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Journal of Open Innovation: Technology, Market, and Complexity

Provided in Cooperation with:

Society of Open Innovation: Technology, Market, and Complexity (SOItmC)

Suggested Citation: Matisone, Anita; Lace, Natalja (2020) : The impact of public interventions on self-sustainable venture capital market development in Latvia from the perspective of VC fund managers, Journal of Open Innovation: Technology, Market, and Complexity, ISSN 2199-8531, MDPI, Basel, Vol. 6, Iss. 3, pp. 1-15, <https://doi.org/10.3390/joitmc6030053>

This Version is available at:

<https://hdl.handle.net/10419/241439>

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Article

The Impact of Public Interventions on Self-Sustainable Venture Capital Market Development in Latvia from the Perspective of VC Fund Managers

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Received: 9 June 2020; Accepted: 13 July 2020; Published: 24 July 2020



Abstract: This paper presents the results of a study on the impact of EU structural funds on the development of a self-sustainable venture capital (VC) market in Latvia from the perspective of VC fund managers. The study had two objectives. The first was to assess the contribution of European Union (EU) structural funds (SF) programmes toward the development of a self-sustainable VC industry in Latvia. The second was to identify ways by which the structural fund support could be better exploited for the development of the VC industry in Latvia. During three SF planning periods, the stated primary goal of the programmes to support high-growth SMEs was attained—to date, 294 VC investments have been made by publicly supported hybrid VC funds. During the 2004–2006 planning period, the first generation of professional VC fund managers in Latvia emerged in response to the opportunity to manage publicly supported hybrid VC funds. During the subsequent programmes, a high continuation rate by the established managers was observed. Nevertheless, Latvian VC fund managers are not yet capable of raising private funds and still encounter difficulties in attracting the necessary level of private capital for the publicly supported hybrid VC funds. The novelty of the study is the finding that improvements in the SF programme designs did not significantly decrease the impact of factors identified as limiting the success of the operations of VC managers. This suggests and confirms conclusions of other studies that argue that public policies aimed at creating healthy and supporting conditions for VC activity are necessary in addition to public financial support for VC funds. Regarding the next planning period, the suggestion regarding programme design is to continue with already started improvements: increasing the volume of funds, widening the geographic area eligible for investments, reducing restrictions on the types of financial instruments that may be used, lowering the administrative burden for VC fund managers and avoiding micromanagement of VC funds by governmental agency. The observation that the influence of investments in VC funds on the governmental agency's responsible for VC investments financial statements may be partly responsible for the tendency to micromanage VC funds could be useful not only in Latvia but also in other countries.

Keywords: Latvia; public interventions; venture capital

1. Introduction

In numerous documents [1,2], the European Union (EU) has acknowledged the need to boost entrepreneurs' access to venture capital (VC) as a way to achieve a higher level of R&D, innovation, productivity and employment. In order to close the significant gap with the US in the amount of available VC, the EU has contributed a significant amount of money to support VC funds since 1998 [3].

Over the period of 2007–2019, governmental agencies provided €16.4 billion to VC funds in the EU [4] (calculations by the authors). In 2019 alone, €2.3 billion or 15.4% of the newly raised committed capital of European VC funds came from governmental agencies.

Public contributions to support VC funds and, as a result, the growth of companies [3], are made not only by each EU member state via so-called shared management interventions, but the EU also provides support for VC funds by centrally managed interventions directly designed and developed by the European Commission (EC).

In the case of shared management interventions, a particular state voluntarily uses part of its available European structural funds (SF) budget and determines which financial instruments (grants, guarantees, loans, venture capital) may be used. Subject to approval from the EC, states even make decisions regarding the volume of the financial instruments. Therefore, the usage of SF for venture capital investments differs substantially among countries [5]. The explanation lies not only with the considerable differences in the maturity and self-sustainability of the VC industries between countries and consequently the level of the necessity for public support. There are undoubtedly also gaps regarding the experience and knowledge of local authorities about the benefits of VC and its development requirements, which are also important factors when deciding whether to use SF as VC [5]. Furthermore, the “grant dependency” culture [6] SF programmes developed before the 2007–2013 planning period had a strong impact on the decisions.

SF became available for Latvia from 2004 when the country became a member of the EU. Latvia has so far participated in three SF planning periods and has deployed part of its available SF in financial instruments, including VC, in all of them. Nevertheless, the Latvian VC industry is still dependent on public support, as is the case in other CEE (Central and Eastern Europe) countries [5,7].

The existing ex-ante and post-ante evaluations of SF mostly focus on direct assessments of the stated aims and achieved results of programmes. The development of a self-sustainable VC industry across the EU is not a direct aim of SF programmes. VC is simply an instrument which may be used to achieve the goals. The direct objectives are to broaden access to finance for small and medium enterprises (SMEs) and to support innovation and employment.

Existing studies known to the authors on the subject cover the 2007–2013 planning period. Therefore, this study was designed to assess the contribution of the EU structural funds programmes (including 2014–2020) to the development of the VC industry in Latvia and to identify the ways by which SF support could be better exploited for this indirect aim of the programmes.

The centrally managed interventions of the EC were excluded from the study due to the lower possibility for Latvia to influence their design. Moreover, until now, Latvian VC funds benefited from them only if they were focused on private equity and not at the VC stage (the authors’ observation).

