

A Comparative Analysis of Government and Private Investments Impact on Start-Up Success

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Abstract

With a multitude of different investors, it can be difficult to discern which investor will benefit startups the most in terms of what the start-ups are looking for. The problem being addressed in this research is the challenge that startups face when identifying the best type of venture capital (VC) investment—specifically between government venture capital (GVC) and private venture capital (PVC). This is important to analyze as the choice of VC significantly impacts the long-term success and growth potential of the startup. The research aims to offer insights into the optimal VC investment strategy that allows startups to reach their full potential. It does this through comparison of the effects of GVC on startups and analyzing various factors such as timing and type of support provided. This analysis is conducted through major papers in the field which led to multiple conclusions. One of the major findings was that a blended approach with VCs is important, they both provide different support (not financial), and the timing of VC investment is critical in growth of the startup.

Keywords

Start-Up Success, Government Venture Capital (GVC), Private Venture Capital (PVC), Investment Impact, Start-Up Life Cycle, Entrepreneurial Financing, Comparative Analysis

1. Introduction

Venture capital firms are at the forefront of innovation because they fund startups with groundbreaking ideas. For example, some of the biggest companies started as start-ups that utilized VC investment. Such examples include Netflix, Apple, and more. Other startups progress societal goals and their success can be critical to solving these issues. In the US economy, public companies backed by VCs play

a pivotal role in the economy. It has been studied that if it weren't for the US VC industry, about 1/3 of the largest 300 US public companies wouldn't have achieved that level of success (Gornall & Strebulaev, 2015). This proves that this is an important topic to study and research in detail. Additionally, if there is inefficient capital allocation, it can cause an underfunding or overfunding of start-ups. This misallocation impedes overall economic growth and innovation and thus it is important to research the different venture capital investments to ensure a successful startup. They are known for their high-risk and high-reward investments that influence startups success and competition in the VC markets (Cochrane, 2005). Researching the characteristics of VCs allows a comprehensive understanding of what strategies will be the most efficient for the enterprises and startups they are financing. VC markets can be considered financial ecosystems in which investors provide funding to startups and small businesses with high growth potential in exchange for equity ownership. The financial goal of most venture capital entities is to have a successful exit (Amit et al., 1998). A successful exit strategy means that their investments are sold at the end which can be done in a couple ways. An IPO, initial public offering, is when the company becomes a publicly traded stock that is traded for cash. There are also leverage buyouts and internal sell of their shares as well. A successful exit strategy for VCs is either IPO or M&A (IPO). There are a variety of different VCs that start ups can choose from. The choice of a VC partner can significantly impact a start-up's success by impacting the amount of revenue generated in the future. The VC partner contributes not only in terms of financial support, but also in terms of guidance, mentorship, and access to professional networks. VC firms provide the necessary capital for startups and it is important to make sure that the startups will be receiving adequate funding to reach their goals (Amit et al., 1998). Some businesses may simply need the financial aid and want to run their company themselves with minimal intervention; others may need heavy guidance to lead their company to success. The right VC partner can also increase the value of the company which can also bring in other sources of financing, furthering the growth of the company. Two major types of VCs that are explored in this paper are government venture capitals (GVCs) and private venture capitals (PVCs). Government venture capital (GVC) investment is when the government undertakes initiatives that they see a future potential in that will ultimately help progress society in the future. There are a variety of rationales for government involvement in venture capital markets. The government plays a crucial role in the VC market. GVC accounted for 30.9% of total venture capital investments in the studied European countries between 2007 and 2021 (Testa & Compañó, 2024). There is research that indicates that government intervention in the VC market is to aid the economy overall (Zhang et al., 2024). They hope to stimulate economic growth, increase productivity of the overall economy, and rectify any market failures. Furthermore, when there is an economic downturn, government investment may increase to help stimulate the economy, however this may lead to the funding of start-ups that are not as efficient. Recessions

