

Squaring the Circle?

Government as Venture Capital Investor

JUDIT KARSAI

*The government participates in the venture capital market in many different ways. This paper examines the role of the state as an investor and gives a thorough review of international trends through examples. It outlines, that contrary to direct participation that could result in the distortion of market processes, the government is increasingly contributing to the growth of venture capital market funds while including the private sector in the process. The inclusion of the private sector is important primarily because this solution ensures the selection of projects that are economically viable, promising and free from political influence, the selection of financing periods independent from election times, and the adequate expertise and incentives of managers entrusted with the investment's management. The main conclusion of the study is that only privately managed venture capital funds financed only to a lesser extent by the state allow for the adequate utilization of state resources, and thus they contribute to the achievement of economic policy objectives and improve the capital supply of young, promising companies.**

Journal of Economic Literature (JEL) code: G23, G24, G28, M13, O31.

Whereas venture capital is a characteristic of market competition, in many countries the state plays a significant role in the capital supply of venture capital markets. There are countries where even the birth and strengthening of the venture capital industry was partially assisted by the government (EVCA, 2010). During the economic crisis the resulting sharp decline in the risk-taking willingness of investors led to the corrective role of the state becoming more prevalent in the venture capital market (Brander *et al.*, 2010, Kramer-Eis-Lang, 2011, Private Equity Findings, 2010).

There are a number of *arguments* for the government's participation in the venture capital market. According to arguments referring to the market failure and a financing gap – by ensuring a critical mass of capital – state intervention could indicate the worthiness of seed or

Judit Karsai, senior research fellow at the Centre for Economic and Regional Studies of the Hungarian Academy of Sciences. E-mail: karsai.judit@krtk.mta.hu

* Financial support from the Hungarian Science Research Foundation (OTKA, grant no. K 105581) is gratefully acknowledged.

The Hungarian version of the article was published in *Külgazdaság*, 2014, Vol. LVIII., No. 9–10., pp. 3–34.

Translated by *Gabriella Nagy*. Translation checked by *Robert Young*.

early phase investments to private investors (*Leleux and Surlemont, 2003*). This claims that government intervention promotes the creation of a seed and early phase private sector segment in the market. Another argument claims that state participation is based on considerations that go beyond pure financial gains, namely on social and national strategy interests such as job creation and the boosting of the economy of certain regions and sectors (*Lerner, 2009, Murray et al., 2012*). Therefore government participation in the venture capital market is underpinned by the fact that through meeting the capital demand of promising, young and innovative enterprises a socially desirable outcome is achieved. The government can fulfil a useful community task if it is able to identify investment projects that promise great social benefit and through adequate incentives it can channel the attention of financial intermediaries (private investors) towards such enterprises.

The success of venture capital investments also depends on the *operational environment* of venture capital markets, i.e. the current state of the economy, the development level of financial institutions, the condition of the job market, the amount spent on research and development, and the regulatory framework for the cooperation of venture capital investors and management companies.¹

Even though the most obvious form of government participation in the venture capital market is direct investment, the state also has a regulatory role. Among the many opportunities that the government has for participation in the venture capital market this paper examines those forms where the state acts as an *investor* in the supply of funds to the venture capital market. Therefore to achieve its objectives the government can create a central fund that boosts resources of venture capital funds – it can invite private investors to the funds set up by the state or it can reduce the costs and the risk of investing exclusively in private sector funds. There are a number of solutions that can make cooperation between public and private investors smoother and joint investments more attractive through asymmetric risk bearing or uneven share of benefits (*Murray, 2007*).

This topic is relevant for two reasons. Firstly, the financial and economic crisis that started in 2008 affected the European, namely the Central Eastern European countries to a large extent,

¹In order to avoid future crises, changes in the financial regulation aimed at reducing system-related risks introduced even stricter restrictions than before in the venture capital industry. The restriction of venture capital market investments of institutional investors and the introduction of a new regulation on venture capital management companies are some of the changes that affect the activity of venture capital funds. Such changes among others include the AIFMD, Solvency II, EuVECA, CRD IV, CRR and a number of changes regarding taxation.

their venture capital industry was more severely impacted than that of their Western counterparts, and therefore public support became increasingly more important for them. Secondly relevant reason means that the European Union – sensing the problems related to traditional venture capital investments – introduced a new scheme available to member states that enabled greater public funds to be accessed than before. This is the new *JEREMIE program* that made it possible to use part of the structural funds for venture capital purposes. It is already available to the new member states joining from Central-Eastern Europe.

The *train of thought* in this article is the following: The analysis first examines the importance of the state's participation in the venture capital market then it presents and categorizes the different government schemes applied at a national and international level in order to boost funds for the venture capital market. The paper examines the factors that affect efficiency of the public venture capital programs, their benefits and disadvantages, and it draws conclusions about the state's participation in the venture capital market.

The effect of the crisis on government participation in venture capital markets

Statistical data confirms that during crises the importance of government funds for early stage innovative companies *increases*. A sign of this is that since 2010 European governmental agencies have provided more than 30 percent of equity raised by venture capital funds (EVCA Yearbook, 2014). Even in 2013 34 percent of equity raised in European venture capital funds originated from governmental resources. In 2007 governmental contribution amounted only to €650 million, in 2010 and since 2011 it amounted to €1 billion and €1.5 billion respectively, a development contrary to the business cycle. Given the fact that between 2007 and 2013 the equity volume raised by venture capital funds in the private and public sector jointly dropped to a half, this “naturally” led to a greater share of public investors (*Kramer-Eis et al.*, 2014).

The importance of public funds in the *Central Eastern European region* is reflected in that around *half* of the €433 million raised in 2013 by venture capital and private equity funds headquartered in the region originates from government sources. An even larger share of the €88 million equity raised by regional funds in 2013 to finance specifically early phase companies – namely over 60 percent – was provided by government institutions, which is almost double the 34 percent measured for the whole of Europe. The high proportion of public resources in Central Eastern Europe was not only typical of 2013. In the five years between 2009 and 2013 near 40 percent of venture capital funds specialized in regional investment came from governmental bodies (EVCA, 2014).

The fact that public equity programmes are widespread is also supported by data published by the European Commission. According to this half of the equity and quasi-equity funds

invested between 2007 and 2012 in Europe originated from European community – more precisely EU structural – funds (European Commission, 2013).

According to *Brander et al.* [2010] government funds contributed to venture capital financing not only in Europe, but all *over the world* to a significant extent in terms of the number of companies that gained access to capital. In their estimate the ratio of venture capital financed companies that received public equity exceeded 50 percent in Canada, was around 35 percent in Germany, and approximately 25% in France and Belgium as well. In the United Kingdom more than half of early stage deals were provided by hybrid funds that simultaneously used public and private funds (*Pierrakis and Mason, 2008*). The high ratio of government participation is not accidental, since according to an OECD survey conducted in 2013 there is some sort of public equity program in most member states, and their number has been increasing over the last five years (*Wilson–Silva, 2013*).

The different types of public venture capital programs

Defining governmental participation in the venture capital market is by no means obvious. Some experts include in the definition all programs where equity is invested in young companies or that encourage other equity intermediaries to carry out such investments (*Lerner, 2002*). According to another approach governmental participation covers programs that support high-tech industries through venture capital funds and taxation policy (*Cumming, 2007*). Yet another branch of governmental participation is hybrid schemes, where venture capital funds use both public and private resources (*Jaaskelainen et al., 2007*).

In regards to the supply of funds for venture capital markets there are two basic structures for government participation. One is the support of private venture capital fundraising whereby the government acts as a limited partner and increases the equity of venture capital funds managed by otherwise independent fund management companies. Such *indirect* public participation in venture capital markets is represented by the *Innovation Investment Fund* in Austria, the *Yozma* program in Israel, the *SBIC* construction in the United States, the *High Tech Fund of Funds* in the United Kingdom, the *Vækstfonde* in Denmark, the *Fund for the Promotion of Venture Capital* in France and the *ERP-EIF Dachfonds* in Germany.

The other form of *direct* involvement by the government is the setting up of state-owned venture capital funds or exclusively mandated fund management companies to manage state-owned venture capital funds. In such instances the state applies a so called hands-on approach, i.e. it creates a venture capital fund that is owned by a state organization, where the state is also General Partner and therefore responsible for the selection of the portfolio companies and investment related decision-making after a state-appointed fund manager is

entrusted with the task of operating the state sourced capital. For example some such constructions are the *Biotech Fonds Vlaanderen* in Belgium, the *SITRA* in Finland, *DC Innovation* in France, *TBG* in Germany, *Piemontech* in Italy, *Axis Participaciones Empresariales* in Spain and the *Scottish Enterprise* in the United Kingdom. In Central and Eastern Europe the simultaneous participation of the state in the venture capital market as an owner and fund manager is particularly widespread, this is how the *Hungarian Development Bank* participates in the financing of the venture capital industry in Hungary.