The article is organized as follows: the next section introduces the literature review of public support for VC. The third section describes the research design. The results of the study are presented in the fourth section. Section five outlines the main conclusions.

2. Literature Review

VC as an industry developed after the Second World War in the US [8] and therefore has a history of over 50 years. It has reached maturity only in the US, while its development elsewhere is only moderate [9]. Other studies [10] have pointed to Israel and the UK as good examples of other countries that have made progress in developing VC industries while stressing that the industry is small in continental Europe and even minor in some EU countries [11].

There are two main factors that have forced governments across the globe to start numerous public initiatives to support the industry and, as a result, to create publicly financed or co-financed VC funds. The first one is the well-documented correlation of VC investments with higher levels of R&D, innovation, productivity, growth, and employment [10]. The second concerns the private sector’s inability to fill the market gap for such risky investments [6].

Public finance theory states that government interventions are exceptional measures that may be used if they generate positive externalities to the society as a whole [12]. Studies [5,13] show that there are regions where there is an absence of private VC investors, such as CEE. In other more mature regions [14], the information asymmetry concerning investments into early stage companies discourages the private sector from investing. Start-ups lack sufficient track records for potential investors to assess risks and if their ideas are technology-based, special knowledge may be required, which investors rarely have. Thus, market imperfections related to such investments and willingness to raise investments in R&D and innovation serve as a justification for public interventions when viewed from the perspective that they should be benefiting society as a whole.

Good design of public interventions is essential [15] to achieve the desired results. In the case of SF, the development of the VC industry is not a direct aim of the programmes. VC is one of several delivery mechanisms for programme objectives [5] to provide SMEs access to finance. Other such delivery mechanisms are grants, guarantees, and subsidized loans. Therefore, when designing SF programmes, the market gap is measured, but supporting factors increasing VC investments influence in a longer period are not assessed.

Several authors [5,10] have pointed that the lack of experience and understanding of VC among governmental officials was one major reason for not only the limited ambition of using VC as an instrument but also for the design problems of the programmes.

Studies have highlighted that the VC industry does not develop alone [10,16]. Besides increasing supply of VC, boosting the demand for it also is necessary. Support infrastructure [17], including universities, is of paramount importance as part of an innovation ecosystem [18]. Its presence or not explains why some regions are regarded as VC hubs, while others, despite efforts of their governments, still do not have mature VC markets. There are also other factors that increase the likelihood that venture capitalists and companies with high growth potential will link up [17,19] and, as result, increase VC market activity.

Wishlade et al. [6], in their assessment of 2007–2013 programmes, proposed using the theory of change to not only evaluate the results of the programmes but to develop them in future. Lerner [10] developed design guidelines for assessing government VC interventions based on lessons learned from VC intervention programmes worldwide. Both of these approaches point to the necessity to supplement money interventions with other actions to make these interventions successful. Several studies with proposed models for assessing the development of regional innovation systems and economic growth [20–22] could be used for designing VC programmes. However, during the current SF period (2014–2020), complementary instruments for VC interventions have not been implemented or implemented vaguely. Furthermore, an assessment of VC programmes from the angle of the long-term effect on VC market development and their interconnections with other programmes or governmental policies has not been done.

Lerner [10] also pointed out that, besides a good design of the programmes, there are several tricky aspects to be overcome for their successful implementation. One of them has roots in the theory of regulatory capture. The idea is that, instead of boosting entrepreneurship, the benefit from the intervention could be captured by local public representatives. The study of Karsai [5] points to some possible unfair fund managers selection tenders in CEE. There are also other implementation problems. For example, delays in the implementation of programmes may result in insufficient time to complete activities [5,6], a succession of initiatives may be not provided or there may be time lags between initiatives.

Despite numerous governmental initiatives, design and implementation problems have kept the VC industry in most countries from reaching maturity. Karsai [5] concluded that SF had very limited impact on the VC industry in CEE: the five-year (2011–2015) average ratio of VC investments to GDP in the CEE region was only one-third of the European average. Wishlade et al. [6] found that introducing financial instruments (especially VC) as a delivery mechanism of SF programmes

generated a beneficial side effect—a move away from a ‘grant dependency’ culture and the fostering of an entrepreneurial culture.

Lerner [10] cited as an excellent example of governmental VC programmes, mentioned Israel’s experience with the \$100 million USD Yozma initiative. Starting from the situation where there was just one private VC fund in the country, ten years later the Israeli venture market expanded to 60 groups managing approximately \$10 billion USD. The success of the programme was attributed to the involvement of experienced VC investors from outside the country to manage available governmental resources and the easiness of administrative procedures.

Besides several studies assessing SF influence starting from 2007–2013 planning period, member states were required to conduct ex-ante and post-ante evaluations of the SF programmes [6]. The researchers pointed to two significant problems in conducting their assessments. First, the data available were hard to compare and were not sufficient for assessment purposes [5,6]. Second, results from the planning period underway were not available early enough to implement lessons learned for the subsequent planning period.

Little research has been done concerning Latvia and there are no studies regarding the 2014–2020 planning period. From previous studies it can be concluded that in Latvia as in other CEE countries there are several factors that potentially reduce the impact of public VC programmes—lack of experience and understanding of VC by governmental officials responsible for the design and implementation of the programmes, a high administrative burden for VC fund managers, limitations on the financial instruments that may be used, restrictions on location, and the financial status of portfolio companies. In addition, the absence of an overarching policy enabling the VC market to prosper is a hindrance.

