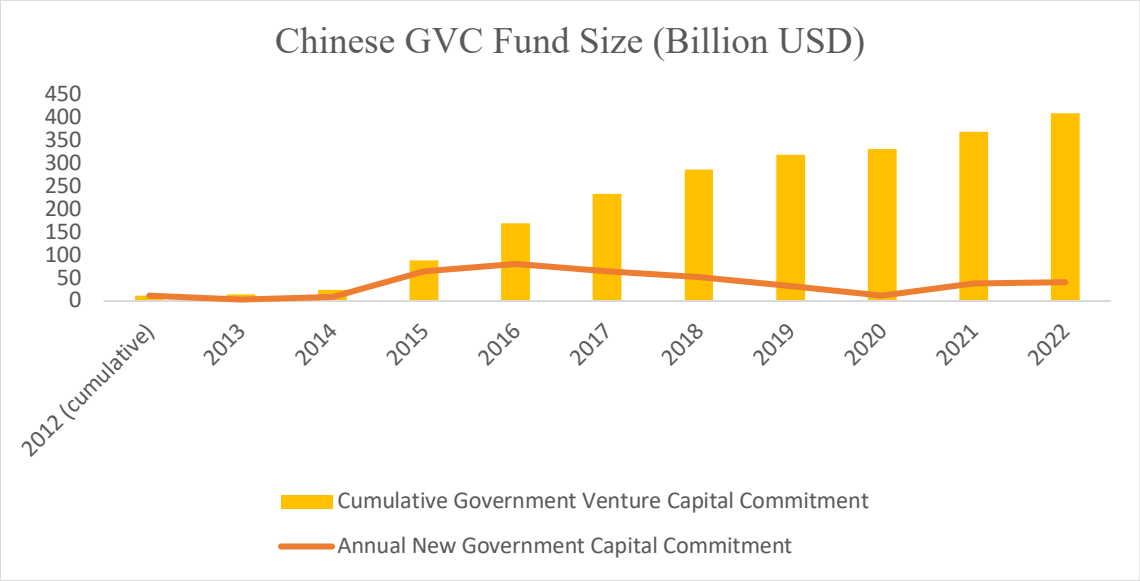

Figure 1: 2009 to 2021 Global, US, and Chinese Government VC capital raised (Billion USD)

Source: data compiled from National Venture Capital Association and Pitchbook Yearbook[17] and CVSource Governmental Venture Capital Guidance Fund Annual Research Report, 2013 to 2022[18]

[17] Different years' of NVCA yearbook has discrepancies (for example. There are discrepancies in the following two links). The data used in Figure 1 is extracted from the NVCA 2023 yearbook, which is the latest yearbook and might offer better accuracy. https://nvca.org/wp-content/uploads/2023/03/NVCA-2023-Yearbook_FINALFINAL.pdf https://pitchbook.com/news/articles/fundraising-down-vc-2023-q1

[18] The annual reports by CVSource before 2013 do not include data on governmental annual commitments. Other sources of such data are not incorporated here due to concerns of data in-consistency and quality concerns.

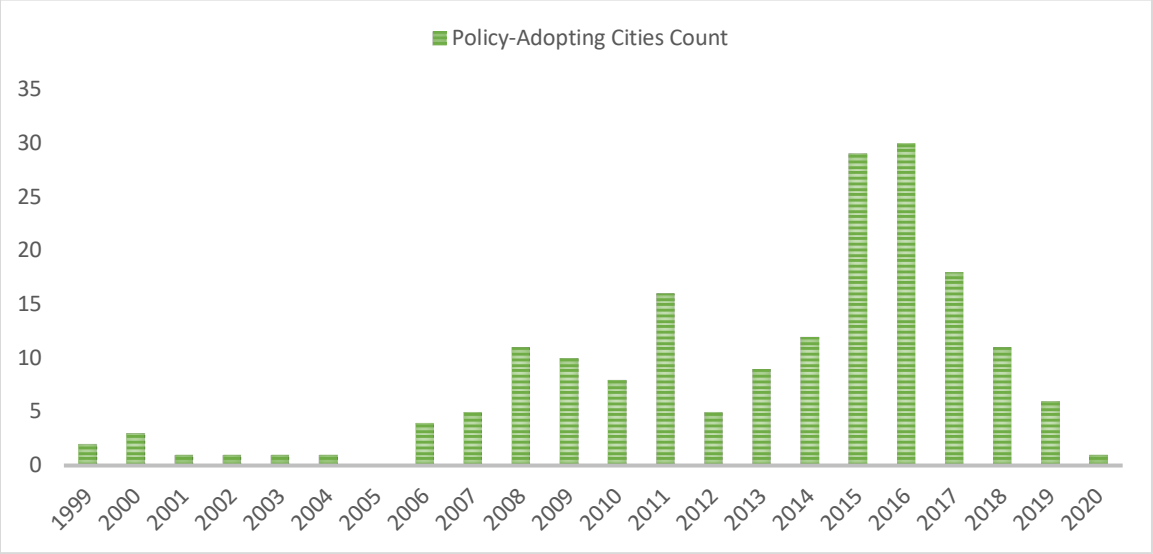
**Figure 2 Chinese Governmental Guidance Fund Size**




2012 to 2022 Chinese GVC Fund Size (Billion USD)

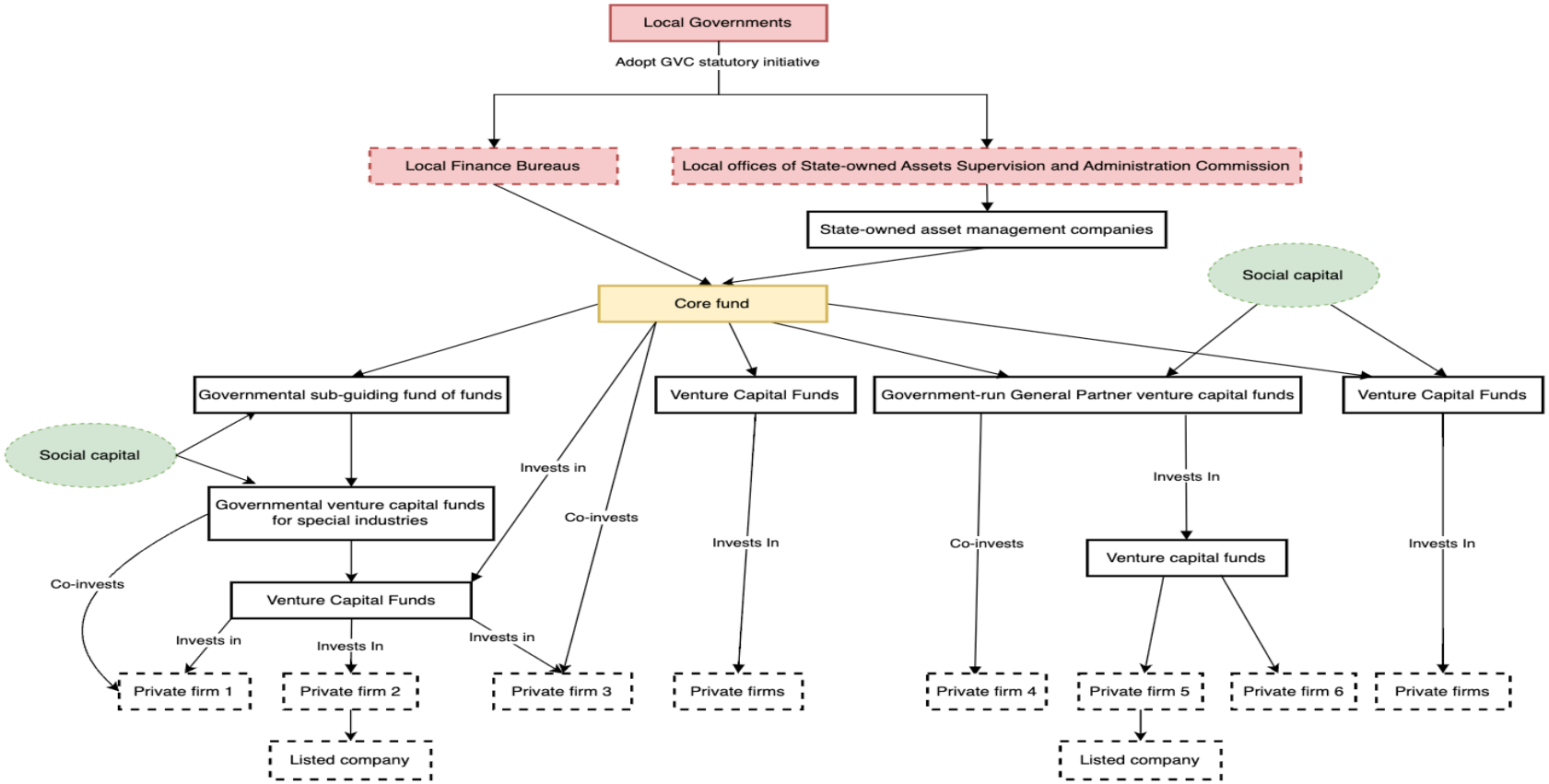
Source: the author; CVSource Governmental Venture Capital Guidance Fund Annual Research Report, 2013 to 2022

