

## Market Failures of Start-up Financing

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*Abstract.* Young companies with growth opportunities face serious problems when it comes to financing. The private venture capital (VC) market fails to provide sufficient funding for this segment. First, we present the main characteristics of start-up companies and market failures that can lead to government intervention. These failures include asymmetric information embodied in the business plan; high transaction costs of the investment process from the investment decision to the exit; and positive externalities in the economy, as the government prefers other goals than profit realization. Government participation is categorized as direct or indirect intervention. We present international studies showing that indirect government intervention can have also beneficial and negative effects on the VC market. Finally, the Hungarian government's participation and intervention are evaluated on the domestic VC market.

*Keywords:* venture capital, state involvement, EU funds, seed stage, start-up

### 1 Start-ups and seed stage companies

According to Berger and Udell (1988), three factors influence the financing opportunities of companies: firm size, firm age, and the availability of information regarding the company. This means that the smallest, youngest firms with the least amount of available information get access to the fewest investors: usually friends and angel investors. As the firm matures and reaches a certain size, it becomes a potential investment target for venture capital (VC) and private equity investors. There is no sharp boundary between the stages of the life cycle. In the following, we present only those stages—start up and seed stage – which are relevant to our current research (see also Jáki and Molnár, 2017).

1. The “seed stage enterprises” often possess merely a product/service idea (“idea company”). We can further categorize these companies into the following categories:
  - *Incubation stage* – the R&D stage of creating the product or service. Companies in this stage require only a small amount of financing. In the case of state intervention, the governments usually aim to provide funds to this sector based on a short and quick evaluation process.
  - *Establishment stage* is when the firm starts to set up their legal framework and operational organization. Investors of these companies are usually business angels, or the 3F (Family, Friends, Fools). In the last decade – due to the EU-Jeremie program – seed funds and accelerators also took part in the financing of these companies.
2. The “Start-up enterprises” have already developed an operational prototype and have some market feedback on the product or service. We can further distinguish the following sub-stages:

- *Introduction stage*: the company operates but doesn't realize revenues yet. Sales and marketing are the key processes.
- *Growth stage*: In this stage, the company starts to realize revenues but usually faces negative earnings. These enterprises are beloved targets of traditional private VC funds.
- *Expansion stage enterprises* have an established business but need additional financing for marketing expenses to expand further. VC funds and private equity investors are the typical investors of these companies. In this stage, less government intervention is needed, so it is out of the focus of our study.

Seed and many start-up stage companies do not realize revenues. Most of them have negative earnings and cash flows. These companies work on their idea and create the prototype of the product or make the service available for costumers. The financial resources are needed usually to cover operational costs, like R&D, personal expenses, or marketing costs. Strong marketing activity is needed to boost sales. There are also considerable costs of seeking new investors, including travel expenses, PR costs. In these early stages, enterprises are obviously out of the scope and risk tolerance of commercial banks, so they cannot count on standard bank loans (Sahlman, Scherlis, 2003 and Walter, 2014).

In this paper, we focus on seed stage and start-up companies where high risk and market failures obstruct many private investors. State involvement is needed as the private sector cannot provide enough equity to seed stage and start-up companies due to market failures (Kovács, 2011 and Karsai, 2004). In the following chapter, we are going to identify and briefly present these market failures.

## **2 Market Failures on the VC market**

Market failures can appear in several forms and all can indicate market distortions: problems with public goods, the presence of monopolistic and oligopolistic market participants, asymmetric information, transaction costs and externalities (Szentes, 2006, Lovas, 2015). The following failures occur in VC market financing (Lovas, 2015):

- *Asymmetric information*: as start-up companies have no track record in their business model, there is few and uncertain information about the company's past and especially about their future. Therefore, it is difficult for investors to assess the quality and the feasibility of the project.
- *High transaction costs*: young companies usually require a small amount of capital while the fixed cost of each investment process is high.
- *Externalities*: supporting these innovative start-up and seed stage companies can result in some positive macroeconomic effects in the domestic economy.

