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Emerging VC Industry: Do Market Expectations Play the Most Important Role in Project Selection? Evidence on Russian Data

I. Rodionov, A. Semenov, E. Gosteva, O. Sokolova

***Abstract*—**The venture capital becomes more and more advanced and effective source of the innovation project financing, connected with a high-risk level. In the developed countries, it plays a key role in transforming innovation projects into successful businesses and creating the prosperity of the modern economy. In Russia, there are many necessary preconditions for creation of the effective venture investment system: the network of the public institutes for innovation financing operates; there is a significant number of the small and medium-sized enterprises, capable to sell production with good market potential. However, the current system does not confirm the necessary level of efficiency in practice that can be substantially explained by the absence of the accurate plan of action to form the national venture model and by the lack of experience of successful venture deals with profitable exits in Russian economy. This paper studies the influence of various factors on the venture industry development by the example of the IT-sector in Russia. The choice of the sector is based on the fact, that this segment is the main driver of the venture capital market growth in Russia, and the necessary set of data exists. The size of investment of the second round is used as the dependent variable. To analyse the influence of the previous round, such determinant as the volume of the previous (first) round investments is used. There is also used a dummy variable in regression to examine that the participation of an investor with high reputation and experience in the previous round can influence the size of the next investment round. The regression analysis of short-term interrelations between studied variables reveals prevailing influence of the volume of the first round investments on the venture investments volume of the second round. The most important determinant of the value of the second-round investment is the value of first–round investment, so it means that the most competitive on the Russian market are the start-up teams that can attract more money on the start, and the target market growth is not the factor of crucial importance. This supports the point of view that VC in Russia is driven by endogenous factors and not by exogenous ones that are based on global market growth.

***Keywords*—**Venture industry, venture investment, determinants of the venture sector development, IT-sector.

I. Introduction

AMONG different types of start-up financing possibilities, venture capital stands alone because it possesses the unique characteristics of financing terms at the beginning of their life cycle, which allow mitigating risks.

Venture capital companies and individual venture investors play an important role in the economic activities in the innovative sector. They are intended to finance new, growing companies that possess high levels of risk, but have substantial growth potential.

The topic of venture investments as a non-traditional way of financing different start-up projects has been booming in the last decades. The focus of venture investors is mostly directed to the companies that demonstrate dramatic growth rates or significant market potential. Considering plenty of success stories of venture financing and the scale of venture market (35-40 billion dollars per year in the world), the strong attention of researchers is focused on the tendencies and determinants of venture investment development at the level of particular company.

Considering the dynamics of venture investment development in Russia in the last years and growing need for data-mining, trend estimation, the research on drivers and constraints to development of start-ups, financed by venture capital, is an actual task. Nowadays, there is still a lack of published fundamental econometric researches on the venture investments in the innovative projects of Russian companies including modern methods of empirical analysis. The vast majority of works on Russian VC market is descriptive and based on the high-level analysis of aggregated statistical reports.

The situation with data gathering in this field caused some major difficulties for researchers because of its inconsistency. Many details of announced deals were under a non-disclosure agreement, and the figures on many important deals are unpublished. In 2013, the rocket growth in the flow of new deal data was registered, new databases and sources appeared, and appropriate information was disclosed for many deals. All these facts opened the way for conducting the deeper econometric research on Russian venture capital data, which was earlier impossible because of the inappropriate size of the possible data sample. The results obtained in this study are based on the recent information aggregated by RusBase portal [1], PwC [2], FastLane [3] data and Thomson Reuter's informational terminal.

Despite the absence of empirical research on this topic, the international experience is full of significant studies of the similar kind. So, the subject of this research was Russian

Alexandr Semenov and Olga Sokolova are with the Department of Finance, National Research University Higher School of Economics, Moscow, Russia (phone: +7 905 7462567, +7 925 2611651; e-mail: semenov.venture@mail.ru, o.sokol95@gmail.com)

Ivan Rodionov and Eleonora Gosteva are with the Department of Finance, National Research University Higher School of Economics, Moscow, Russia (e-mail: irodiono@mail.ru, eleongost@gmail.com)

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companies operating in the information technology sector (IT) and attracting venture capital investments.