Therefore, it may be assumed that the impact of the SF programmes on VC market development would be more substantial if the influence of these limiting factors are mitigated.

3. Materials and Methods

Latvian government interventions in the VC market during three SF planning periods (2004–2006, 2007–2013, 2014–2020) and their impact on the local VC fund managers community were examined using mixed research methods.

The first step was collecting information from a wide range of documentary sources (listed in Supplementary file) about the design and implementation of the interventions. Additional data not publicly available (the actual number of investments) from the governmental agency ALTUM and the former governmental agency’s Latvian Guarantee Agency (LGA) staff was requested. The accuracy of the data was verified with information available on the websites of Latvian VC fund managers and the Latvian Private Equity and Venture Capital Association (LVCA). The data were evaluated using the inductivism and generalization approaches.

The second step was conducting an evaluation of the VC fund managers established as a result of the interventions. Data regarding the managers were collected from the sources listed in Supplementary file, Table S1. The data were evaluated using the inductivism and generalization approaches. The activity continuation rate of VC fund managers (%) was calculated using the formula

$$\frac{\text{Number of the managers continuing operations in the next period} * 100}{\text{Number of the managers in the previous period}} \quad (1)$$

The third step was to measure the impact of the factors restraining the operations of VC managers. For that purpose, a questionnaire was developed containing factors identified in previous studies [5,10] and derived from the content analysis of discussions with several Latvian VC managers conducted in the first part of 2020. The respondents were asked to rate the impact the factors had on limiting their operations using a Likert scale (1–5). A ‘5’ indicates a very strong limiting impact, and ‘1’ indicates no impact. All active VC fund managers in Latvia were approached (eight in total). Answers to the questionnaire were provided by seven managers (for a response rate of 88%). To understand the distribution of the answers, the mean, its standard deviation, mode, and median were calculated.

Explanations regarding the impact of the factors were obtained during personal interviews, and some managers added explanations as comments to the questionnaire.

The observation about a possible correlation between the level of the micromanagement and the impact of VC investments on the governmental agency’s financial statements was derived from the ALTUM financial statements, interactions with several ALTUM staff members and an interview with the former head of ALTUM’s VC unit.

The main limitation of the study is that the impact on self-sustainable market development was assessed only from the perspective of Latvian VC fund managers.

4. Results

4.1. Impact of the SF Programmes

4.1.1. Comparison of the VC Programmes over 2004–2006, 2007–2013, 2014–2020 Planning Periods

Latvia was the first Baltic country to employ VC as a means for achieving SF programme goals. From its EU accession in 2004, there have been three planning periods (2004–2006, 2007–2013, 2014–2020), and in each of these, structural funds were used to create VC funds. During the 2004–2006 planning period, Estonia and Lithuania did not create VC funds. In Latvia, like many other CEE countries [5], public funding was provided to so-called hybrid funds managed by private VC managers. The managers were selected via tenders. The structure for providing public support for VC was the same in all planning periods. Table 1 explains the structure of VC funds, their managers, and portfolio companies.

Table 1. Structure of the provision of public venture capital (VC) support in Latvia.

Type of a Fund	Owners of a Fund (Limited Partners)	Manager of a Fund	Selection of a Manager	Fund Portfolio Companies
Hybrid fund	1. Government agency responsible for VC programme (LGA, later ALTUM) 2. Private investors 3. A manager of a fund	Private VC fund manager	Tender procedure	Private SMEs

(Designed by authors on the example of Karsai [5].)

The managers had an obligation to attract private investment into the hybrid funds (with several exceptions mentioned in Table 2, third column). Table 2 provides an overview of all the VC programmes implemented in Latvia. The latest programme (2014–2020 planning period) has not finished yet. Complete data will become available only after 2023, when all investments have been completed.

Data in the second column of Table 2 indicates that the amount of public resources has increased in each subsequent period. However, the increases are not substantial if the support is divided by the number of years during which the particular amount was available for investments (Table 3).

Table 2. Public VC interventions in Latvia.

Planning Period/the Programme	Public Funding	Required Private Funding	VC Funds	Allowed Stages	Max Investment in One Company	Geography	No of Investments
2004–2006 Entrepreneurship and Innovation	€15 million	30%	Three VC funds	Start-up Later-stage Growth	€146,350 first round; Total investment in one company €487,830	Latvia	28
2007–2013 JEREMIE	€28 million	33%, Except for seed fund-0	Three VC funds	Seed (1 fund) Start-up (1 fund) Growth (1 fund)	Seed: €50,000, additional investment allowed in total €200,000; Start-up: €1,000,000 Growth: €3,000,000	Latvia	199
2007–2013 Investment fund for investments in guarantees, credit guarantees, venture capital and financial instruments	€40 million	33% (Later lowered to 5%)	Three VC funds	Later-stage Growth	€1.5 million	Latvia	
2014–2020 Growth and employment	€75 million	0: pre-seed funds 10%: Seed; 25: Start-up 40%: Growth	Three pre-seed funds with acceleration programmes Four seed funds One start-up fund Two growth funds	Pre-seed; Seed; Start-up Growth	€50,000 pre-seed; €250,000 seed; €2.1 million start-up; €3.75 million growth	Latvia for pre-seed stage. For other stages, at least 75% in Latvia	67 up to March 2020

(Source: compiled by the authors from the interviews, ex-ante and post-ante reports, public information on websites. Complete list of sources in Supplementary file).