### **2.1 Asymmetric information - the business plan**

To find an appropriate financing partner, seed and start-up companies must present a business plan. Apparently, all inventors, contractors and entrepreneurs believe in their idea, but their business plan is obviously overoptimistic. Business plan based decision-making is discussed in the literature in details. The cognitive sources of overoptimism during the preparation of a business and financial plan is presented by Jáki (2010). Kirsch, Goldfarb, Gera (2009) studied the VC decision-making process based on the submitted business plan. Balboni, Bortoluzzi, Tivan, Tracogna, and Venier (2014) gave a literature review of the growth drivers of start-up firms and their business modeling. VC decision makers are often forced to make fast decisions and in such settings decision makers rely on heuristics to facilitate decisions. Kirsch et al. (2009) found that the presence of business plan documentations and information contained therein are weakly associated with VC funding decisions.

In all financing cases, the elaboration and evaluation of all business plans are characterized by asymmetric information which can also be simplified as lack of trust by the investors in the original owners and their submitted business plans. Trust was identified by Paliszkievicz (2011) a major factor influencing capital investments. High-level uncertainty and therefore severe asymmetric information problems arise by almost all classic parts of the business plan and can be hardly treated. These can appear in the marketing and sales plan, the operational plan, the investment plan but even in the description of the planned organizational structure or the specification of the product and services.

A seed stage company cannot give a detailed *product/service description* – especially in the information technology sector – because they possess merely an idea but they need time and money to work on it. VC investors usually reject these companies because of the undeveloped nature of their business. In the case of seed stage companies, it is a real challenge for the founder to create a detailed *marketing and sales plan* without the exact knowledge of what the product/service is. Merely ideas in the business plan can be presented and the realization of those ideas is entirely uncertain. Since start-up companies already possess a working prototype, the marketing and sales plan is a crucial part of the development of their business. It is highly challenging to convince the VC decision makers that the start-up's sales plan is realistic and attainable. Start-up firms struggle even to get letters of intent and preliminary contracts from the potential customers to support their sales plan. The expertise and experience of the marketing/sales director have therefore significant importance and it must be convincingly communicated to the investor. Even the industrial analysis is often a struggle since the product/service can create an entirely new, untouched, 'blue ocean' industry (Kim, and Mauborgne, 2004). A seed stage company typically has a delineated idea about the exact *operational process* since even the central concept of the business is not finalized. Start-up companies can usually go into more details and can make the operational plan more credible by attaching preliminary contracts with their suppliers. Finally, seed stage and start-up companies usually spend most of the invested capital on labor and personnel, therefore one of the most important parts of the business plan is the introduction of the *management team and the organization* (Sahlman, 1997) because investors accentuate the experience of the management.

In conclusion, a seed stage company can only present its product/service idea with informational asymmetry and therefore the lack of trust is apparent. Since investors get more (but still insufficient) information about start-up companies, VC funds focus more commonly on start-ups rather than on seed stage companies.

Going beyond general business planning for financing, in the case of seed stage and start-up companies the following plans are also required to be presented to the investor:

- *Action plan, strategic actions.* The strategic actions should be presented in detail regarding how to launch the business and entry into the market. Seed stage companies can present their research and development (R&D) activities or the steps taken to exploit sales opportunities. A start-up company can introduce its actions related to the development of the organizational structure, capital investments or additional sales expansion. It is very important for investors to see the specific strategic steps planned to be taken by these companies.
- *Financing plan.* Seed stage technological companies spend most of the initial investment on labor expenses which contribute to their intellectual property. The investors want to see precisely the intended use of the funds requested.

