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STRUCTURE OF DEMAND AND SUPPLY OF INVESTMENTS OF STATE-SUBSIDIZED VENTURE CAPITAL FUNDS IN LATVIA

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ABSTRACT
One of the tools for financing young innovative companies is state-subsidized venture capital funds (VCF). The paper explores the issues of demand for investment and the structure of Latvian state-subsidized VCF investments. We found that of the total number of applications for investment received by state-subsidized VCFs, only 42.5% come from innovative companies. The number of innovative companies that received investment from state-subsidized VCFs is even lower and amounts to 32.9%; moreover, of the total number of investments, 28.2% were made in young and innovative companies. The volume of VCF investments in innovative companies amounts to 29.6% of the total amount of investments made. The reason for such a low share of financing for innovative companies from state-subsidized VCFs may be a low demand for VCF investment from innovative Latvian companies and VCFs' unwillingness to invest funds in companies with a high level of information asymmetry or to have more than 15-20 companies in the portfolio of small funds, since this increases the administrative costs of managing VCFs.
Keywords: venture capital; state and hybrid venture capital fund investment; start-up financing; innovative company financing; demand for the investment of venture capital funds
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INTRODUCTION

Innovative development of the economy is one of the major priorities of the EU and its member states (European Commission, 2014). Venture capital (VC) investment is becoming an important source of financing for innovative and high-tech companies (European Commission, 2011). An innovative company is a company with a significant proportion of sales and profits derived from products or services that have recently been introduced to the market (McFarthing, 2010). The characteristics used to identify young innovative companies (YICs) are therefore a combination of age, size and innovation profile (Schneider and Veugelers, 2008). Based on these definitions, YICs are small, young and intensely involved in innovation (Carnitski and Delanote, 2012). The EU uses various tools to support innovative companies, including the EIF, acting as a fund of funds and subsidizing venture capital funds (VCFs) (Kraemer-Eis, Signore and Prencipe, 2016). It can be expected that the share of various projects and EU funding programs for subsidizing VCFs in CEE countries in the next programming period (2021-2027) will be significantly reduced. (Among the possible reasons for the reduction of VCF-subsidizing programs: a potential reduction in the EU budget due to Brexit, the need to channel financing to programs addressing the migration crisis, and changes in the EU development strategy, including in the context of discussions about a two-speed Europe). Accordingly, the role of economic efficiency of VCF state support will increase.

In our opinion, one of the most effective measures to increase the efficiency of state support for innovative companies may be an increase in concentration of state-subsidized VCFs on investment in young innovative companies. In the analysis of the scientific literature, we were not able to find data on the quantitative indicators of the structure of demand for investments by state-subsidized VCFs or on the quantitative indicators of the structure of VCF investments in the context of the division of applications and investments in innovative/non-innovative companies. A number of researchers note that one of the biggest problems in researching the supply and demand of VC is the collection of primary data (Jagwani, 2000, Tykvova, Borell and Kroencke, 2012).

In our opinion, the acquisition of such data is critical for conducting an analysis of the possibility to improve the efficiency of state-subsidized VCFs in the context of increasing the number and volume of financing for innovative companies. In the research on VC supply and demand, accurate data are also important for determining the optimal support tools for innovative companies. The availability of such data will allow us not only to more accurately determine incentive tools, but also to distribute support budgets among stimulating demand for VC, generating more qualitative demand for VC, and increasing supply volumes and quality of VC delivery. Therefore, the purpose of our research is to identify the indicators (and structure) of the demand and supply of investments of state-subsidized VCFs in Latvia.

On that premise, in the research we will consider what proportion of applications from innovative/non-innovative companies for funding are received by state-subsidized VCFs in Latvia out of the total number of applications for financing, and what share of investments in the portfolio of these VCFs are held by innovative companies. We will also determine what share of innovative companies applying to state-subsidized VCFs is less than three years old and what the average investment amount of the VCFs is. In addition, the research will determine the average number of portfolio companies in state-subsidized VCFs and the type of financing provided to portfolio companies (equity/convertible loan).