often clear out any inefficient companies, keeping only the strongest and quickest to adapt to changing economic conditions. This was shown through the NASDAQ crash in 2000. Many companies struggled to raise new capital but lenders continued to support startups backed by VCs with sufficient capital but withdrew from others. This shows how certain companies are able to stay afloat while others are wiped off during recession (Hochberg, Yael, & Fehder, 2015). An example of this is Zoom. Zoom was heavily invested in by venture capital companies during the COVID recession as it was an emerging company. Its use was rapidly increasing during virtual school, workplace, etc. Even though the economy as a whole was crumbling, investors took a risk by investing in Zoom. This risk eventually led to Zoom becoming a strong company and eventually had an IPO. Some of the most successful companies are born during recessions (Microsoft, Uber, and Venmo). Along with these issues, there is a social motive for GVCs. Governments aim to solve issues and bridge gaps in society, and they do this through backing up startups that they believe will provide solutions to these issues or solve market failures (Alperovych, Groh, & Quas, 2020). It is also important to note that social connectedness lowers the likelihood of a successful exit since it induces VC firms to undertake suboptimal investment decisions (Nguyen & Pham, 2023). Although GVCs intend to do this, there are also theories that highlight the negative effects of their actions. This is the crowding-out effect; when increasing government investment, it crowds out private investors. This can be explained by increased government spending, leading to deficit spending. When the government spends more money than they have, they are forced to borrow funds. This increases the demand of loanable funds and decreases the supply of loanable funds, driving the interest rate up. An increase in the real interest rate discourages private investors and individuals from taking out loans which can decrease PVC investment. There are other challenges and limitations that are associated with government venture capital initiatives. One major one is political interference. GVCs will differ between each country because each society and government has different goals and agendas to fulfill. Additionally, in corrupt political systems, GVCs can push certain political messages and ideas. This can influence which start-ups get the funding. The other major VC that will be analyzed in this paper are private venture capital entities (PVCs). This is where private companies invest in companies that they believe will give them a greater rate of return. PVCs main objective is to earn a profit which is exceedingly different from GVCs. These distinct motives are also examined to understand their impact on the startup. Another common characteristic of private venture capital investors is their relatively riskier investment patterns. They invest in riskier companies because they yield high returns for investors. They take high risks in exchange for the potential for returns to make-up for this risk taken. There is an established direct relationship between risk and return in investment. Risk requires reward because a higher return for higher risk for a return for delaying consumption and an additional return for more risk. PVCs also generally have a smaller time frame to exit to get gains on their investment.

Lastly, PVCs prioritize economic performance over innovation which is then reflected in their investment patterns and the type of startups they invest in. Their portfolio of start-ups will differ from PVC to GVC. This research is conducted in order to assess which type of VC is best for startups and when it is best for them. The difference between the impacts of GVC and PVC will be analyzed and be evaluated. In the existing literature there are many contradictions on what VC is the best, so in order to analyze, many factors are considered. These include the exit success of each VC, what round of financing will produce the best economic performance, the trade-off between innovation and economic performance, and value-added by each investor.

In the previous research between PVC and GVC, there have been many contradictions and limitations due to differences in methodology across studies. Previous research comparing PVC and GVC has revealed numerous contradictions and limitations, largely stemming from the diverse methodologies employed across studies. Variations in sample sizes, timeframes, geographic focus, and analytical techniques have contributed to conflicting conclusions about the relative effectiveness of GVC and PVC in supporting startup growth. For example, while some studies emphasize the long-term stability and strategic support of GVCs, others highlight their inefficiencies compared to the agility and risk tolerance of PVCs. Additionally, the lack of standardized metrics to measure success, such as differing definitions of growth, profitability, or innovation, further complicates comparisons. These methodological discrepancies underscore the need for more comprehensive and harmonized approaches in future research to better understand the distinct roles and impacts of GVC and PVC in the startup ecosystem. Although it has been extensively studied what decisions VCs should make to make the greatest return on their investment, little attention has been paid to what financing most benefits the enterprises being funded. By addressing this gap, this paper forms a unique approach by synthesizing the various factors to provide a comprehensive analysis of the effectiveness of VCs. It enhances the understanding of venture capital dynamics and contributes to the existing literature by offering actionable insights to push startups to fulfill their potential. This research is important for start-up businesses, policy makers, and guidance to future start-ups. Current start-up businesses can use this to evaluate