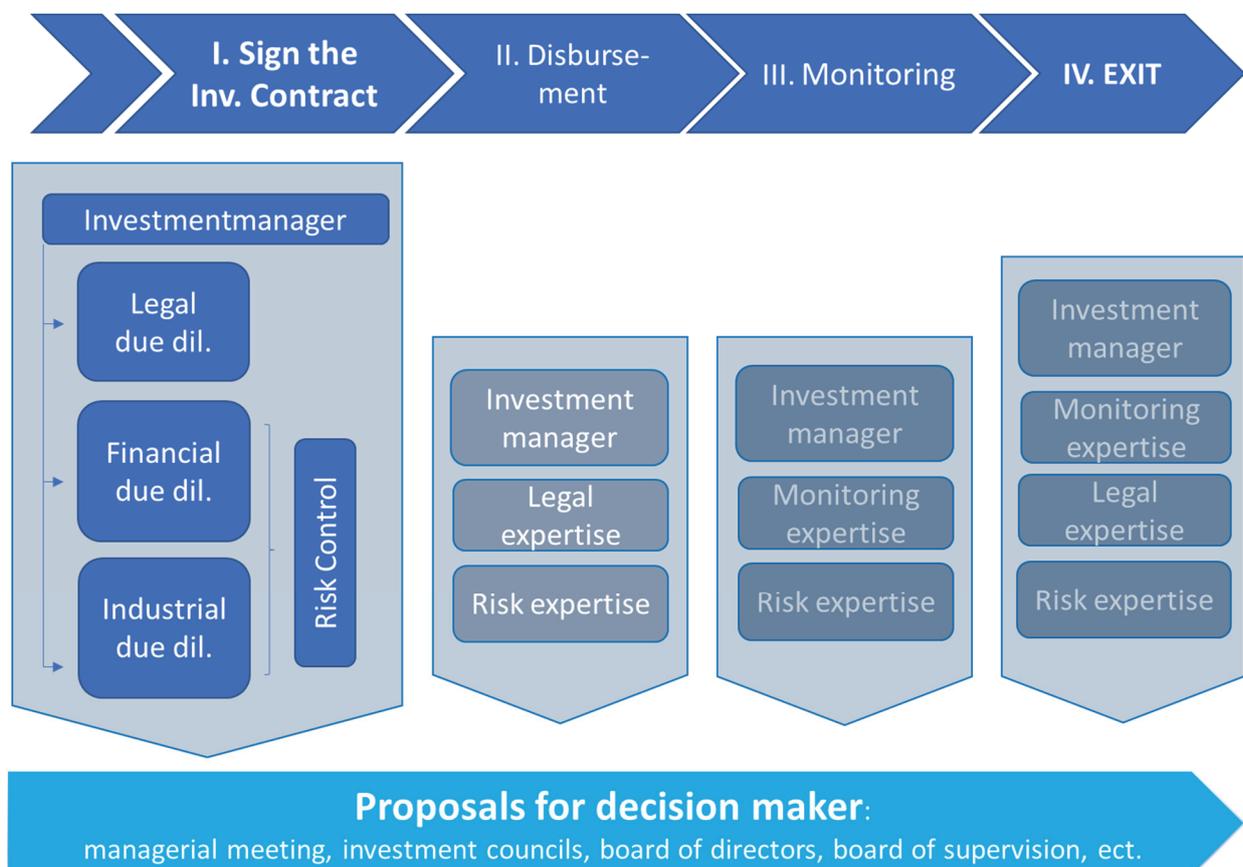
Based on all this we can see that a seed stage and a start-up company tries to sell merely a business idea. The organization is incomplete, characterized by hardly forecastable supply and demand and industrial risks. The initial investment will be spent on the intellectual property, R&D or marketing, the efficiency of which is hard to measure. It is understandable why angel investors and the so called

“family, friends and fools” are the main source of capital for them, as the information asymmetry is usually too high for classic institutional VC investors.

## 2.2 Transaction costs

The fund manager company collects liquid funds from different investors into a VC fund. It invests from the fund into target companies in line with the authorized Management Guidelines. The investors of the fund expect a return on their investment, so the investment decisions must be made carefully by the fund management to meet return expectations (Jáki and Molnár, 2017). To understand why transaction costs is a market failure at the VC market, the decision-making process is presented.

Figure 1: Venture Capital Investment Decision Making Process



Source: own editing

The investment process is composed of four different phases (See Figure 1):

- I. Investment decision.** Before signing the investment contract, the investment manager should assemble the investment proposal and submits to the decision maker boards. To assemble the investment proposal, first, the investment manager must filter the fund requests and carefully evaluate the chosen projects in cooperation with the legal and risk division of the fund manager company. Based on legal requirements, VC fund manager companies must operate an independent risk management division. They are also required to employ a lawyer for the contract signing. Commonly legal, financial, operational or another type of due diligences is made. The investment manager coordinates the whole process: contacts with the representatives of the target company, the legal and risk division of the fund management and the experts who make the due diligence. Overall, a minimum of three divisions are required to prepare an

investment proposal: investment managers, legal experts, risk experts and finally the forum of decision makers, which can be a committee, board, etc. are required, too. After a positive investment decision, the fund manager company signs the investment contract with the target company on behalf of the fund. The contract contains inter alia the terms of ownership rights and obligations, the possibilities and requirements of the exit, the terms of disbursement and exit, and the data supplement obligation for the monitoring process.