In the beginning many governments opted for the latter, more *direct route that is they* established a state-managed venture capital fund. As the setting up of a state fund, when the government is a fund manager and an investor at the same time, entails the risk of market *distortions* due to bad placement of capital and the probability to exclude private investors (*Armour and Cumming, 2006, Avinimelech and Teubal, 2006, Gilson, 2003, Leleux and Surlemont, 2003, Lerner, 2009*), many of these constructions have since been amended (OECD, 2013).

In the case of *indirect* state investments the government participates in the process by mandating private sector venture capital management companies with the management tasks. The state delegates the executive power to the fund manager, while it acts as one of the investors of the financed funds, with special objectives. Besides an expected yield such objectives could include the development of certain regions, job creation or the promotion of innovation. Nowadays this indirect way of government participation in the venture capital market is the most dominant one (*Gilson, 2003, OECD, 2006*). Indirect public investment therefore is basically a *co-investment structure*. The government itself does not create a venture capital fund, but with its investment it joins private funds. In such cases the state does not only entrust the management of the fund to a private fund manager, but it becomes merely one of the co-financing limited partners of the fund. Besides effecting leverage, this solution is also effective in building the market of seed and early-stage investments, through the availability of ampler resources and conducive to growing the professionalism of its participants. Co-financing could also attract foreign investors provided the regulatory environment allows for it. Co-financing can take many different forms. Most often the *state invests in the funds with conditions identical to what apply to private investors – i.e. pari passu*. There can be conditions that are *more favourable* to private sector investors *compared with their public peers*. These are meant to provide incentive and protection for them. Such asymmetric financing schemes ensure a higher proportion of the yields than their share of investment, and likewise, they carry a ratio of the losses smaller than their share. This bonus

provided to private limited partners, intends to compensate the higher risk and slower rate of return that accompanies seed and early-stage financing. Experience indicates that these hybrid constructions offer the right incentives without resulting in unwanted consequences while they have a positive impact on the yield (Murray, 1998). In recent years – in the wake of success of the already existing programs – these co-financing funds have become very popular.

Another fairly widespread solution for indirect government investments is the *fund of funds* scheme. Public funds do not directly go to a selected fund, but *a state holding fund is established from state resources* and so private funds can apply for its public equity. The fund manager of the government owned holding fund, in the allocation of the public resources, only finances funds that undertake to meet certain objectives in their investment policy important for the state, such as the financing of young companies with a high growth potential (Murray, 2007).

According to the strength of the market's role there is a full range of models with different levels of state participation in the venture capital market. On one end of this range there are investments carried out exclusively by wholly state-owned investment funds, then there are individual co-financing schemes with public investment and finally there are hybrid funds co-financed by private investors and state holding funds. There are also public funds that occasionally join individual private sector investments, and there is the financing of private venture capital funds that have international financial institutions among their limited partners. Besides the share of equity, the differences between these solutions can also be the size of the investment effectuated, the hurdle rate, the criteria applied in the selection of companies and the incentive methods used to stimulate private limited partners among the fund's investors.

A survey conducted by the OECD in 2013 (Wilson–Silva, 2013) indicates that 14 out of 32 member states have direct government capital investment programs, while 21 out of 21 countries have fund of funds and co-investor constructions structures. Among co-financing programs the so called *pari passu* types were more prevalent at 80%. Among the programs the number of fund of funds and schemes realizing co-investments have increased while direct investment programs decreased in number. In case of co-investment structures the general practice is to conduct a preliminary screening of the investors that wish to join, an acceptable practice in almost 75 percent of the cases.

International public equity programs

Besides public equity programs at the national level international government equity investment programs also play an important role in the development of the venture capital market. In Europe for example public contribution to venture capital funds from EU resources is a widely used tool of enterprise and innovation policy (EC, 2006a, 2006b, *Martin et al.*, 2003, *Murray*, 1998). Moreover, with the lack of private and informal investments, international structures are one of the most important and continuous sources providing new companies with venture capital on the European market.

There are many different EU resources to support venture capital financing. Member states can spend resources from the EU structural funds on venture capital programs, but the development of the venture capital industry can be supported with *European Investment Bank (EIB)* and *European Investment Fund (EIF)* resources; these resources can even be linked.

Unfortunately it is difficult to give a picture based on data summarized and published by the European Union on the amount dedicated to finance venture capital in a given programming period, and what percentage of it was actually used, i.e. allocated to the different members states and the amounts they provided for the beneficiary funds and they in turn to the financed enterprises. The main challenge is that funds dedicated to the same objective in the different programs are not added up. For example, measures that support the financing of small and medium-size enterprises are separate from the ones that promote innovation, whereas supporting venture capital can occur in both.

The European Union's €3.6 billion *European Competitiveness and Innovation Framework Programme – CIP*) dedicated to financing innovative small and medium-size enterprises between 2007 and 2013 covers numerous aims. It included – among others – the improvement of competitiveness, support of innovation and entrepreneurship, promotion of technology transfer, assistance of the appearance of new financial intermediaries, the role of being a catalyst towards market-oriented investors, the spread of renewable energy and the support of energy efficiency. 60 percent of the program budget constituted one of its main pillars: the *Entrepreneurship and Innovation Programme (EIP)*. From the EU budget the EIP program enabled credit, guarantee and the provision of venture capital through the financial engineering instruments by envisioning over €1 billion in equity. Slightly over the half of this amount was designated to boost venture capital equity that undertakes to finance fast-growing innovative small and medium-size companies. The regulation prescribes that at least fifty percent of privately-managed venture capital fund financing must come from private investors and the state – as an investor to the funds itself – would contribute with similar conditions. Besides these programs, European venture capital funds could receive government support

even from other EU resources such as the *JEREMIE-program* through the *European Regional Development Funds (ERDF)*.

In the framework of the *Joint European Resources for Micro and Medium Enterprises – JEREMIE* program announced in 2005 participants had to invest their EU funds until the end of 2015. The financial package created with the contribution of the European Commission, the European Investment Bank and the European Investment Fund offers old and new EU members an opportunity to invest a part of the structural funds as refundable amounts into venture capital. Venture capital constitutes only a small ratio of the JEREMIE-program, credit and guarantee constitute a much larger share in it (EIF, 2014). Moreover, venture capital is not listed as a financial tool in some of the countries and regions that participate in the JEREMIE-program. While the JEREMIE-initiative is applicable on a regional level, the CIP/EIP work at an EU member state level. The JEREMIE-program is basically a *complementary* program to the CIP/EIP.

Due to the regional nature of the program and the relatively small size of the participating venture capital funds, experts did not consider the JEREMIE-scheme's effect on the venture capital market very significant (EP DG, 2012). Expert analyses that examined the efficiency of financial tools applied in the EU to promote innovation weren't fully satisfied with the applied constructions and recommended their *restructuring*. They highlighted – from an economies of scale perspective – the too small, domestic regional funds and the low growth potential of the companies financed by them as the main concerns, and in their view there should be a shift towards a lesser number yet adequately flexible funds that are capable to adapt to investment trends (Reid and Nightingale, 2011).

The JEREMIE-programme is important in the Central Eastern European region because, besides the technological boom of the 2000's, innovation financing in the region has been less than dominant (Karsai, 2010). In this context the creation of JEREMIE-funds that combine EU and private resources was a definite step forward, even if due to the lengthy introduction process their operation in the region was launched only in 2010. This scheme is *extremely important* to new EU member states because it represents a clear shift from the previously common venture capital market operation where exclusively state resources were invested via state-owned venture capital fund management companies. While all Central Eastern European member states joined the JEREMIE program by the end of 2013, venture capital is missing from the profile of some holding funds that theoretically finance credit, guarantee and venture capital funds in some countries in the region. The appearance of hybrid funds does not mean

that the previous, direct public financing of venture capital investments ceased to operate when the JEREMIE-funds appeared on the scene.

The JEREMIE program enables member states to use a part of their share from the structural fund to finance small and medium-size enterprises with the supervision of their own managing authorities in a repayable and reusable way. The managing authority first sets up a holding fund to manage the resources, which selects the intermediaries via tender for proposals who will allocate the resources to the actual beneficiaries in the form of equity, credit or guarantee. Such intermediary organizations can be commercial banks, saving banks, micro-financing organizations or venture capital fund management companies (KPMG, 2011).