their financial structure and understand which type of VC investment will best suit them and align with their goals. Policymakers can now see the weaknesses and strengths of GVCs. They can better understand how government investment impacts private investment and the social impact their investments have. This can shape future policy. Future start-ups will have insights on how to optimize their funding and investment. The paper then goes on to explain the theoretical foundation of the paper and a review of major papers in the field. It is important to understand the background of what has been studied and these papers are synthesized to form an argument. The methodology to conduct the research is described as well as the motivations of those papers. Lastly, the results are discussed which

shows the purpose of the research and the outcome of it. These results and analysis is used to set the foundation for future implications and applications in the real world.

2. Key Terms

1) Government Venture Capital (GVC): investments in start-ups that are government-backed/financed.

2) Private Venture Capital (PVC): investments in start-ups that are financed by a private firm.

3) Blended Approach: startup receives funding from both GVC and PVC investment, each investor bringing different contributions.

4) Exit Strategy: a plan on how venture capitalists (VCs) will gain returns on their investment (usually by selling their investment).

5) Equity Ownership: The % of ownership that venture capitalists gain in a startup in exchange for their money they give to the start-up. Equity ownership typically gives VCs an opinion in business decisions as well as a portion of future profits.

6) Market Failures: private markets do not efficiently allocate resources which usually leads to government intervention. In the VC market, market failures occur when there is an underfunding of socially beneficial innovations or startups in risky but high-potential sectors.

7) Growth Potential: this is the ability of a startup to become profitable over time. It is a critical consideration for VC investors deciding where to pool their funds.

8) Non-Financial Support: Additional resources or services provided by venture capitalists beyond just funding: mentorship, guidance, access to networks, operational support, and expertise in scaling a business.

9) Initial Public Offering (IPO): A privately-owned company offers its shares to the public for the first time. It is a common exit strategy in the VC market to gain returns on their investment in start-ups.

10) Merger and Acquisition (M&A): Another exit strategy in which a startup is either acquired by a larger company (acquisition) or combines with another company (merger). Both allow VCs to gain profits on their investment.

11) Crowding-Out Effect: Suggests that increased government investment offset private investment. In the VC context, this happens when government spending/investment hikes up interest rates, discouraging private venture capitalists from investing in startups.

12) Leverage Buyout (LBO): exit strategy in which a company is bought using borrowed money. The company's assets are used as collateral for the loan. VCs gain from this because they sell their shares during this process.

13) Probit Regression Model: A type of regression model in which the dependent variable is binary (success/failure). For this paper it is important to understand it can be used to estimate the probability of exit success based on type of VC

funding.

14) Government-Owned Venture Capital (GOVC): A type of government venture capital where the government owns and operates the venture capital fund. It provides direct funding using public money.

15) Government-Supported Venture Capital (GVC Supported): Venture capital that is provided by private firms but heavily subsidized or incentivized by the government. This can be done through tax credits or other benefits.

16) Human Capital: The skills, knowledge, and experience possessed by individuals.

17) Portfolio Firms: The startups or companies that receive funding from venture capital firms, making up the firm's portfolio.

3. Literature Review

The research aims to understand what type of VC is the most beneficial to startups for innovation and economic performance, often indicated by exit success (IPO or third party acquisition). Venture capital (VC) markets provide vital financial resources to firms in the early stage of development that have high growth potential. It has been proven that VC-funded companies typically have higher employment and sales growth rates (Samila, Sampsa, & Sorenson, 2011) There are a multitude of different VCs but this paper primarily focuses on private venture capital funds and government venture capital funds. Within the GVCs, there are two types: government-supported and government-owned (Zhang et al., 2024). They include government owned and government supported. In government owned venture capital, it is the government's company and they are fully funded through the government and using public money. However, in government supported venture capitals, it is a private company that the government heavily subsidizes. They are often given tax credits and other benefits. They are still considered GVC because they are pursuing the start ups that the government is backing and wishes to advocate. This literature review aims to analyze the differences between government venture capital funds and private venture capital funds in a multitude of aspects. They are compared through the lens of the economic performance of startups, their impact on funding dynamics in the venture capital market, and the comparative analysis between PVC and GVC in terms of their value-added activities. It can be hypothesized that GVC expands total funding in VC markets which contradicts the crowding out effect. This is the crowding out effect; the crowding out effect is when increasing government spending crowds out private investors. The cause of this is deficit spending; when the governments spend more than they have. When they do this, they have to borrow funds. This will increase the demand for loanable funds and decrease the supply of loanable funds, driving the interest rate up. Increases in the real interest rate discourage private investors and individuals from taking out loans. This can have the negative intended effect of boosting the economy and can cause the economy to plummet due to decreased investment. Although GVC funding does not do this in venture

