Chapter 9
The Role of Public Funding Agencies for Startup Promotion: An International Comparison

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Abstract The chapter analyses the political and economic conditions for the establishment of state-financed funding agencies to support startups. Both the advantages and disadvantages of state intervention are analyzed. When receiving government funding, the risk of inefficiently designing processes and value chains increases. It may lead to less diligent evaluation and decisions about costs and questions about the best use of spending public money. This can severely impact the profitability or even the viability of business. Further, there is a risk that government funding will demand public documentation or influence on the company.

Keywords Public funding for startups · Startup ecosystem · Government innovation support programs

Hard Landing of Startup Funding in 2022

The following analysis is based on the latest observations of startup development in OECD countries. These are those countries that feel they belong to the Western democratic community of values and coordinate their economic, trade, and development policies together. Both in terms of investment culture and the financing of startups, these countries follow similar paths because they have similar problems.

Global startup funding has to look for new solutions because the conditions for sufficient access to venture capital have changed dramatically in 2022. Funding, which is vital for the initial growth phases of a company, decreased to 415 B $US, indicating a 35% drop from 2021 about half of the same period last year (CBinsights, 2023). Even in Silicon Valley as a hotspot for investment in startup innovation, investments fell to the lowest level since the fourth quarter of 2019, when the coronavirus pandemic spread out (CBinsights, 2023).

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A. H. Verkuil (ed.), *Start-up Cultures in Times of Global Crises*, Sustainable Business Development, https://doi.org/10.1007/978-3-031-53942-8_9

However, it must be conceded here that as recently as 2021, the flood of money from venture capital firms, hedge funds, and other capital providers had taken on absurd features. For example, a company that specializes in raising money for start-ups had received a completely unrealistic valuation of $80 million in previous rounds of funding (CNBC, 2022). In another case, a tiny software company with just $50,000 in revenue was valued at $35 million (CNBC, 2022).

During the pandemic, new players also jumped into funding adventures. Blank checks were issued for many startups without conducting serious due diligence. As a result, the valuations of the companies tripled within a few months. In the USA alone, more private US companies reached valuations of at least $1 billion last year than in the previous half decade combined (CNBC, 2022).

In 2022, the overheated market cooled abruptly, investors dropped out in the middle of funding rounds, leaving founders at risk of bankruptcy without any funding options. Today, we have valuations back that are roughly in line with what we encountered before the pandemic began. This makes such valuations realistic, which are about 40%–50% below the recent peak (Glassner, 2023).

Financial support for founders thus depends on timing—or in other words, luck. Investments were also generously spoken because cheap money was abundant with the low-interest rate policy of the national banks. Now, since 2022, prices began to fall as investors anticipated the start of interest rate climbs by national banks, led by the Federal Reserve (Vedantam, 2023).

For founders, this means having to accept tougher conditions in future financing rounds. On the other hand, a look at history shows that investments can pay off, especially in downturns. As valuations have generally been revised sharply downward, getting into the right startup can be rewarding. Global companies operating today, such as Airbnb, Slack, and Uber, were founded during the 2008 financial crisis. So, an investment at that time had paid off handsomely to date (CNBC, 2022).

The Importance of Startups for Economic Development

Startups are nowadays regarded as triggers of economic innovation. With their research-based, innovation-focused, and growth-driven business models, startups are an important factor in industrialized countries when it comes to keeping a nation productive, innovative, and competitive in the medium and long term. Startups are seen as a beacon of hope for sustaining productivity growth, as they are often believed to help economic innovations and breakthroughs more quickly and to deploy human capital more productively than is the case in established companies. Although there is little validated or not very up-to-date data on how strong the actual economic performance of startups is, there are indications that can be used to estimate the market potential. In Germany, for example, 537,000 founders realized their first steps into entrepreneurial independence in 2020 and created 454,000 new full-time jobs (BMWK, 2022).

The importance of startups can be seen above all in the use of venture capital. According to the OECD, although only about 1% of startups in the OECD area were provided with venture capital averaging more than USD 2 million in 2016, investments increased by double-digit percentages every year (OECD, 2017). The question is whether this investment momentum will be matched once the current global crisis, triggered by the Ukraine war, Taiwan conflict, and supply chain adjustments, ends.