**Figure 3: Count of Cities Implementing New Statutory Initiatives by Year**




Source: hand-collected by the author

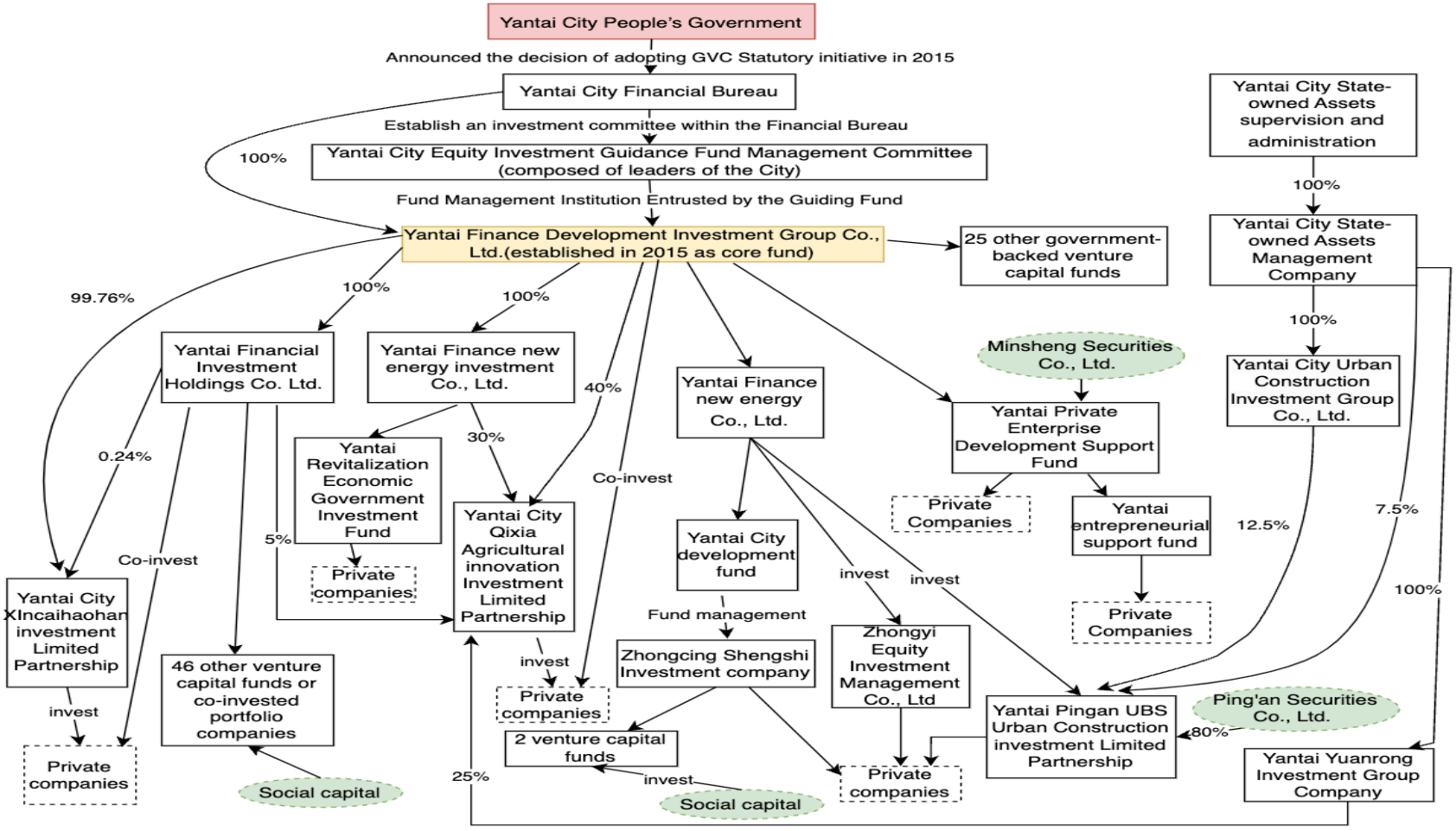
**Figure 8: A typical organizational structure of Governmental Venture Capital Funds**




Source: the author[19]

[19] As is detailed in section II, in Chinese policy statements, non-governmental capital from banks, insurance companies or securities are referred to as “social capital”. It is crucial for a US audience to understand that this term, when directly translated from the Chinese context, diverges from the traditional understanding of "social capital". In this context, it means capital that is not directly sourced from specific government bureaus, such as the financial bureau and other direct governmental entities. It includes contributions from private firms but may also include contributions from State-Owned Enterprises (SOEs), which encompasses large banks, securities firms, and insurance companies.

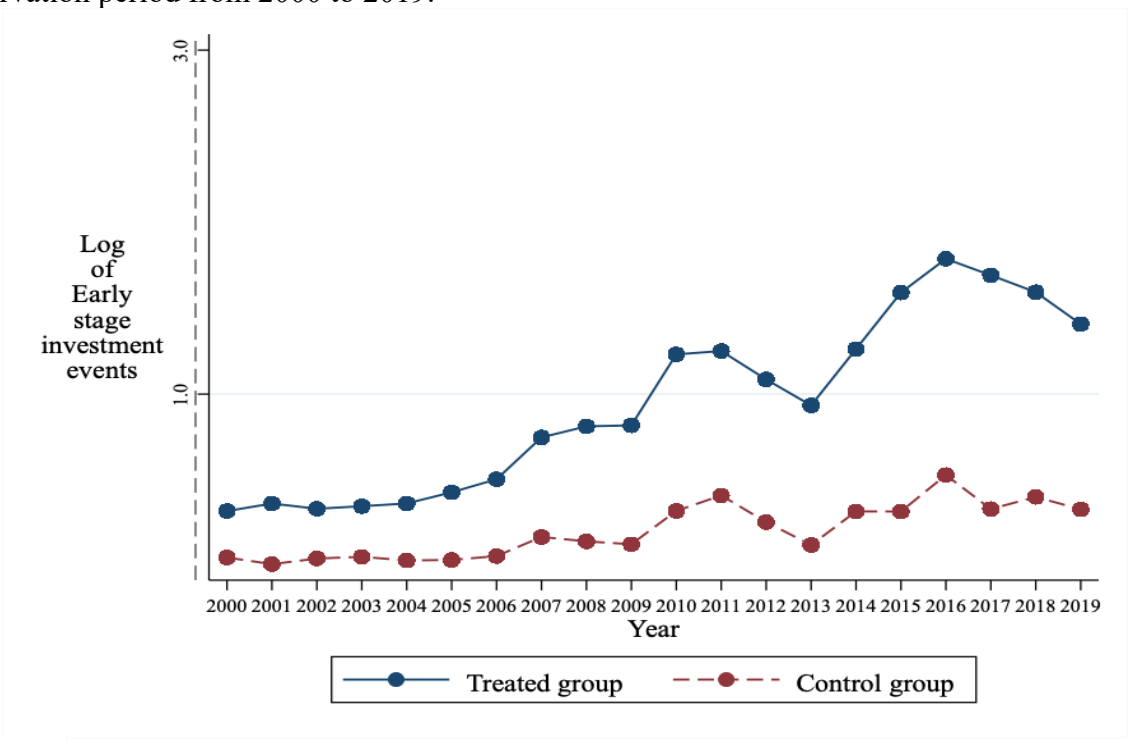
**Figure 9: Statutory Framework Flowchart for GVCs in Yantai City, Shandong Province**