We hypothesize that most of the investments made by state-subsidized VCFs in Latvia are not investments in young innovative companies. We justify our assumption with two arguments. First, guided by the theory of information asymmetry, state-subsidized VCFs whose investment memorandum does not envisage investing only in young innovative companies will avoid funding such companies whenever possible. The reason for VCFs' reluctance to finance such companies is that the latter have a higher level of information asymmetry compared to innovative companies of later development/financing stages or companies that are not innovative. Second, young innovative companies do not require significant amounts of funding at the initial stage of financing. Meanwhile, small (in terms of attracted capital) state-subsidized VCFs prefer to finance transactions of a larger size, in order to have no more than 15-20 companies in the fund's portfolio. When the number of portfolio companies significantly exceeds 15-20, the administrative costs of private management companies increase (General Partner, GP), which, with a small fund size, becomes unprofitable for the VCF managing company.

The issues we consider are particularly relevant for the development of financing programs for innovative companies in the Republic of Latvia for the following reasons. In the European Innovation Scoreboard, Latvia ranked 25th out of 28 countries (European Commission, 2016). In addition, in Europe, the share of financing of small and medium-sized enterprises by venture capital is 2%, while in the US it is 14% (Barnier, 2012). In

Latvia, this share is only 0.35% (Prohorovs and Beizitere, 2015). This is almost 6 times less than the average European figure and 40 times less than in the US.

The paper is organized as follows: at the beginning of the research a review of the scientific literature is conducted; the methodology and data on which the research is based are then presented. The next section (research and discussion) presents indicators of the number and structure of applications (innovative / non-innovative companies) for investments by state-subsidized VCFs in Latvia for 2015-2016 and the amount of investments made by Latvian VCFs in 2015-2016 (innovative/non-innovative companies). Further on, we consider the proportion of investments in innovative companies in the total volume of investments made by funds and the share of young innovative companies that received investments from VCFs. After that, the size (amount) of state-subsidized VCF investments, the number of portfolio companies in VCFs and the methods of investing are examined. Based on the results of the research, we make conclusions and recommendations for future studies.

LITERATURE REVIEW

A study by Invest Europe (formerly EVCA) presents the structure of VCF investments by industry (Invest Europe, 2015). However, this study does not separate data on state-subsidized VCFs. In addition, belonging to innovative industries may not always mean that the VCF-funded companies are innovative. The abovementioned study by Invest Europe also does not consider the age of the companies receiving investments. Therefore, this study does not offer an idea of whether the companies invested in by VCFs belong to the category of young innovative companies. In our opinion, both the age of the companies and their innovativeness are necessary estimates for the development of state policies and EU policies in the scope of stimulating young innovative companies and supplying VC. An active venture capital market can promote economic growth (Lerner, 2009). However, VC activity in Europe is very low, especially in the seed financing stage and in high-tech industries (Tykvova et al., 2012). In their opinion, VC investments are most needed in the seed stage of financing and in high-tech industries. They believe that VC investments are less necessary at later stages and in low technology industries where there are other sources of capital. Participation in solving the problem of supplying VC in the context of a supply gap is a natural step on the part of government agencies (Brander, Du and Hellmann, 2015).

In addition to creating conditions conducive to investment in RandD and innovation, governments use various tools, such as tax incentives and government support for VC (OECD, 2013). Rigby and Ramlogan find that in cases of government support for VC, insufficient attention is paid to financing truly innovative companies and the impact of these investments on long-term innovation development (Rigby and Ramlogan, 2013). This can be explained by the fact that it is young innovative companies that cannot receive bank financing (Veugelers, 2011; Reid and Nightingale, 2011; Snieska and Venckuviene, 2011; Prohorovs and Jakusonoka, 2012).

