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Where is the EXIT? – The Exit Characteristics of Venture Capital Through the Case of Hungarian JEREMIE Investments

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ABSTRACT

For developing markets, including those in the Central and Eastern European region, the available data on the venture capital sector at the investment level are rather limited. While surveys on investment activity and capital outflows are becoming more comprehensive, the study of firm-level effects, in particular exits, is considered a major research gap. Using one of the most active venture capital markets' example in the region, this paper examines the exit characteristics of firms in the region by exit type, as well as the main financial characteristics that influence each exit method. Our analysis is based on a unique hand collected dataset covering the entire population of the Hungarian JEREMIE investments including the data from 340 companies that received funding between 2010 and 2016. The approach includes a detailed assessment of key financial metrics, such as revenue growth, to understand their impact on exit events. Firms are classified into three categories based on exit mode, which are sale to 3rd party, manager buy-back and failed exit. Logit models were used to examine the factors influencing each exit mode. Our results show that among the financial characteristics, rapid revenue growth is considered to be the most important success factor, while financial characteristics can explain exit types only to a small extent. Due to the significant regional state involvement, the characteristics of exit types do not necessarily coincide with the exit patterns of traditional market-based investments despite of the hybrid investment strategy. The study addresses a significant research gap concerning firm-level effects, particularly exits, in the venture capital sector of the Central and Eastern European region. Due to significant state involvement, the characteristics of exit types do not necessarily align with those of traditional market-based investments. This discrepancy underscores the differences inherent in hybrid investment strategies and emphasizes the unique economic context of the region.

INTRODUCTION

The European venture capital market is still lag behind the US market (Karpa and Grginovic, 2019), and the industry in the Central and Eastern European region is underdeveloped compared to developed countries and faces significant new challenges due to the increase in regional risks (Karsai, 2022). The importance of the topic is heightened by the fact that many countries in the region have faced the problem of the middle-income trap in the process of economic convergence. One of the ways to overcome this is to create an ecosystem that supports the development of high value-added enterprises, of which the venture capital sector is an integral part. Overcoming the financing constraints of these firms can contribute to higher innovation performance (Khalid et al., 2023; Bontempi et al., 2024; Juskaite et al., 2024).

In recent years, venture capital research has increasingly relied upon extensive databases. While in advanced sectors, the processes ranging from resource acquisition, investments, and their impacts on company performance to exits are well-mapped areas. On the other hand, the available data in developing markets, including the countries of the Central and Eastern European region, is notably limited. Zinecker et al. (2021) highlighted that more focused data gathering is required to enhance the development of the financing of the startup entrepreneurial system. This holds particularly true for in-depth analyses of exits from ventures on larger samples.

The present study aims to address the gap existing in the context of venture capital exits. Specifically, when exits occur outside the public market, the characteristics of equity sales are considered confidential data. Consequently, the analysis of exits has long been an uncharted territory, even in international markets, especially when conducted through non-public market mechanisms. This gap has been partially alleviated by international organizations relying on voluntary disclosure-based databases. However, these analyses primarily pertain to more developed markets. In the case of developing markets, such as the Central and Eastern European region, the examination of exits has predominantly been conducted through case studies and individual instances. While studies in Hungary's venture capital market have presented exits through case studies, a comprehensive analysis of exits on a large sample has not been undertaken previously. This study seeks to narrow this research gap through the analysis of JEREMIE investments' exits. JEREMIE venture capital programme had a significant role in the regions' venture capital market, as it was introduced in many countries besides Hungary.