capital markets, there is evidence to support that this is done on an enterprise level. The potential economic performance of a startup depends on many factors, including the balance between PVC and GVC and the nature of value-added activities.

Studies show that startups with a mix of both private and government venture capital funding have higher potential economic performance than purely private venture capital or purely government venture capital funding (Brander et al., 2010). Furthermore, a start up that is purely funded by PVC does better than a purely GVC-funded company. The measure of economic performance was indicated by exit success. Exit success is when the investment is sold and they gain a profit.

It was also found that GVC does not crowd PVC out in the venture capital market, and government venture capital fosters growth in the venture capital market. This shows that government venture capital funds complement private VCs rather than displacing private funds. However, it is not the same case in the context of individual startups. There is an inverse relationship between public financing and private financing in a startup. If there is a great amount of funding from GVC, it will receive less PVC funding. This can be caused by many things, but it is likely that GVC funds the enterprises that are rejected by PVCs. The goal of GVC is to increase funding per enterprise as well as the number of enterprises. PVCs and GVCs have different goals when financing; PVCs main incentive to invest in these VCs is to earn a profitable exit success, however GVCs aim is to help foster innovative companies to solve issues deemed important to their administration (Zhang et al., 2024). Thus, PVCs may not always invest in companies that don't seem economically promising, however if those companies are creating a service or product that could have social implications, GVCs will be more likely to fund them. This could be a potential cause for the inverse relationship between GVC and PVC financing on the individual level. In this study, the definition of GVC was both government owned companies and companies with heavy government support. The data of this literature proves the claims. The mean exit success of the sample with the entire sample is .19 whereas with PVC pure had .2. GVC and PVC mix had .24 and GVC pure had .15. The closer to 1 indicated a higher exit success. This data and conclusion is also supported by another paper. It claims that firms that are financed with both PVC and GCV do better economically, but to a certain extent. Excessive GVC investment can hinder the economic performance of the company. It is essential to balance the amount of financing throughout both types of VCs. Using a Probit regression model, they examine whether government-sponsored venture capitalists are associated with better or worse enterprise performance than private venture capitalists (Brander et al., 2010) It was discovered that the impact of government-sponsored venture capitalists on businesses doesn't follow a straight line, it vacillates up and down. One of the possible causes of this is the timing of investments. GVCs are relatively stable and do not change based on market conditions. However, the market for venture capital is cyclic with

fluctuations of boom and bust. It is shown that enterprises initially financed in markets that are facing economic downturn have a higher rate of successful exit. A probable cause of this is that recessions often eliminate inefficiencies. Companies that are not producing at their lowest possible costs and are not producing at socially optimal prices and quantity will face extremely difficult times when the money supply is low. Because of this most companies still open during recessions are those with higher potential economic performance. It was proven that GVC investment is most powerful during economic downturns, but not as efficient during time periods of economic success. With the research of this paper it can be stated that GVCs are the most efficient during recessions and financed with a mix of PVC and GVC with limited GVC involvement.