American start-up companies rely more on financing from family and friends, while Swedish companies rely more on funding from state sources (Soderblom, Samuelsson, Martensson, 2013). The participation of governments in developed countries is becoming an increasingly prevalent model for securing VC investment (Baldock, North, Bhaird, 2016). Positive examples, such as Australian VCFs, contrast with the lack of

success of similar programs in other countries (Colombo, Cumming, Vismara, 2016). They find that the negative aspects of state-subsidized VCFs can be expressed in the absence of skills in the selection and upbringing of portfolio companies as well as in the negative impact on private VC. There are certain types of companies that are unattractive to private VCFs, for example, enterprises that are at a very early stage of development (Bertoni et al., 2015). State-subsidized VCFs must invest in competitive clusters and at the beginning of the life cycle of young enterprises (Alperovych, Groh, Quas, 2016). Based on a study of the experience of advanced Western economies, Murray et al. (2012) find that measures only on the part of VC supplies cannot create a viable VC industry. They find that, in addition to the VC proposal, there should be major changes in entrepreneurial activity as well as a significant improvement in the quality and prospects of development of firms seeking VC funding. In other words, not just demand, but the quality of demand for VC is important. According to Tykvova et al. (2012), in Europe there are problems both with the amount of VC supply from private and institutional investors and with the quality of supply (quality of investment management). They find that in Europe there are few promising high-tech enterprises with a prospect of rapid growth (low quality of demand). The results of their research indicate that demand and supply do not match (Tykvova et al., 2012). The low quality of demand for VC is confirmed by the results of a survey of VCF GPs in Latvia (Prohorovs, 2013b). According to the GPs of Latvian VCFs, this factor is the fourth (out of twenty-seven) in importance, negatively affecting fundraising (Prohorovs, 2013b). There is a positive relationship between the dynamic sectors of high-tech enterprises and an effective VC industry (Tykvova et al., 2012). Dessi and Yin (2010) also find that there is a correlation between the level of VC development and innovation. In addition, there is a correlation between the level of RandD development in specific countries and their attractiveness for VC investors (Lerner and Tag, 2013; Prohorovs and Pavlyuk, 2013). According to Tykvova et al. (2012), to create conditions for an active VC industry with a large number of successful innovative portfolio companies, it is necessary to take into account both demand and supply. It is important to pinpoint that companies are innovative and have the potential for rapid growth to become a project that will be financed by state-subsidized VCFs (Snieska and Venckuviene, 2012). The Estonian government invests VC directly in some promising innovative companies (Kitsing, 2013; Estonian Development Fund, 2013). However, according to Lerner (2010), instead of direct financing of VCFs, the state should take measures that would increase the demand for VC. Jaaskelainen, Maula and Murray (2007) consider that state-subsidized VCFs are only able to supply the missing VC temporarily. In their opinion, with this method of supplying VC, the quality of supply does not increase. They find that the state should apply other forms and methods of promoting investors, experienced venture capitalists and entrepreneurs in key technology sectors. According to Groh (2010), state subsidies do not play a positive role where decisions about VC investments are made by institutional investors, since public money does not attract private VC. He believes that VC investors pay more attention to the skills of venture capitalists (GPs). Prohorovs et al. (2015) and Groh (2010) also find that VC delivery can be limited due to an insufficient flow of transactions. The lack of a balance between the demand and supply of VC may be due to the low number of VC-ready companies as well as the small number of VCFs specializing in the early stages of financing (with a sufficient number of VCFs specializing in the late stages of VC investment) (Prohorovs, 2013a).

DATA AND METHODOLOGY

There are methodological problems in calculating VC supply and demand. For example, when calculating supply and demand for venture capital in Latvia, Dijokas and Vanags (2004) and Vanags et al. (2010) study the demand for VC investment without dividing investments with demand and supply data of later financing stages specific to the investments of private equity funds (PE). In the above studies, there is also no binding of potential volumes of VC demand or supply to the time period. The method of expert assessment or the method of comparison with other countries (Hungary and Finland) used in these studies and the introduction of adjustment factors also significantly reduces the accuracy of the results. Data obtained in research on VC supply and demand in most cases are used in the development of government programs to stimulate VC demand and supply. Therefore, developing the right methodology for researching supply and demand for VCF investment is very important. Based on this, in our research we analysed data on investment applications (number thereof) and investments made (number and amount) only for VCFs (rather than PE funds).