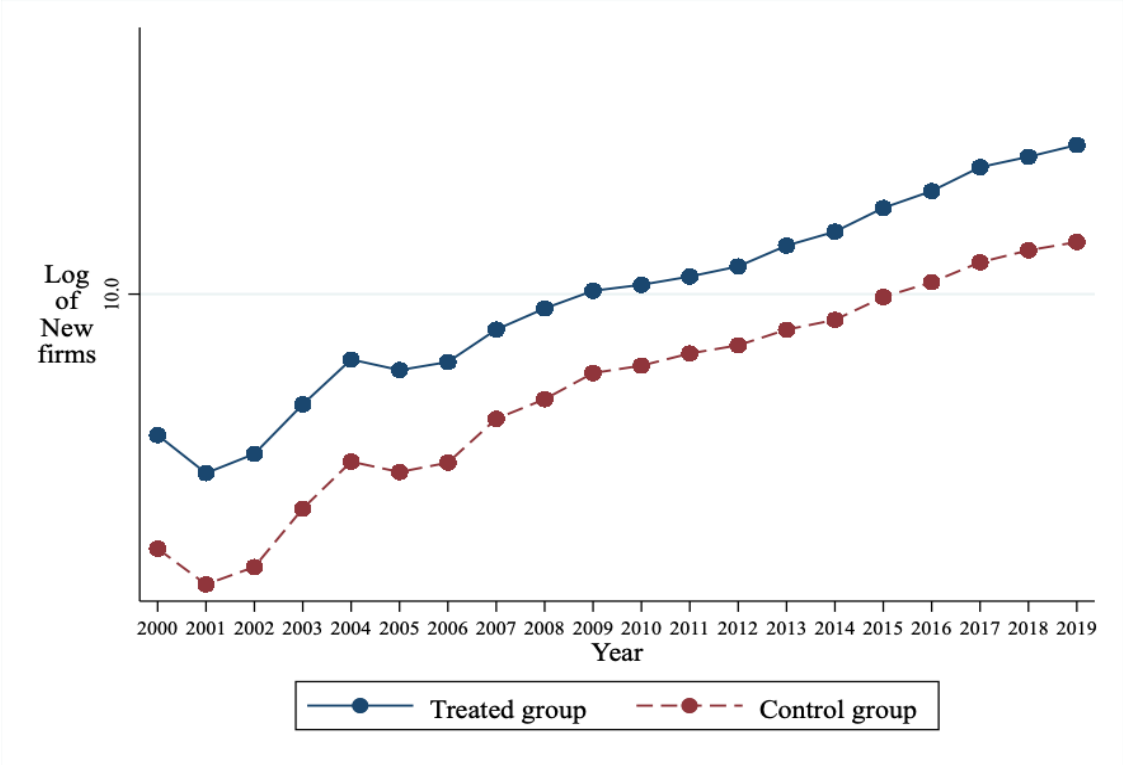



Source: the author

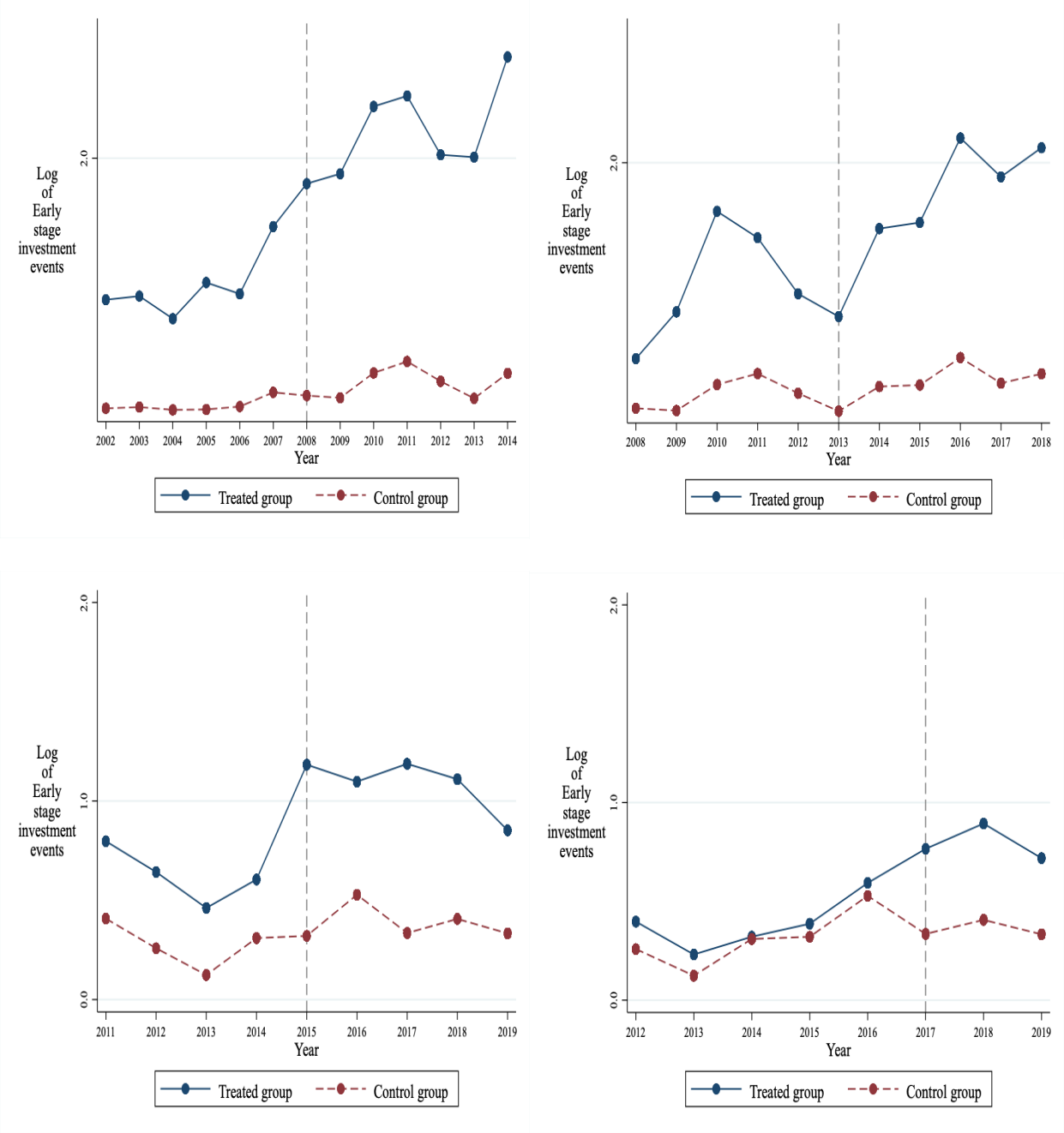
**Figure 10 Average trends in early-stage VC investment events and new firm formation**

Panel A Control group and treated group overall trends
This panel shows the comparison between the control and treated groups for our entire observation period from 2000 to 2019.

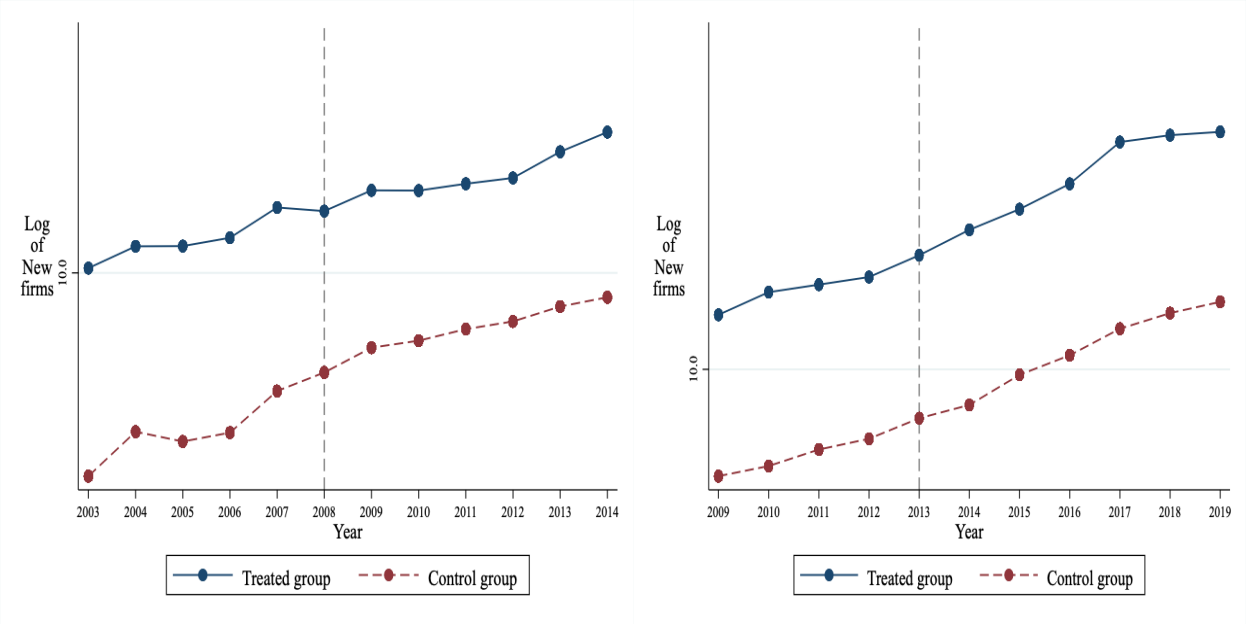


Panel B Early-stage investment events trends in individual treatment years
This panel highlights the average log of early-stage VC investment events in cities from the treated group that adopted the policy in the years 2008, 2013, 2015, and 2017, compared with the control group



Panel C Control group and treated group new firm formation trends in individual treatment years This panel highlights the average log of new firm formation in cities from the treated group that adopted the policy in the years 2008, 2013, 2015, and 2017, compared with the control group.