The analysis of exits is done through the identification of the type of exits. While actual returns on exits from JEREMIE investments are not available due to the confidential nature of the data, the types of exits can be indirectly identified through an examination of the composition of the ownership structure. Accordingly, 3 different types of exits have been distinguished, namely sale to third parties, managerial buyout (MBO) and write-off as a loss. While in general IPOs are considered to be the most successful exits, in the framework of JEREMIE in Hungary there was no exit via stock exchange initiation. Our aim is to assess the success of investments through the types of exits and to isolate the characteristics that emerge for each type of exit, with a particular focus on the financial characteristics of the investee companies. Firm level anaylsis is especially important, as the factors influencing aggregate and firm-level exit patterns are different (Frimpong et al., 2024). In the field of exit evaluation, the results of this research can be considered as a gap in the venture capital market of the Central and Eastern Europe region. Institutions, public policy and culture shaping the entrepreneurial context and this relationship can be reversed, as entrepreneurship can influence these factors (Audretsch, 2023). In this sense the findings of this study may contribute to a deeper understanding of the regional venture capital market and facilitate more effective planning of future programs. From a research perspective, the findings can provide a basis for comparison in further studies. From a policy point of view the results can contribute to the more efficient design of private and government backed sovereign funds (Teti et al., 2024).

1. LITERATURE REVIEW

Hungarian venture capital market has been active since the 1990s but has seen negligible activity. The JEREMIE venture capital programme, which was launched in the 2010s, was a significant stimulus for the Hungarian venture capital market, with around 340 companies receiving funding from 28 venture capital funds. While prior the programme the Hungarian venture capital market was characterised by scarce

supply, a low number of deals and a concentrated investor base, after JEREMIE the oversupply of capital led to a high number of deals and a wider range of intermediaries providing venture capital type investments. At the same time, the role of public funding in the sector has increased significantly. Accordingly, the programme has attracted a lot of attention, but the less transparent nature of venture capital has hampered the development of a comprehensive and reliable picture, as the publicly available data is very limited.

Initially, Hungarian research presented the programme primarily through capital disbursement, mainly highlighting the problems of capital transfers and the purpose of the use of funds. Kállay and Jáki (2019) investigated the impact of Hungarian venture capital investments on firms based on limited data and a narrow set of indicators. More detailed studies on the impact on enterprises that received funding have been published only later, mainly examining the impact of investments on firm growth, sales and employment through a comparison of different types of public backed venture capital investors (Becsky-Nagy-Fazekas, 2023). The conclusion of these studies is that, although the JEREMIE venture capital programme has played an important catalytic role, it contributes indirectly to the development of the venture capital sector. However, in terms of direct impact, on average, it has not been able to have a significant positive impact on the investee companies in terms of either employment or growth. This was enhanced by the extensive moral hazard problems and the two-goal system of the hybrid scheme of JEREMIE funds, where the economic policy goals and private interests were in conflict (Fazekas and Becsky-Nagy, 2021). Karsai (2021) synthesized international experiences and concluded that public involvement can be an effective financing instrument in the venture capital market by building on cooperation with market actors. However, it should be stressed that in the cooperation between market and state actors, economic development and yield maximisation objectives may lead to conflicts of interest and increasing moral hazard, which may reduce the efficiency of the financing scheme (Fazekas and Becsky-Nagy, 2021). Karsai (2022) points out that the emergence of rent seeking behaviour due to state subsidies may reduce the competitiveness of startups and thus the market efficiency of the venture capital sector, which may also reduce the possibility of exits, especially in the light of increasing risks in the region. Based on a systematic literature review, Jáki and Molnár (2021) find that the primary success criterion for public venture capital investments is not the exit return. This type of investment also has economic development objectives.

There are 5 typical ways to exit risk capital, namely: initial public offering (IPO), strategic sale to a third party, managerial buy-out by a co-owner (MBO), buy-out by a financial intermediary and write-off as a loss. Among these exit routes, IPOs and strategic sales to third parties have traditionally been considered successful exit routes, while the financial return of the other exit types are usually lower.

Schweinbacher (2002) finds that IPOs have more distinguishable characteristics, while strategic sales do not have significant distinguishing investment characteristics, as they can be considered 'average' investments. Cumming (2008) highlights the characteristic of takeovers, based on a sample of European investments. His findings suggests that investors gain more control in takeovers than in write-offs or IPOs. Grežo (2024) highlights the importance of entrepreneurial experience in the venture performance. Félix et al. (2012) also highlight the impact of contractual clauses on exits in a European sample and the role of investor background. Their results show that exit takes longer for investors with a financial background, especially for strategic sales. Guo et al. (2015) find that the investment duration of venture capital with a corporate backing is longer than that of independent fund managers. Their results show that longer investment duration increases the probability of a firm being acquired, while larger investments are more likely to lead to an IPO. Cumming and Johan (2008a) find that investors are more likely to use contractual clauses with higher control than veto rights or convertible securities in the case of planned exits. Focusing on information asymmetries, Cumming and Johan (2008b) highlight that the more venture capitalists are able to reduce information asymmetries with potential investors, the more likely they are to exit their investments successfully.