In addition, the type of government venture capital that is most effective is explored in this paper: differentiating between government owned and government supported. It was proven that government supported VCs rather than government owned VCs are more successful and have a higher exit success. The reason for this is that a lot of times GOVCs work better with PVCs rather than GVCs. This is because of the idea that GOVCs and PVCs undertake different kinds of enterprises and it has been established that for ideal economic performance it must be a mix of PVC and GVC funding. PVCs, in contrast to GOVCs, usually take on projects that will provide them with the most profit. These articles have compared PVC and GVC impacts on exit success and which types will bring the best performance. Another difference is the idea that GVCs match to companies with inferior potential economic performance compared to PVC because GVCs receive the companies that are rejected by PVCs (Zhang et al., 2024). Another difference is that GVCs fund companies that will provide them with short term economic value, and this can be caused by political pressure to achieve certain goals or earn a certain amount of money. The next article explores the reasons for the different successes faced by the firms with different financiers (Luukkonen et al., 2013). The profile of value added is different between both types of investors. Despite financial support, VCs often give additional resources

such as access to their internal network, marketing strategies, and managerial professionalism of young and innovative firms. This is very important in early stages of financing, and this is the stage where most VCs invest. It is important because this type of support brings these new start-ups to the professional world and helps them navigate their way. It has been observed that PVCs and GVCs differ greatly in this aspect. The causes for this are that they have different human capital, different motives for financing the startups, and different investment patterns. Their objectives are translated into the investment decisions as well as their choice to add further value to the company. Government venture capitalists are less engaged in coaching and value-added activities for their portfolio firms; they have a limited potential for hands-on activities because they have fewer contacts and are not as interested in this aspect compared to PVCs. This limited involvement leads to worse performance of GVCs in comparison to PVCs. PVCs are

more engaged in helping raise additional finance, manage employees, and help them grow as a company.

Another critical aspect to consider when evaluating VC investment is the round of financing. To compare this with PVC and GVC, the rounds of financing must be understood first. There is Pre-Seed, Seed Round, Series A, Series B, Series C, & beyond. Each stage has a different purpose. In sum, pre-seed investing is typically prior to any VC investment. This is the earliest stage of financing with small pools of funds. This is when the business idea is just coming to life and to prove that there is potential. Oftentimes this source comes from entrepreneurs themselves or any other close contacts. Then there is the Seed Round with the first formal stage of financing. Oftentimes, the company is still prototyping but there is enough potential for investors to see and understand that it will be profitable in the future. For VCs there will be 10-20% stake in the company at this point. Series A is where the company is fully established and these funds are used for further development of the product and creating a scalable plan for growth. Series B is a financing stage when the companies have reached a steady revenue and the funds are used to increase market share and maximize growth potential. Lastly, Series C is used for international expansion and where the preparation for IPO begins which will in turn bring in a lot more funds to fuel expansion of the business. VC impact in general fluctuates between rounds of financing. It has been proven that financial resources constrain startups growth in the early stages whereas research finds that in late funding rounds, the amount of funding becomes strongly related to growth. This can be used as a basis to compare how government and private investments address early-stage funding constraints differently. Private VC funding on one hand is more focused on growth potential and a quick exit strategy, government funding often targets sectors with a longer-term developmental focus. This strategy is strongly seen through a case study on China's government capital funds in the AI sector. One of the key findings is that GVCs in China are geographically dispersed. This shows a characteristic of GVCs that often differ from PVCs. Private investment is generally limited to select areas (e.g. Silicon Valley) whereas governments often target and foster innovation in underdeveloped areas. Another key development that is highlighted through this is the signaling role that government VC plays. In high-risk markets such as AI, government investment usually precedes private investment. This highlights the different portfolios that GVC and PVC typically have and the different stages that they would invest in. GVCs will invest in more risky but potentially more innovative startups. Their initial investment will in turn attract more private investment, the signaling theory. To further highlight the differences between private investment and government investment startup, case studies that were majority backed by private investment must be examined. AirBnb & Zoom are prime examples of PVC financing.

Overview of Air BNB Financing Rounds

1) Pre-Seed stage

small funding from founders + close contacts to develop business model and

test ideas

2) Seed Round

Raised \$20,000 to validate concept and build early user base. This round was focused on proving the potential growth and scalability of the business in order to attract more funding.

3) Series A Round

Raised \$7 million and now the objective had shifted from proving potential to major expansion. They began to reach new markets and this significantly accelerated the company's growth.