This work is the first Russian detailed analysis of determinants of the IT-sector venture deals that have taken place from 2010 to the first two-quarters of 2014. Sixty-nine companies that attracted venture capital investments are investigated. The result of the work is the dependence that was explored between the responding variable, which is the second round investment values, and the explanatory variables; the first round investments values, participation of investors with first-class reputation, and the growth rate of market sector, in which the invested company operated.

According to that aim, the following tasks of the study have been formulated:

- To collect the sample of Russian venture deals.
- To collect data by the basic parameters of companies.
- To find key determinants of the Russian venture development (by studying foreign academic research).
- To detect the drivers of the venture capital attraction (Using empirical analysis).

This work consists of an introduction, three sections and conclusion. The list of references is also provided. Section 1 is the description of the venture industry and the review of the academic literature that is devoted to the venture capital analysis. Furthermore, in Section II the methodology of the research is discussed, and hypotheses are set out. After that, in Section III, the model is outlined, with the high-level regression variables.

II. Review and Background

A. Basic Information

During the last 20 years, Russia has been trying to build an effective hi-tech market system. The development of innovations and technologies is commonly considered as the best way to success. Existing advantages of previous early-stage financing alternatives, for example public-based, often are not able to solve appearing problems of lack of capital available for seed and start-up projects.

Venture capital takes a special place in the innovation development and is considered a good solution. The venture money is the capital of investors that is involved in the financing of new growing firms with a rather specific deal pattern. The markets where venture capital operates differ from other types in some characteristics: the high level of risk, innovative nature of the subject, possibility of changing the market structure where the business operates, and an investor has enormous profit opportunities in the projects in case of success. Such famous companies as Intel, Microsoft, Google, Yandex, etc. appeared due to the participation of venture capital and succeed because of venture funds.

Russia became the highest growth venture capital market of Europe in 2011-2012, having climbed to the 4th place by the available venture capital volume in the high-tech sector by the 2012 totals [4], but due to the short story of Russian VC, and small number of exits we still cannot say that this trend is stable.

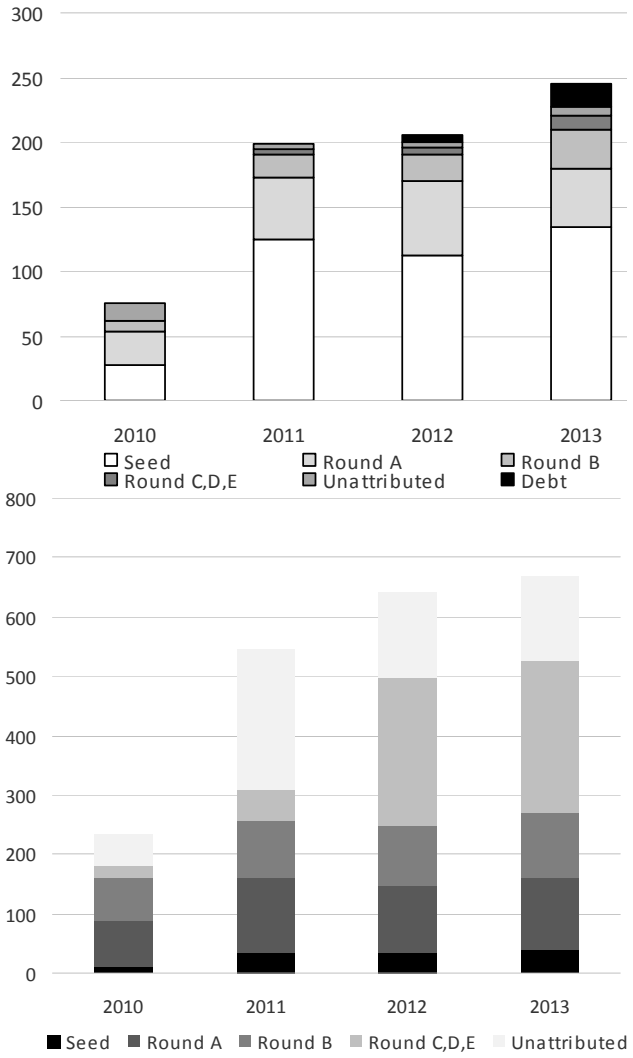

Fig. 1 Total number and the total amount of the venture IT deals, 2010-2013 [5]

The presented charts illustrate that the volume of the Russian venture capital market was doubled in 2011. In 2012, the market growth ratio amounted 18% versus 4% in 2013. At the same time, there were 205 deals in the amount of 643 mln. USD in 2012 with 245 deals in the amount of 667 mln. USD in 2013.