Regarding the performance of venture capital invested firms, studies agree that firms with a venture capital background are able to achieve higher growth in turnover compared to other similar firms (Chemmanur et al. 2011; Puri and Zarutskie, 2012; Dankiewicz et al., 2022). In terms of employment, Lerner (1999) and Cowling et al. (2009) confirmed the positive impact of venture capital. In addition, one of the most important features of traditional venture capital is its positive impact on innovation performance (Kortum and Lerner, 1998; Olah et al., 2021).

In line with international evidence, we have used financial indicators of business growth to explain the differences between the different types of exits. Accordingly, company revenues, income, assets and employment are highlighted. In addition, the role of innovation was also examined, building on the specific characteristics of venture capital. The next section describes the database and methodology of the research.

2. DATA AND METHODOLOGY

The present research is a continuation of previous research that analysed the Hungarian venture capital market through the performance of companies that received investments under the JEREMIE programme. Previous studies investigated the use of capital with regards to the geographic and industrial focus, the model of hybrid financing and the impact of investments on firm growth and innovation performance (Becsky-Nagy and Fazekas, 2023). Using this updated database, we analyse the exit patterns of JEREMIE backed venture capital investments in Hungary.

The dataset on which the study is based includes around 340 companies that received venture capital investments through JEREMIE funds between 2010 and 2016. The investments were identified through company registry database and investor disclosures; thus we identified the full set of investee companies. The data set containing the financial data of the enterprises under investigation was updated annually on the basis of the annual financial reports (Tamini and Orbán, 2022).

We identified failed investments and write-offs in cases where the company was in bankruptcy, liquidation, winding-up or compulsory liquidation according to the Hungarian Company Register. We classified exits as MBOs, where the venture capitalist sold their ownership stakes in the company and after the sale there was no new stakeholder in the ownership structure of the invested firm, but the sold equity was acquired by parties with a previous ownership interest in the company. Investments where the venture capitalist sold their shares of the enterprise with a new owner taking their place in the ownership structure are classified as third-party sales. The ownership data for MBOs and third-party sales were determined on the basis of the company register and the annual financial reports of the invested enterprises.

The data set including financial and ownership data is structured as shown in Table 1.

Table 1. Data set of enterprises that have received venture capital investments with JEREMIE backing in Hungary in 2010-2016

Name of the variable	*Description of the Variable*
name	Name of the invested enterprise.
investmentyear	Year, when the enterprise received venture capital funding. (range: 2010-2016)
exityear	Year, when the venture capitalist exited the enterprise. (range: 2012-2022)
term	Length of the investment in years.
bankrupt	Dummy variable. 1, if the investment failed, 0 if not.
MBO	Dummy variable. 1, if the venture capitalist's ownership stake was sold to a co-owner, 0 if not.
tradesale	Dummy variable. 1, if the venture capitalist's ownership stake was sold to a third-party previously not present among the owners, 0 if not.
age	The age of the enterprise at the time of the investment.
revenues	The total annual revenue of the enterprise in thousand HUF.
assets	The total assets of the enterprise in thousand HUF.
ebt	The annual earnings before taxes of the enterprise in thousand HUF.
employment	The number of employees of the enterprise.
haspatent	Dummy variable. 1 if the invested enterprise has a patent application, 0 if not.
ownership	Ownership stake in the business acquired by the venture capitalist.
Δrevenues	The difference between annual revenue in the year of exit and the year of investment (turnover at exit - turnover at investment).
Δassets	Difference between the value of total assets in the year of exit and the year of investment (total assets at exit - total assets at investment).