Table 3. Average public support available for VC investments in SMEs per year.

Years	2007–2008	2009	2010–2012	2013–2016	2017	2018	2019–2021	2022–2023
Source	2004–2006 SF planning period		2007–2013 JEREMIE	2007–2013 JEREMIE + SF planning period		2014–2020 SF planning period	2014–2020 SF planning period	2014–2020 SF planning period
Funds available per year	€7.5 million	0	€4 million	€14 million	0	€3.75 million	€15.75 million	€12 million

(Calculations by the authors).

The first period (2004–2006) was significantly shorter than later ones. During the second period (2007–2013), two initiatives were implemented, each with a different starting year for investments.

1. Joint European Resources for Micro to Medium Enterprises (JEREMIE) with funds created as a part of its activities beginning operations in 2010;
2. Investment fund for investments in guarantees, credit guarantees, venture capital and financial instruments, with funds created as a part of it starting activities in 2013.

In total, €68 million in public funding was made available for VC funds during the 2007–2013 period. During the subsequent period (2014–2020) public funding for VC increased by 9%. However, the total available capital during the 2014–2020 period is expected to be much higher as during the previous period the level of private funding required was lowered to 5% given the financial crises. As all funds have not yet finished their second round of fundraising, it is not possible to make completely accurate comparisons between the periods.

The required percentage of private capital that funds were required to attract fluctuated over the planning periods. In 2004–2006, it was 30% for all funds. The actual amount that was attracted was higher: instead of €6.4 million a total of €16.9 million in private capital was attracted. The high level of participation by private investors in the VC funds was not repeated in later periods [13], in Latvia or CEE in general [5]. The conditions before the 2008 financial crisis—the availability of money and willingness of investors to accept risk in search of higher returns—could explain the exceptional situation.

During the subsequent 2007–2013 period, 33% in private funding was required. An exception was a fund providing loans for start-ups in their earliest development stage (seed) and in next round of quasi-equity financing. For this fund, no private funding was required. In addition, for those funds which started their operations after 2013, the required level of private funding was decreased to 5% due to the impact of the eurozone sovereign debt crisis.

Zero private funding is required for pre-seed funds in the current period. The level is 10% for seed funds, 25% for start-up funds, and 40% for growth funds.

The number of funds established during a period has increased with each subsequent period—three in 2004–2006, six in 2007–2013, and 10 in 2014–2020.

The stages of the company life cycle in which investments were permitted was also broadened. During the 2004–2006 period, investments were limited to companies that had at least a fully developed product or service (start-up). During the 2007–2013 period, one seed fund was established for companies before they start mass production/distribution to complete research, product definition or product design, market tests or prototypes. For the 2014–2020 period, the range of funds was broadened with three pre-seed funds and acceleration programmes to develop a business idea from scratch.

The maximum allowed investment in one company also increased over time. Starting from €487,830, it grew to €3 million during the 2007–2013 programme period and to €3.75 million in the 2014–2020 period for later and growth stage companies.

The catchment area for investments was broadened only during the current period: up to 25% of all investments were permitted in companies with their main operations place outside of Latvia, but still in the EU.

In conclusion, the primary goal of SF programmes was attained—investments in 294 SMEs were made. To reach the goal, the design of the programmes was improved with each subsequent planning period:

- widening the scope of companies suitable for investments (stages and geographic catchment area);
- increasing the allowed amount of investment into each company;
- increasing the volume of the funds;
- increasing the total amount of public support during a programme;
- adjusting the necessary share of private funding to the economic situation and ex-ante and post-ante evaluations.

4.1.2. Professional VC Fund Managers Development

During the 2004–2006 planning period, the first generation of professional VC fund managers emerged in Latvia in response to the opportunity to manage publicly supported hybrid VC funds. Supplementary file, Table S1 contains information on all Latvian VC fund managers who participated in SF programmes, the funds they raised, and their further involvement in the Latvian VC ecosystem.

Table 4 provides calculations on continuation rate of VC fund managers.

Table 4. Continuation rate of the VC fund managers

Continuation Rate	Managers from 2004–2006 Planning Period	Managers from 2007–2013 Planning Period
Continuation rate of the same VC fund manager activity	33%	80%
Continuation rate including involvement in other VC fund manager establishment	67%	
Continuation rate including involvement in Latvian VC ecosystem	100%	100%

(Calculations by the authors from data in the Supplementary file, Table S1).

The continuation rate of VC fund managers established in response to SF programmes activity is high. From the first generation managers one is still active, but the staff of the others was involved in the establishment of the next generations of fund managers. All of the second-generation fund managers are active. (One of them decided not to participate in Latvian public VC fund managers tender for the next period as a result of the ability to raise next funds from directly managed EC programmes.)