For more information, and to identify the structure of the demand for investments and VCF offers, we considered the number of applications from innovative and non-innovative companies separately. When studying the structure of investment among innovative companies, we also singled out the category "young innovative companies".

In order to identify the number of VCFs operating in Latvia and in the investment cycle in 2015-2016, interviews were conducted with representatives of the state institution ALTUM, responsible for the development and financing of venture capital in Latvia, and with the Members of the Board and the Executive Director of the Latvian Venture Capital Association (LVCA).

It was found that in 2015-2016 there were five VCFs in Latvia in the investment cycle. All of these VCFs were subsidized by the state. (VCFs with private capital were not registered and did not operate in Latvia during the considered period). One of these funds, founded in 2010 and specializing in the late stages of investment, was 66.7% subsidized by state capital. Another VCF, 100% subsidized by state capital and also founded in 2010, specialized in investments for the seed financing stage. In accordance with their investment memoranda, three more VCFs (founded in 2013) planned to invest in all stages of VC financing; therefore, in our research we refer to them as universal VCFs. The general partners (GPs) of these three VCFs, who claimed to manage universal VCFs subsidized by state capital under the terms of the tender for management, had to invest in the fund 5% of the amount of fund capital. That is, the share of state capital of these three funds was about 95%. All five of the VCFs in our research are managed by private companies. They had three types of specialization (by funding stages – seed stage, all venture capital, later-stage venture), which allowed us to identify both the overall picture of the indicators considered in the research and the differences in VC demand and investment preferences for each of the types of VCFs considered in the research.

To obtain (create) primary data on the number of applications of entrepreneurs for VCF investments, investments and other issues considered in the research, a questionnaire was developed and a survey of all five VCFs in the investment cycle in 2015-2016 was conducted. The number of applications for investment, investments made, and other indicators considered in the research were analysed in each of the VCFs for 2015 and

2016. The number of applications for investment and the number of VCF investments were calculated separately for innovative companies and non-innovative companies.

Belonging to the categories of innovative and non-innovative in this research was determined on the basis of whether the VCF referred to specific companies as innovative or non-innovative. The research also determined how many innovative companies funded by VCFs were under three years old. Innovative companies whose age was less than three years were identified in our research as young innovative companies. In addition, the research determined which type of investment in portfolio companies was used by VCFs (in the form of a contribution to equity or as a convertible loan). The average amount of VCF investment was also calculated. The survey and questionnaires were conducted in March 2016. The condition for VCF questioning was to ensure the confidentiality of the information obtained; therefore, all the data in the research are presented in a generalized form. Our research did not consider the investments of private equity (PE) funds, as such investments are made in more mature companies usually not subject to VCF investments.

RESEARCH AND DISCUSSION

Quantitative indicators and the structure of demand for VCF investments subsidized by the state

One of the problems of the VC industry is the demand for VCF investment (and from other venture investors) and its stimulation (Lerner, 2010). Table 1 shows the indicators of demand for VCF investment in Latvia subsidized by the state.

Table 1

The number of applications for investment considered by VCFs in 2015-2016

Year/Number of investment applications considered	2015 (Number)	2015(%)	2016 (Number)	2016 (%)	Total in 2015-2016	2015-2016 (%)
Number of applications considered	769	-	568	-	1337	-
Number of applications from innovative companies	317	41.2	251	44.2	568	42.5
Number of applications from non-innovative companies	452	58.8	317	55.8	769	57.5

Source: Authors' data (based on a survey of VCFs in Latvia)