Δebt	Difference between the earnings before taxes in the year of exit and the year of investment (total EBT at exit - total EBT at investment).
Δemployment	Difference between the number of employees in the year of exit and the year of investment (total employees at exit - total employees at investment).
industry variables	Dummy variables. Their value is 1 if the activity of the enterprise is classified in the industry. The sectoral classification is consistent with the Hungarian Statistical Office's classification according to the TEÁOR number of the main activity.

Source: Authors' compilation

The research question is whether the expected mode of exit can be predicted based on certain financial characteristics. This is an indirect way of investigating what critical financial criteria a successful exit firm must meet and what characteristics might predict a failed investment.

To answer the research question, we use a binary logit model in which the dependent variable is a dummy variable denoting the exit mode, while the explanatory variables are the main financial indicators of the firms, as well as venture capital-specific indicators such as the ownership share acquired by the venture capitalist and the innovative nature of the firm as measured by patent activity. Accordingly, 3 models have been developed according to the 3 different exit modes, where the dependent variables are the dummy variables for the different exit methods. The models are specified as follows:

$$logit(exit) = \beta_0 + \beta_1 \Delta revenues + \beta_2 \Delta employment + \beta_3 \Delta assets + \beta_4 \Delta ebt + \beta_5 haspatent + \beta_6 lnownership + \beta_7 lnage + \beta_8 lnrevenues + \beta_9 lncapital + \varepsilon_i \quad (1)$$

The financial variables explaining exits are designed to capture the growth of the firm, so the change between the value of sales (*Δrevenue*s), number of employees (*Δemployee*s), total assets (*Δasset*s) and earnings before tax (*Δebt*) at the time of investment and at the time of exit are included as explanatory variables. The logarithm of the age of the firm (*lnage*), its total annual revenues (*lnrevenues)* and the ownership stake acquired by the venture capitalist (*lnownership*) for the year of investment is incorporated in the model. Finally, assuming a significant role for innovation, the variable *haspatent* was included in the model.

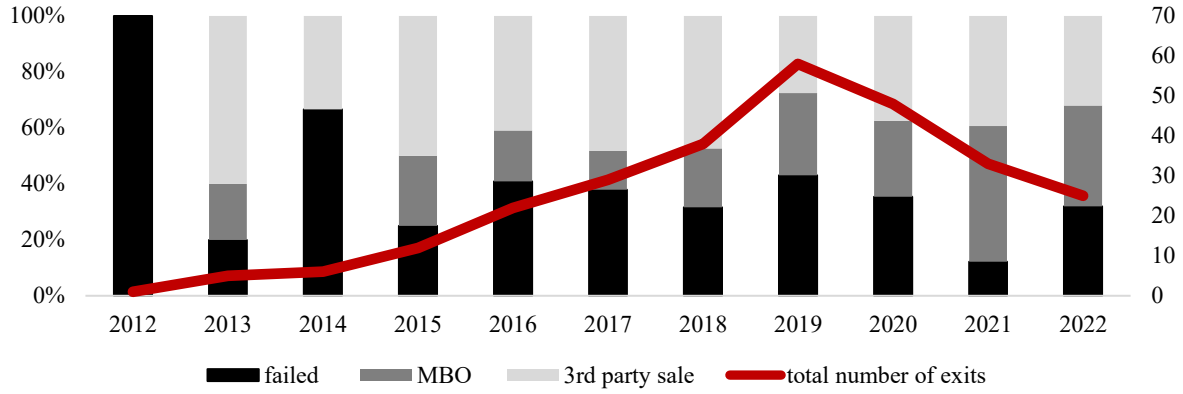
The major financial indicators of the model describe the growth of companies during the investment period by the difference between the first and last year of investment. In order to eliminate the variation due to the different investment duration, the impact of the annual average value of the above financial ratios on exits was also examined, and the model was specified as follows:

$$logit(exit) = \beta_0 + \beta_1 \Delta annualrevenues + \beta_2 \Delta annualemployment + \beta_3 \Delta annualassets + \beta_4 \Delta annualebt + \beta_5 haspatent + \beta_6 lnownership + \beta_7 lnage + \beta_8 lnrevenues + \beta_9 lncapital + \varepsilon_i$$