The promotion of innovative startups, whether with private or public funds, is therefore of great economic policy importance. It therefore makes sense to analyze which measures can be used to lead startups into a secure economic future, specifically how to ensure sustainable financial security for these new companies. While funding measures are mostly in place up to the startup phase, a gap has been diagnosed in recent years for the scale-up phase, in which a much higher financial requirement is registered in order to be able to scale up the business model (Quas et al., 2021).

For some years now, numerous states have begun to engage in extensive state-orchestrated or wholly state-funded innovation support. In this article, we will examine which forms of financing can be found among startups. We will then analyze the advantages and disadvantages of state financial support for startups and, in a third part, take a closer look at individual country cases that have already established public startup support.

Specifics of Startups Compared to Traditional SME

However, before we get into the discussion of startup funding, we should first define what a startup is or which companies are not startups. As always in the social sciences, a variety of definitions are possible. Especially the temporal and structural classification in which a company finds itself makes positioning difficult here. We prefer the following categorization, which is based on the think tank BAK (BAK Economic Intelligence, 2021):

- Startups are younger than 5 years.
- They have planned annual employee or revenue growth, which is typically higher than established companies.
- The companies are highly innovative in their products, services, business models, or technologies.

Another characteristic of startups is that they have flat hierarchies and work in a quasi-expert ecosystem. The entrepreneurial spirit is strongly pronounced. These characteristics are elementary, as the company's employees have to face new challenges, problems, and areas of responsibility every day. This is a significant difference from established companies.

Startups are foundations with innovative business ideas, high growth potential, and a scalable business model. They are in the first phase of the life cycle of a

company—the seed phase, meaning the preparation of the foundation and the development of a business plan, has been completed. The duration of the startup phase varies significantly according to technology field and industry, rather 2–3 years for startups in the IT sector, 8–10 years in the life sciences. The same applies to capital requirements and the time-to-market breakthrough. Growth-oriented startups aim for rapid expansion with rapid market penetration and international presence, expansion of their service offerings, and expansion of organizational structures (Stam & Schutjens, 2004).

Raising Capital in the Startup Ecosystem

Startup ecosystem refers to groups of organizations such as universities, venture capitalists, public institutions, and companies that influence the success of startups. This also includes, for example, political frameworks and regulations, university networks, and venture capital organizations, which not only secure or support financing, but also engage in pronounced network promotion and bundle innovations. For startups, easy access to funding is a key factor in the success or failure of their business model (Spender et al., 2017).

Own Funds

Many successful founders have implemented their business ideas with their own funds alone. The term "bootstrapping" has become established for this. This type of financing is suitable for startups that can be implemented with manageable funds, based on sums between EUR 5000 and EUR 50,000 (Dec & Masiukiewicz, 2017).

The disadvantage of this type of financing is not only the modest means, but also the more difficult connection or even exclusion from networks that venture capital investors bring with them. In the event of economic failure, one is liable with one's own assets.

The biggest advantage of bootstrapping is the independence of business development. There are no investors to talk into a business model. Also, one does not have to share possible profits with lenders. Moreover, one is not exposed to high interest payments.

Loan

In legal terms, loans are credits. In practice, however, higher sums lent over a longer period (of more than 3 years) are often referred to as loans. Loans are often provided by private investors or from within the family circle. Interest payments are also often waived (Dec & Masiukiewicz, 2017).

A special form of loan is mezzanine capital. This is a hybrid form of equity capital (as in the case of a participation agreement) and debt capital (as in the case of a bank loan). This has the advantage that the creditors have no right of co-determination but are still subordinated in the event of insolvency: The claims of all other creditors take precedence. As a rule, therefore, raising capital in this way is relatively expensive and therefore not very attractive (Nomoz & Mexriddin, 2023).

Bank Loans

Bank loans are rather unusual in the startup sector. Exceptions are special credit lines that traditional banking houses have built up for financing startups. Here, we are talking about sums between EUR 25,000 and EUR 300,000 (Dec & Masiukiewicz, 2017).