- II. *Disbursement.* The contract signing and founding of the company is followed by the disbursement. This is done after verification of the financial and legal contractual obligations. This review process is done by the investment manager, the legal expert and the risk management representative for maximum prudence.
- III. *Monitoring.* Following the disbursement, the ownership rights of the fund must be exercised. The target company must be monitored continuously based on quarterly, semiannual or at least annual reporting specified in the investment contract. Monitoring is responsible for checking the realization of the business plan, main financial data, customers' and suppliers' contracts made during the investigated period and to measure all risk factors. This is executed by the monitoring manager, in some cases in cooperation with the investment manager. The monitoring report must be also reviewed by the risk division. As the owners of the target company, the fund manager company must take part and vote in the general assembly. All the items on the agendas should be reviewed by the monitoring and/or by the investment manager, by the risk manager and by the legal expert. At the end, the fund manager company's representative gets a mandate to take part and vote at the general assembly. Apart from the monitoring process, in the contract, it is usually ascertained that the fund manager company has the right to mandate one or more members of the board of directors or supervisors. Overall, at least three divisions are required to monitor the investment: monitoring managers, risk experts and in legal questions the legal experts. Additionally, the fund management also assigns members of the boards.
- IV. *Exit.* In case of a successful investment, the fund can realize the return by exiting form the company. This process also requires active involvement by legal and risk manager experts in addition to the monitoring representative's opinion.

Overall, the typical investment decision, disbursement, monitoring and exit process is long, complex and expensive. Therefore, it is not economic for the fund manager company to even start the investment decision-making process under an investment threshold.

### **2.3 Externalities**

Obviously, without financial resources, many promising ideas of these usually seed stage and start-up companies couldn't be introduced into the market. Considering the uncertain direct returns, the success of these programs is can also be explained and justified by the positive externalities associated with financing innovative young companies. High transaction costs and severe asymmetric information problems are obvious obstacles for private investors to be more active in this segment of VC financing. However, positive externalities may justify active participation from the government's point of view. According to Karsai (2013) state participation is needed on the VC market, because the state considers other goals than just profit realization. These include motivating the local innovation and supporting social and regional economic development, establishing new jobs and increasing tax income spent on social services, etc. If the entrepreneurs can't find investors in their homeland, they turn to foreign investors and possibly bring their idea abroad.

Although positive externality is one of the most powerful and easily understandable explanations for government intervention, quantification of these benefits is extremely difficult. In the following part,

we present several studies which examined how government VC programs in various parts of the world.

### **3 Evaluating the government interventions – international experiences**

Despite obvious market failures described above, there is an intensive debate about the role of government in the financing of seed stage and start-up companies. State involvement has a long history worldwide and it is severely debated by researchers (Kovács, 2011; Szentes, 2006). There are several types of state involvement based on development area or motivator factors used by the state (Gilson, 2003) or according to the contract's characteristics (Jääskeläinen, Maula and Murray 2007, Cumming and Johan, 2009). In our study, in accordance with Kovács (2011) and Karsai (2015), we distinguish two types of state involvement: direct and indirect. Direct involvement means that both fund and the fund manager company are owned by the state. Indirect involvement means that funds are partially or completely provided by the state but they are managed by a private sector fund manager company.

The following studies evaluate the efficiency of different government sponsored VC programs around the world, leading to controversial conclusions. These studies evaluate the various government sponsored VC programs based on the analysis of the number of patents held and number and size of initial public offerings. They do not evaluate efficiency by the realized profit on the individual investments.

There are numerous studies which found that *direct state involvement on the VC market is inefficient*. Cumming and MacIntosh (2006) analyzed Canadian government owned VC fund manager companies. They concluded that these had not only higher agency costs and lower profitability than funds managed by the private sector, but their presence also decreased the VC availability to young companies in Canada. Brander, Egan and Hellmann (2008) also examined the Canadian VC market and found that companies that were directly financed by the government possess fewer patents, they have a lower probability to accomplish initial public offerings, acquisitions than firms who did not receive direct investment from government venture capitalists. Moreover, they also found evidence of a crowding-out effect.