3. RESULTS AND DISCUSSION

The surge in venture capital investment in the first half of 2010 in Hungary was largely due to the fact that JEREMIE funds were under a resource allocation constraint, as they committed to allocate 80% of their capital to portfolio companies. The increase in market-based investment would most likely be in response to the widening financing gap created by the demand-side boom, but this could be tempered by artificial supply-side push by the state. Consequently, it could not be concluded from the increase in investment activity that the venture capital sector, and within it the demand side of the market, has developed at the same pace as the increase in investment activity. Exits can be seen as the primary measure of investment success. Figure 1 illustrates the evolution of exits over time, broken down by the three exit modes.

Figure 1. Evolution of exits from venture capital investments made by Hungarian JEREMIE funds between 2010 and 2016 by type of exit between 2012 and 2022



Source: Authors' compilation

The average maturity of the investments exiting the market was between 4 to 5 years. While the period of 2014-16 was the most dominant in terms of investment activity, the period of 2018-2020 was the most active in terms of the year of exits. In total, nearly 280 exits took place in the given years under review, with around 60 enterprises having not yet exited at the end of the investigated timeframe. The period of slowdown due to the COVID-19 epidemic also made it difficult to sell investments that were still in active status. However, international experience suggests that the lengthening of the investment period reduces the chances of a successful exit, so that these investments are likely to be written off as losses.

Table 2 illustrates the course of the main financial indicators and the number of employees of the exited firms in the first year of investment and in the year of exit. There is no clear difference in the number of employees between the two events. Depending on the type of exit, it can be observed that the invested enterprises had a low number of employees throughout the whole period of the investment. Even in the case of a successful exit, the average number of employees was below 10, while the median number of employees was 2, suggesting a more skewed distribution of enterprises in terms of the number of employees, with a few larger employers and a majority of firms with a minimum number of employees.

In terms of total revenues, there were larger variations for unsuccessful exits and for sales to co-owners and third parties. Unsuccessful exits also had lower revenues at the time of entry, and on average had lower turnover at the time of exit. This indicates that one of the main reasons for the failure of unsuccessful investments is their inability to successfully enter the market and generate significant revenues. In contrast, in the case of investments that resulted in tradesales, companies were able to quintuple their sales revenue on average. However, it should be noted that the distributions are strongly skewed to the left, i.e. the majority of companies had relatively lower sales, while some companies had high sales, which shifts the average upwards. The distribution of enterprises by total assets shows similar characteristics. While both average and median asset values increased for investments where ownership stakes were sold, unsuccessful investments show a loss of assets by median values. Although the average total asset value has also increased for unsuccessful investments, this is mainly due to the fact that the distribution is highly skewed to the left and thus the average cannot be considered a typical central value.

The final financial characteristic examined is the profit of the enterprises at the level of earnings before taxes. Based on the averages, no differences of magnitude can be observed in this respect by type of exit. It is worth noting, however, that the majority of enterprises are unprofitable even if co-owners or third parties outside the enterprise are willing to buy out the venture capitalists' share. Based on this we might conclude, that profitability should not be considered as a major condition for successful exit for early-stage investments. Given the characteristics of the businesses concerned, this is not surprising, as the increase in capacity following investment is accompanied by an increase in costs (e.g. depreciation and amortization), which can only be followed later by an increase in revenues, assuming successful market entry.

Table 2. Descriptive statistics of the number of employees (number of persons), turnover (thousand HUF), total assets (thousand HUF), earnings before taxes of the exited enterprises in the year of investment and exit