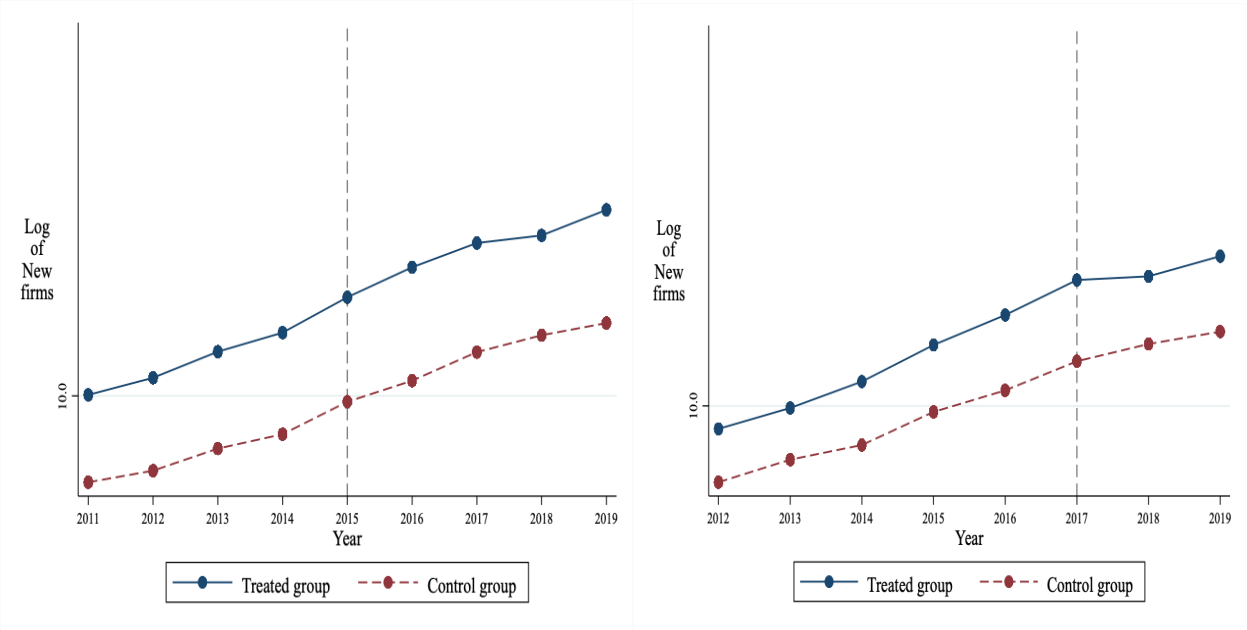
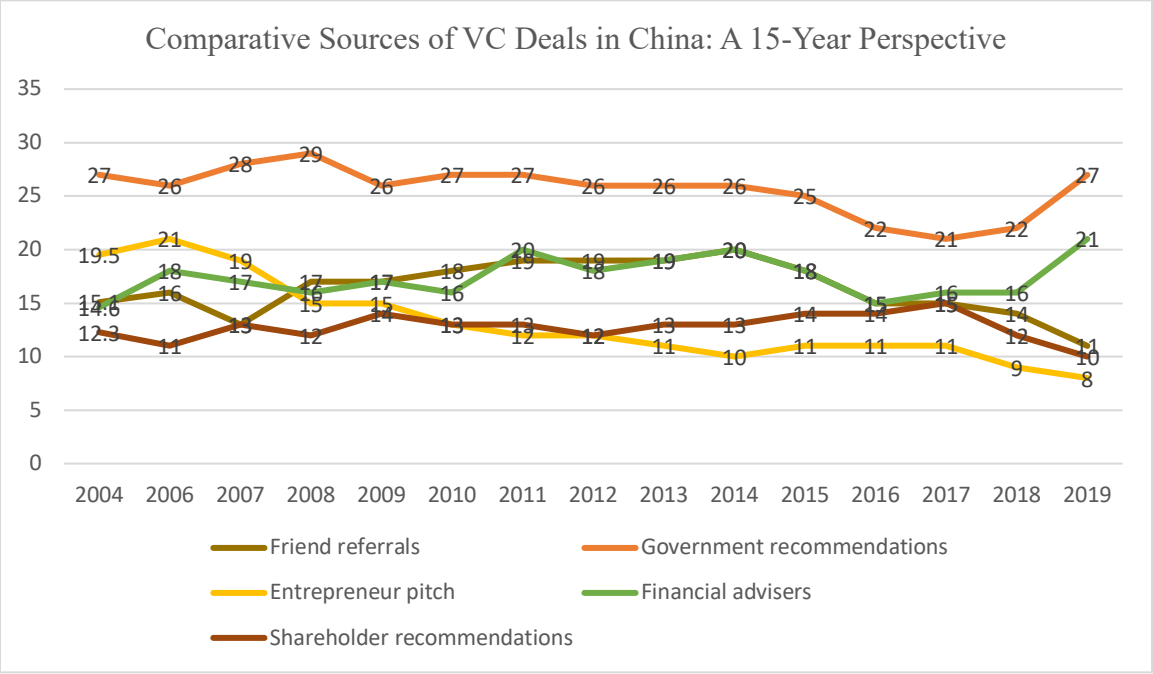



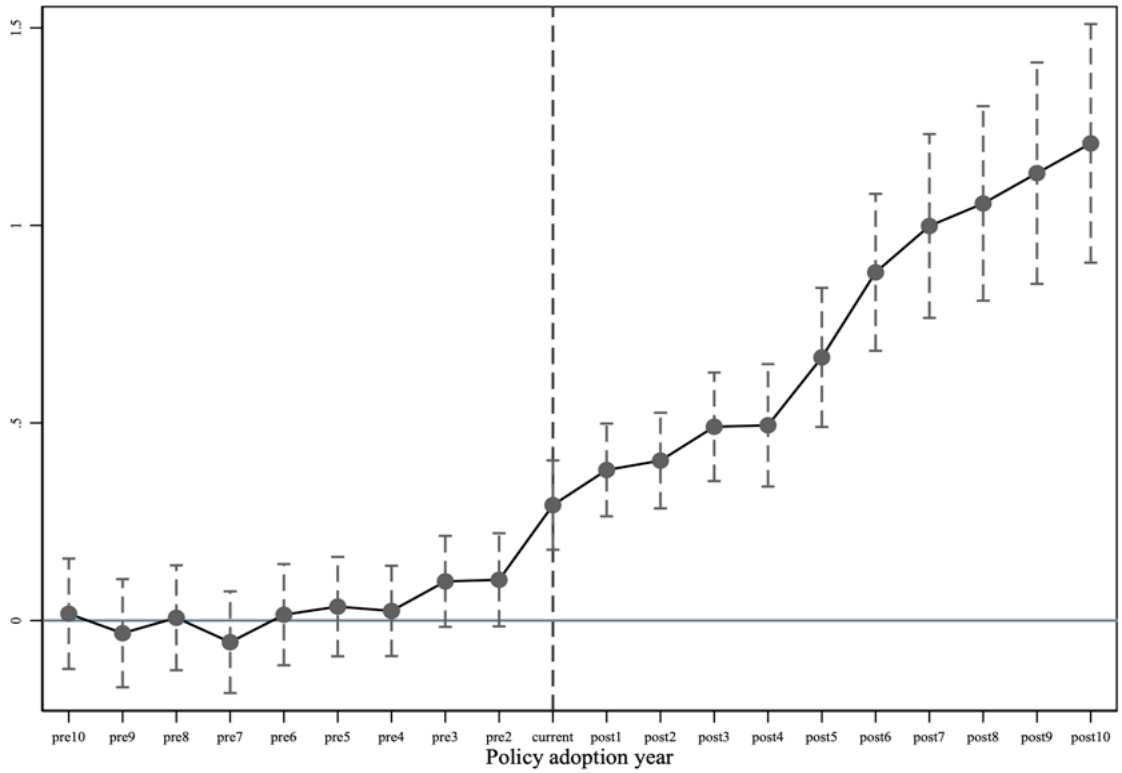
**Figure 11 Comparative Sources of VC Deals in China: A 15-Year Perspective**