Grilli and Murtinu (2014) examined the growth of the number of employees and the growth of sales of European young companies directly financed by government venture capitalists. They found that direct financing by the state had no effect on the growth of these companies. Luukkonen, Deschryvere and Bertoni (2013) analyzed data from seven European countries and concluded that private sector fund manager companies could provide better strategical support to young companies to grow than government owned fund manager companies. Bertoni Colombo and Quas (2012) found that European government owned VC fund manager companies failed to attract private venture capitalists to fund seed stage companies.

Another group of researchers found *indirect involvement by the state beneficial* in various countries. Colombo, Cumming and Vismara (2016) found that the Australian Innovation Investment Fund (IIF) was a significant help in easing market failures in Australia. They also state that government VC programs are not successful in every country by nature. According to them, the biggest mistake of government programs is that they don't mandate the most successful private sector VC fund manager companies to manage the state funds.

Brander, Du and Hellmann (2015) analyzed an international database and found that companies who received VC funds provided by both the government and the private sector, received more funds

overall. In those cases, funds also had a higher chance for a successful exit compared to firms that only received either public or private investments. Additionally, in countries with more government sponsored VC investments, more companies receive greater amounts of financing on average. According to the authors, the government involvement doesn't crowd out private investors but augments them.

Murray, Cowling, Lu, and Kalinowska-Beszczyńska (2012) analyzed seven government sponsored VC programs in the United Kingdom. They concluded that these programs were successful in providing financial resources to firms that would not have been funded by private sector venture capitalists. But they also warned that these programs can only be beneficial to the economy when they are accompanied by a constant development in entrepreneurial culture and innovation.

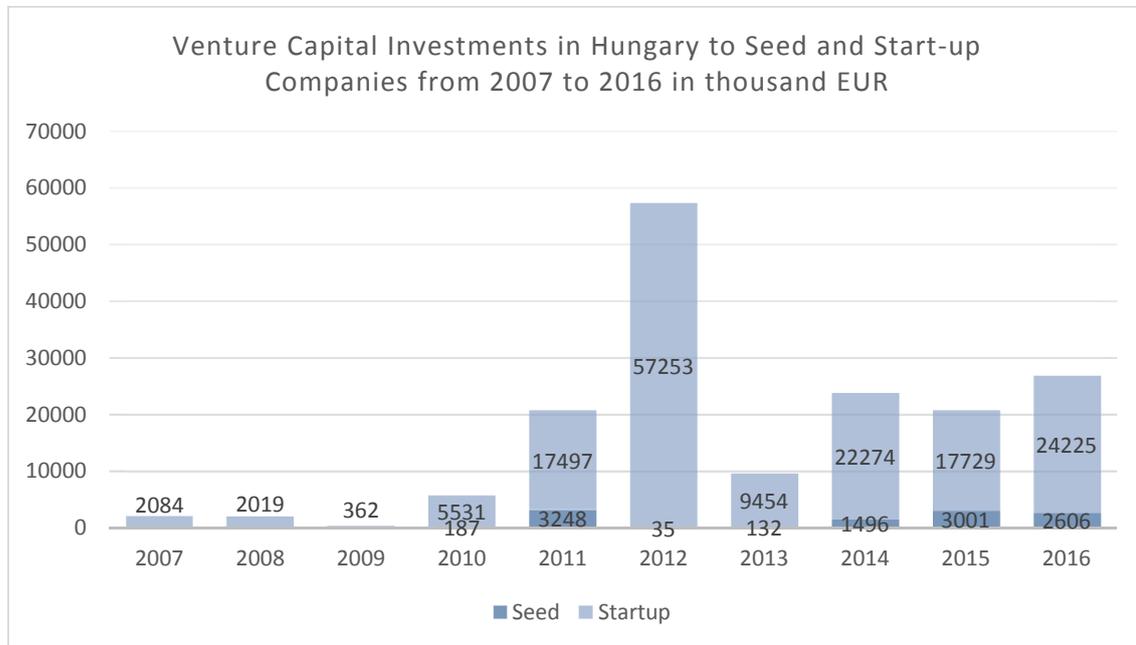
*Both direct and indirect involvement was found inefficient* by Lerner (2009), who analyzed the American government sponsored VC programs. He started with the Small Business Innovation Research Program (SBIR) in 1999, which distributed directly billions of dollars over the years. He found, that the program had a significant impact on sales and employment growth only where the VC sector was already active before the program. After examining multiple phases of government VC programs, he concluded that these programs were designed faulty and the state doesn't understand entrepreneurship. But he also adds that even privately managed state funds can't be justified based on performance, he essentially condemned indirect involvement of the government.