Thus, despite the fact that growth of the market has slowed down in 2013, the number and total amount of investments still grow. According to Thomson Reuters' customer, support the number of venture transactions in the first half of 2014 reached only approximately 70 units but the average sum of investments totaled 2.71 million dollars that is much higher than for previous period.

The performed successful investors' exits became the main growth driver of the venture capital market in Russia. It is the most important indicator of the market development. The positive tendency of exists will stimulate further capital

inflows to Russian venture industry and promote its development.

The growth also is driven by investments in IT-sector, whose main driver was the enormous growth of online retail. This market segment in Russia offers some easy innovation opportunities with a relatively short return on investments.

The volume of venture investment in the Russian IT sector in 2012 increased by over 50% to exceed USD 450 million. In 2013, it accounted for almost 87% of deals – 213 deals, and 93,5% of total investments – 623 mln. USD.

The venture company as the subject of investments has the following stages of development:

- The seed stage (the stage when the idea of the business appears, and only the first investments are made).
- The start-up stage (the beginning of the business).
- The early stage of the project (the project is gradually reaching the break-even point).
- The growth stage (the model of realization proved its successfulness, expansion of the business).
- Pre-IPO stage.
- Selling stage (investor sales the share by Initial Public Offering (IPO), Managerial Buyout (MBO), Trade Sale, Leveraged Buy-Out (LBO) or other ways).

There also can be other stages like pre-seed stage or late growth mezzanine stage.

It is necessary to notice that these six stages describe the «classic» successful venture project. Moreover, most projects do not have the final stages because of bankruptcy. In that work would use terms «first» and «second» round without the reference to the stage.

B. Literature Review

To underpin the methodology, which is proposed in the next sections, the extensive literature review is given. The review is chronological, and will also provide the sample details and the methodology summary.

One of the first articles on the topic was the work by [6]. The aim of this framework was to assess the importance of the factors numerically, which are interpreted by venture investment specialists to provide a definitive decision on the investment in the start-up. As the financial statistics were not available to the necessary extent at the time, the researchers had to use expert opinion as a key method. After carrying out a survey on 41 venture funds, five main stages of a venture investment deal were identified.

These main stages included:

- Deal origination, meaning the information about a project reaching the interesting parties.
- Deal screening, the high-level primary selection of deals that did not fit the criteria of the venture investor.
- Deal evaluation, the deep analysis of the projects, e.g. the projected returns and inherent risks, the assessment of the start-up non-numerical data. As a result of this stage, a weighted score is obtained implementing all the available data. Consequently, a decision on the investment is made.
- Deal structuring, this stage happens in the case of an accepted project and includes the transaction negotiations on the price, share to be bought and minor juridical issues, associated with the transaction.
- Post-investment activities, which implies a stage when an investor actively participates in the operational activities of the invested company.

Obtaining a sample of 90 deals, which reached the 3rd step from 41 funds (while being rejected by 100 for confidentiality matters), the researchers required additional data concerning the qualities of the project. To get it, they gathered information on 23 characteristics of each project (including required return and risks). Most of the companies in the sample were from the electronics industry, on average requiring 1 mln. USD of external financing. After the analysis of the results, the criteria were narrowed down to 5 basic ones. The list is provided below:

- Market attractiveness (the market share, growth opportunities, the level of monopolization).
- The level of product differentiation (the uniqueness of the product, patents, innovative technology).
- Quality of management (professional level of managers in areas of finance, marketing).
- The stability in case of external shocks (the level of technological development of the market segment, business-cycle susceptibility, stability in case of recession).
- The exit strategy possibilities (potential opportunities for M&A (Mergers and Acquisitions), IPO, LBO, MBO and other possibilities of exit).