In 2015-2016, VCFs received 1337 applications for investment. Of these applications, 568 were from innovative companies (42.5%) and 769 (57.5%) were from non-innovative companies. (VCFs with private capital were not registered and did not operate in Latvia during the considered period of time.) If we take the average data on the number of applications per year and per VCF, it turns out that a state-subsidized VCF received an average of 134 applications per year, of which 57 applications were from innovative companies. According to the National Venture Capital Association (NVCA) and the British Venture Capital Association (BVCA), VCFs most often fund young innovative companies with a potential for rapid growth (NVCA, 2017; BVCA, 2017). In the rating of the Venture Capital and Private Equity Country Attractiveness Index, the United States is the most attractive country in the world for venture capital investment, and

the United Kingdom ranks second (Groh, Liechtenstein, Lieser, 2016). Based on the information that the main investment target of VCFs in the US and the UK are young innovative companies, we can conclude that the bulk of applications for VCF investment come from young innovative companies. Consequently, the structure of the investment applications (innovative/non-innovative companies) received by VCFs in Latvia differs significantly from the structure of the investment applications received by VCFs in the US and the UK.

Correlation of the quantitative indicators of the demand for investment and the supply of investment by VCFs

Rose (2012) notes that a VCF usually considers about 400 companies, of which it invests in only one. That is, in the US VCF investment is received by 0.25% of companies that apply for it. Mason and Harrison (2003) state that some VCFs in Europe even have to return funds to investors because they cannot find suitable investment opportunities. They note that according to the EVCA, only 3-4 out of 600-700 business plans in Europe are funded every year (an average of 0.54%). Murray (2008) finds that regional VCFs in the UK have selected 48 out of 2,680 applications for investment received (1.79%). If we apply the above data on the share of applications received for VCF investment in the US, Europe and the UK for the selection of companies to Latvian VCFs, then each VCF, for the two considered years, should have invested in one or several companies. If we consider only the applications Latvian VCFs have received from innovative companies, the indicator of the amount of investments should be even lower; that is, altogether, five Latvian VCFs in two years should have invested in 2-3 innovative companies. The data we obtained testifies that there is a very low demand for VC in Latvia. In the first place, there is a lack of demand for VCF investment from innovative companies. It seems logical that the low demand for VCF investment should have a negative impact on the quality of selection of companies for investment. This, in turn, has a negative impact on the results of VCF investment subsidized by the state.

Let us compare the number of applications received from enterprises in 2016 and the number of companies registered annually in Latvia. In 2016, only 11,206 new companies were registered in Latvia (Lursoft, 2017). Accordingly, in 2016, applications for VCF investment were submitted by 568 companies or about 5% of the total number of annually registered companies. 0.33% of the number of annually registered companies obtained VCF investment. The data on the number of investments made by VCFs in Latvia for 2016 practically coincide with the data for 2015 – 0.35%, which is almost 6 times less than the average European indicator and 40 times less than in the US (Prohorovs and Beizitere, 2015).

Table 2 presents data on the amount of investments made by state-subsidized VCFs in Latvia. In total, 85 investments were made in 2015-2016. Let us compare the number of investments made with the number of applications received for VCF investment.

Table 2

The number of investments made by VCFs in 2015-2016 (including 21 investments made in the form of soft loans).

Year/Number of applications considered and investments made	2015 (Q-ty)	2015(%)	2016 (Q-ty)	2016 (%)	Total in 2015-2016	2015-2016 (%)
Total number of investments made	47	-	38	-	85	-
Number of investments made in innovative companies	19	40.4	9	23.7	28	32.9
Number of investments made in non-innovative companies	28	59.6	29	76.3	57	67.1

Source: Authors' data (based on a survey of VCFs in Latvia)

In 2015-2016 state-subsidized VCFs in Latvia made investments in 6.3% of companies that submitted applications. Based on the data presented in this section on the ratio of companies filing applications and receiving VCF investments in the US, Europe and the UK, it can be concluded that the share of investments made in relation to the number of applications received was 25 times more than in the US. And it was almost 12 times more than in Europe and 3.5 times more than in the UK's regional VCFs. These data may indicate either a very high quality of applications for investment or a low quality of the selection of investment projects. According to the available data, as of 1 September 2017, none of the projects reviewed in our research received investment of the A round. Of the previous two VCF generation programs (the Programs of 2007 and 2010), only one portfolio investment provided a successful exit (sale of the company Naco Technologies to a strategic investor). Therefore, we suppose that the project selection ratio of 6.3% is the result not of a high quality of investment projects, but of a low demand for VCF investment in Latvia and not enough stringent criteria for selecting projects from the VCF side.