The *European Investment Fund* fulfils an important role in the execution of European public venture capital programs by investing in 80 percent of all venture capital funds active in Europe. The EIF unites both public and private resources, and it participates in the financing of the European capital market in many different forms, may it be *fund* or *fund of funds* investments in the seed, early-stage and expansive small and medium-size companies in the technology sector. Besides EC-mandated management of equity financing allocated as part of the CIP program the EIF also manages 13 national and regional fund of funds and 14 JEREMIE-holding funds as well (EIF, 2014).

The EIF's importance is reflected by the fact that through its €8 billion share capital portfolio at the end of 2013 it *catalysed* the fundraising of over €40 billion resources in 500 funds (EIF, 2014). In case of these investments the EIF joins private investors and provides 15–40 percent of the funds' equity at the first closure of the funds *pari passu* whereby professional private fund management companies do the fund management task (European Investment Group, 2013).

The overall professional evaluation of the EIF's activity is positive. 30 percent of the funds financed by the EIF since 2011 wouldn't have reached the set size and 60 percent wouldn't have reached the first closure, therefore its role as a successful catalyst is underpinned (*Kraemer-Eis et al.*, 2014). However, it was criticized that in practice the EIF prefers larger size venture capital funds that have a proven track record and not necessarily inclusive towards new, emerging teams or small funds that manage less than €70–80 million (French non paper, 2013).

In regards to the government's participation in the venture capital market as an investor the question of potential *distortions to the competition* arises, that is when does equity provided to enterprises in the form of venture capital qualify as *state aid* that ensures competitive

advantage to affected participants. Therefore the European Commission prepared its Risk Capital Guidelines in 2006 for state subsidies that have been amended several times in response to the dangers of market conditions. The directive for venture capital differs from the otherwise applicable state aid regulations in that it doesn't prescribe the individual listing of eligible costs and the calculation of support intensity based on it, but in case of venture capital it requires only an assessment for compatibility of the full amount of capital contribution – the private investor share included (EC, 2011; Nicolaidis, 2013). In practice, authorities that develop public equity investment programs must do so while getting prior approval from the EU through a notification process, so that all elements of the construction would comply with the relevant directive. Central and Eastern European authorities that used EU funds to develop their venture capital industry between 2006 and 2014, and investors and enterprises that wished to participate in government equity programs only *faced* the strict and – compared with their national practices – very restrictive nature of EU expectations only in the course of the notification of their programs. The compatibility criteria with state aid rules had a tremendous impact on the program's efficiency and fruitfulness.²

Assessment methods and areas of government venture capital programs

In order to determine whether public venture capital investment programs are progressing in the right direction, that is they don't result in effects contrary to the state's interest, the launched program's interim and the closed program's post-evaluation are necessary. Its purpose is to establish whether the government venture capital programs achieved their objectives and expected results. Even though the seed and early-stage financing venture capital schemes have been utilized in a number of countries, according to a survey by *Wilson–Silva* [2013] the programs were evaluated only in a few instances, namely in 13 out of the 32 participating countries; while active and well-practiced grant, loan and guarantee schemes were evaluated in more locations – in 21 countries (*Wilson–Silva*, 2013).

Solutions that offer public participation in the venture capital markets can be evaluated from many different viewpoints. The program planning can be analyzed to establish whether it was properly constructed. The process itself can also be examined, i.e. whether the intervention occurred according to plans, but even the program management can be examined to ascertain that its management was adequate. You can consider the institutional environment's effect, in

²*Risk Capital Guidelines* also contained requirements for venture capital funds, fund management companies and companies that receive capital investment. Thus they defined the criteria based on which the investor's activity is defined as profit-driven – the basic requirement to exclude competitive advantage – and the guidelines also set the size, age, location and industry of companies entitled for certain amount and type of equity investment without qualifying as a state aid.

case of different programs, their eventual effect on each other, the interpretation of the program as well as the level of intervention, and to what results the program led to at a local, regional and national level. Assessment that takes into consideration different viewpoints and uses different evaluation methods will necessarily lead to different results and levels of utilization. It matters who conducts the evaluation, whether it is the executive organization of the program, another public organization, an independent external expert or the academic world. The evaluation can differ also based on whether a qualitative or quantitative approach was used during the analysis.

The selected method obviously depends on the objective of the given program's evaluation and the policy questions to be answered (HM Treasury, 2011). The assessment can ask whether the program was executed according to plans or what were the changes resulting from the program on the market that finances start-ups and early-stage companies, and what the costs and the benefits of the economic policy intervention were. In many cases the programs are evaluated against the results of similar domestic or foreign programs. The majority of assessment conducted in regards to venture capital programs in OECD countries was qualitative, and these evaluations were usually carried out by external experts or academic workers (OECD, 2013).

It is useful if the evaluation is prepared not only for the participating venture capital funds and companies, but if the program's effect in a wider context is also examined. Through the comparison of companies and entrepreneurial groups supported by the program with other companies that received no similar public support for their development, the program-induced differences become tangible. It is worth keeping a track of not only the financial results, but also changes in revenues and employment data for the two kinds of groups (*Lerner, 2014*). Naturally, such comparisons require a fairly widespread database. A database that enables the comparison between the effect of independent (private) and state venture capital investors' activity on the revenues and employment figures of companies financed by them. This new approach was utilized in the VICO database that made it possible to measure on a representative sample the effect of venture capital financing on high tech companies in Europe between 1993 and 2010 (VICO, 2011).

Even though the number of government venture capital investors is very prevalent in Europe and they have a significant weight at the level of syndication and co-financing with independent (private) venture capital investors, there was virtually no evaluation before 2012 regarding the role government funds played in the growth of high tech companies in Europe. Analyses up to then only examined the characteristics of special governmental programs

outside Europe and what moderate effect public venture capital investors had on the performance of funds financed by private venture capital investors.

It is relatively rare that already at the launch of the program the state would define conditions that allow for the obvious evaluation of the given equity investment program. Formal assessment and its publishing is not common practice. Evaluation by independent academic bodies is automatically difficult because data are accessible only to a limited extent about the programs. Internal governmental evaluations are also rare, but if they exist they tend not to be strict enough, lacking the adequate competences and are often biased. Most programs that use government resources do not set a method of evaluation or what kind of data should be collected for it. Formal assessments are often very superficial and refer only to the execution of the program (NAO, 2009). *Lerner* [2009] considered it a fundamental flaw that the evaluation of public programs that boost enterprise growth most of the time is not carried out. He found that even in cases where there was an assessment, it was limited to a compilation of success stories. He considered this practice disputable because the tacit requirement for success propelled investors to finance companies even where the role of public contribution was rather limited. In *Lerner's* view the adequate assessment should have enquired into what would have happened without the government's participation in the venture capital market.

The European Union's venture capital programs' obligatory interim evaluations are usually descriptive and lack the intention to raise issues and explain them. In the reports on the equity program, data on venture capital is mixed with data from other types of programs that also assist the financing of small and medium-size enterprises. Such reports are usually compiled according to the viewpoint of the public administration, which is reflected in the fact that they *mix* data on credits, guarantees and equity, and they focus mainly on the number of contributing intermediaries and the number of deals carried out by them. It is difficult to see clearly since the data for the lending in the form of financial instruments when risk financing small and medium sized businesses, the data for equity financing, and the data on venture capital provided by institutional and informal venture capital investors are difficult to separate from one another in the statistical sources. When counting the state co- and joint risk financing investments, equity from public and private sources are often blurred together.

Aspects affecting the efficiency of public venture capital programs

The analysis of public venture capital programs highlights a number of features of the applied schemes that play an important role in the success of their execution. Among other things the preparation of the program and the time frame available for the execution, the formation of regulations that apply to investments of preferred venture capital fund managers, the

opportunity to extend the programs in space, the volume of capital available for investments, the selection of private investors, the incentive system used to attract them and the management of publicity are extremely important.

The time frame for the program

In terms of evaluation and actual effect timeframe plays an important role in the programs. According to precedent a lot of programs can only be launched very slowly, partly because of delays in acquiring the required co-financing, the obligatory procedure to evaluate the deal-flow and the possible investment's feasibility, as well as the long time required to recruit staff. The coordination of regulations on EU funds and legal requirements of the different venture capital schemes, like the settlement of regulatory contradictions in the case of venture capital funds financed by the ERDF, take a long time resulting in a long investment process. There is a risk that the investment ratio will not achieve the previously planned level because during the program period not all the available equity can be invested (Tillvaxtverket, 2011). In Latvia, for example, more than half of the JEREMIE-program's time frame was spent with establishing of the legal and institutional framework, the selection of intermediaries, the setting-up of the funds and advertising the call for proposals (*Michie–Wishlade, 2012*).