4) Series B Round

Major investors such as Tiger Global Management, T. Rowe Price, and Wellington management began to invest in this growing firm. This mirrored the increased confidence in the potential of this startup

5) IPO

Finally, the company went public and the VC investors reached a strong exit strategy. This example highlights the above claim made on how later-stage funding in Series A and Series B is catalytic for global growth. Specifically, the Series B financing was pivotal for scaling the company which eventually led to its initial public offering. In total they had raised \$112 million in this round of financing from top private venture capital firms. Aside from those mentioned above, Andreessen Horowitz, DST Global, and General Catalyst began to heavily back this company.

In the literature of VC markets, there are often many contradictions and limitations to their research. This paper aims to collect the most accurate data and find a solid plan for what VC is the most effective for startups to utilize for their early stage financing.

4. Methodology

This literature review was written to examine the various types of venture capital investors that are available to startups. The goal is to find the characteristics of the best type of VC for growth and success and evaluate which factors are the most important. The methodology used for this study is a literature review: a systematic approach to gathering and synthesizing relevant literature (scholarly research in the field). Prior to evaluating the methodology of the paper it is important to establish the primary research objective. The objective of this research is to assess the different types of venture capital funding available to startups, in specific, GVC and PVCs It also includes determining the key traits that make VCs more efficient for startups in terms of growth, innovation, and long-term success. A comprehensive literature review was conducted using academic databases such as Google Scholar, Science Direct, and JSTOR. The literature search employed a variety of keywords including "government venture capital (GVC)," "private venture capital (PVC)," "startup success factors," "VC funding comparisons," "impact of government investment on startups," and "PVC vs. GVC performance."

To ensure the relevance and quality of the selected studies, specific inclusion and exclusion criteria were applied. Studies published in peer-reviewed journals with a focus on those examining GVC and PVC impacts on startup growth, innovation, and financial performance. Papers were excluded if they lacked empirical data, were focused solely on non-startup contexts, or did not differentiate between GVC and PVC as funding mechanisms. This structured approach helped to compile a diverse yet targeted body of literature that informed the comparative analysis in this research. Data and ideas from these studies were extracted such as the exit success of different investors, factors that influence effectiveness of VCs, and comparison of different VC models. The literature was carefully chosen based on the credibility of authors, the rigor of the methodology, and how relevant the findings were to the research objectives. These findings were then analyzed to draw conclusions to find the best type of VC for startups. This involves identifying themes, contrasting different types of VC, and evaluating their advantages and disadvantages in impacting startups. This was a mostly qualitative process by comparing and contrasting qualitative papers, however some data is utilized to further represent the best approach to financing a start-up. In sum, the methodology outlines the systematic approach used to find the best type of venture capital investments for startups. Case studies such as government venture capital in China in the AI sector and private venture capital in companies like Zoom and Air BNB. By defining clear research objectives, conducting a comprehensive literature search, analyzing and synthesizing relevant data, and interpreting findings within the context of existing literature, this study aims to provide valuable insights for entrepreneurs, investors, policymakers, and researchers interested in the dynamics of startup financing and venture capital.

5. Results

Through the research it can be analyzed that startups with a mix of private and government venture capital funds have been the most effective for potential economic performance. It is also concluded that this balance should not be equally split, it should be more PVC rather than GVC. Another establishment is the idea that PVCs and GVCs have different goals for investment which is then reflected in the performance of their startups. PVC entities are primarily profit seeking enterprises in contrast to GVCs which could be investing for a variety of reasons. Thus, PVCs often earn more profit financially however GVCs are categorized with startups that are

more innovative and technologically advanced. If a startup is obtaining their funding from GVCs it should be noted that GVCs generally stay stable through business cycles but the impact of government-sponsored venture capitalists is not linear. There is a hypothesis that this is because of the economic environmental conditions. It has been proven that startups financed at stages in the economic cycle where a downturn is when startups are more likely to have a higher rate of successful exit. There are also two types of GVCs, government owned and

government supported VCs. The VCs that are government supported have a higher rate of exit success rather than the government owned VCs. Another difference that is important to note is the value added by each investor. PVCs are more involved with direct guidance whereas GVC pursues a more relaxed policy with startups.

From these research findings a sample example of how much private versus government investment should be pursued can be created. For each stage of funding, there is a different balance that will be ideal.