Source: Manually extracted from China Venture Capital Reports 2004-2019

**Figure 12 Event study and parallel trend**

(a) Panel A: VC early-stage investment events




(b) Panel B: New business creation

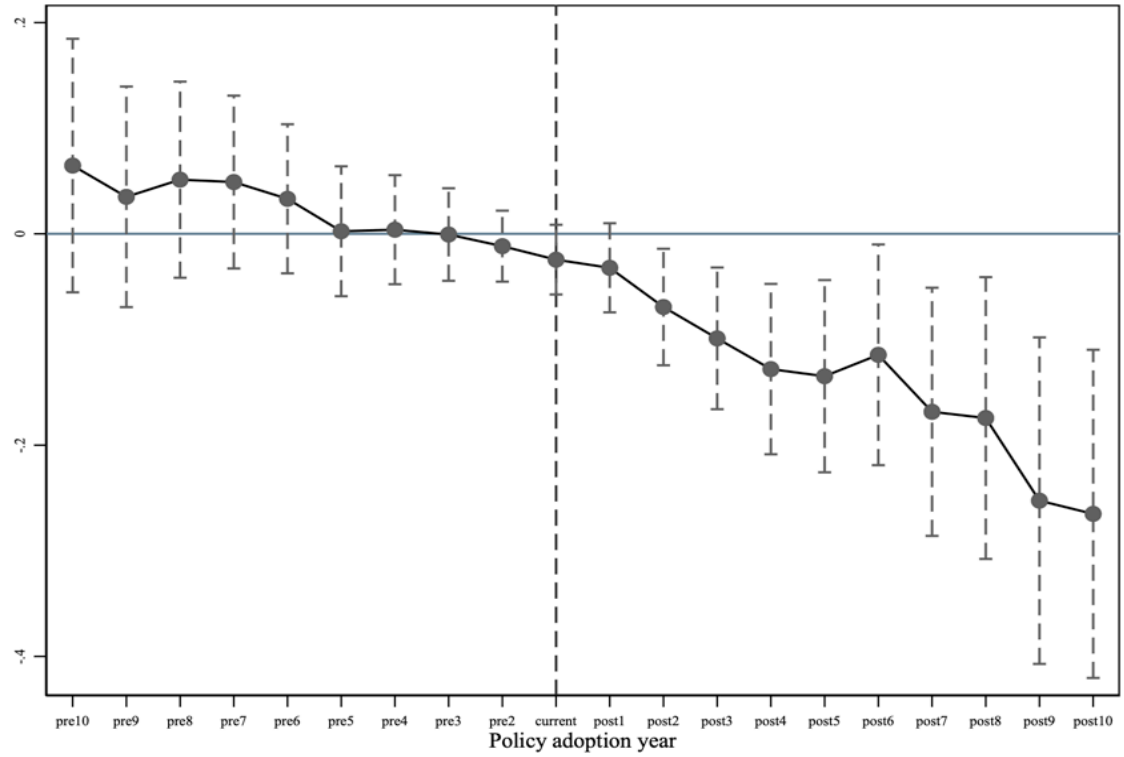
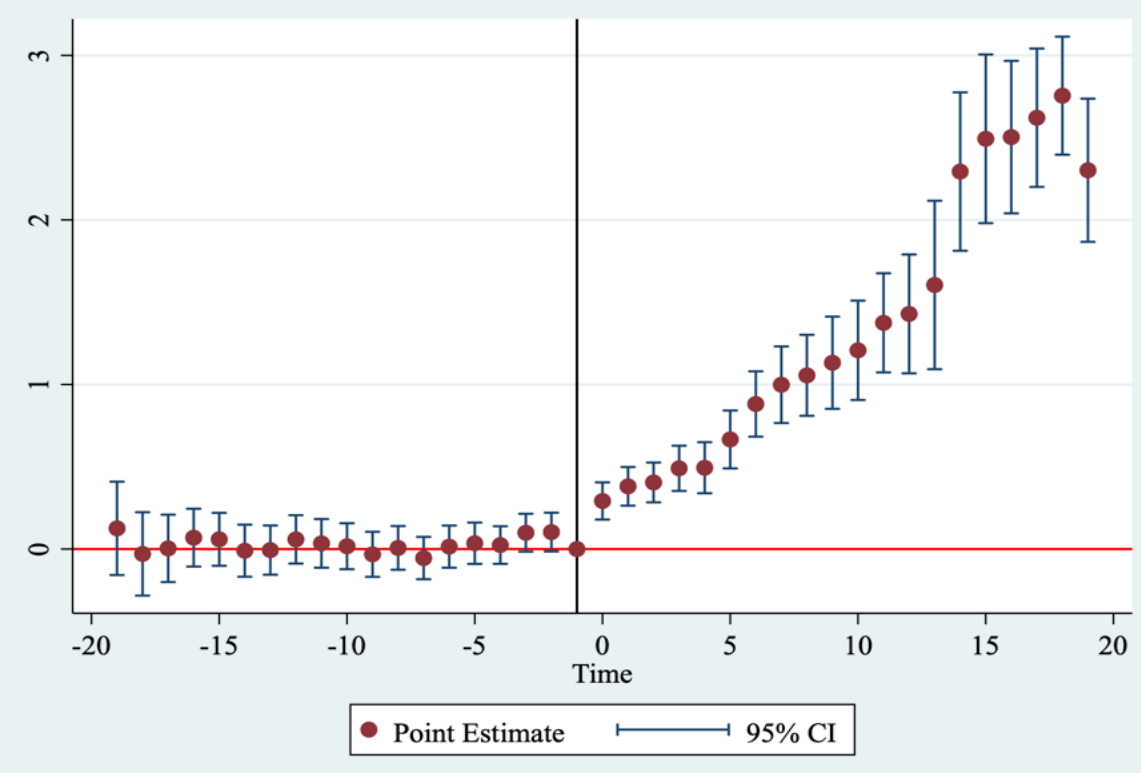