An important advantage is the planning security, because the credit line, the time periods as well as the interest rates are fixed. In addition, the bank usually receives neither shares nor co-determination rights. But for these very reasons, banks are also risk averse. Traditionally, banks look more closely at collateral and prefer business models that are already established in the market. In addition to a solid business plan, banks often require a guarantee or collateral, for example, in the form of real estate, for higher sums.

Crowdfunding

Crowdfunding is like a swarm effect An idea is presented on a crowdfunding platform. Depending on how well the business idea is received by people, a very large number of participants can provide support with small contributions. In this way, a significant sum can be raised. The focus of the donors is not profit, but the support of the idea. In return, the participants—depending on the amount invested, the product brought to the market or options to receive this quasi first (Sterblich et al., 2015).

Crowdinvesting

This is a crowdfunding variant that has established itself as a serious financing option. The sums raised are in some cases up to several million euros. In this variant, investors receive financial compensation, such as a percentage share in future profits, but usually no say in the matter (Beck, 2017). However, in this case you also have to publish your business model for the campaign. This can lead to competitors profiting from the information. A further minus point is given in case of failure because alternative investors can be deterred by the public handling. Another disadvantage is having too many crowd investors on board in later financing rounds. One solution is to bundle the crowd investors by means of contracts.

Venture Capital

By means of venture capital, a company participates in the startup with money from a fund. Sums of up to several million EUR are involved here. In return, the investors expect company shares, rights of co-determination, information, and control. The goal of the investment is to achieve the highest possible profit. As a rule, the influence on the startup is enormous (Janeway et al., 2021).

Business Angels

Business angels are people who invest in startups. They are often active or former entrepreneurs or managers. Typical investments range from EUR 25,000 to several EUR 100,000. Unlike venture capital, investments are not primarily about maximizing profit as quickly as possible, but are based on sympathy and interest (Grilli, 2019). That is why they usually not only invest money but also support the startup with their expertise and access to their network.

Active Industrial Policy Through Government Innovation Support Programs

Startup momentum is essential for developed economies to sustain economic growth and prosperity. This is because a weakness in productivity growth is observed in the euro area in particular. For the euro area as a whole, a noticeable slowdown in productivity progress is evident between 1999 and 2019, regardless of the measurement concept for labor input (Deutsche Bundesbank, 2021). This is also the reason why more and more developed countries are developing state-orchestrated startup

funding. It is, therefore, important to take a closer look at the advantages and disadvantages of state financial support for startups below.

In general, observers assume that state innovation funds make the venture capital market more resilient by strengthening its resilience and can thus improve the attractiveness of an economy as a location.

Many governments in developed countries are showing interest in specifically promoting startups to increase innovation, employment, and productivity. This trend has increased significantly, especially since the COVID-19 crisis. In particular, government participation in venture capital, as practiced in Europe, is fully in line with the trend.

However, some demands are exorbitant. For example, the director of the German government's Leap Innovation Agency is calling for the German government alone to grow from 10 billion to 10 trillion euros over the next 20–30 years in the "Future Fund" launched in 2021 to finance startups (Zukunftsfonds., 2023). This is the only way, he said, that Germany can master the energy transition, absorb the consequences of war, and avoid falling even further behind in innovation.

For him, the role models are the sovereign wealth funds in Norway, Singapore, or Saudi Arabia, which invest privately for the long term. A German sovereign wealth fund could initiate major projects in Europe and invest in wind power, hydrogen, and laser fusion, for example, if possible with "several hundred million per project," says Laguna. In contrast to private investors, sovereign wealth funds could even be profitable because they have a long-term strategic orientation. Similar experiences have already been made in France, China, Scandinavia, and Saudi Arabia (Handelsblatt, 2022).

Venture capital is an important part of the financial ecosystem and a major driver of job creation and innovation. It has an enormous impact on how we will all live in the future. It plays a critical first role in the investment chain, supporting the next generation of business leaders and leading companies around the world and financing innovation to drive technological solutions to solve major problems such as resource conservation, energy generation, and biodiversity (Janeway et al., 2021).

However, venture capital investments also have the potential to severely disrupt the economy and society in general, which can have significant negative consequences.