1) Pre-Seed Stage (0 - 12 months)

- **Funding Sources: Personal Savings, Friends & Family, Grants, GVC**
 - **Proportion: 70% GVC/30% PVC**
 - **Timing: First 6 - 12 months**
 - At this stage, the start-up is focused on validating the idea and creating an initial prototype. Government grants and GVC can provide non-dilutive or lower-risk capital.
 - PVC involvement is minimal, often limited to angel investors or small amounts of seed funding.
 - **Primary Uses of Funds:** Research & development, early-stage product testing, team building.

2) Seed Stage (12 - 24 months)

- **Funding Sources: Seed Capital, GVC, Early PVC**
 - **Proportion: 50% GVC/50% PVC**
 - **Timing: 12 - 24 months**
 - At this point, the product is developed, and the start-up needs to gain traction. GVC continues to play a critical role in supporting early market entry (especially for innovative or high-tech industries), but PVC begins to play a more prominent role through angel investors and small VC funds.
 - PVC can be more aggressive at this stage in exchange for equity, but the involvement of GVC helps de-risk the project.
 - **Primary Uses of Funds:** Refining product-market fit, customer acquisition, marketing, initial scale.

3) Early Growth Stage (24 - 48 months)

- **Funding Sources: Series A, GVC, PVC**
 - **Proportion: 30% GVC/70% PVC**
 - **Timing: 24 - 48 months**
 - This is where private venture capital begins to dominate the funding mix. Series A rounds typically come from PVC, as the start-up has demonstrated a scalable business model. GVC involvement may persist, but it is reduced as the start-up begins to rely more on private capital for expansion.
 - PVC investors expect higher growth and may influence strategic decisions. Government funds can still assist with R&D or expansion into regulated markets.
 - **Primary Uses of Funds:** Expansion into new markets, increasing team size,

scaling product distribution, infrastructure investment.

4) Late Growth Stage (48 - 72 months)

- **Funding Sources: Series B & C, PVC, Strategic Partnerships**
 - **Proportion: 90% PVC/10% GVC**
 - **Timing: 48 - 72 months**
 - The start-up has achieved significant traction, revenue growth, and market share. At this stage, private venture capital dominates funding rounds (Series B or C) as the company scales aggressively.
 - GVC presence is minimal, potentially through government-backed loans or grants for expansion into specific sectors (e.g., clean energy, biotech) but is no longer a significant funding source.
 - **Primary Uses of Funds:** International expansion, large-scale customer acquisition, operational scaling, M&A activity.

5) Maturity Stage (72+ months)

- **Funding Sources: Series D & Beyond, Private Equity, IPO**
 - **Proportion: 100% PVC (or strategic investors/private equity)**
 - **Timing: 72+ months**
 - At this point, the start-up is preparing for an exit, either through an IPO or acquisition. Private equity or large PVC firms take over, with little or no GVC involvement. The start-up is now a late-stage company with a clear path to profitability or a liquidity event.
 - **Primary Uses of Funds:** Pre-IPO prep

6. Conclusion and Recommendations

The findings from research on startups backed by a combination of private and government venture capital provide future information on economic performance and innovation. The research suggests that a mixed approach of both PVC and GVC offers the best outcomes for startup success. These findings offer essential guidance for policymakers, investors, and entrepreneurs. Policymakers may consider incentivizing collaborations between private and government investors to harness the complementary strengths of both investments. An example of this is co-investment schemes. These are programs in which government venture capital and private venture capital must invest jointly in startups. The government commits to matching private investment in startups, ensuring both public and private funding are leveraged. This is similar to UK Enterprise Capital Funds program where public investment complements private-investors in early-stage companies. Aside from this program, policymakers can provide tax breaks to private investors when their investments are complemented with government investment. Similarly, startups that pursue a mixed approach of funding may also receive tax breaks which further incentivizes a blended approach of GVC and PVC funding. Lastly, there can be a policy that creates dedicated public-private partnership venture funds that pool resources from both government and private sectors. Governments provide initial funding while private investors bring additional