Applications for financing from young innovative companies and VCF investments in young innovative companies

Table 2 shows the number of investments that have been made in innovative companies. The share of VCF investment in innovative companies was 32.9%, which is lower than the share of applications from innovative companies (42.5%). Meanwhile, VCF investment in innovative companies was even less – 29.6% (Table 3.) For comparison, in the Estonian Development Fund, which invested in new technologies jointly with private investors, the share of innovative companies was 2/3 of the number of investments (Kitsing, 2013; Estonian Development Fund, 2013). That is, the share of investments of Estonian state VC with the participation of private investors in innovative companies was 2 times more than that of the VCFs of Latvia. If we deduct from the investment of all five VCFs examined in the research the investments of one fund, which, in accordance with the investment memorandum of the fund, finances only young technology companies, it turns out that the share of investments of the remaining four VCFs in innovative companies will only be about 24%. However, according to Cumming and Johan (2009), pre-seed VCFs subsidized by the government invest in high-tech companies no more than private VCFs.

The fact that VCFs subsidized by state capital avoid financing young innovative companies and seek to finance the activities of non-innovative companies is confirmed by earlier data that, despite the fact that state-subsidized VCFs are the first investors in 66.7% of cases, they made 55.3% of the investment in expanding the activities of non-innovative companies (Prohorovs and Jonina, 2017).

We also calculated that the share of investments given to innovative Latvian companies (in relation to the applications received from them) was 4.9%. (The share of financing of non-innovative companies by Latvian VCFs in relation to the number of applications received was 7.4%). That is, the criterion of "stringency" of selection of innovative companies from VCFs in Latvia was only 1.5 higher in relation to non-innovative companies that received investments from state-subsidized VCFs.

We also estimated that, of the investments made by VCFs in innovative companies, 89.8% was made in companies whose age does not exceed three years. Of 28 innovative companies that obtained VCF investment, 24 companies were under three years old. These facts show that among innovative companies it is the young innovative companies that are applying for investment from state-subsidized VCFs.

It could be assumed that one of the goals of state-subsidized VCFs is to finance young innovative companies. RandD and innovativeness are key to a (potential) company / national champion (Schlepphorst, 2016). Moreover, the ability to turn ideas into new products and services that people need is a source of prosperity for any developed country, since economic growth is due to new technologies and their creative applications (Sappin, 2016).

It is VC investment that provides financing for young innovative companies with the potential for rapid growth (Prohorovs and Pavlyuk, 2013). In this light, the beneficiaries of VCF investment should be young innovative companies. To some extent, financing of young innovative companies could justify the not-so-stringent selection criteria for portfolio companies on the part of VCFs subsidized by the state. That is, state-subsidized VCFs could concentrate on financing only young innovative companies, as such companies cannot obtain bank financing (Veugelers, 2011; Reid and Nightingale, 2011; Snieska and Venckuviene, 2011; Prohorovs and Jakusonoka, 2012).

The data we obtained testify that state-subsidized VCFs in Latvia do not seek to finance young innovative companies. In our opinion, the main reason for this is the highest level of information asymmetry in the financing of young innovative companies.

The amount of VCF investment, the number of portfolio companies and forms (types) of investment

In the process of researching the quantitative indicators of supply of state-subsidized VCFs in Latvia, we revealed that, of investment made by VCFs in innovative companies, 41.7% was made in the form of equity investments and 58.3% in the form of convertible loans. That is, of 28 innovative companies that received state-subsidized VCF investments, 16 received not equity investments, but a convertible loan. This fact may indicate that VCFs subsidized by state capital widely apply methods of financing of private VCFs and are also cautious about investing in innovative companies, despite their small share among portfolio companies. Table 3 shows other quantitative indicators of state-subsidized VCFs.