**Figure 13 Alternative parallel trend test**

(a) Early-stage VC investment events




(b) New firm formation

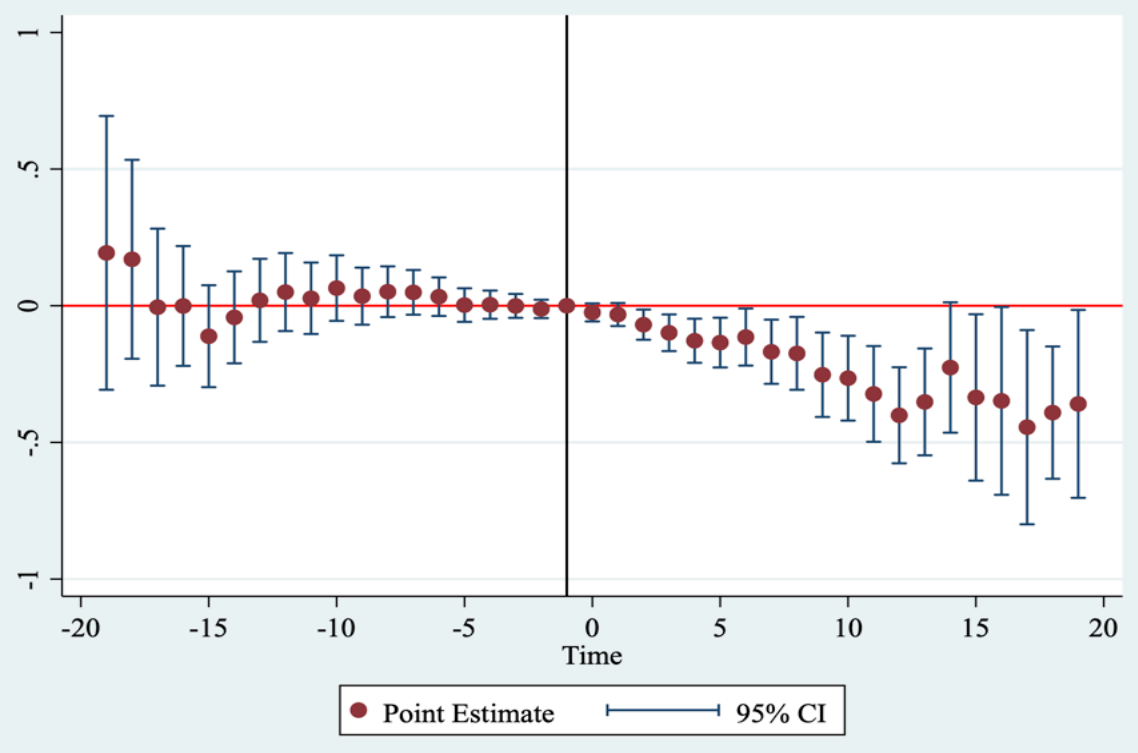
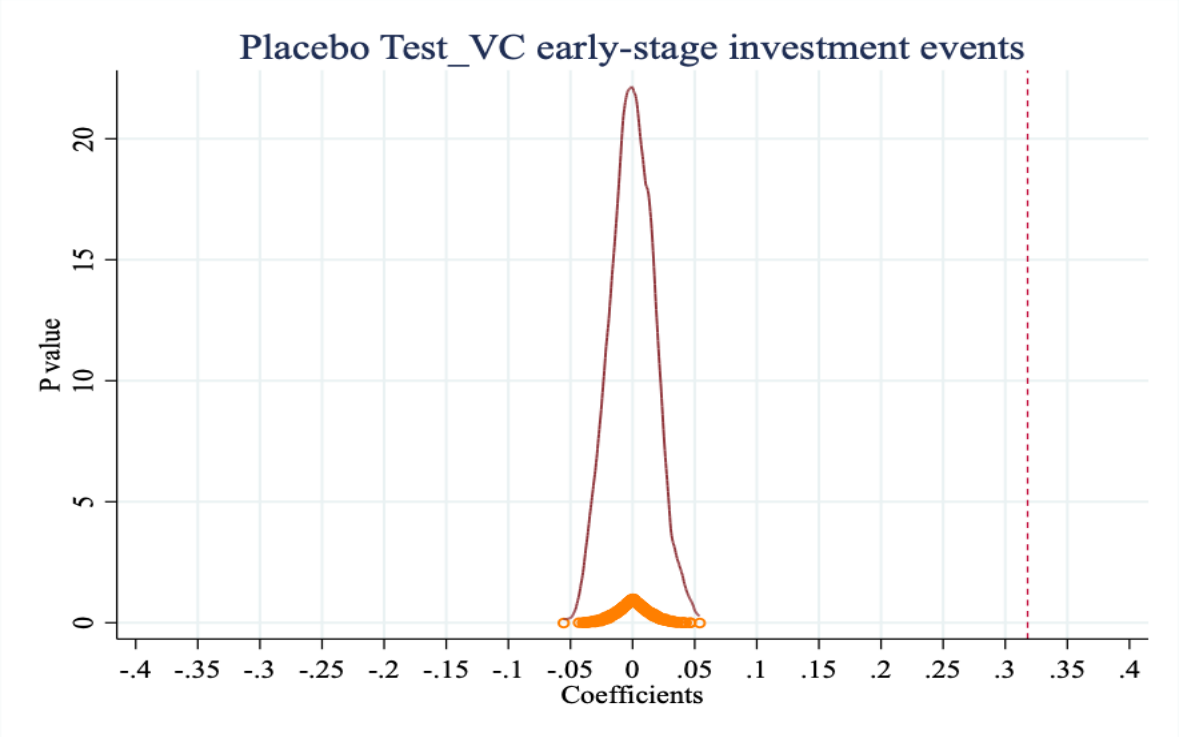
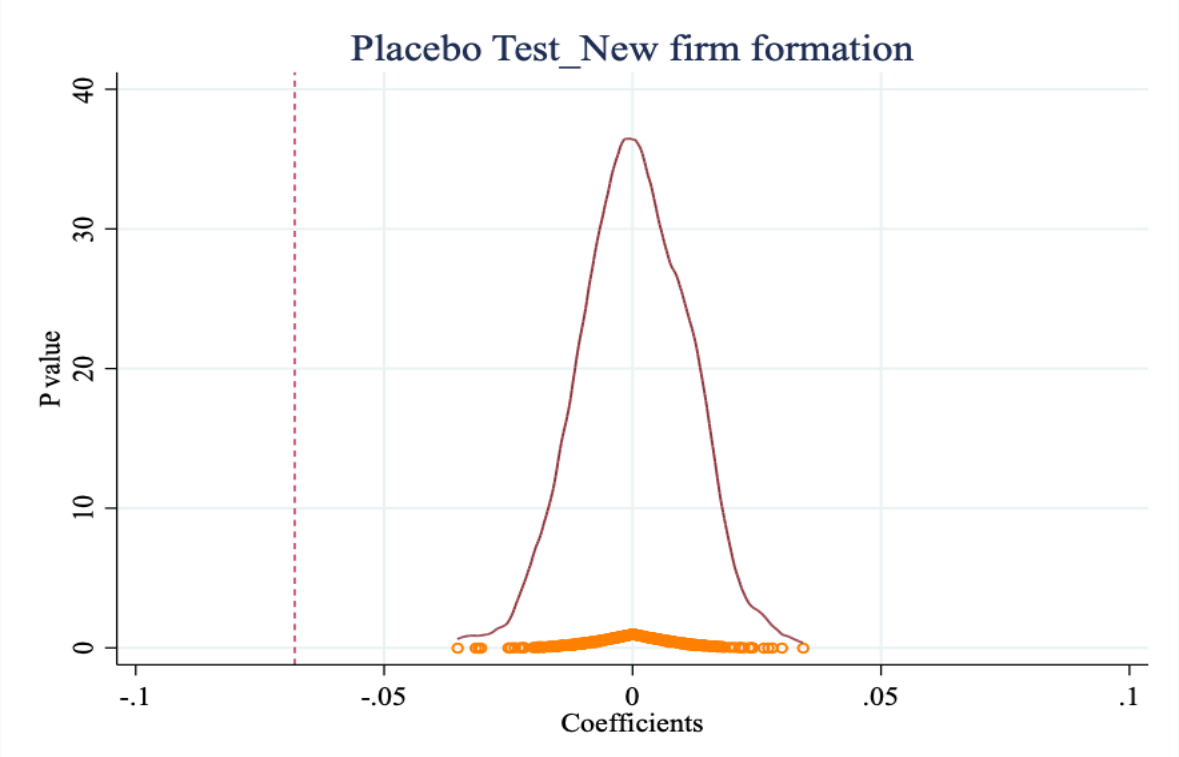


**Figure 14 Placebo Tests**

(a) Placebo test for early-stage VC investments events




(b) Placebo test for new firm formation



**Tables**

Table 1 Full sample summary statistics

| Variable | N | Mean | p50 | SD | Min | Max |
|---|---|---|---|---|---|---|
| cityid | 5600 | 142.3 | 142.5 | 81.88 | 1 | 285 |
| provinceid | 5600 | 14.09 | 12.50 | 9.097 | 1 | 30 |
| treat | 5600 | 0.654 | 1 | 0.476 | 0 | 1 |
| GVC-SI | 5600 | 0.229 | 0 | 0.420 | 0 | 1 |
| FDI | 5356 | 9.322 | 9.419 | 2.066 | 1.099 | 14.94 |
| GDP | 5506 | 15.79 | 15.78 | 1.168 | 12.04 | 19.61 |
| Patent | 5598 | 5.937 | 5.781 | 1.897 | 0 | 11.85 |
| Gov Revenue | 5575 | 12.91 | 12.92 | 1.419 | 9.071 | 18.08 |
| Education | 5556 | 5.281 | 5.318 | 0.662 | 2.197 | 7.400 |
| Population | 5600 | 15.05 | 15.07 | 0.701 | 11.98 | 17.27 |
| New business formation | 5600 | 9.708 | 9.739 | 1.164 | 6.071 | 13.77 |
| VC early-stage investment events | 5544 | 0.681 | 0 | 1.124 | 0 | 8.133 |

Table 2 Treated group summary statistics

| Variable | N | Mean | p50 | SD | Min | Max |
|---|---|---|---|---|---|---|
| cityid | 3660 | 144.5 | 148 | 84.27 | 2 | 285 |
| provinceid | 3660 | 14.69 | 13 | 9.201 | 1 | 30 |
| treat | 3660 | 1 | 1 | 0 | 1 | 1 |
| GVC-SI | 3660 | 0.351 | 0 | 0.477 | 0 | 1 |
| FDI | 3608 | 9.810 | 9.903 | 1.983 | 1.099 | 14.94 |
| GDP | 3621 | 16.07 | 16.12 | 1.170 | 12.45 | 19.61 |
| Patent | 3660 | 6.425 | 6.394 | 1.906 | 1.099 | 11.85 |
| Gov Revenue | 3637 | 13.27 | 13.28 | 1.413 | 9.717 | 18.08 |
| Education | 3645 | 5.389 | 5.425 | 0.634 | 2.773 | 7.400 |
| Population | 3660 | 15.22 | 15.29 | 0.672 | 12.74 | 17.27 |
| New business formation | 3660 | 9.969 | 9.989 | 1.143 | 6.103 | 13.77 |
| VC early-stage investment events | 3605 | 0.938 | 0.693 | 1.290 | 0 | 8.133 |

Table 3 Control group summary statistics

| Variable | N | Mean | p50 | SD | Min | Max |
|---|---|---|---|---|---|---|
| cityid | 1940 | 138.2 | 132 | 77.01 | 1 | 284 |
| provinceid | 1940 | 12.97 | 10 | 8.789 | 1 | 30 |
| treat | 1940 | 0 | 0 | 0 | 0 | 0 |
| GVC-SI | 1940 | 0 | 0 | 0 | 0 | 0 |
| FDI | 1748 | 8.315 | 8.559 | 1.861 | 2.079 | 13.36 |
| GDP | 1885 | 15.23 | 15.28 | 0.941 | 12.04 | 17.71 |
| Patent | 1938 | 5.017 | 4.987 | 1.495 | 0 | 9.597 |
| Gov Revenue | 1938 | 12.24 | 12.24 | 1.160 | 9.071 | 15.20 |
| Education | 1911 | 5.076 | 5.130 | 0.666 | 2.197 | 6.372 |
| Population | 1940 | 14.74 | 14.79 | 0.649 | 11.98 | 15.94 |
| New business formation | 1940 | 9.215 | 9.336 | 1.038 | 6.071 | 12.23 |
| VC early-stage investment events | 1939 | 0.203 | 0 | 0.407 | 0 | 2.485 |