A study [23] looking at the performance of VC firms found that the success of VC investments is more attributable to individual partners rather than a VC firm. This implies retention of individuals within the sector is the same important as the continuation of firms, and data presented in Table 4 indicates this has indeed been the case in Latvia. The existence of a cluster of venture capital firms in a region is regarded as a factor which can stimulate the development of local demand for venture finance, which in turn can catalyse the growth of the entire VC ecosystem [16]. The emergence of a clutch VC firms and fund managers in Latvia is a positive outcome of SF programmes with the potential to be a driver for VC market development.

Nevertheless, Latvian VC fund managers are still not able to raise sufficient amount of private capital (Supplementary file, Table S1). One of the second-generation fund managers was not able to raise the necessary private share for the fund from 2014–2020 planning period. Only one Latvian VC fund manager tried to raise a fund without public support, but it exited from only one investment before being dissolved.

4.2. Factors Limiting Latvian VC Managers Successful Operations

The authors conducted a survey of Latvian VC fund managers. The participants were asked to rate by a Likert scale (1–5) the impact of factors limiting their operations. A ‘5’ indicated that a factor had a very limiting impact, and ‘1’ indicated no impact. The responses of the managers are in Supplementary file, Table S2.

The impact from different factors varied a lot between managers investing in the earliest stage (accelerator funds) and those investing in later stages. Therefore, Table 5 provides the mean value of the accelerator funds’ answers value and separately the mean of other fund managers answers. Results of other methods assessing the distribution of the answers are in Supplementary file, Table S2.

Table 5. Impact of limiting factors on the fund managers activities in 2014–2020 planning period.

Factors	Mean Value of the Accelerator Fund Managers Answers	Standard Deviation	Mean Value of the Other Fund Managers Answers	Standard Deviation
Restrictions on investments (limits on geography, allowed financial instruments; financial status and stages of a portfolio company; max amount of one investment)	3.0	1.6	4.0	0.7
Small size of funds	3.3	0.5	2.5	1.5
ALTUM rights to influence a fund investment decisions (exceeding typical LPs rights)	4.0	0.8	3.3	1.3
Reporting obligations towards ALTUM and Financial Market commission	3.0	0.8	2.5	0.5
Imperfections of the infrastructure and legislation affecting VC market	2.7	0.9	2.3	1.1
Lack of the experience and capacity of the governmental agency responsible for the programmes (ALTUM)	2.7	0.9	2.8	1.5

(Calculations by the authors from data in the Supplementary file, Table S2).

The most powerful obstacle for the later stage fund managers are the restrictions on investments. These restrictions include the location of the portfolio companies, their financial status and development stage, which financial instruments may be used, and the maximum amount of one investment. Deviation from the mean value of the answers was small, indicating that the impact of the factor was rated similarly by all later stage managers. The distribution of the answers of later stage fund managers regarding the impact of the restrictions is Gaussian.

The opinion of the accelerator funds regarding the impact of investment restrictions was very diverse, but with a mean value of medium impact.

The most powerful obstacle for the accelerator fund managers is excessive rights of the Latvian governmental agency (ALTUM) to take part in decision-making regarding investments. The limiting effect of the factor was rated as 4, meaning a substantial negative impact, and there was a low deviation in responses (normal distribution). This factor was rated lower by the later stage fund managers, and their answers had a wide range (no Gaussian distribution). The higher effect upon accelerator funds was explained by them as being due to higher number of investments they make and necessity at the accelerator stage to make decisions quicker.

Accelerator funds also rated higher as limiting factors the small size of funds and burdensome reporting obligations than later stage funds. The variance between answers of the accelerator fund managers was close to normal distribution. The explanation for the difference here also could be the higher number of investments increasing the reporting burden on small funds that have limited resources for administrative expenses.

A lack of infrastructure and legislation necessary for the smooth operation of the VC market and the lack of experience and capacity of the governmental agency were rated as having slightly less than medium impact by all funds. However, the deviation between answers was rather significant and did not show a normal distribution.

To see if the improvements in the design of the SF programmes led to a diminution of the impact of the factors the authors asked fund managers to rate the impact in the 2007–2013 and 2014–2020 planning periods separately. Table 6 provides a comparison between the impact value differences of the 2007–2013 and 2014–2020 planning periods.

Table 6. Comparison between impact value differences in 2007–2013 and 2014–2020 planning periods.

Factors	Mean Value for the 2007–2013 Planning Period	Standard Deviation	Mean Value for the 2014–2020 Planning Period	Standard Deviation	Difference between Impact Value in the 2007–2013 and in the 2014–2020
Restrictions on investments (limits on geography, allowed financial instruments; financial status and stages of a portfolio company; max amount of one investment)	4.3	0.4	4.0	0.7	–7%
Small size of funds	3.0	1.4	2.5	1.5	–16.7%
ALTUM rights to influence a fund’s investment decisions (exceeding typical LPs rights)	2.3	1.1	3.3	1.3	+43.5%
Reporting obligations towards ALTUM and Financial Market Commission	2.8	0.4	2.5	0.5	–10.7%
Infrastructure and legislation imperfections	2.8	1.1	2.3	1.1	–17.9%
Lack of the experience and capacity of the governmental agency responsible for the programmes (ALTUM)	2.8	1.3	2.8	1.5	0%

(Calculations by the authors from data in the Supplementary file, Table S2).

The results of the comparison do not provide sufficient grounds for reaching a conclusion that design improvements led to a decrease in the impact of limiting factors. The reduction in the impact as perceived by the fund managers is small, except for the impact from the governmental agency’s micromanagement, which became substantially stronger.