In the area of financing opportunities for the early growth phase of startups ("scale-up phase"), many developed countries have identified potential for improvement. Corresponding country cases are discussed later in this chapter. Here, it can be seen that many countries are more active in shaping their government innovation policies to support startups.

This is primarily related to the high private investment risk in entrepreneurial startups. The antecedents for the establishment of such institutionalized startup funding are rooted in these high risk financing conditions. The goal is always to alleviate or completely avoid undercapitalization of promising startups. The hope is to use state-subsidized financing to attract additional venture capital and at the same time prevent the migration of lucrative startup companies abroad (Swiss Economics, 2022).

Private investment in startups is highly risky. On the one hand, there is a fundamental business risk as to whether the business plan will work out. This is because even in the scale-up phase, the startup in question still has to develop the product or service further, scale it up, and then market it successfully. The startup phase of a break-even is also unpredictable. In extreme cases, there is a total loss of the invested funds.

When investing in startups—or in funds that invest in startups—there are no guaranteed returns and it often takes several years until the respective startups increase in value and the shares once acquired can be sold. Therefore, as an investor, you need staying power and a lot of willingness to take risks until the capital shares of a company are listed on a stock exchange and regular trading of the corresponding equity securities takes place. In addition, the influence of the individual investor can diminish if new investors appear in further financing rounds, possibly with higher capital sums.

Finally, it always remains difficult to realistically assess the value of a startup, as there is normally no objectively negotiated market price. The startup company as the issuer of further shares sets the issue price for new financing rounds—investors thereby run the risk of paying too much for their acquired shares compared to other investment opportunities. The investment would no longer be lucrative (Trautwein, 2021; Sherman, 1999).

Even if a startup is able to achieve further revenue growth within the planned period, the management must be able to absorb this revenue growth organizationally. Success in this challenge is by no means guaranteed, even with good growth rates.

Basic Types of Government-Orchestrated Startup Funding

Three basic types of government or government-orchestrated startup funding can be manifested in the literature (Swiss Economics, 2022; OECD, 2017; IWSB, 2022; Cumming et al., 2017; Colombo et al., 2016; Brander et al., 2010):

Variant 1: State-dominated institution or authority

In this variant, the management of the state fund is directly managed by a state institution.

Variant 2: Private company with state participation or full ownership

In this variant, the investor intervenes in the invested company with a loan or also with any ownership shares.

Variant 3:

In this variant, the allocation of funds is delegated to someone else, an organization is mandated to allocate funds.

Advantages and Disadvantages of Public Startup Funds

As explained above, the purpose of public subsidies is to prevent successful startups from being underfunded because the hurdles for private financing are too high. However, the fundamental question is whether government-funded startups actually perform better economically than those funded by private venture capital. Or even more provocatively, can government intervention programs even have a counterproductive effect, because under certain circumstances startups are financed that would have fewer financing opportunities on the private capital market? Therefore, we take a look at the advantages and disadvantages of public financing in the following.

Advantages

Government funds can be a signal to other financiers to also invest in this company. However, the prerequisite is that the selection and award criteria of the respective innovation fund are transparent.

The state can plan and intervene strategically over the long term because it pursues macroeconomic and social goals. This is often not the case with private investors because of their short-term profit expectations. A state-financed innovation fund can also steer larger investments in certain directions with political motivation. Accents can be set, for example, to promote sustainable products or services.

In the private venture capital sector, the inclusion of ESG standards is only slowly beginning to emerge. The venture capital industry has some catching up to do, particularly in the areas of diversity, equity, and inclusion. This is where sovereign wealth funds can take a guiding role (PRI, 2022).

Disadvantages and Risks

Observers and analysts assume that publicly financed companies perform worse than privately financed ones. Whereas according to their findings, financial hybrids of public and private capital showed no significant differences (Cumming et al., 2017; Colombo et al., 2016; Brander et al., 2010).

Young companies with high growth potential face considerable information problems. There are not yet many "hard facts" available. Consequently, allocating capital efficiently and precisely to such companies can be difficult for the public sector. Private investors, too, often must make investment decisions on the basis of incomplete data. This is likely to be even more difficult for public institutions because they are handling taxpayers' money. A higher loss or even total loss of an investment can have political consequences.