Table 4 Effects of GVC statutory initiatives on entrepreneurial activity

Panel A: Effects of GVC statutory initiatives on early-stage VC investment events

| VARIABLES | (1)<br>Model 1:<br>VC early-stage investment events | (2)<br>Model 2:<br>VC early-stage investment events |
|---|---|---|
| GVC-SI | 0.471*** | 0.317*** |
| | (7.77) | (5.94) |
| GDP | X | -0.064 |
| | | (-0.51) |
| FDI | X | -0.001 |
| | | (-0.07) |
| Patent | X | 0.072** |
| | | (2.25) |
| Gov Revenue | X | 0.059 |
| | | (0.82) |
| Education | X | 0.311** |
| | | (2.01) |
| Population | X | 1.661*** |
| | | (3.46) |
| Constant | 0.220*** | -26.489*** |
| | (6.94) | (-4.42) |
| Observations | 5,544 | 5,277 |
| R-squared | 0.363 | 0.440 |
| Number of cityid | 280 | 280 |
| City FE | YES | YES |
| Year FE | YES | YES |

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

Panel B: Effects of GVC statutory initiatives on new firm formation

| | (1) | (2) |
|---|---|---|
| VARIABLES | New business formation | New business formation |
| GVC-SI | -0.076** | -0.068** |
| | (-2.21) | (-2.07) |
| GDP | X | 0.219*** |
| | | (2.69) |
| FDI | X | 0.057*** |
| | | (5.34) |
| Patent | X | 0.013 |
| | | (0.56) |
| Gov Revenue | X | -0.034 |
| | | (-0.70) |
| Education | X | 0.207** |
| | | (2.32) |
| Population | X | -0.277** |
| | | (-2.45) |
| Constant | 8.559*** | 8.365*** |
| | (253.12) | (4.88) |
| Observations | 5,600 | 5,333 |
| R-squared | 0.858 | 0.864 |
| Number of cityid | 280 | 280 |
| City FE | YES | YES |
| Year FE | YES | YES |

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

Table 5 Triple diff-in-diff effects on new firm formation

| VARIABLES | (1)<br>New firm formation:<br>supported industries | (2)<br>New firm formation:<br>Non-supported industries |
|---|---|---|
| Triple_diff | 0.055*** | -0.023** |
| | (4.17) | (-2.04) |
| GDP | 0.255** | 0.229** |
| | (2.38) | (2.58) |
| FDI | 0.037*** | 0.060*** |
| | (3.06) | (5.11) |
| Patent | 0.139*** | 0.005 |
| | (4.97) | (0.18) |
| Gov Revenue | 0.006 | -0.044 |
| | (0.09) | (-0.82) |
| Education | 0.593*** | 0.227** |
| | (4.94) | (2.42) |
| Population | 0.486*** | -0.405*** |
| | (3.08) | (-2.95) |
| Constant | -10.160*** | 9.803*** |
| | (-4.01) | (4.92) |
| Observations | 101,327 | 101,327 |
| R-squared | 0.779 | 0.858 |
| Number of cityid | 280 | 280 |
| City FE | YES | YES |
| Year FE | YES | YES |

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

Table 6 PSM-DiD

Panel A: PSM Balance Test

| PSM balance test | | | | | | | |
|---|---|---|---|---|---|---|---|
| Variable | Unmatched Matched | Mean Treated | Mean Control | %bias | %reduct bias | t-test t p>t | V(T)/ V(C) |
| lnfdi | U | 9.9728 | 8.2851 | 87.2 | 98.4 | 28.27 0.000 | 1.02 |
| | M | 9.6341 | 9.6073 | 1.4 | | 0.57 0.566 | 0.98 |
| lnpatent | U | 6.658 | 5.2222 | 83.2 | 99.5 | 25.95 0.000 | 1.69* |
| | M | 6.3058 | 6.3137 | -0.5 | | -0.18 0.859 | 1.12* |
| lnrevenue | U | 13.471 | 12.426 | 83.4 | 99.0 | 26.17 0.000 | 1.56* |
| | M | 13.201 | 13.212 | -0.9 | | -0.35 0.724 | 1.02 |
| Education | U | 5.4007 | 5.1171 | 45.2 | 93.6 | 14.72 0.000 | 0.97 |
| | M | 5.3363 | 5.3543 | -2.9 | | -1.19 0.233 | 1.28* |
| Population | U | 15.237 | 14.792 | 69.4 | 96.5 | 22.27 0.000 | 1.15* |
| | M | 15.128 | 15.144 | -2.4 | | -1.01 0.312 | 1.16* |
| lngdpgrowth | U | -2.0979 | -2.1298 | 4.1 | 61.5 | 1.35 0.178 | 0.88* |
| | M | -2.1175 | -2.1297 | 1.6 | | 0.63 0.526 | 1.08* |

Panel B: PSM-DiD Results

| VARIABLES | (1) VC early-stage investment events | (2) New business formation |
|---|---|---|
| GVC-SI | 0.285*** | -0.074** |
| | (5.71) | (-2.12) |
| Observations | 3,707 | 3,707 |
| R-squared | 0.368 | 0.869 |
| Number of cityid | 270 | 270 |
| City FE | YES | YES |
| Year FE | YES | YES |
| Control variables | YES | YES |

Robust t-statistics in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table 7 Effects of GVC statutory initiatives on entrepreneurial activity (alternative measurements)

| VARIABLES | (1)<br>IRIEC_new_business_score | (2)<br>Scaled enterprise output value |
|---|---|---|
| GVC-SI | -3.375*** | -0.118*** |
| | (-4.84) | (-3.24) |
| Observations | 5,333 | 4,504 |
| R-squared | 0.853 | 0.936 |
| Number of cityid | 280 | 280 |
| City FE | YES | YES |
| Year FE | YES | YES |
| Control variables | YES | YES |

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

Table 8 Excluding mega municipal cities

| VARIABLES | (1)<br>VC early-stage investment events | (2)<br>New business formation |
|---|---|---|
| GVC-SI | 0.326*** | -0.078** |
| | (6.21) | (-2.37) |
| Observations | 5,213 | 5,269 |
| R-squared | 0.437 | 0.866 |
| Number of cityid | 276 | 276 |
| City FE | YES | YES |
| Year FE | YES | YES |
| Control variables | YES | YES |

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

Table 9

Panel A: Shortened Period 2007-2017

| VARIABLES | (1) VC early-stage investment events | (2) New business formation |
|---|---|---|
| GVC-SI | 0.392*** | -0.085** |
| | (8.26) | (-2.40) |
| Observations | 4,677 | 4,725 |
| R-squared | 0.431 | 0.868 |
| Number of cityid | 249 | 249 |
| City FE | YES | YES |
| Year FE | YES | YES |
| Control variables | YES | YES |

Robust t-statistics in parentheses

*** p<0.01, ** p<0.05, * p<0.

Panel B: DD comparison decomposition

| | Early-stage VC investment events | | New firm formation | |
|---|---|---|---|---|
| DD Comparison | Weight | Avg DD Est | Weight | Avg DD Est |
| Earlier T vs. Later C | 0.204 | 0.692 | 0.264 | -0.156 |
| Later T vs. Earlier C | 0.100 | -0.302 | 0.120 | 0.053 |
| T vs. Never treated | 0.656 | 0.852 | 0.580 | -0.078 |
| T vs. Never T vs. Already treated | 0.040 | -0.782 | 0.036 | 0.106 |

Robust t-statistics in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Panel C: Alternative methods for estimating effects with staggered difference-in-differences

| Methods | (1) VC early-stage investment events | (2) New business formation |
|---|---|---|
| Goodman-Bacon | 0.316*** | -0.068*** |
| | (11.89) | (-4.08) |
| Callaway and Sant'Anna | 0.443*** | -0.077** |
| | (5.54) | (-2.43) |
| De Chaisemartin and D'Haultfoeuille | 0.506*** | -0.050** |
| | (9.08) | (-2.21) |
| Control variables same with Equation (1) | YES | YES |

Robust t-statistics in parentheses

*** p<0.01, ** p<0.05, * p<0.1

## Appendix A Selective Laws and Regulations

| Law/regulation/policy statement | Chinese tittles | Year | Issuing institutions | Key points |
|---|---|---|---|---|
| Interim Measures for the Management of Venture Capital Enterprises | 《创业投资企业管理暂行办法》 | 2005 | NDRC; CSRC; People's Bank of China; Ministry of Commerce; State Administration of Taxation; Ministry of Science & Technology; Ministry of Finance; State Administration for Industry and Commerce; China Banking Regulatory Commission; State Administration for Foreign Exchange | Article 22 The state and local governments may establish GVC statutory initiatives funds so as to support the establishment and development of startup investment enterprises by way of holding their shares, providing financing guaranties, etc. |
| National Medium and Long-term Science and Technology Development Plan Outline (2006-2020) | 《国家中长期科学 和技术发展规划 纲要(2006-2020年)》[20] | 2006 | The State Council | Plan 12: Support the development of venture capital industry. Especially for venture capital enterprises that primarily invest in small and medium-sized high-tech enterprises. |
| Notice for Promoting the Industrialization of Independent Innovation Achievements | 《发展改革委等部门关于促进自主创新成果产业化若干政策的通知》 | 2008 | NDRC; Ministry of Science and Technology, Ministry of Finance, Ministry of Education, People's Bank of China, State Administration of Taxation, Intellectual Property Office, Chinese Academy of Sciences, Academy of Engineering | "Initiate and implement special projects for the industrialization of independent innovation achievements. The state shall select a batch of significant independent innovation achievements in key areas such as information, biology, aerospace, new materials, advanced energy, advanced manufacturing, energy conservation and emission reduction, and marine development, and implements special projects for the industrialization of these achievements, providing appropriate policy, financial, and other forms of support." |
| Decision on Accelerating the Fostering and Development | 《关于加快培育和发展战略 | 2010 | State Council | Decision of 1 point 3: "At present, the pattern of global economic competition is undergoing deep revolution…. to |