Results from several interviews suggest the impact of VC investments on the financial statements of the governmental agency ALTUM could be partly responsible for its micromanagement and the trend for this to increase.

The investments into VC funds form part of ALTUM’s assets. ALTUM has listed securities, and from a ratings perspective, ALTUM is interested in the better performance of its assets and a risk level that is easy to understand for investors. This is a mismatch with VC, which is high-risk, long-term investment.

4.3. Governmental Activities Promoting VC Market Operations

Lerner [10] pointed out that instead of a narrow policy of providing VC funds a government should focus on creating conditions for the industry to prosper. The authors compiled the Latvian government’s activities, or lack of them, in this area in Table 7.

Table 7. Governmental activities to promote VC market.

	2004–2006 Planning Period	2007–2013 Planning Period	2014–2020 Planning Period
Comprehensive policy for VC market development	No	No	No
Tax initiatives supporting VC investments	No	No	Law on Aid for the Activities of Start-up Companies
Other programmes beneficial for VC	No	Business Angel network, Stock market for SME. Suspended due to the crisis	Stock market for SME. Reduction of fees and reporting requirements to Financial Market Commission.

(Compiled by the authors from data sources listed in Supplementary file and information on lvca.lv).

The SF programmes in 2004–2006 did not take into account the necessary overlapping with other activities to get the best possible outcome. In 2007–2013, several activities from which the venture capital market could have benefited had been planned (Business Angel network, stock market for SME). Due to the 2008 financial crisis, these activities were suspended. Several activities carried out during this period under the programme of promoting entrepreneurship could be beneficial in the future for the VC market. However, most of these activities are directed at supporting regions and not companies with high growth potential. Furthermore, assessments of the influence of programmes upon one another is not being conducted and not taken into account when programmes are designed.

In 2017, the European Commission prepared a special report on the effectiveness of tax incentives on venture capital [24]. It was concluded that taxation plays a critical role in supporting or hindering venture capital investments. Latvia was listed among states that had no tax incentives to promote venture capital investments. Latvia later that year adopted the Law on Aid for the Activities of Start-Up Companies. The law is regarded as a good idea but with a very limited set of companies eligible for support. As of 28 February 2020, only six companies had been able to qualify under the criteria set out under the law to benefit from lower corporate or individual income taxes.

As seen in the data in Table 7 there is no comprehensive policy for the development of the VC market in Latvia. Few initiatives in the 2014–2020 planning period are beneficial for VC managers.

5. Discussion

5.1. Fundraising Ability and Open Innovation

As in other CEE countries [5], the VC market in Latvia is still not mature and depends on public support. As the result of SF interventions, 294 VC investments (as of 31 March 2020) have been made by the funds established during the three planning periods. As a side effect of the programmes was the emergence of a generation of professional VC managers for the VC funds that were established. These fund managers have a high activity continuation rate—even if a fund manager has suspended activities its partners continued to work in other fund managers or stayed within the VC ecosystem in another capacity.

Despite gaining experience over three planning periods these managers have yet not to be able to raise independent private funds. The study also confirms the conclusion of other authors [5,13] about the difficulties encountered in attracting private investors into publicly supported VC funds in CEE. It adds the observation about the persistence of this problem from one planning period to another. This suggests that even if the primary goal of SF programmes to support SMEs is attained, the programmes are not sufficient to attain the self-sustainability of the VC market in Latvia.

The proven track record of a VC fund manager is considered to be a crucial factor in its fundraising ability. The researchers [25] found that for fund managers with low levels of track records, other factors (particularly trustfulness) do not serve as substitutes. Latvian VC managers still have low levels of track records. The state has no direct ability to influence the successfulness of VC firms' exits from their investments. Still, studies suggest several pathways on how VC funds' exit landscape could be improved. One is raising entrepreneurial activity in general and particularly activity on a local stock exchange market [26]. Another is raising growth perspectives for the funds' portfolio companies.

Several studies [27–30] suggest that open innovation provides opportunities for the increasing growth and competitiveness of companies. The extent to which Latvian VC fund portfolio companies benefit from open innovation is not known. Traditionally, VC is regarded as funding for very innovative companies with strong internal innovation capacities. Nevertheless, the examination of Latvian VC fund investment patterns [31] showed that 35% of investments in manufacturing went to low technology sectors and 44% of investments to services (to less knowledge-intensive sectors). Presumably, Latvian firms operating in these sectors lack in-house R&D and have a low level of absorptive capacity of external knowledge. The suggestion to build intra-organizational absorptive capacity for such firms [28] needs exploration in the Latvian context. Also, the existence of cross-industry open innovation culture among portfolio companies of Latvian VC funds remains to be determined and the possibility of promoting it to be investigated. Further research is also required on the issue of balancing government support for market growth in particular subsectors and innovation policies [29]. The proposed conceptual framework to understand dynamics between different stakeholders of open innovation [32] could be useful also for understanding the dynamics between open innovation and venture capital market participants.

5.2. VC Interventions Design and Necessity for Aligned Activities to Develop VC Market

The survey of Latvian VC fund managers confirms that their activities are impacted by restrictions on investments; the small size of funds; governmental agency micromanagement; burdensome reporting obligations; infrastructure and legislation imperfections, and the lack of the experience and capacity of the governmental agency. Surprisingly, the value of the impact did not decrease significantly as a result of design improvements in the programmes.