Investment restrictions

It is a fundamental problem when the concept that the “market dictates” is ignored. It is contrary to the nature of venture capital to predefine what areas it should finance; more precisely such practice itself reduces the potentially acquirable success rate (EVCA, 2010). One cannot predict what the fields and industries with adequate number of fast-growing companies will be, or where breakthrough inventions will be made that could be supported by venture capital. Therefore it is unfortunate to limit the project selection only to a certain group of companies in case of public programs (EC, 2012).

Government programs often sought to promote the financing of industries and geographical regions where there was no capital interest. Such efforts resulted in a waste of resources. A similar fundamental problem is when the program allow support of only certain elements in the entrepreneurial process. For example, if the participating venture capital funds can finance companies only at a certain phase or a defined size or age. Programs can also prescribe what kind of securities can be purchased by the investors; moreover, government schemes can influence the later fortune of financed companies by limiting company acquisitions or

secondary buy-outs. These restrictions may be understandable from a governmental policy point of view, but they go against the entrepreneurial process. It creates an obvious contradiction that the objectives of the public and the private sector might not necessarily overlap. There is a potential conflict of interests between the social and economic development objectives of the state and that of the profit-driven private sector. This can manifest primarily in early-stage or risky innovative projects where the state seeks to support the start-up and innovative companies, while private fund managers interpret it as the undermining of the accessible profit potential of the program. While the development of small and medium-size enterprises and the promotion of innovation is the state's main objective, for the profit-oriented private investors it is only a by-product (*Meyer, 2007; Michie–Wishlade, 2012*).

The program's geographical extension

One of the typical mistakes of government programs is that they prescribe that only domestic enterprises are eligible for the funds (*Lerner, 2009*). On one hand, only those early stage financing venture capital funds can become successful that are considered to be worthy by international investors as well, which contradicts the geographical limitation of the investment. On the other hand equity from governmental sources can flood the market, but if it is not capable of absorbing it, that can be detrimental to market processes (*Lerner, 2009*). In the end, the territorial limitation related to government schemes goes contrary to the principle that public funds must entrust the selection of attractive offers to the markets. Therefore even a regional focus should be avoided, if possible, because this way programs cannot operate efficiently. The regional restriction can have an adverse effect on performance if there are not enough numbers of good investment opportunities or there is no adequate infrastructure in place. A different tool should be used for this development objective (*EC, 2012*).

During realization of public equity programs the international nature of the entrepreneurial process is often ignored. In the venture capital industry the promise of capital for fund investors and the expenses of investments and enterprises increasingly reach over country borders and to different continents. Therefore failure is sure to ensue if the local entrepreneurial sector and venture capital industry is built without global connections. In addition, companies that grew strong with public venture capital can often become the target of foreign private equity investors even before they are fully fledged. In such cases the full potential of the government-supported investee occurs beyond the country borders and thus it doesn't contribute to growth, job creation and innovation in the given country. It is very

difficult and senseless to resist such trends and this requires a new kind of assessment on the promotion side (*Carpentier and Suret, 2014*).

The size of venture capital funds

State intervention must serve the efficiency and long-term stability of the venture capital sector. For this, the government must cooperate with the business world in its programs. At the same time it must also pay attention to not to crowd private investors out of the market, but it should not generate a proliferation of small funds that are not capable of adequately exploiting economies of scale either. While too small programs can have little effect, programs that are too large risk flooding the local market, therefore neither too small nor too large funds are a good solution.

The equity of smaller funds is not sufficient to adequately diversify the funds' investments and if they lack adequate resources they cannot employ experienced fund managers either. The material compiled by the European Commission in September 2009 (EC, 2009) mentions a “vicious circle” consisting of small funds, low yields and low investor interest in the funds that can be altered only by venture capital funds of a European scale.

The operation of regional funds structure in the United Kingdom shows a lack of fund management companies experienced in early-stage investments, and that regional funds proved to be too small to be financially viable, that is to manage the greater risk resulting from their limited diversification. They couldn't finance the follow-on financing rounds at the same companies, and they were unable to compensate the high ratio of fixed costs either (*Mason and Harrison, 2003*). The inadequate fund size and the limitation of investments according to size as well as the limitations of geographical location have proved to be equally detrimental to the profitability of investments (NESTA, 2009). According to the British data, £50 million was the minimum size that still enabled an efficient operation, while an even bigger size was justified for early stage or life sciences specified funds. It turned out that an adequate number – at least 20 – investments are required for diversification at the different funds.

A bigger sized fund – through its better diversification – can reduce risks, i.e. if investments are better spread among the different life-cycles and geographical locations. Therefore the *fund of funds* construction promises to be a better choice for the government, even if the intermediary fund management fee makes this solution more expensive; public participation itself makes the operation of funds more costly due to the required reports, compliance with the regulations and the coordination tasks.

A bigger fund size entails a higher attraction for institutional investors since the investment threshold of certain institutions allows them to invest only in bigger funds (EVCA, 2010). If institutional investors can invest in government-sponsored venture capital funds then potential risks for both parties might diminish. As a prerequisite for this regulation institutional investors must make the selection of venture capital as an asset class a viable option.

The selection and incentives of private fund managers

Precedent indicates that the formation and realization of the financing scheme plays an important role in how much the given program can meet the objectives of the state. For a successful operation of the programs the most seasoned and experienced fund managers must be recruited. If there are not enough experts in the domestic market with the right experience, foreign fund managers must be included in the programs. These experts should be able to help the portfolio companies so they would become international, get listed on the stock exchange and they should be such investors who could offer an advantageous syndication with the local fund management companies (EC, 2012).

The *structures* generally used to stimulate financing differ according to the following criteria: how they divide profit, how they stage investments and how they compensate losses for private and public investors of hybrid funds. The limitation of profit that public investors can get increases the profit private investors can gain from the business. The drawing of government funds prior to the private equity can also be beneficial to the private sector co-financing partners because it reduces the investment period for them. The guarantee to cover a part of losses that private sector investors encounter will also protect these actors from the economic consequences of an unsuccessful project (Murray, 2007). The examination of hybrid funds through a simulation method (Jaaskelainen et al., 2007) made it possible to identify the criteria in terms of profit division and compensation systems that still enable a profitable operation even for early-stage hybrid venture capital funds. According to the calculations of Jaaskelainen et al. [2007] the asymmetric timing of contributions and disbursements was the only incentive that could truly attract private investors to the early-stage market segment, in a field where the expected yield of specialized funds were significantly lower than those of private funds in general. An important conclusion of the analysis was that no hybrid solution proved to be sufficient in the event of moderate or severe market failure; i.e. other measures are required to fill this equity gap. Governments in such cases will not be able to increase the equity supply for early-stage financing in the long-run based exclusively on hybrid programs (Jaaskelainen et al., 2007).

Political pressure

Offering government investment and support always entails the threat of abuse (*Florida and Smith, 1993; Leleux et al., 1998*). Resulting from personal and political connections, and intentional misuse the subsidiaries often end up not at the enterprise circle that the subsidy was meant to support, therefore central funds in the end do not serve the public. This is particularly true for subsidies where there are no clearly set requirements or where public investors are rarely checked or not checked at all.

Regulatory capture is not unprecedented in government funding schemes, when private and public sector participants try to acquire the direct and indirect subsidies offered by the state. For example, when the beneficiaries of the programmes meant to promote start-ups end up being program managers or friends with the legislators (*Lerner, 2014*). So that political pressure could be excluded from the selection process of funds and portfolio companies that participate in governmental equity programs, a transparent decision-making process is required that is similar to the one customarily used in the private sector. Experience tells that the smaller the amount to be awarded, the bigger number of bodies decide about its allocation and the smaller the role of subjective evaluation in the scoring system the smaller chance there is to exert political pressure (EC, 2012).

In summary, experts conducting the evaluation consider the elimination of the narrow timeframes and the contradictions caused by the different timings according to the origin of the funds, a clear establishment of rules already at the launch of the programs, the extension of the group of final beneficiaries and the strengthening of clear vision in regards to applicable legislation to be the most vital aspects determining the success of an operation. Although it may pose a great temptation to policy experts, administration should seek to avoid micro-managing the entrepreneurial process, that is they must avoid over-regulating the financial construction.