#### **4 The Hungarian VC market and state involvement**

Hungary participates in the European Union's VC program called JEREMIE (Joint European Resources for Micro to medium Enterprises). The program was announced for 2007-2013 and was available for VC fund managers from 2009 in multiple rounds. In each round hundreds of millions of EUR were distributed to Hungarian private sector VC fund manager companies to invest in start-up, seed SME companies. The private sector fund manager companies were required to provide at least 30% own participation from their total managed capital. The latest investment period to seed and start-up companies ended on mid of 2016. The principal objective of the program was to revitalize the Hungarian VC sector and provide sources to innovative young companies that would have otherwise do not have access to funding.

To assess the effects of the Jeremie program on the Hungarian VC market, the size of seed and start-up investments made in the country from 2007 to 2016 and the number of investment from 2014-2017 Q1 can only be investigated. As only a few investments ended, and many investments are still in its early stage, there is a limited opportunity and publicly available information to assess the total investment phase from funding to exit and their value-added effect on macroeconomic factors.

Figure 2: Venture Capital Investments in Hungary to Seed and Start-up Companies from 2007 to 2016 in thousand EUR



Source: Invest Europe (2017)

Figure 2 shows that before the start of the Jeremie program in 2009, there was very weak seed and start-up VC activity on the Hungarian market. From 2010 the VC market began to speed up, reaching the peak point of its investment activity in 2012. After a decline in 2013, VC activity remained stable during 2014-2016. Interestingly, seed investment activity remained on a low level, development was much more apparent on start-up market.

Examining the last three years of the program in Hungary, around 100 investments were made annually between 2014-2016, see Table 1. The Jeremie funds' share of these investments increased year by year from 50% to 84%.

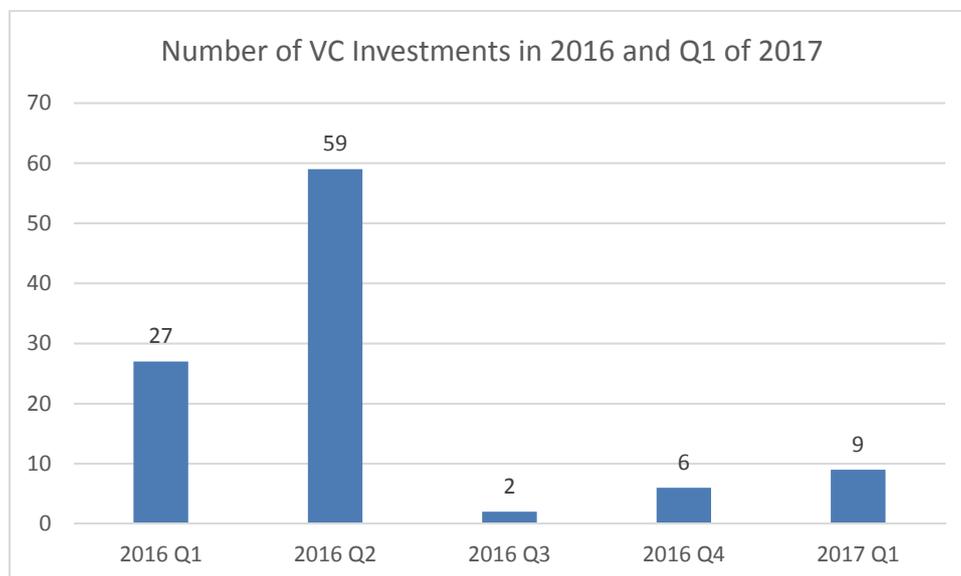
Table 1: Total Number of Investments and the Share of JEREMIE Funds

year	2014	2015	2016
total number	96	109	94
JEREMIE share	50%	61%	84%

Source: HVCA (2014, 2015, 2016)

Figure 3 shows the number of investments from 2016 Q1 to 2017 Q1. It can be stated that after the end of the investment period of the JEREMIE program, the number of investments drastically decreased from 59 investments to 2 investments in Q2, and remained low at the end of 2016.