There is no overarching governmental policy to support the VC market in Latvia, a tool that has been suggested by other authors [16,33]. The Latvian government's support of VC investments as a way to support the establishment and development of high-growth enterprises has been sporadic and has missed out on reaching a potentially cumulative result. There are gaps between programmes.

There are other potentially beneficial activities for the VC market, such as the recently started support of initial public offerings for SMEs. But these initiatives are not aligned.

The lack of aligned support measures could be a reason why improvements in the programmes' design did not result in a decrease in the factors restraining the impact of the activities of VC fund managers. It strongly suggests that an umbrella strategy for developing the Latvian VC market is necessary. This would eliminate existing gaps between VC programmes and support them with other activities essential for the development of the market. As Lerner [15] suggested, there is a need to respect the need for conformity with VC global standards and as a result, adjust local legislation and implementation of support programmes. In addition, other activities which support entrepreneurship are necessary.

Results from several interviews suggest that there is conflict of interests of sorts for the government agency: the need to justify the value and appropriate risk level of its publicly listed notes, runs counter to the reasons that justified public investment in VC—that these were investments in SMEs that were too risky for private investors and would require considerable time to generate profits.

Further investigation of this possible conflict of interest is merited. A review of the experience in other countries is necessary to determine if a correlation between micromanagement and a similar listing of notes of the public entity holding VC investments.

Supplementary Materials: The following are available online at <http://www.mdpi.com/2199-8531/6/3/53/s1>, List of the sources, Table S1: Latvian VC Fund managers and the funds raised, Table S2: Impact from the limiting factors on VC fund managers activities.

Author Contributions: Conceptualization, A.M.; Funding acquisition, N.L.; Investigation, A.M.; Methodology, A.M. and N.L.; Project administration, N.L.; Supervision, N.L.; Writing—original draft, A.M. All authors have read and agreed to the published version of the manuscript.

Funding: This research was funded by Department of Corporate Finance and Economics at Faculty of Engineering Economics and Management of Riga Technical University.

Conflicts of Interest: The authors declare no conflict of interest.

References

1. Bilbao-Osorio, B.; Burkhardt, K.; Correia, A.; Deiss, R.; Lally, D.; Martino, R.; Rueckert, E.; Senczyszyn, D. *Science, Research and Innovation Performance of the EU 2018 Strengthening the foundations for Europe's future European Commission Directorate-General for Research and Innovation Directorate A—Policy Development and Coordination*; European Commission Publications Office: Luxembourg, 2018. Available online: <https://op.europa.eu/en/publication-detail/-/publication/16907d0f-1d05-11e8-ac73-01aa75ed71a1/language-en> (accessed on 20 July 2020).
2. European Commission. *Europe 2020: A Strategy for Smart, Sustainable and Inclusive Growth*; European Commission: Brussels, Belgium, 2010. Available online: <https://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=COM:2010:2020:FIN:EN:PDF> (accessed on 21 July 2020).
3. European Court of Auditors. *Centrally Managed EU Interventions for Venture Capital: In Need of More Direction*; ECA Press: Luxembourg, 2019. Available online: <https://www.eca.europa.eu/en/Pages/DocItem.aspx?did=51616> (accessed on 23 July 2020).
4. Invest Europe. *Investing in Europe: Private Equity Activity 2019*; Invest Europe: Brussels, Belgium, 2020.
5. Karsai, J. Government venture capital in central and eastern Europe. *Ventur. Cap.* **2018**. [CrossRef]
6. Wislade, F.; Michie, R.; Familiari, G.; Schneiderwind, P.; Resch, A. *Ex-Post Evaluation of Cohesion Policy Programmes 2007–2013, Focusing on the European Regional Development Fund (ERDF) and Cohesion Fund (CF): Work Package 3: Financial Instruments for Enterprise Support—Final Report*; Publications Office of the EU: Luxembourg, 2016. Available online: <https://doi.org/10.2776/259268> (accessed on 23 July 2020).
7. Matisone, A.; Lace, N.; Danilchenko, A.V. How do Venture Capital Funds support value addition to portfolio companies? Case of Latvia. In Proceedings of the WMSCI 2018—22nd World Multi-Conference on Systemics, Cybernetics and Informatics, Orlando, FL, USA, 8–11 July 2018.
8. Gompers, P.A. The Rise and Fall of Venture Capital. *Bus. Econ. Hist.* **1994**, *23*. Available online: <https://pdfs.semanticscholar.org/2f08/dcc60c8efbfc209a8a8c15c76a6a80a08c17.pdf> (accessed on 23 July 2020).