The outcome of public venture capital programs

According to analyses direct government venture capital programs had a *worse performance* than the ones operating on business principles (*Armour and Cumming, 2006, Da Rin et al., 2006, del-Palacio et al., 2012, Leleux and Surlmont, 2003, Lerner et al., 2011, Murray, 1998, NAO, 2009*). These evaluations essentially indicated that public funds are generally smaller, are invested in fewer companies and have a smaller average size of investment. Their investments realized a yield less frequently, therefore were less likely to exit profitably, and their yields – the internal rate of return – was all in all lower than that of average private funds in the United Kingdom and the United States. To sum up the results, researchers measured a *positive*, yet statistically weak effect for public venture capital investors and in general their

effect was less compared with the results of other independent (private) fund managers (*Balboa et al., 2007, Manigart and Bauselick, 2001*).

According to *Grilli and Martinu [2013b]* the reason for the ineffectiveness of government schemes in stimulating revenues in high tech companies was not due to the bad availability of financing resources, but more to the lack of *expertise* that would provide added value. In *Ryan's [1990]* evaluation the Australian *Management and Investment Companies (MIC)* program proved to be unsuccessful because only *less efficient private investors* could be included in the program, whose exit strategies were also limited. In case of some state-incentivised investments there was political pressure as well, while structural problems could have also contributed to the less efficient decision-making and the relatively lower added value the program achieved (*Murray et al., 2012*).

The differences between success stories in different countries could be explained with the different structures of the programs. One such feature is whether the public and private venture capital funds *competed on the same market with each other* that, resulting from less strict public investor expectations, led to the crowding-out of private funds from the market. It is worth taking a look at the analysis of *Becker and Hellmann [2003]*, who examined the failure of *Deutsche Wagnisfinanzierungsgesellschaft (WFG)*, the German Venture Financing Corporation. They pointed out that a main element of the failure was that in order to boost bank investments the state undertook a 75 percent guarantee for losses that generated conflicting interests between the government and the banks from the very beginning. Another reason for the failure was that shareholders of the investor company did not seek to maximize the shareholder value, and contracts provided little guarantee for investors while the management structure also impeded value creation for venture capitalists and audits at the portfolio companies.

Even where the government programmes focused on companies working on highly promising technological innovations, the results measured by the researchers were still perplexing. Such was the case of the *Australian Pre-Seed Fund* established in 2002. In analyzing this fund *Cumming [2007]* pointed out that their investments did not target innovative or high-tech companies more intensively than other funds of the same size. It occurred despite the fact that the above target was specifically prescribed by the regulations that govern fund managers. The situation was similar at the regional government funds; their activity – according to *Murray [1998]* – *promoted innovation to a lesser extent* than those private funds that sought out new technology based companies for their investments. Such innovative companies were more often found among the investment of private funds than among companies financed by

public regional funds, even though they believed to be doing the very opposite. *Jaaskelainen et al.* [2007] claim that presumably the management and operational problems of the funds resulted in the outcome that a fund specifically targeted at high tech companies did not provide more support to such firms than other funds not specialized in this field.

The failure of regional funds introduced in the United Kingdom was made more severe by the fact that the selected scheme ignored the problems of the *demand side* from the very beginning (*Murray et al.*, 2012). Thus regional fund investors specialized on early-stage companies encountered a number of obstacles in terms of investment opportunities (*Mason and Harrison*, 2003). *Nightingale et al.* [2009] came to a similar conclusion when they established that it is overly simplistic and misleading to consider the financing challenges of small and medium-size UK companies merely a *supply* problem that can be tackled simply by providing more funds. According to their paper the problem in the United Kingdom presented itself both on the demand and the supply side. The demand side was characterized by a lack of companies with a high growth potential, worthy of investment. On the supply side – besides the high costs – the difficulty to find each other and sign agreements posed a challenge both for investors and enterprises alike.

The previously mentioned *crowding-out* effect (*Cumming and MacIntosh*, 2006, *Leleux and Surlumont*, 2003) also works against the efficiency of public venture capital programs. Government investments can not only complement, but as an unwished consequence they could also *substitute* private investments. The reason for this is that if public investors compete for the same deal with private investors, the former can push up the prices and reduce the yields. Public investors can offer more for a deal than private venture capital investors since there are no institutional investors behind them in their funds who would require an explanation for the low yields generated. Private investors could be discouraged by governmental presence even in this way. If private investors avoid risk and overestimate the expected presence of government investors in the market, they might reduce their own presence to a greater extent than public investors actually contribute to it, which can result in them being crowded-out (*Li and Wu*, 2008).

Such a crowding-out effect was observed by *Cumming and MacIntosh* [2006] regarding Canada. The authors found that the Canadian *Labor Sponsored Venture Capital Corporation (LSVCC)* program had a significant exclusion effect, and the primary reason for it was the extremely large tax break that LSVCCs received. Following the launch of the program the LSVCC sector experienced a massive expansion, contrary to a small reduction that occurred in terms of private venture capital. There was an additional structural problem, and it caused a

significantly weaker performance by state investors, that, since public fund managers had a lot of equity at their disposal, individual fund manager handled a lot more deals than their counterparts at private venture capital funds. The consequence was less efficient decision-making, worse selection and more limited due diligence, a weaker corporate governance and low added value consultancy (*Cumming and Johan, 2013a*). Similar data was found for crowding-out and for not crowding-in private capital in the sample that included Western Europe, Canada and the USA by *Armour and Cumming [2006]*. *Da Rin et al. [2006]* proved the exclusion effect with similar data from Europe. In Central and Eastern Europe the crowding-out effect of public venture capital investments prior to joining the EU was presented by *Karsai [2013]*.

Interestingly, even in regards to community equity schemes financed by EU funds the possibility of eventual *exclusion* was raised, even though funds financed by the European Union were always operating on market principles. A number of national authorities that participate in the community equity programs of the EU were surprised to find that the EIB and EIF applied strict profit-oriented approach in their investments, since they believed that such institutions will act as supportive partner institutions of the community, and not as bankers. This is why they thought it was possible that these very organizations would exclude the “real” private investors from the market (*Michie–Wishlade, 2012*). It seemed to have been confirmed when a number of private investors simply avoided investing in funds that received EIF capital. According to representatives of the national authorities if all private investors accepted the criteria only the EIF did not then fund managers would have to choose between EIF and their own private investors. Representatives of the EIB and EIF – who invested community resources into the funds – argued that in terms of state aid they count as private investors. They believed that the relatively high contribution and the higher yield expected by the private fund managers was the most important tool in harmonizing the interests of fund managers and investors (*King, 2013*).

Empirical results in some studies report *not exclusion*, but to the contrary, the increase of resources available in the private sector, i.e. the inclusion of private sector equity into the venture capital market. For example according to data by *Cumming [2007]* the *Australian Innovation Investment Fund (IIF)* program gave a significant boost to the Australian venture capital market in the 90s. The Australian IIF program’s success was largely due to its structure. The government could act as an institutional investor to private investors and it resulted in an increase of early stage venture capital investments. There was no direct competition between public and private investors; they enjoyed a cooperation similar to

partnership between them. The Australian IIF program contributed to the increase of venture capital investments while they achieved a smaller portfolio per fund management company, a more intensive investment phasing and syndicated, that is jointly executed, investments (*Cumming and Johan, 2013a*). Companies with an IIF background proved to be more intensive in R&D, they reported patents relatively more frequently, and made a more successful appearance on the stock exchange (IPO), in other terms they achieved a higher market capitalization (*Cumming and Johan, 2013a, 2013b*). Data revealed that government programs in the USA and Israel were also successful in boosting the venture capital market (*Lerner, 2009*). Following the initial governmental support the venture capital industry could succeed in Israel without any support, a result of among others the strong ties that formed between Israeli entrepreneurs and foreign investors (*Avnimelech and Teubal, 2008; Jeng and Wells, 2008*).

Mid-term evaluation of the Swedish regional venture capital program was also positive (*Tillvaxtverket, 2011*). Companies that received equity in general were satisfied with their relationship to venture capital funds and private co-investors as well. The equity enabled them to grow faster, it provided them access to more external financing, it resulted in an increased production capacity and more professional company work, greater expertise and higher profitability. Experts who evaluated the Swedish scheme say that it was difficult to answer whether the programme increased capital supply for companies and the equity market or not, but they believed that there were signs for the reduction of the equity gap and attraction of private capital, which in the end confirm the additional effect of the measure. According to the survey without the governmental co-financing of venture capital funds approximately half of the private co-investors would not have invested, while others would have undertaken less investments, that is the volume of private equity increased and no crowding-out effect towards private funds could be experienced (*Tillvaxtverket, 2011*).