Table 3

Investment in innovative and non-innovative companies made by VCFs in 2015-2016

Year/Investment made	2015 mln. EUR	2015 (%)	2016 mln. EUR	2016 (%)	Total in 2015-2016 mln. EUR	2015-2016 (%)
Total investment made	18,496	-	13,882	-	32,378	-
Investment made in innovative companies	5,951	32.2	3,620	26.1	9,571	29.6
Investment made in non-innovative companies	12,545	67.8	10,262	73.9	22,807	70.4

Source: Authors' data (based on a survey of VCFs in Latvia)

The average investment of the five VCFs in portfolio companies was 381 thousand EUR. However, if the number and volume of investment of VCFs specializing in seed financing and the fund that specializes in investing in later stages of financing is deducted from the total number and volume of investment of all VCFs, the average investment of "universal" VCFs with state capital will be 509 thousand EUR. Let us compare the investment of "universal" VCFs with the investment of VCFs specializing in seed financing of high-tech innovation companies. The average investment made by these seed VCFs in the form of soft loans amounted to 50 thousand EUR. Meanwhile, the amount of investment made in the form of convertible loans and/or equity amounted to 108 thousand EUR. Hence, the volume of average investment by “universal” VCFs was 4.7 times higher than in VCFs that focused on seed-stage financing.

On average, the portfolio of universal VCFs had about 20 companies. Since the average investment of universal funds was 5 or more times higher than the investment of seed VCFs, it can be assumed that the second reason for the lack of desire to finance innovative companies (except for a higher level of information asymmetry) is the relatively small amount of investment in young innovative companies. Each of the universal VCFs we considered had an average capital of about 10 million EUR. Therefore, a decrease in the average investment from 509 thousand EUR to, say, 200-300 thousand EUR doubles the administrative burden on VCF managers. It seems logical that with a fixed commission fee for managing VCFs, it would not be beneficial for managers of small-sized VCFs (GPs) to reduce the indicator of the average investment amount.

CONCLUSIONS

Having conducted research on the structure of the demand and supply of state-subsidized VCFs, we fully confirmed our hypothesis that most of the investments made by state-subsidized VCFs in Latvia are not investments in young innovative companies. The share of young innovative companies that received VCF investments was 28.2%. It should be noted that among all innovative companies that received investments from VCFs, young innovative companies received 89.8% of it. This fact shows that when investing in innovative companies, state-subsidized VCFs prefer to invest in young innovative companies.

We found out that the share of applications for VCF investments from innovative companies was 42.5% and the quantitative share of VCF investments among innovative companies was 32.9%. That is, the share of applications that received state-subsidized VCF investments among innovative companies was 1.5 times less than that of non-innovative companies. The volume of VCF investments made by VCFs in innovative companies was even less – 29.6%. The share of investments in innovative companies of the three universal VCFs and one VCF specializing in the late stages of VC investments was only 24% of the amount of investments made by these funds.

The data we obtained show that, unlike VCFs of the US and the UK, Latvian VCFs subsidized by the state and not specializing in financing innovative companies in the initial stage of financing do not seek to finance young innovative companies (and innovative companies).

Firstly, it is likely that VCFs face the fact that innovative companies that seek investment not only have a higher level of information asymmetry, but also correspond less to the funds' investment criteria compared to non-innovative companies. Secondly, however, comparing the size of VCFs, their specialization in financing stages and the amount of investment they made, it can be concluded that it is not economically profitable for VC funds to fund innovative companies in the initial stages of financing with a fixed commission for managing the fund. This is confirmed by the fact that the average investment amount of a Latvian universal VCF is 4.7 times higher than the average investment amount of a VCF specializing in financing young innovative companies. This means that with a small fund (in our research – three funds of 10 million EUR each), each of these funds would have to make not ~20 investments, but ~90, which would significantly increase the administrative expenses of the fund. The results of our research show that the third reason for VCFs' unwillingness to invest in young innovative companies is the small demand for VCF investment from innovative companies (only 42.5% of the total number of applications). Herewith the demand indicators for VC investments are low not only among innovative companies but also among all companies in Latvia. In 2016, only 568 companies submitted applications for investments to VCFs, or about 5% of the number of annually registered companies. VCFs invested in 0.33% of the number of companies registered annually in Latvia. We also compared the data we obtained on the ratio of demand for VC and the supply of VCF venture capital in Latvia, with similar data on demand and supply of VC in the US, Europe and the United Kingdom.