Number of employees						
	Third-party sale		*MBO*		*Failed exits*	
	investment year	*exit year*	*investment year*	*exit year*	*investment year*	*exit year*
n	104	93	73	69	91	81
mean	3.44	9.33	2.81	6.49	2.19	2.66
standard deviation	6.63	15.14	4.44	11.02	3.44	5.41
median	1	2	1	1	1	1
skewness	3.38	2.28	2.73	2.80	2.53	3.35
Total revenues (thousand HUF)						
n	105	93	76	68	95	83
mean	44 616	228 020	32 284	180 714	24 484	22 120
standard deviation	122 664	453 247	85 169	406 413	77 363	63 601
median	0	10 623	678	26 693	0	895
skewness	4.19	3.07	3.67	3.92	4.60	4.92
Total assets (thousand HUF)						
n	105	93	76	69	94	83
mean	306 800	580 214	222 364	499 262	182 961	358 128
standard deviation	304 962	915 965	247 642	865 364	255 139	2 167 372
median	250 314	298 505	123 168	163 722	50 945	44 896
skewness	2.07	4.16	1.57	3.73	2.22	8.82
Earnings before taxes (thousand HUF)						
n	105	93	75	69	95	83
mean	-19 909	-15 648	-22 895	-37 914	-20 699	-57 834
standard deviation	49 938	520 270	38 641	122 384	50 377	142 848
median	-5 979	-17 281	-13 714	-3 197	-6 614	-11 101
skewness	-1.63	7.19	-1.28	-1.68	-5.64	-4.75
Duration of investment (years)						
n	104		75		94	
mean	4.69		5.37		4.18	
standard deviation	2.28		2.30		2.14	
median	5		5		4	
skewness	0.55		0.24		0.52	

Source: Authors' compilation

In the following, the results of logistic regression models are presented to investigate the factors influencing the exit outcomes. Table 3 presents the models where the difference between the investment and exit values for the financial indicators is used to explain the type of exit; in Table 4, on the other hand, the annual average change in the financial indicators is included in the models among the explanatory variables.

It should be noted that the explanatory power of the models for the type of exit is rather low. This suggests that financial indicators of firms cannot capture the success of exits from early-stage investments. Neither for sales to third parties nor for managerial buyouts by co-owners does the model have significant explanatory power, and the financial indicators are not significant. Only in the case of unsuccessful exits was a financial variable significant in the model, where the change in total revenues was significant in the model with a negative coefficient. This suggests that the main financial characteristic of unsuccessful investments is their inability to increase their sales revenues. In contrast, the change in the value of the company's assets and earnings before tax did not turn out to be significant. This is in line with the characteristics of this specific group of enterprises, which show that young enterprises predominantly accumulate losses in the initial stages of their operations in the search for and development of a sustainable business model. In the 'valley of death' stage, sales are the only way out toward a successful business model, and in their absence the company cannot sustain its operations.

For the non-financial variables, we have assumed that the effect of innovation performance as evidenced by patent activity is significant, but the results suggest that this assumption should be rejected. The logit models suggest that innovation activity did not have a significant role in any exit mode. It did not reduce the probability of bankruptcy but did not significantly increase the probability of successful exit.

Among the non-financial variables, ownership by venture capitalists played a significant role, with a negative coefficient for MBOs and a positive coefficient for sales to third parties. For MBO, the result is consistent with prior expectations, as a significant ownership stake in the firm reduces the chance of a buy-back by a co-owner. If the founders' objective is to run the business on a long run, they are less likely to be willing to transfer a significant ownership stake in the investment. In contrast, the positive coefficient observed in the case of a sale to a third party suggests that a higher ownership stake acquired by venture capitalists increases the likelihood of a sale, which is contrary to prior expectations that an increase in the ownership stake transferred indicates moderate business potential. The explanation for the empirical result, which contradicts theoretical expectations, is that the sale of JEREMIE venture capital investments to third parties was not always consistent with the sale of the business to strategic investors in case of market-oriented private backed venture capital investments. Exits were observed where venture capitalists sold their stakes to actors who were not independent of the investors, and the proportion of these sales was higher for companies where the venture capitalist had a significant qualifying majority stake.