According to an international survey conducted by *Brander et al. [2014]* the *contributitional* benefits of public venture capital are confirmed negating its crowding-out effect. Based on data collected in the examined countries the higher number of public venture capital investments resulted in a higher capital per company and more companies could access venture capital. According to the survey companies that received both public and private venture capital accessed more equity than companies financed only by private venture capital investors, and significantly more if they had access only to government venture capital. Resulting from the additional effect the authors found a positive correlation between

companies that accessed both public and private venture capital and the successful exit rates from the investments.

The *debate is far from being closed* regarding the utility of government venture capital programs. In recent years – in the wake of the successful Australian and some Asian state programs – a lot of countries have re-evaluated their stance on the exclusion effect. It was also proved that the evaluation of this effect greatly depended on the indicators that researchers used for their calculations (*Cumming, 2011, 2013*).

In assessing the results of successful government participation, additional, very important data came from research that compared the performance of companies that received venture capital either from the public or from the private sector. The analysis carried out by *Nightingale et al. [2009]* did not indicate a better performance for UK companies that accessed venture capital in the hybrid form than the ones that did not receive public venture capital.

Beside the effect of the volume of public contribution on the efficiency of hybrid funds' operations researchers also wanted to know whether the weight of government participation influences the success rate of the financed companies. Research conducted by *Brander et al. [2010]* is one of these studies where the authors examined the effects of government venture capital in other areas besides growth, such as the conclusion of the investor's initial public offering (IPO), the sale of the investee to a third party and the patent applications. A positive effect was found only in those cases where the government contribution to the entire private and public investment was relatively low. This is why *Brander et al. [2010]* claim that those companies that received venture capital both from private and public investors realized a better performance in the exits, and especially in terms of IPO and trade sale, than their counterparts who received venture capital only from private investors. This positive effect was present only when a moderate share of the equity came from public venture capital funds. Where government venture capital investment shares were higher than 50 percent, the performance of investees proved to be relatively worse. In cases of moderate government intervention only those fund management companies performed better where the fund manager was not owned by the government.

From studies that compare public and private investments, it transpires that investees financed by public funds – yet fewer than 50 percent – reached the best performance. These companies had better results than their peers financed only by private sector funds. Meaning that from the three possible variations of venture capital funds only the partially government-financed version produced the best results, contrary to the fully public or exclusively private funds.

Therefore *Brander et al.* [2010] concluded that government venture capital investors can provide assistance with certain funds, financial contribution included, while they are less useful if they exercise full control over business decisions. If they do not exercise full control the concerns of altering the business perspective, which arise due to the state's alternative objectives, will be less prevalent. According to research, governmental promotion can be most efficient if it remains under the management of private venture capital investors. There is a big difference therefore between state-owned and state-sponsored venture capital management companies.

Brander et al. [2012] later made a global analysis on the effect of public venture capital investors and they confirmed the previously presented findings. During the project commissioned by the World Economic Forum they examined 28 800 enterprises in 126 countries that received venture capital financing between 2000 and 2008 (World Economic Forum, 2010). The analysis examined the effect of public involvement in venture capital in terms of value creation, innovation and employment. It examined direct capital investment in case of state-owned venture capital funds, at privately managed hybrid funds that were financed both by private and public investors; and it also analyzed subsidies and tax breaks provided to venture capital investors. The study concluded that the best performance was achieved when public venture capital was at a moderate level. The existing yet moderate public venture capital activity contributes to value creation and innovation; contrary to venture capital that is 100 percent private or public. The research found that value creation was best supported by public venture capital through *legitimization*. The performance of the investees grows when the public venture capital investment is managed by private management companies. Other analyses came to similar conclusions.

For example, *Grilli and Murtinu* [2013a] sought to give an estimate –using a longitudinal European database – on the effect governmental venture capital investors have on European high tech companies' growth compared with independent (private) venture capital investors. Researchers on one hand examined whether the two investor types have a positive impact of the companies separately, and on the other hand – having regard to the already existing syndication and co-investment activity between the two investor groups – they also analyzed whether the investment order of the two types of investor groups is relevant or not. In the end, they also examined whether government capital investment following financing from independent (private) venture capital investors generates any significant difference, that is whether the simultaneous presence of the two investors is advantageous or not during first round of investments to the portfolio companies. Researchers found that in the seven

European markets they examined new technology based and public venture capital supported companies would have followed a similar growth pattern even without the initial government involvement. Therefore, they think that public venture capital investors *do not have a significant* impact on the revenues of new technology based companies, while private venture capital investors had a positive and remarkable effect on the turnover growth of these companies, independent from which stage the new, technology-based firm received the first such investment. This handling effect was greater for very young companies in case of independent (private) investors, while in case of public investors this effect was not recorded. The only exception, i.e. the public venture capital investor *played a positive role only when* the public and the private venture capitalists jointly financed the investees and they aimed at relatively young, technology based companies (Grilli and Murtinu, 2013b).

According to the authors' analysis, independent (private) venture capitalists had a positive and statistically more significant impact on the turnover growth of high tech companies, while they measured no such effect among public venture capital investors. It means that between 2003 and 2010 government venture capital investments had no measurable or significant impact on the growth of European start-up high-tech companies neither in terms of revenues nor in employment figures. The financing had a revenue-boosting effect when the public and private players syndicated, that is, co-invested in the companies so that the state investor was subordinate to the private investor. Therefore the participation of government venture capital investors in the venture capital financing had a positive impact on company growth only if the public investors did not have a leading role in the syndicate. In all other cases, even when the investors were exclusively government funds or their investment preceded or followed the investment of independent (private) funds, their participation in European high-tech companies had no impact whatsoever neither on the revenues, nor on employment figures (Grilli and Murtinu, 2013b). Research conducted by Grilli and Murtinu shed a *negative* light on the government's ability to promote high-tech companies on the venture capital market through *direct* fund management. This research also confirms the previously quoted results of Brander et al. [2012] who found that the performance of companies financed by a syndicate grows if the public venture capital investors have a minority role compared with when they have a majority role.

Based on their analysis of public venture capital fund managers researchers found that even if the European venture capital market needs governmental support, state intervention must primarily create an *advantageous environment* for venture capital initiatives and not utilize a hands-on approach when it directly invests state funds. Measures acting on the supply alone

will not be enough to ensure the viable operation of the venture capital industry (Meyer, 2007; Murray et al., 2012). Therefore the European Union is right to promote a higher number of fast growing high tech companies by strengthening the underdeveloped venture capital industry. On the other hand the hands-on policy, whereby the governmental bodies apply a “we can do it on our own” investment strategy, is remarkably ineffective. Instead, cooperation between governmental and independent (private) venture capital investors and their joint targeting of new technology based companies could be the way forward (Grilli and Murtinu, 2013a).

Summary

State subsidies to the venture capital market can be justified based on three criteria. Firstly, the participation must have a real positive effect on the companies and the economy. Secondly, there must be a market failure present in the given segment. Thirdly, this market insufficiency must be reduced or eliminated by the relevant public measures. The objective of financial engineering instruments applied in the venture capital market is to enable their profit-oriented utilization in order to boost the private sector and to more efficiently reach economic policy objectives.

Since the venture capital market is moved by the private sector, all government intervention naturally entails the *risk of market distortions*. Therefore the state must seek to distort the market to the least extent, and this effect should last as short as possible, it shouldn't be bureaucratic and finally, it should happen with full publicity and accompanied by independent assessment.

In recent decades the government participation on the venture capital market as an investor has undergone a significant change. In the beginning the state had a direct role that also entailed the risk of distorting the market processes, but nowadays the government tends to participate in the venture capital market in more indirect ways. These are mechanisms where the government entrusts private sector fund managers and prompts them to reach objectives important for the state in their venture capital investments. An indirect scheme could be organised among others where there is a venture capital fund created jointly from state and private resources, and the private funds selected based on prior agreement that the state fund joins as a partner, or a holding construction as a “fund of funds” that offers public equity to private fund management companies via call for proposals.

From browsing the program evaluations it transpires that the analysis of these schemes is fairly underdeveloped or only formal. In most cases the evaluation criteria weren't even set at the program launch, and in lack of the right indicators only qualitative evaluations were

carried out, and the differences in the programs hardly made it possible to make comparisons between the countries. Despite the lacking formal evaluations the assessments make it clear what main criteria define the success of government venture capital programs. These are the following: the duration that allows the programs to be completed, the size of the venture capital funds created as part of the governmental programs, the minimizing of limitations applicable to investment deals, the offering of incentives to private fund investors working together with the state in the form of profit share, the selection of private investors based on objective criteria, and publicity of the venture capital investment programs.