capital. Both parties would share the risks and rewards, creating aligned outcomes. For startups, they should think about a more diverse investment portfolio to include a blend of both types of venture capital to avert risk and maximize returns. It has been established that a balanced approach is essential, but how can this be achieved? Attracting private venture capital (PVC) while maintaining government venture capital support for innovation requires a nuanced strategy. Restating the signaling theory, GVC supports early-stage development that private investors may view as too risky. Start-ups should focus on securing GVC first by reducing risk of failure to PVCs. GVC funding is helping accelerate progress toward commercialization and revenue generation, making the start-up a more attractive PVC target. When start-ups are seeking investment they should create a hybrid funding pitch. To secure both types of investments, they need to shape their narratives in such a way. For GVC they should emphasize the innovation and societal impact whereas for PVC they should focus on commercial scalability and market potential. In addition, PVC often takes more equity and is more involved in the startup. So, startups can highlight to private investors that GVC is non-dilutive and they can raise capital without giving up significant equity early on. This leaves more room for PVC equity later without excessive dilution. Lastly, they should utilize these results to align their funding sources with their goals for their start-up. By understanding the preferences and priorities of different types of investors, they can obtain a competitive advantage. This study explores GVC that usually leverages investment to promote social welfare and social impact. Future studies should explore the role and pattern of investment in developing countries where social agenda may not be the focus of the government investment strategy.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

References

- Alperovych, Y., Groh, A., & Quas, A. (2020). Bridging the Equity Gap for Young Innovative Companies: The Design of Effective Government Venture Capital Fund Programs. *Research Policy*, 49, Article 104051. <https://doi.org/10.1016/j.respol.2020.104051>
- Amit, R., Brander, J., & Zott, C. (1998). Why Do Venture Capital Firms Exist? Theory and Canadian Evidence. *Journal of Business Venturing*, 13, 441-466. [https://doi.org/10.1016/s0883-9026\(97\)00061-x](https://doi.org/10.1016/s0883-9026(97)00061-x)
- Brander, J. A., Du, Q., Hellmann, T. F., & National Bureau of Economic Research (2010). *The Effects of Government-Sponsored Venture Capital: International Evidence*. National Bureau of Economic Research. https://www.nber.org/system/files/working_papers/w16521/w16521.pdf
- Cochrane, J. H. (2005). The Risk and Return of Venture Capital. *Journal of Financial Economics*, 75, 3-52. <https://doi.org/10.1016/j.jfineco.2004.03.006>
- Gornall, W., & Strebulaev, I. A. (2015). The Economic Impact of Venture Capital: Evidence from Public Companies. *SSRN Electronic Journal*. https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2681841

- Hochberg, Y. V., & Fehder, D. C. (2015). Accelerators and Ecosystems. *Science*, *348*, 1202-1203. <https://doi.org/10.1126/science.aab3351>
- Luukkonen, T., Deschryvere, M., & Bertoni, F. (2013). The Value Added by Government Venture Capital Funds Compared with Independent Venture Capital Funds. *Technovation*, *33*, 154-162. <https://doi.org/10.1016/j.technovation.2012.11.007>
- Nguyen, G., Nguyen, M., Pham, A. V., & Pham, M. D. (2023). Navigating Investment Decisions with Social Connectedness: Implications for Venture Capital. *Journal of Banking & Finance*, *155*, Article 106979. <https://doi.org/10.1016/j.jbankfin.2023.106979>
- Samila, S., & Sorenson, O. (1970). Venture Capital, Entrepreneurship, and Economic Growth. *Review of Economics and Statistics*, *93*, 338-349. <https://econpapers.repec.org/RePEc:tpr:restat:v:93:y:2011:i:1:p:338-349>
https://doi.org/10.1162/rest_a_00066
- Testa, G., Quas, A., & Compañó, R. (2024). Governmental Venture Capital Policies Are Not All Alike: Design Features in 11 European Countries. *Venture Capital*. <https://doi.org/10.1080/13691066.2024.2391373>
- Zhang, J., Fan, Y., & Liu, Y. (2024). The Effects of Government Venture Capital: New Evidence from China Based on a Two-Sided Matching Structural Model. *Journal of Corporate Finance*, *84*, Article 102521. <https://doi.org/10.1016/j.jcorpfin.2023.102521>