Furthermore, there is scientific evidence that startups that are exclusively publicly funded would have had little or no chance of investment in a private funding environment. This means, that investments from public agencies will not attain the same efficiency and results as from private investors. On the other hand, the country cases also show that there are other reasons for the financial commitment than maximizing the return achieved. Accordingly, this also has direct implications for further financing rounds, in which the state-funded startups either receive significantly smaller amounts or a stock exchange listing becomes less likely (Breschi et al., 2021).

Another problem is the risk of distortion of competition because the public investor is triggered by the political goal of faster and more frequent financing.

Selected Cases

When selecting the examples, we were guided by the venture capital investment per capita. Therefore, we present the TEMASEK Fund of Singapore and the Yozma Fund of Israel. On the other hand, we pay special attention to the European Investment Fund, as it is endowed with a high financial volume and holds a dominant position as a startup investor in European countries.

Singapore

Together with Hong Kong, Singapore is one of the economic leaders in Southeast Asia. Therefore, Singapore has also developed a broad-based macro policy strategy that promotes a long-term growing startup scene (TEMASEK, 2023). The startup policy is embedded in the city-state's entrepreneur-friendly culture and free movement of capital.

The Singapore government has allocated a special payment of $300 million in 2020 for the so-called Startup SG Equity Initiative (StartupSG, 2023). The aim is to invest in DeepTech sectors and encourage entrepreneurship in these markets such as AI, robotics, biotechnology, and others. The funds will be used to encourage private sector investment in Singapore-based startups. The prerequisite is innovation potential with global impact.

The Startup SG Equity program is an incentive program to attract private investors. The idea is to motivate them for larger investments in high potential startups. It seems to be, that the program is very much focused on those companies, which have a real global potential. Thus, it is a co-investment modality with specific investment parameters for general tech and deep tech startups. Thus, the investment focus is on early-stage tech startups based in Singapore, related to advanced manufacturing, pharma and biotech, medtech, and agri-food tech. The minimum funding size is $21 million (StartupSG, 2023). Eligible startups are those that are registered with the Singapore Companies Registry, have been operating for less than 10 years, have a minimum capital of USD 35,000 (StartupSG, 2023). In addition, the business model and the professionalism of the management must be convincing; an already confirmed patent is also advantageous. The core premise is a high growth potential with scaling prospects in international markets.

Enterprise Financing Scheme

The Enterprise Financing Scheme (EFS) was established in October 2019 as an all-encompassing program that combines several policy programs into one. The

centralized EFS was created to support startups and companies at various stages of growth. Among other things, the program provides risk sharing for loans of up to 70%, which addresses the financing difficulties of startups, provided they are high growth companies (EFS, 2023).

Israel

Yozma invests mainly in companies in the fields of communications, IT and medical technologies, and life sciences. The focus is on companies developing infrastructure and enabling technologies. Yozma has got a worldwide echo in media and in expert circles as the founder of the Israeli venture capital industry. The focus is on high potential companies operating globally. Yozma invests in all stages of a company's development, with a focus on the early stages. Initial individual investments typically range from $1 million to $6 million (YOZMA, 2023). Additional capital is earmarked for follow-on investments.

Yozma I grew out of a government program to promote venture capital investment in Israel and fundamentally changed the Israeli private equity landscape. The Israeli model has since served as a blueprint for other government-organized funds. The launch of this amazingly successful program began in 1993. Today, it is the main trigger for a strategic and publicly managed venture capital market.

In the meanwhile, two further programs were launched, the so-called Yozma II and III (YOZMA, 2023). Generally, the two updates did not change the intention and strategy. However, the program is adopted based on market needs. Currently, when this manuscript is being completed, we do not know the political impact of the strong turmoil of the new government.

The big takeaway with the Israeli program is that the financial investment policy, aligned with government strategic objectives, serves as a trigger for further private investment. For example, market and investment corrections can be made to realize sustainable tech projects. In this regard, the system is based on three pillars, government-led policy, strong financial intervention, and associated private capital involvement in terms of crowd-in of private investment (Wonglimpiyarat, 2015; Avnimelech, 2009).