International experience confirms that the government's participation as an investor is not a paradox – a square out of a circle –, but an adequately formed mechanism that can contribute to the easing of imperfections on the venture capital market. The appearance and active participation of the government on the venture capital market cannot be limited only to ease the lack of capital supply. In order to phase this approach out, the state must make the financing of the socially important enterprises attractive to private sector investors, that is, it must mitigate the uneven supply of private investors' funds in the venture capital industry. The state's participation in the venture capital market can be only a temporary solution, since providing venture capital is a business activity at its core. If public intervention does not result in making the private sector more active, the government is confined to a role that it can fulfil only with continuously growing budgetary burdens. The state would like to hand the financing role over to the private sector in the long run, but it requires that all its roles would be absolutely compatible with standards applicable in the private sector and it must come on stage as a reliable investment partner. In this sense there should be a difference between the yield expectations of the state as an investor from the way the given investment organization selects the enterprises to be financed and define the yield expected of them. If the state's participation as an investor is successful, in its wake private sector investors become willing to finance the enterprises considered to be important by the state, therefore the development of economic function and the venture capital industry can occur simultaneously, and in due course private investors can take over the government's direct participation in the market. If this is how the state interprets its role on the venture capital market, the public contribution to the venture capital shall not be mixed with state aid provided to companies under the disguise of venture capital. The objective of the state is not to support individual companies out of competition, but should be to strengthen the competitiveness of the economy, and promote innovation with market tools.

Bibliography

- Armour, J. – Cumming, D. J.* [2006]: The Legislative Road to Silicon Valley. Oxford Economic Papers, Vol. 58., No. 4., pp. 596–635.
- Avnimelech, G. – Teubal, M.* [2008]: From direct support of business sector R&D/Innovation to targeting venture capital/private equity: A catching-up innovation and technology policy life cycle perspective. *Economics of Innovation and New Technology*, Vol. 17., No. 1–2., pp. 153–172.
- Avnimelech, G.– Teubal, M.* [2006]: Creating venture capital industries that co-evolve with high-tech: insights from an extended industry life cycle perspective of the Israeli experience. *Research Policy*, Vol. 35., No. 10, pp. 1466–1498.
- Balboa, M.– Marti, J. – Zieling, N.* [2007]: Is the Spanish public sector effective in backing venture capital? In: *Gregoriou, G. N. – Koolo, M. – Kraussl, R.* (eds.): *Venture Capital in Europe*. Butterworth-Heinemann, pp. 115–128.
- Becker, R. M. – Hellmann, T. F.* [2003]: The Genesis of Venture Capital – Lessons from the German Experience. CESifo Working Paper, No. 883.
- Brander, J. – Hellmann, T. – Du, Q.* [2010]: The Effects of Government-Sponsored Venture Capital: International Evidence. Working Paper 16521., National Bureau of Economic Research. Downloaded from: <http://www.nber.org/papers/w16521>
- Brander, J. A. – Du, Q. – Hellmann, T. F.* [2012]: The Effects of Government-Sponsored Venture Capital: International Evidence. Working Paper. Downloaded from: <http://strategy.sauder.ubc.cs/hellmann/pdfs/BranderDuHellmannApril2012.pdf>
- Brander, J. A. – Du, Q. – Hellmann, T. F.* [2014]: The Effects of Government-Sponsored Venture Capital: International Evidence. *Review of Finance*, 2014, pp. 1–48. Review of Finance Advance Access published March 17, 2014.
- Carpentier, C. – Suret, J. M.* [2014]: Post-Investment Migration of Canadian Venture Capital-Backed New Technology-Based Firms. Cirano, Montreal, April, Social Science Research Network. Downloaded from: <http://ssrn.com/abstract=2444976>.
- Cumming, D. J.* [2007]: Government policy towards entrepreneurial finance: Innovation Investments Funds, *Journal of Business Venturing*, Vol. 22., No. 2., pp. 193–235.
- Cumming, D. J.* [2011]: Public policy and the creation of active venture capital markets. Venture Capital. *An International Journal of Entrepreneurial Finance*, Vol. 13., No. 1., pp. 75–94.
- Cumming, D. J.* [2013]: Public Economic Gone Wild: Lessons from Venture Capital. *International Review of Financial Analysis*, 29 October, forthcoming. Available online DOI: 10.1016/j.irfa.2013.10005

Cumming, D. J. – Johan, S. A. [2013a]: *Venture Capital and Private Equity Contracting*. 2nd Edition, Elsevier Science Academic Press

Cumming, D. J. – Johan, S. [2013b]: *Venture's Economic Impact in Australia*. *Journal of Technology Transfer*, forthcoming

Cumming, D. J. – MacIntosh, J. G. [2006]: *Crowding out private equity: Canadian evidence*. *Journal of Business Venturing*, Vol. 21., No. 5., pp. 569–609.

Da Rin, M. – Hellmann, T. F – Puri, M. [2011]: *A Survey of Venture Capital Research*. NBER Working Paper, No. 17523. Downloaded from: <http://www.nber.org/papers/w17523>

Da Rin, M. – Nicodano, G. – Sembenelli, A. [2006]: *Public policy and the creation of active venture capital markets*. *Journal of Public Economics*, 90., pp. 1699–1723.

del-Palacio, I. – Zhang, X. T. – Sole, F. [2012]: *The capital gap for small technology companies: public venture capital to rescue?* *Small Business Economics*, April, Vol. 38., No. 3., pp. 283–301.

EC [2009]: *Financing innovation and SMEs*. Commission Staff Working Document, Brussels

EC [2011]: *State aid Scoreboard. Report on State aid contribution to Europe 2020 Strategy*. Brussels, 22.6.2011, COM(2011) 356 final

EC [2012]: *Potential of Venture Capital in the European Union*. Directorate General for International Policies. Policy Department A, Economic and Scientific Policy Industry, Research and Energy, p. 90.

Economist [2014]: *Innovation by fiat. European venture capital*. *The Economist*, May 17., pp. 62–63.

EIB [2013]: *About EIF & its Venture Capital activity*. EIB, 02.

EIF [2014]: *Annual Report 2013*. European Investment Fund

EP DG [2012]: *Potential of Venture Capital in the European Union*. European Parliament. Directorate-General for International Policies, p. 73.

European Commission [2013]: *Summary of data on the progress made in financing and implementing financial engineering instruments co-financed by Structural Funds*. September

European Investment Group [2012]: *Supporting small and medium-sized enterprises in 2012*. A joint report of the European Commission and the European Investment Bank Group. 2013. May 2., p. 5.

EVCA [2010]: *Closing gaps and moving up a gear: The next stage of venture capital's evolution in Europe*. European Private Equity & Venture Capital Association, EVCA Venture Capital White Paper, p. 20, Brussels. March 2. Downloaded from: <http://iri.jrc.ec.europa.eu/concord-2010/presentations/fricke.pdf>

EVCA CEE [2014]: Central and Eastern Europe Statistics 2013. An EVCA Special Paper. Ed. by the EVCA Central and Eastern Europe Task Force, August. European Private Equity and Venture Capital Association, Zaventem, Belgium.

EVCA Yearbook [2014]: EVCA Yearbook 2014. EVCA, Zaventem, Belgium.

Florida, R. – Smith, D. F. [1993]: Keep the Government out of Venture Capital. *Issues in Science and Technology*, No. 9., pp. 61–69.

French non paper [2013]: The case for a European Venture capital fund for innovative companies. EU position paper, 01324EN, p. 3.

Gilson, R. J. [2003]: Engineering a Venture Capital Market: Lessons from the American Experience. Paper presented at the Global Markets, Domestic Institutions: Corporate Law and Governance in a New Era of Cross Border Deals. *Stanford Law Review*, Vol. 55., No. 4., April, pp. 1067–1103.

Grilli, L. – Martinu, S. [2013b]: New Technology-based Firms in Europe: Market Penetration, Public Venture Capital and Timing of Investment. Downloaded from: <http://ssrn.com/abstract=1892024>

Grilli, L. – Murtinu, S. [2013a]: Government, venture capital and the growth of European high-tech entrepreneurial firms. SSRN Working Paper Series. Downloaded from: <http://ssrn.com/abstract=2066867>

Grilli, L. – Murtinu, S. [2014]: Government, venture capital and the growth of European high-tech entrepreneurial firms. *Research Policy*, Vol. 43., No. 9., November, pp. 1523–1543
Downloaded from: <http://dxdoi.org/10.1016/j.respol.2014.04.002>.