State-subsidized VCFs in Latvia made investments in 6.3% of companies that submitted applications. The share of investments made in relation to the number of applications received was 25 times more than in the US. And it was almost 12 times more than in Europe and 3.5 times more than in the UK's regional VCFs. These data may indicate the low quality of the selection of the companies to invest in, due in part to the low demand for VC investment.

It is possible that Latvian VCFs subsidized by the state, in order not to lose some of the state financial resources allocated for investment (as this will reduce the commission income for the management company), finance lower quality companies and companies that are not suitable for VC investments. That, in turn, can have a negative impact on the results of the investment from state-subsidized VCFs.

It is obvious that applications for VCF investments of poor quality should be rejected. It follows from this that there cannot be an equilibrium between supply and

demand for VC investment. Therefore, the goal of government incentives for VC, along with ensuring the financing of innovative projects, should be to balance the quality supply and demand of VC, instead of supply and demand in general.

The data of our research show that in Latvia, the major bottleneck in this balance is the lack of quality demand for VC.

The availability of supply from local universal state-subsidized VCFs is not the primary factor hindering the financing of innovative Latvian companies. VCFs of Latvia subsidized spent 67.8% of VCF investments for 2015-2016 (EUR 22.8 million) on financing non-innovative companies. In our opinion, this amount of financing could be aimed at developing and improving the quality of demand for VC among innovative companies and, possibly, improving the quality of VC supply.

There are at least three reasons for such a proposal. Firstly, in recent years the probability of promising companies obtaining investments has increased due to the fact that VC has become very internationalized (Lerner, 2010). Secondly, the likelihood of promising young innovative companies obtaining VC investment in recent years has increased due to a very significant growth in crowdfunding. (The volume of the equity crowdfunding market in 2015 amounted to 2.5 billion US$. In 2015, the total investment from crowdfunding exceeded the investment of business angels and is about 70% of VCandPE investment (Crowdfunding Industry Statistics 2015-2016)).

Thirdly, as the Latvian economy develops, the number of private VC investors, including business angels, investment companies and regional VCFs ready to finance promising companies, is increasing. On the basis of the data we obtained, we believe that the calculation of the qualitative demand (the necessary volume of venture investments), the number of quantitative and volumetric indicators of VC demand, could be applied based on the number of young innovative companies applying for VC investment. For this, the proportions of the number of applications and the number of investments could be applied, for example, 2% (slightly higher than in regional funds of the UK and 4 times higher than in Europe in general). This value should be multiplied by the average amount of investments received by a similar category of companies for the previous year. As there are changes in the indicators of the country's economic growth and fluctuations in investment cycles for venture investors, it is necessary to adjust the indicator obtained taking into account possible changes in these two parameters.

RECOMMENDATIONS FOR FURTHER RESEARCH

One of the relevant issues for state support of VC is the criteria for selecting companies for investment from state-subsidized VCFs (or other forms of state support of VC investment in innovative companies). The scientific literature applies the term "young innovative company", often adding "with the potential for rapid growth". However, to some extent almost every company is innovative. Therefore, a certain classification or a scale of levels of innovativeness and criteria of “youth” for companies is required. Of course, one could be guided by whether the company developed a disruptive innovation in accordance with the theory of disruptive innovations by Clayton Christensen (Christensen, 1997). However, a very small number of young innovative companies can create disruptive innovations. Probably, it is possible to consider the criteria for assessing the innovativeness of companies, such as referring to the company's products as high-tech or identifying the level of added value in the company’s product. Determining the criteria for companies’

belonging to the categories of innovative and young so that state-subsidized VCFs can select them for financing may have both theoretical and practical significance.

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