The regression analysis of the data showed that for the calculation of the required return of the project investors use such factors as the market attractiveness and level of product differentiation (R2=0,22), and for the risk assessment the quality of management criteria and stability are most relevant (R2=0,33). Moreover, the analysis proved that in 89,4% of the cases the result of an investment decision was dependent on the risk/return ratio.

It is important to note that comparing the results with previous works; the researchers emphasized the same key factors on project evaluation stage. At the end of the research project, seven representatives from venture funds were invited. The results of the analysis proved to be satisfactory. However, the experts thought that the management role was overvalued as a key factor, and some of them pointed out that it should be more relevant in the risk assessment, but not in the return assessment.

In another relevant article [7], the venture investments were analysed from the point of view of the presence of successful venture projects in the same region. Working with the 1000-deal sample, the research was concentrated mostly on the San-Francisco, Boston and New-York areas since these areas have most start-ups that were venture-financed. In conclusion, a positive relation between a number of venture funds and a number of successful venture projects in each city was found. However, the success of venture projects in the “home” region was more significant than of the projects financed by the same companies but in other regions, in terms of returns.

The research [8] tried to estimate the impact of personal qualities of a venture fund manager on the funds' financials. Based on the sample of 1184 funds, the conclusion was that the experience of venture financing proved to be crucial, and the managers have a significantly large number of companies in their portfolios. The start-up management experience nearly doubled the strength of this relationship. It is also interesting to note that at the seed stage the impact was the strongest, other stages were much less influenced by the managerial experience.

The article [9] focused on another issue arising from the venture investment decision. The authors analysed the bias of venture investors towards the start-ups created based on the educational institution rather than a private project. The sample of 247 companies was also divided between venture funds and public funds. As a result, the hypothesis of such a bias was rejected. The amount of venture capital raised by venture was deemed most dependent on intellectual property rights, the business model and the prestige of the educational institution.

Another branch of articles focuses on the determinants of the venture activities from the macro-economic standpoint. The first article under review from this sphere is by [10]. The research was focused on the drivers of venture capital investments in Western Europe. Analysing the issue from the narrow definition of venture (seed-stage) and wider (later financing stages), the conclusions were drawn that the key drivers are liquidity and the capitalization of the stock exchange in the region, human capital potential and the stability of labour market. The regressions, however, proved that at the later stages of financing the results are independent of these issues.

Another study, addressing the same issues from a different perspective, is the one by [11]. The hypothesis tested empirically in the article was about the level of dependence of venture capital activities on the size of the M&A market. The sample included companies from 23 countries for the period 1998-2003. The null hypothesis was proven, in that case, the relevance of M&A market was significant. Moreover, the level of entrepreneurial activities and unemployment rate played a major role in the volume of the venture capital market. The issues, which were highlighted for the future research were mostly considering the asymmetric information and the exit environment.

An analysis of the cross-country data is also a valid source of knowledge about the venture financing. The study [12] was focused on the macro-factors of venture capital activities. Among the variables in the model were the GDP, IPO number, data on the capital markets, etc. The results showed the significance of IPO market for the success of venture investing, especially in the later stages, since the exit strategy is an important factor then. The government-owned venture capital funds showed little relationship with economic variables, and that have proven to be a good ground for future research.

Since the cross-country data proved to give some valuable insights into the venture capital markets, another source of a relevant hypothesis can be found in studying venture financing for funds investing domestically and internationally diversified funds. This issue was researched in [13]. The sample was based on the Chinese companies and proved that the results of venture investing were strongly dependent on the amount of experience of the fund in the country's operations. The networking, relations and value created by it are the keys to venture capital success in a particular investment. Therefore, investing locally was in most cases the better strategy.

III. Data and Methodology

A. Data Sources

The analysed data for Russia was collected based on the RusBase – a web-project that collects information about the venture market [1] and Thomson Reuters' one [4]. Moreover, FastLane Ventures base was used [3]. It is an investment company that creates and develops successful internet businesses using their unique model, and it publishes annual reports. Furthermore, the annual analytic reports of PricewaterhouseCoopers for Russian VC market were used [2].