Figure 3: VC Investments in 2016 and Q1 of 2017



Source: HVCA (2016, 2017)

Just before the Jeremie program's closing in the second quarter of 2016, fund manager companies made tremendous efforts to finish ongoing investment processes so the number of investment doubled from 27 to 59 in this period. After the end of the program, the number of VC investments fell drastically and there is no sign of improvement even in the first quarter of 2017.

On the Hungarian VC market, 19 fund manager companies operate in 2017 and two of them are owned by the state: Hiventures (before Corvinus Venture Capital Fund Management Plc. - CVCFM) and Széchenyi Venture Capital Fund (SZTA). SZTA was launched on the 1<sup>st</sup> of June, 2011. We need to note that despite being labeled as a VC fund manager company, SZTA also makes later stage investments. CVCFM originally was founded in 1999 as Regional Fund Management and was appointed as the State Venture Capital Fund in 2016. To accomplish this task, the organization and the managed funds had to be restructured and the company was renamed to Hiventures.

According to the openly available figures of Hiventures, it possesses 9 investments at present but due to its organizational restructuring, its investment activity cannot be thoroughly examined. According to the Széchenyi VC fund website, they accomplished 94 investments in the period 2012-2016, see table 3. Due to the typically three to five-year investment period, most of the investment exits will take place after 2018.

Table 2: Széchenyi Venture Capital Fund investment activity

Year	2012	2013	2014	2015	2016
Num. of investment made by SZTA	13	17	30	25	9
Investment made by SZTA in thousand EUR	3 109,71	5 388,72	15 226,88	11 939,20	6 100,23
Total VC and PE investment in Hungarian VC (database of Invest Europe)	66 819,00	18 376,00	29 902,00	23 798,00	28 940,00
<i>SZTA proportion of total VC and PE investment in Hungary</i>	4,65%	29,32%	50,92%	50,17%	21,08%

Source: [www.szta.hu](http://www.szta.hu) and [www.hvca.hu](http://www.hvca.hu), Invest Europe (2017), and MNB (2015)

According to Table 2, the government owned SZTA – the fund manager company – made a very significant portion of all VC and PE investments in Hungary during its lifetime so far. It has provided half of the total invested capital in 2014 and 2015. Based on this, we can state that despite the major indirect VC program Jeremie, the government still has a significant direct presence on the Hungarian VC and PE market. As it was written on the SZTA website, the efficiency of their investments can be evaluated after 2018 based on the realized exits.

As the majority of investments are still running in their early stage, it is too early to draw down final conclusions about the efficiency of these programs and institutions on a macroeconomic level. There is only one research available (Becksky-Nagy and Fazekas (2015)) at present which evaluate the program efficiency on the Hungarian VC market. They concluded that direct state involvement is not efficient as they believe that private sector fund manager companies have better skills in selecting target companies than the state. In addition, as the government plays an inactive role in the management of the target company, it can't control the management of the financed companies adequately. These conclusions are in harmony with results of Cumming and MacIntosh (2016), Brander, Egan and Hellmann (2008), Grilli and Murtinu (2014) and Luukkonen, Deschryvere and Bertoni (2013).

Despite questions concerning efficiency, we can state that the Hungarian government plays a significant role on the VC market and counts as a very active participant. There is no doubt about that it largely influences the market. The efficiency of these investments can be investigated more in detailed only later based on the exits made by the SZTA and Hiventures fund manager companies.

## 5 Conclusion

Nowadays governments actively participate in VC financing. Several market failures occur in the financing of seed and start-up companies like asymmetric information, high transaction costs, and externalities. Information asymmetry and high transaction costs are obvious obstacles for funding of potentially good companies. Positive macroeconomic externalities originated from the development of these successful companies can justify government interventions, too. Government intervention can be categorized in several ways. In our research, we categorized it as direct and indirect form corresponding with international research. There are several studies evaluating the direct and indirect intervention of the governments all around the world. Results are controversial. Numerous studies showed that direct state involvement on the VC market is not efficient. Another group of researchers found indirect involvement by the state beneficial. Most of the positive evaluations emphasize that

government and private investors together had a positive effect on the VC market especially if private investors can make the final investment decision. We can also definitely state that the government sponsored VC (direct and indirect) programs have a huge impact on the Hungarian VC market. It is obviously shown in market statistics: in the number of new investment, in the dynamic of fund volumes, the number of funds. However, the efficiency of these investments and its macroeconomic impact is still questionable, as these projects are still in their early stages and exits are expected only after 2018.

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