9. Grilli, L.; Mrkajic, B.; Latifi, G. Venture capital in Europe: Social capital, formal institutions and mediation effects. *Small Bus. Econ.* **2018**, *51*, 393–410. [CrossRef]
10. Lerner, J. The future of public efforts to boost entrepreneurship and venture capital. *Small Bus. Econ.* **2010**, *35*, 255–264. [CrossRef]
11. Economidou, C.; Grilli, L.; Henrekson, M.; Sanders, M. Financial and Institutional Reforms for an Entrepreneurial Society. *Small Bus. Econ.* **2018**. [CrossRef]
12. Hyman, D.N. *Public Finance: A Contemporary Application of Theory to Policy*; Cengage Learning: Boston, MA, USA, 2010. Available online: <https://lib.hpu.edu.vn/handle/123456789/27838> (accessed on 23 July 2020).
13. Prohorovs, A. The Volume of Venture Capital Funds of Latvia and Their Financing Sources. *China-USA Bus. Rev.* **2014**, *13*, 217–235. Available online: <http://www.davidpublisher.com/index.php/Home/Article/index?id=611.html>. (accessed on 23 July 2020).
14. Kraemer-Eis, H.; Botsari, A.; Gvetadze, S.; Lang, F.; Torfs, W. *European Small Business Finance Outlook: December 2019 (No. 2019/61)*; European Investment Fund (EIF): Luxembourg, 2019. Available online: https://www.eif.org/news_centre/publications/eif_working_paper_2019_61.pdf (accessed on 23 July 2020).
15. Lerner, J.; Leamon, A.; Hardyman, F. *Venture Capital, Private Equity, and the Financing of Entrepreneurship: The Power of Active Investing*; John Wiley & Sons: Hoboken, NJ, USA, 2012.
16. Martin, R.; Berndt, C.; Klagge, B.; Sunley, P. Spatial proximity effects and regional equity gaps in the venture capital market: Evidence from Germany and the United Kingdom. *Environ. Plan. A* **2005**, *37*, 1207–1231. [CrossRef]
17. Matisone, A.; Lace, N. Entrepreneurs' and Venture Capitalists' openness for cooperation: Barriers and drivers. In Proceedings of the 10th International Multi-Conference on Complexity, Informatics and Cybernetics, Orlando, FL, USA, 12–15 March 2019.
18. Krishna, V.V. Universities in the national innovation systems: Emerging innovation landscapes in Asia-Pacific. *J. Open Innov. Technol. Mark. Complex.* **2019**, *5*, 43. [CrossRef]
19. Goo, J.J.; Heo, J.-Y. The Impact of the Regulatory Sandbox on the Fintech Industry, with a Discussion on the Relation between Regulatory Sandboxes and Open Innovation. *J. Open Innov. Technol. Mark. Complex.* **2020**, *6*, 43. [CrossRef]
20. Firsova, A.; Chernyshova, G. Efficiency Analysis of Regional Innovation Development Based on DEA Malmquist Index. *Information* **2020**, *11*, 294. [CrossRef]
21. Firsova, A.A.; Makarova, E.L.; Tugusheva, R.R. Institutional Management Elaboration through Cognitive Modeling of the Balanced Sustainable Development of Regional Innovation Systems. *J. Open Innov. Technol. Mark. Complex.* **2020**, *6*, 32. [CrossRef]
22. Laplane, A.; Mazzucato, M. Socializing the risks and rewards of public investments: Economic, policy, and legal issues. *Res. Policy X* **2020**, *2*, 100008. [CrossRef]
23. Ewens, M.; Rhodes-Kropf, M. Is a VC Partnership Greater than the Sum of its Partners? *J. Financ.* **2015**, *70*, 1081–1113. [CrossRef]
24. European Commission. *Effectiveness of Tax Incentives for Venture Capital and Business Angels to Foster the Investment of SMEs and Start-Ups*; European Commission: Brussels, Switzerland, 2017. [CrossRef]
25. Kuckertz, A.; Kollmann, T.; Röhm, P.; Middelberg, N. The interplay of track record and trustworthiness in venture capital fundraising. *J. Bus. Ventur. Insights* **2015**, *4*, 6–13. [CrossRef]
26. Black, B.S.; Gilson, R.J. Venture capital and the structure of capital markets: Banks versus stock markets. *J. Financ. Econ.* **1998**, *47*, 243–277. [CrossRef]
27. Enkel, E.; Gassmann, O. Creative imitation: Exploring the case of cross-industry innovation. *R&D Manag.* **2010**, *40*, 256–270. [CrossRef]
28. Spithoven, A.; Clarysse, B.; Knockaert, M. Building absorptive capacity to organise inbound open innovation in traditional industries. *Technovation* **2010**, *30*, 130–141. [CrossRef]
29. Yun, J.J.; Won, D.; Park, K. Entrepreneurial cyclical dynamics of open innovation. *J. Evol. Econ.* **2018**, *28*, 1151–1174. [CrossRef]
30. Yun, J.J.; Won, D.; Park, K.; Jeong, E.; Zhao, X. The role of a business model in market growth: The difference between the converted industry and the emerging industry. *Technol. Forecast. Soc. Chang.* **2019**, *146*, 534–562. [CrossRef]
31. Matisone, A.; Lace, N. Where do Venture Capitalists invest? Case of Latvia. *Intellect. Econ.* **2019**, *13*, 9–21.

32. Yun, J.J.; Liu, Z. Micro-and macro-dynamics of open innovation with a quadruple-helix model. *Sustainability* **2019**, *11*, 3301. [[CrossRef](#)]
33. Lerner, J.; Moore, D.; Shepherd, S. *A Study of New Zealand's Venture Capital Market and Implications for Public Policy: Report to the Ministry of Research Science & Technology*; LECG Ltd.: Wellington, New Zealand, 2005.



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