As a result, there are taken into consideration venture investments made by business-angels, investment companies, and private, corporate and state venture funds in the first round of financing, according to open data sources. If a company attracts investments during two or more rounds, then every round is seen as a separate deal.

According to some experts, the modern conditions for creating the venture industry in Russia are becoming more favourable due to active government policy and intensive growth of the IT-sector (Information technology sector). Therefore, only Russian IT companies are investigated in this paper.

TABLE I
Regression Statistics

Multiple R	0,624261		
R Square	0,389702		
Adjusted R Square	0,362376		
Standard Error	25,12874		
Observations	71		
	Coefficients	St. error	P-value
Intercept	2753991	3910360	0,4864
1 round	1,312883	0,225755	1,90E-07
branded investor	7072816	4513371	0,12181
market growth	-81170,6	102812	0,4326

B. Selection Methodology

The sample of more than 120 companies that attracted venture investments was formed on the base of the mentioned sources. Then, the companies that attracted venture capital more than once were selected. Finally, 69 companies with all relevant information are taken into account.

The information required is about the value of investments in the first and second rounds, the name of the business-angel, an investment company, a private, corporate and state venture

fund and the date of the deal. The investor was considered reputed if it has successful exits or represents a serious brand, such as Intel Capital or Mail.ru Group.

All companies in the sample operate in such markets as IT services, mobile apps, protection from leaks of confidential data. This information is completed by the forecasted market growth on the moment of the deal. It was supposed that in the process of decision-making investors focus on market trends and uses the estimations of market growth forecast provided by leading marketing agencies at the moment of the deal. This factor is the main landmark for investors' decisions. So the market growth predictions made by the leading Russian marketing agencies were also taken as a variable.

C. Hypothesis

The value of investment of the second round is influenced by such factors as the value of the first round deal, the participation of a reputed investor and also the forecasted data about the market growth.

H1. There is supposed to be a stable positive relationship between the second round investments and the first round ones. It is possibly based on the factors connected with the company's operating process ('enough money is required to pass the first stage'), and the fact that in Russia *the money available for the company is the most crucial factor of competitiveness (not the operating skills)*. On the other hand, the participation of experienced (reputed) investor in the previous round can influence the size of next investments.

H2. The participation of an experienced (reputed) investor can influence the next rounds negatively because they are supposed to be thrifty and economize.

H3. Finally, because of the anticipation of a dramatic increase in the volume of investments after the deal, experienced investors choose the optimal level of their investments that is lower than the level of others.

IV. Model

The sample consists exclusively of Russian companies, which operate in the IT sector and had some kind of venture transactions for the period under review. Number of observations, representing considered companies, that is discussed in this context, is equal to 69 units, and the reviewed period is from 2010 to the first quarter of 2014. The responding variable of the regression is a value of the second round investment. It is nominated in US dollars. The explanatory variables are the first round investments values, the participation of investors with first-class reputation, and the growth rate of the market sector.

The "reputed investor" is the investor that is well known in the venture market (took part in plenty of successful deals or makes big investments or this investor is an expert in the field he invests in) or the fund with corporate participation. This is supposed to be a dummy variable: 1 – the reputed investor takes part in the deal unless 0.

As for market growth, it is different for all parts of the highly diversified IT-sector. Therefore, it is relevant to check this influence on investment decisions.

The best way to estimate this influence is the Ordinary least squares method.

Regression statistics is presented in Table I, the parameters of the regression are in Table II.

So that, the getting model is the following:

$$Y = 2753991{,}1 + 1{,}3128833X_1 + 7072816{,}2X_2 - 81170{,}57X_3 \quad (1)$$

Y - the value of investment of the second round; X_1– the volume or the first round investments are significant at a level of 1%; X_2– the participation of branded investor is significant at a level of 15%; X_3– the forecasted market growth now of deal is non-significant variable.

The positive dependence between Y and X1 that is demonstrated by the model (1) is evident: investments in the previous stage attract the following investors. So the H1 is not rejected. The participation of branded investor in the first round influences the second round investments positively since investors trust them and try to follow their way. So the H2 is rejected.