Table 3. Results of logit models explaining exits from JEREMIE venture capital investments in Hungary between 2010 and 2016 (financial variables measure the total change between the values at the time of investment and exit)

	Logit		
Dependent variables	*third-party sale*	*MBO*	*failed*
Δrevenues	2.88e-07	1.79e-07	-6.66e-06***
	[3.91e-07]	[4.01e-07]	[2.11e-06]
Δemployment	0.020	-0.003	-0.012
	[0.017]	[0.014]	[0.022]
Δasset	-7.13e-08	-1.58e-11	1.19e-07
	[9.66e-08]	7.98e-08	[8.91e-08]
Δebt	4.15e-07	-2.21e-07	-1.32e-06
	[3.30e-07]	[2.98e-07]	[1.01e-06]
haspatent	0.294	-0.549	-0.153
	[0.464]	[0.595]	[0.561]
lnownership	0.600**	-0.560**	0.004
	[0.247]	[0.221]	[0.206]
lnrevenues	-0.020	0.011	-0.006
	[0.029]	[0.031]	[0.032]
lncapital	0.043	0.054	-0.047
	[0.032]	[0.038]	[0.031]
lnage	0.286	0.317	-0.878**
	[0.270]	[0.290]	[0.374]

constant	-0.933**	-2.310***	-0.040
	[0.389]	[0.463]	[0.361]
number of observations	334	334	334
Pseudo R^2	0.0394	0.0377	0.1168

Note: ***, **, * denote significance at 1%, 5% and 10% respectively. The table presents the coefficients and their robust standard errors in brackets.

Source: Authors' compilation

Measuring the change in financial indicators on an annual basis, the models lead to similar results, but the role of some variables becomes significant. The change in the role of financial indicators over the annual and full investment period is due to the different investment duration between each exit and the still active investment. For market-backed investments, there is an inverse proportionality between the duration of the investment and the success of the investment, i.e. the duration of the most successful investments is on average lower than the holding period observed for other investments.

Table 4. Results of logit models explaining exits from JEREMIE venture capital investments in Hungary between 2010 and 2016 (financial variables measure the average annual change between the values at the time of investment and exit)

	Logit		
Dependent variables	*tradesale*	*MBO*	*failed*
Δannualrevenues	5.54e-06**	-4.16e-07	-2.30e-05**
	[2.38e-06]	[2.54e-06]	[1.15e-05]
Δannualemployment	0.587	0.001	-0.070
	[0.064]	[0.066]	[0.082]
Δannualasset	-4.11e-07	5.66e-08	3.39e-07
	[5.11e-07]	[4.06e-07]	[5.13e-07]
Δannualebt	2.71e-06**	-1.21e-06	-1.14e-05**
	[1.25e-06	[9.74e-07]	[5.39e-06]
haspatent	0.258	-0.525	-0.240
	[0.463]	[0.588]	[0.551]
lnownership	0.635**	-0.562**	-0.023
	[0.255]	[0.220]	[0.205]
lnrevenues	-0.022	0.012	-0.008
	[0.028]	[0.031]	[0.030]
lncapital	0.043	0.054	-0.050*
	[0.033]	[0.039]	[0.030]
lnage	0.271	0.318	-0.828**
	[0.273]	[0.288]	[0.374]
constant	-0.956**	-2.294***	-0.079
	[0.393]	[0.464]	[0.354]
Number of observations	334	334	334
Pseudo R^2	0.0552	0.0383	0.0996

Note: ***, **, * denote significance at 1%, 5% and 10% respectively. The table presents the coefficients and their robust standard errors in brackets.

Source: Authors' compilation

The change in financial indicators on an annual basis confirms the result of the previous specifications that an increase in revenues reduces the probability of failure. In other words, the main reason for failure is insufficient sales and thus low turnover. Although the sign of a change in the level of pre-tax profit measured on both time bases was negative, i.e. an increase in income reduced the chances of failure, the

indicator only had a significant role for changes on an annual basis. These results suggest that the rapid accumulation of losses led to bankruptcy or negative exit events for venture capital investee firms. This is in line with the 'grow fast or die trying' attitude prevalent in venture capital investments, i.e., given the higher cost opportunity of growing fast, if the firm is unable to achieve significant revenue growth, investors exit the firm, perceived as a failed investment.

The above argument is consistent with the significant role of the increase in revenues on an annual basis in the case of sales to third parties. In the models specified in Table 4, the increase in annual revenues was found to be significant for exits with sales to third parties. Based on the positive coefficient of the variable, it can be concluded that the rapid rate of sales growth significantly improved the probability of exiting via a sale to a third-party. The result confirms the international evidence that venture capitalists primarily seek opportunities for rapid growth in their portfolio companies. At the same time, the annual increase in earnings also increases the likelihood of exiting through sales.