HM Treasury [2011]: The Magenta Book: Guidance for evaluation. HM Treasury, London, Government Social Research Unit.

Jaaskelainen, M. – Maula, M. – Murray, G. [2007]: Profit Distribution and Compensation Structures in Publicly and Privately Funded Hybrid Venture Capital Funds. *Research Policy*

Jeng, L. A. – Wells, P. C. [2000]: The determinants of venture capital funding: evidence across countries. *Journal of Corporate Finance*, Vol. 6., No. 3., pp. 241–289.

Karsai, J. [2003]: What has the state got to do with the venture capital market? Public financing of Venture Capital in Hungary. *Acta Oeconomica*, Vol. 53, No. 3., pp. 271–291.

Karsai, J. [2010]: Private Equity in CEE. The Development of Venture Capital and Private Equity Industry in Central and Eastern Europe. VDM Verlag dr. Muller, Saarbrücken, 2010

Karsai, J. [2013]: Venture Capital and Private Equity Industry in Hungary. *Acta Oeconomica*, Vol. 63, No. 1., pp. 23–42.

King, A. [2013]: EIF terms come under fire, Unquote, November 11.

KPMG [2011]: EU Funds in Central and Eastern Europe. Progress Report 2007–2010. kpmg.hu, p. 13.

Kramer-Eis, H. – Lang, F. [2011]: European Small Business Finance Outlook 2/2011. Working Paper, 2011/12, EIF Research and Market Analysis. European Investment Fund.

Kraemer-Eis, H. – Lang, F. – Gvetadze, S. [2014]: European Small Business Finance Outlook. Working Paper, 2014/24, EIF Research & Market Analysis, European Investment Fund, June.

Leleux, B. – Surlemont, B. [2003]: Public versus private venture capital: seeding or crowding out? A pan-European analysis. *Journal of Business Venturing*, Vol. 18., No. 1., January, pp. 81–104.

Leleux B. – Surlemont, B. – Wacquier, H. [1998]: State versus Private venture capital: cross Spawning or Crowding out? A Pan-European Analysis. Paper presented at the Babson College Kauffman Entrepreneurship Research Centre.

Lerner, J. [1999]: The Government as Venture Capitalist: The Long-run Effects of the SBIR Program. *Journal of Business*, Vol. 72., No. 3., pp. 285–318.

Lerner, J. [2002]: When Bureaucrats Meet Entrepreneurs: The Design of Effective 'Public Venture Capital' Programmes. *Economic Journal*, Vol. 112., No. 477., February, F73-F84.

Lerner, J. [2009]: Boulevard of Broken Dreams: Why Public Efforts to Boost Entrepreneurship and Venture Capital Have Failed and What to Do About it. Princeton, Princeton University Press.

Lerner, J. [2014]: Entrepreneurship, Public Policy, and Cities. Policy Research Working Paper, No. 6880. The World Bank, Sustainable Development Network, Urban and Disaster Risk Management Department, May.

Lerner, J. – Sørensen, M. – Strömberg, P. [2011]: Private Equity and Long-Run Investment: The Case of Innovation. *The Journal of Finance*, Vol. 66., No. 2., pp. 445–477.

Li, X. – Wu, Z. [2008]: Reputation entrenchment or risk minimization? Early Stop and investor-manager agency conflict in fund management. *Journal of Risk Finance*, Vol. 9., No. 2., pp. 125–150.

Manigart, S. – Bauselick, Ch. [2001]: Supply of Venture Capital By European Governments. Working Paper, No. 111., Ghent University.

Martin, R. – Berndt, C. – Klagge, B. – Sunley, P. – Herten, S. – Sternberg, R. [2003]: Regional venture capital policy: UK and Germany compared. Report for the Anglo German Foundation for the Study of Industrial Society.

- Mason, C. M. – Harrison, R. T.* [2003]: Closing the Regional Equity Gap? A Critique of Department of Trade and Industry's Regional Venture Capital Funds Initiative. *Regional Studies*, Vol. 37., No. 8., pp. 855–868.
- Meyer, T.* [2007]: The Public Sector's Role in the Promotion of Venture Capital Markets. SSRN, 1019988.
- Michie, R. – Wishlade, F.* [2012]: Between Scylla and Charybdis: Navigating Financial Engineering Instruments Through Structural Funds and State Aid Requirements. European Policies Research Centre, *IQ-Net Thematic Paper*, Vol. 29., No. 2., pp. 101.
- Murray, G. C.* [1998]: A Policy Response to Regional Disparities in Supply of Risk Capital to New Technology-based Firms in the European Union: The European Seed Capital Fund Scheme. *Regional Studies*, Vol. 32., No. 5., pp. 405–419.
- Murray, G. C.* [2007]: Venture Capital and Government Policy. In: *Landstrom, H.* (ed.): Handbook of Research on Venture Capital. Cheltenham. Edward Elgar.
- Murray, G. C. – Cowling, M. – Liu, W. – Kalinowska-Beszczyńska, O.* [2012]: Government co-financed 'Hybrid' Venture Capital programmes: generalizing developed economy experience and its relevance to emerging nations. Kauffman International Research and Policy Roundtable, Liverpool, March.
- NAO [2009]: Venture capital support to small businesses. The Department for Business, Innovation and Skills, Report by the Comptroller and Auditor General, HC 23, Session 2009–2010, December 10. Supplementary Appendices One to Three, Appendix Two, pp. 6–13.
- NESTA [2009]: From Funding Gaps to Thin Markets: UK Government Support for Early-Stage Venture Capital. Research Report, September. Downloaded from: <http://www.nesta.org.uk>
- Nicolaidis, P.* [2013]: Financial Engineering Instruments and their Assessment Under EU State Aid Rules. Bruges European Economic Policy Briefings, No. 26, 2013.
- Nightingale, P. – Baden-Fuller, G. – Cowling, M. – Siepel, J. – Hopkins, J. – Tidd, J. – Dannreuther, C.* [2009]: Government Support for Enterprenurial Finance in the UK: From “Market Failures” to “Thin Markets”. University of Exeter, p. 29.
- OECD [2006]: The SME Financing Gap. Theory and Evidence. Vol. 1., OECD, p. 76.
- Pierrakis, Y. – Mason, C.* [2008]: Shifting sands: The changing nature of the early-stage venture capital market in the UK. London, NESTA.
- Private Equity Findings [2010]: Great intervention? Private Equity Findings, Issue 2., Spring, pp. 8–10.

Reid, A. – Nightingale, P. (eds.) (2011): The Role of Different Funding Models in Stimulating the Creation of Innovative New Companies. What is the most appropriate model for Europe? A report to the European Research Area Board. Study funded by the European Commission, Directorate-General Research.

*Ryan, N. [1990]: Policy evaluation and Australian support for innovation. *Technovation*, Vol. 10., No. 4., pp. 265–272.*

Tillväxtverket [2011]: Mid-term evaluation of regional venture capital funds. Implementation and lessons learnt. Tillväxtverket, September. Downloaded from: <http://publikationer.tillvaxtverket.se/ProductView.aspx?ID=1680>.

Tykvová, T. – Borell, M. – Kroencke, T. A. [2012]: Potential of Venture Capital in the European Union. Directorate-General for Internal Policies, Policy Department A: Economic and Scientific Policy, Industry, Research and Energy, European Parliament, February.

Veugelers, R. [2011]: Mind Europe's Early-Stage Equity Gap. Breugel Policy Contribution, Issue 2011/18., December.

VICO [2011]: Venture Capital: Policy lessons from the VICO project. Downloaded from: http://www.vicoproject.org/doc/policy/VICO_FinalPolicyBrief.pdf

Wilson, K. – Silva, F. [2013]: Policies for Seed and Early Finance. Findings from the 2012 OECD Financing Questionnaire. OECD Science, Technology and Industry Policy Papers, No. 9., OECD Publishing. Downloaded from: <http://dx.doi.org/10.1787/5k3xqsf00j33-en>

World Economic Forum [2010]: Globalization of Alternative Investments. Working Papers, Vol. 3. 'The Global Economic Impact of Private Equity'. Report 2010. Governments as venture capitalists: Striking the right balance. World Economic Forum, Geneva. Downloaded from: <http://www.weforum.org/en/media/publications/PrivateEquityReports/index.htm>