[20] https://www-pkulaw-com-s.qh.yitlink.com:8444/chl/e8bdbb150b0dcad6bdfb.html?keyword=%E5%9B%BD%E5%AE%B6%E4%B8%AD%E9%95%BF%E6%9C%9F%E7%A7%91%E5%AD%A6%20%E5%92%8C%E6%8A%80%E6%9C%AF%E5%8F%91%E5%B1%95%E8%A7%84%E5%88%92%20%E7%BA%B2%E8%A6%81%282006-2020%20%E5%B9%B4%29&way=listView

| | | | | |
|---|---|---|---|---|
| of Strategic Emerging industries | 性新兴产业的决定》 | | | promote the rapid development of emerging industries in fields such as energy conservation, environmental protection, new energy, information and biology. To hold an advantageous position in future international competition, we must accelerate the fostering and development of strategic emerging industries, control the key and core technologies and related intellectual property rights, and enhance our capability of independent development." |
| Measures for the Management of Participation in Venture Capital Funds for Emerging Industry Venture Capital Plans | 《新兴产业创投计划参股创业投资基金管理暂行办法》 | 2011 | Ministry of Finance; NDRC | Article 7 stipulates that each participating fund should concentrate its investments in the following specific areas: information technology, biotechnology and pharmaceuticals, new energy, new materials, aerospace, marine industry, energy conservation and environmental protection, manufacturing, new energy vehicles, high-tech services (including information technology, biotechnology, research and development design, testing and inspection, and technology commercialization services), strategic emerging industries, and the transformation and upgrading of traditional industries through high-tech advancements. |
| Notice on Further Supporting the Development of Venture Capital Industry | 《关于进一步做好支持创业投资企业发展相关工作的通知》 | 2014 | NDRC | Principle 2 states that governmental guiding funds should intensify their efforts to attract non-governmental capital. |
| Interim Measures for Government-funded Industry Investment Funds | 《政府投资基金暂行管理办法》 | 2015 | Ministry of Finance | Article 3 "For the purpose of these Measures, the term "government investment" means funds arranged by public finance departments through general public budgets, government fund budgets, and state-owned capital operating budgets, among others." |

| | | | | |
|---|---|---|---|---|
| Amending the Law of the People's Republic of China on Promoting the Transformation of Scientific and Technological Achievements | 《中华人民共和国促进科技成果转化法》 | 2015 | The Standing Committee of the National People's Congress | Article 3 is amended to: "The transformation of scientific and technological achievements shall be conducive to accelerating the implementation of innovation-driven development strategies, promoting the combination of technology and economy, improving economic returns and social benefits, protecting the environment, making rational use of resources, promoting economic construction and social development, and safeguarding national security. |
| Administrative Measures for Government Investment Funds | 《政府出资产业投资基金暂行办法》 | 2016 | NDRC | Article1 local governments should improve and optimize the government investment funds, leverage the guiding function and attract more non-governmental capital to invest in government-supported sectors and industries.[21] |
| Opinions of the State Council on Promoting the Sustainable and Sound Development of Venture Capital | 《关于促进创业投资健康发展的若干意见》[22] | 2016 | The State Council | Opinion 4 [GVCs should] uphold social responsibility. Focusing on the mission and social responsibility of promoting the construction of an innovative nation, supporting mass entrepreneurship and innovation, and promoting economic structural adjustments and industrial transformation and upgrading in key industries |
| Notice by the Ministry of Finance of Strengthening the Management of Government Investment Funds and Improving the Benefits of Fiscal Contributions | 《关于加强政府投资基金管理提高财政出资效益的通知》[23] | 2020 | The Ministry of Finance | "In recent years, the government investment funds established with approval of the governments at all levels have reached relatively large scale and have maximized an important role in innovating on the use of fiscal funds, directing the development of the emerging industries, and leveraging the investment of private investors. However, concurrently, many funds manifest repeated and redundant policy objectives and misuse of the capital." |

[21] https://www.ndrc.gov.cn/xxgk/zcfb/ghxwj/202006/P020200616534029012811.pdf
[22] https://www-pkulaw-com-s.qh.yitlink.com:8444/en_law/57f752005ce0d6bfbdfb.html
[23] https://www-pkulaw-com-s.qh.yitlink.com:8444/en_law/fe2e0e66ae597bc1bdfb.html

## Appendix B Variable Definitions

| Variable | Definition | Source |
|---|---|---|
| **GVC statutory initiatives Adoption** | The adoption of governmental venture capital investment fund statutory initiatives by local governments. Treated group: cities where local governments have allocated public sector capital. Control group: cities without such public sector capital involvement. | Government websites; CVSource, Tianyancha; The China Venture Capital Reports |
| **Venture Capital Early-Stage Investment Events** | The annual number of early-stage investment events, defined as the annual number of investment events from angel, seed, round A, and round A+ VC investment events in entrepreneurial firms. If a company receives funding from different VCs in the same round, the investment event is counted as 1, as syndication is a common phenomenon in the VC industry. However, if the same firm receives investments from VCs in different rounds, this is counted as multiple investment events, as they show a different stage of the firm's development. | CVSource |
| **New Venture/Business Formation** | The annual number of newly incorporated companies in each city, including varied types of firms (e.g., limited liability company, joint-stock limited company, individual proprietorship enterprise, partnership enterprise, shareholding cooperative company, and sole proprietorship enterprise). | Tianyancha |
| **Gross Domestic Product (GDP)** | Represents the total value of all goods and services produced over a specific time period within a city's borders. | China City Statistical Yearbook |
| **Population** | The total number of residents in a city.<br>4th (1990), 5th (2000), 6th (2010), and 7th (2020) | National Population Censuses |
| **Government Revenue** | Total income received by the government from various sources. | China City Statistical Yearbook |
| **Foreign Direct Investment (FDI)** | Direct investment into production or business in a city by a company from another country. | China City Statistical Yearbook |
| **Number of Educational Institutions** | The total number of secondary and higher education institutions in each city. | China City Statistical Yearbook |
| **Patent Authorizations** | The number of patents approved within a city, acting as a measure of innovative activity. These authorization numbers include three types of patents: utility model patents, invention patents, and design patents. | China City Statistical Yearbook |
| **New Business Formation Ranking** | The annual ranking of new business formation in each city according to the Index of Regional Innovation and Entrepreneurship in China (IRIEC). | Index of Regional Innovation and Entrepreneurship in China (IRIEC) by Peking University |
| **Scale Enterprise Production Value** | The annual production value of scale enterprises (enterprises that are beyond micro-firm size) in each city. Although these firms are larger than the startup firms usually associated with entrepreneurial activity, this measure provides a reflection of the overall economic value created by these firms and offers an additional dimension to entrepreneurial activity. | China City Statistical Yearbook |

## Appendix C Excluded city list

| Cities CN | Province CN | Cities EN | Province EN |
|---|---|---|---|
| 中卫市 | 宁夏回族自治区 | Zhongwei City | Ningxia Hui Autonomous Region |
| 乌兰察布 | 内蒙古自治区 | Ulanqab | Inner Mongolia Autonomous Region |
| 儋州市 | 海南省 | Danzhou City | Hainan Province |
| 吐鲁番市 | 新疆维吾尔自治区 | Turpan City | Xinjiang Uyghur Autonomous Region |
| 呼伦贝尔 | 内蒙古自治区 | Hulunbuir | Inner Mongolia Autonomous Region |
| 山南市 | 西藏自治区 | Shannan City | Tibet Autonomous Region |
| 崇左市 | 广西壮族自治区 | Chongzuo City | Guangxi Zhuang Autonomous Region |
| 张掖市 | 甘肃省 | Zhangye City | Gansu Province |
| 思茅市 | 云南省 | Simao City | Yunnan Province |
| 毕节市 | 贵州省 | Bijie City | Guizhou Province |
| 海东市 | 青海省 | Haidong City | Qinghai Province |
| 海东市 | 青海省 | Haidong City | Qinghai Province |
| 莱芜市 | 山东省 | Laiwu City | Shandong Province |
| 襄樊市 | 湖北省 | Xiangyang City | Hubei Province |
| 铜仁市 | 贵州省 | Tongren City | Guizhou Province |

Together with 7 regions, 30 autonomous prefectures and all areas of Tibet.