The market growth is insignificant variable. Moreover, the dependence is negative. It is important to conclude that this variable is not the factor all investors pay attention to – H3 is rejected.

So that there is a regression (2) which has two significant regress variables from the last model:

$$Y = 999316 + 1{,}330758X_1 + 7051297X \quad (2)$$

where Y - the value of an investment of the second round; X_1 – the volume or the first round investments; X_2 – the participation of branded investor.

Both regressors (1) and (2) now are significant (significance level – 12%). As it can be seen from the descriptive statistics, the dependence between Y and X_1 and X_2 remains positive.

TABLE II
REGRESSION STATISTICS

Multiple R	0,619697		
R Square	0,384025		
Adjusted R Square	0,365908		
Standard Error	186964		
Observations	71		
	Coefficients	St. error	P-value
Intercept	999361	3208437	0,7564
1 round	1,330758	0,223994	1,08E-07
branded investor	7051297	4500771	0,12183

V. Conclusion

The main conclusion of this empiric research is that investments in the previous stage attract the following investors stimulating the further capital inflows to Russian venture industry and promote its development. Expected market growth of target companies plays the secondary role in investment decisions. So, the endogenous factors are

predominant, and the global market growth rates play the second role. The VC continues invest in companies who have attracted investors and reputed investors among them, not in trends.

The world experience shows the efficiency and importance of venture schemes for the financing of risky early-stage projects. Venture investments are a good instrument for the competitive battle for the most valuable and promising start-ups and projects. However, the topic has not been adequately investigated from the point of view of determinants of venture capital activities in Russia at the macro and micro-economical level. In this research project, the focus was maintained on the determinants of the volume of successful venture capital investments based on the emerging market sample. The results proved that the venture capital in Russia can be explored econometrically and allow future analysis.

TABLE III
THE STATISTICS USED

Responding variable	Explanatory variable 1	Explanatory variable 2	Explanatory variable 3	Responding variable	Explanatory variable 1	Explanatory variable 2	Explanatory variable 3
400000	1600000	1	20	**874611**	2000000	1	20
135868	65500	0	12	**70000**	500000	0	9
10000000	6600000	1	20	**12000000**	5000000	1	19
25000000	8300000	1	9	**8000**	55000	1	68
1000000	500000	0	68	**40000**	30000	0	5,4
200000	200000	0	68	**17000**	67000	0	20
75000000	26000000	1	19	**1000000**	10000	1	68
25000	350000	1	9	**2000000**	2500000	0	9
40000	100000	1	9	**40000**	100000	0	68
2500000	50000	1	5,4	**1000000**	400000	0	9
500000	250000	1	9	**2000000**	2400000	1	19
100000	150000	0	5,4	**1000000**	200000	1	5,4
700000	300000	0	7	**3000000**	1600000	1	9
50000000	1000000	1	19	**30000**	250000	0	5,4
1200000	30000	1	9	**25000**	167000	0	9
1000000	30000	0	68	**100000**	200000	0	5,4
80000	50000	1	68	**200000**	100000	0	68
4000000	600000	1	5,4	**500000**	300000	0	19
163000	900000	1	20	**1000000**	25000	0	5,4
250000	500000	0	25	**10000000**	1000000	1	68
25000000	3300000	0	19	**80000000**	80000000	1	5,4
900000	500000	1	20	**30000**	20000	1	9
40000	25000	0	5,4	**1000000**	100000	0	9
750000	150000	1	9	**450000**	2000000	1	5,4
1,3E+08	16000000	1	5,4	**2900000**	1600000	0	8,4
139000	200000	1	19	**2500000**	2500000	0	8,4
20000	20000	0	20	**1000000**	500000	1	28
730000	500000	1	5,4	**190000**	100000	1	24,3
10000000	3000000	1	20	**1000000**	600000	1	8,4
6000000	7000000	1	19	**2500000**	1000000	0	24,7
16000000	9000000	0	5,4	**13000000**	1600000	0	11
20000	20000	0	5,4	**4500000**	4000000	0	8,4
1E+08	5500000	1	9	**20000**	20000	1	77
750000	220000	0	9	**2000000**	1750000	1	8,4
1000000	500000	0	9	**10000000**	10000000	0	77

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