When examining the role of the variables that are significant in terms of exits, we see that the same variables, profitability and sales growth, played a significant role, but they have a different coefficient. They impact differently the probabilities of the two exit types

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CONCLUSIONS

Venture capital can be a means of financing high value-added businesses that can be a major driver of economic development. This has led to a number of initiatives at national and EU level to develop the sector, including in the Central and Eastern European region. Venture capital may be one significant element to overcome the problem of the middle-income trap that is emerging during the convergence process in many countries in the region.

One way to address this issue was the hybrid venture capital schemes in the region under the JEREMIE programme, which allowed market investors to invest a combination of private and public funds in the targeted young and innovative companies. Among JEREMIE investments, the Hungarian market has been particularly active at regional level. In our study, we analysed the performance of the sector by looking at the exits of JEREMIE-backed venture capital investments in Hungary. In parallel, we examined the factors that increase the likelihood of different exit routes from the business.

The research gap that we targeted with our study was that an analysis of the regional venture capital market based on extensive, large sample data collection of exits, that has not been done before. From this perspective, the results of our research could provide a basis for future studies besides giving a better understanding of the regional market.

In the course of our research, we analysed around 340 investments in hybrid structures in Hungary, of which we were able to identify 277 exits. When evaluating the exits, we were unable to determine the financial returns due to the confidential nature of the data, and we inferred the performance of the exits based on the type of the exit. In this sense we separated 3 different exit methods: sale to a third party previously not present among the owners, MBOs where ownership stakes were sold to previous co-owners, and failed investments where the invested firm went bankrupt, were liquidated or was written-off as loss. As venture capital funds have committed to investing the capital entrusted to them, the artificially enhanced investment activity has not been a faithful reflection of market developments, but the exits give a more realistic picture.

The results show that there are no sharp dividing lines between investee firms according to the exit route through which investors sold their ownership stakes. A general characteristic of investments, regardless of exit type, is that on average they did not experience significant growth, whether we look at the dimensions of employment, turnover, income or asset value. However, there were strongly left-skewed distributions for each indicator, suggesting that the best performing investments were able to achieve outstanding returns, although this was not the case for investments in general. This strengthens the conclusion that in emerging, relatively underdeveloped sectors, supply and demand-side challenges are present together. This is attributed to the insufficient number of commercially prospective ventures capable of successfully leveraging the increased capital.

According to the logit models, financial indicators based on annual growth rates were identified, significantly influencing the likelihood of various exit methods. Nevertheless, even with the financial indicators, the models depicting exit modes exhibited relatively low explanatory power. This suggests that the exit paths of young, innovative ventures are far from being solely determined by their financial characteristics.

On the other hand, the reason for the low explanatory power of financial indicators may also lie in the fact that business considerations did not always play the most important role behind the exits. Consequently, financial characteristics could not be consistently aligned with the traditional features of exits. Practical manifestations of this include cases where the sale of equity acquired in the venture occurs towards a party not entirely independent of the investors.

Among the financial indicators, the revenue of the ventures played a significant role. As anticipated, the growth in revenue increases the likelihood of successful third-party sales of equity while reducing the occurrence of negative exit events. The role of the earnings before taxes of invested firms had a similar role. The growth of employment and assets were not significant in any of the model specifications.

Beyond financial indicators, we also examined the role of innovation performance measured by patent activity. Contrary to our initial expectations, the variable did not prove to be significant in any model variant or for any exit mode. Overall, it can be concluded that the exits show a picture indicating that a significant number of successful investments was not carried out, and hybrid venture capital funds utilizing state funding partially were not able to directly contribute substantially to economic development during the examined period. The indirect impact on the market development of investments could provide a topic for future research. Within this framework, examining the performance and exits of a new set of state-backed programs, as well as investments carried out by market investors, could provide insights into whether the entrepreneurial ecosystem was evolved. To achieve this, further and more detailed data collection efforts specific to Hungary and the region are necessary.

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