EIF European Investment Fund

The EIF is a specialized provider of venture financing designed to benefit small and medium-sized enterprises (SMEs) across Europe. The program is backed by the European Investment Bank (EIB), the European Commission, and a broad range of public and private financial institutions. That is, the aforementioned players, namely the European Investment Bank EIB with 59.4%, the European Commission with

30%, and financial institutions from the Member States of the European Union, the United Kingdom, and Turkey with 10.6% (EIF, 2023).

The aim is to support SMEs in particular—and this primarily means startups—through intermediaries. These are usually banks, guarantee and leasing companies, and providers of private equity funds. The program thus follows a typical public-private partnership approach, with the EIB acting as the main investor.

The risks of the initial financing of SMEs are cushioned. Nevertheless, an appropriate return and a balanced ratio of fee-based and risk-based income are to be achieved for investors through a commercially oriented pricing policy.

The strength of the program lies in its applied breadth and the enormous amount of capital available. More than 1 million SMEs have benefited from improved access to finance through the financial instruments managed by the EIF. In 2021, the fund had a capital of €7.37 billion (EIF, 2023). Thematically, one does not find a strong focus at the EIF. This is certainly due to the different interests of the member countries. New and emerging areas are mentioned alongside those of air space, blue economy, life sciences, healthcare, fintech, and water treatment. Beyond that, however, the thematic focus blurs as additional funding opportunities are mentioned in the skills and education, creative, and cultural sectors. It is hoped that this will promote projects with social impact, sustainability, and social influence. However, this threatens to overlap with the many subsidy programs of the European Commission, which are already available for individual sectors and thematic areas (Mertens & Thiemann, 2019; Clifton et al., 2020).

Conclusion

The benefits of state-orchestrated financial support for startups are double edged. The 2022 anthology by Karl Wennberg and Christian Sandström describes a very negative picture of government investment. Government funding, they argue, is a blunt instrument, fraught with politics, bureaucracy, and unintended consequences. It is also an inefficient means for the intended goals. The effort required to apply is disproportionate to the return, i.e., the amount of financial support (Wennberg & Sandsröm, 2022).

An analysis of recent studies suggests that startups that received support from private financiers in their first phase of investment are less likely to survive a second round of financing. In contrast, even lower-performing startups are more likely to successfully complete additional rounds of financing if they receive matching funds through SWFs. survive the next round to obtain refinancing, compared to companies that were supported solely by PVCs. This suggests that the support criteria are softer defined than for pure private investments. On the other hand, the state, with funds appropriately orchestrated by it, can realize an active industrial policy to support socially relevant investments. In some cases, academic criticism even goes so far as to claim that financial support via startup funds alone even has little or no impact on innovation. Depending on whether private donors are directly involved in

the financing rounds, an innovative impact can be assumed. Thanks to the signaling effect of government investments, they can have a positive crowding-in effect on the development of privately oriented venture capital markets (Colombo et al., 2016; Zhang, 2018; Bertoni & Tykvová, 2015).

The assessment of Mariana Mazzucato, a professor at University College London, is much more positive. She sees the government as a precursor to entrepreneurship. Government support, she says, is crucial to fostering economic growth. If there were no government investment in innovation, there would be little or no growth (Mazuccato, 2018).

The reflections so far have focused primarily on the economic significance and the impact on market access of government intervention. However, there is also an economic downside, which has a direct impact on the entrepreneurship-based culture of a startup. What does government support mean for the individual entrepreneur? The question is, to what extent does a financial commitment lead to the government funder intervening in business policy? Josh Lerner of Harvard University argues that the track record is rather dismal. No evidence exists as to whether they actually help the company succeed and really mean an impact.

The goal of entrepreneurship is to create value for the customer. When focusing on public funding, there is a risk of losing sight of the company's actual mission. In the worst case, there is a risk of changing the business idea or value proposition to fit the funding criteria of a funding program.

When receiving government funding, the risk of inefficiently designing processes and value chains increases. You become less diligent about cutting costs and making the best use of necessary spending. This can severely impact the profitability or even the viability of your business. On the other hand, there is a risk that government funding will demand public documentation or influence on the company. Reporting and controlling then misses the original goal of entrepreneurship and frustrates the workforce (Bylund, 2022).

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