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START-UP EXITS: EVIDENCE FROM THE CZECH REPUBLIC

Abstract

The aim of this paper is to identify the main characteristics of start-up exits in the Czech Republic. The research gap stems from the lack of research on the start-up exits. For this purpose, the unique Czech Founders database has been used, which includes data on 100 transactions for the 2007-2021 period. Data are evaluated using selected statistics methods. The results indicate that there are statistically significant differences between the industry and the location of the start-up. This research is the first ever to map start-up exits in the Czech context. The contribution of extending the current state of knowledge is the formulation and application of tools supporting the development of entrepreneurial ecosystems by policy makers.

Keywords: start-up, venture capital, exit, exit strategy, Czech Republic

1.   INTRODUCTION

Start-ups have seen significant growth in the last decade, with the associated growth in the economic importance of these companies (Schumacher, 2022). Moreover, start-ups are generally categorized as small and medium-sized enterprises (SMEs), which are a source of economic growth. SMEs account for more than 99% of all businesses in most industrialised countries (Filipe, Grammatikos & Michala, 2016). In addition, start-ups create new job offers, thereby stimulating the labour market and unemployment. However, the identification of start-ups in the total number of SMEs is very difficult. There is no official database in the Czech Republic that collects data on start-ups. For example, according to the Czech Founders database (2023), more than 400 start-ups have

been created every year since 2017. Specifically, there were 467 start-ups in 2023, when these companies created roughly 10,000 jobs in the Czech labour market (StartupJobs, 2023). This is a significant number from a macroeconomic point of view; in addition, the exit of these businesses brings funds released into the economy for reuse explicitly linked to further economic growth

Fons-Rosen, Roldan-Blanco and Schmitz (2022) report the potential impact of exits or acquisitions on economic growth. In the first place, acquisitions can stimulate the creation of other start-ups, as companies assume that they will be bought. They also enable knowledge transfer, and start-ups tend to be better at introducing innovations, as well. The interest of the academic sphere in start-ups is showing a growing trend, as evidenced by the growth in the number of scientific outcomes on the topic. Nearly 80% of the publications were published in the last ten years, as confirmed, among other things, by the bibliometric analysis of Benziane and Houcine (2021). The research articles focus mainly on innovation, sources of growth, scalability or business models of start-ups (e.g. Cavallo, Ghezzi, Dell'Era & Pellizzoni, 2019; Grimpe, Murmann & Sofka 2019; Schumacher, 2022).

Reflections on exits of innovative firms tend to be placed in the broader context of research on the start-up ecosystem (Salamzadeh & Kesim 2016; Pavlák & Petrů; 2018). The subject matter of the analysis includes the forms and timing of exit, as well as valuation issues (Cotei & Farhat, 2017; Kim, 2022). Specifically, in a global context, research on exits in the context of start-ups has been mainly conducted in the USA (e.g. Cotei & Farhat, 2017; Pissoni & Onetti, 2018; Ferrati & Muffato, 2021; Ahluwalia & Kassicieh, 2022; Bowen, Frésard & Hoberg, 2022; Kim, 2022). In the European context, this is research conducted by Pisoni and Onetti (2018). In the context of the exit, these studies deal mainly with the identification of the number of acquisitions, the nationality of the acquirer, the average time of the start-ups on the market before the acquisition, as well as the identification of the amount of funds invested in the company, the sector of the start-ups' business or the most important acquirers. In this case, there are open questions remaining in relation to other basic characteristics of start-up exits, such as the valuation of exits, or more generally in the context of identifying the basic characteristics of other exit strategies, particularly for Initial Public Offerings and the subsequent comparison of findings.

Systematic research on exit strategies in the Czech Republic is still almost absent (e. g. Meluzín, 2008; Chmelíková & Somerlíková, 2014; Pavlák & Petrů, 2018). The authors focus on the motivation for the choice of individual exit strategies, the respective reasons for the low interest in initial public offerings on the Czech capital market (Meluzín, 2008), the capital structure of start-ups and the possibility of additional capital sources in the event of an exit of a venture capital investor (Chmelíková & Somerlíková, 2014), or the ecosystem as a whole and the possibilities of supporting start-ups (Pavlák & Petrů, 2018), not only in the case of a final exit. These publications use primary data analysis for the conducted interviews or secondary data in the form of literature review to reach their conclusions. Analysis of a more comprehensive sample of secondary data from dedicated databases is absent. An exception includes a study by the World Bank

Group (2018), which identifies different types of exit strategies in the Czech Republic. However, there are still topics that are insufficiently explored, namely the analysis of the development of the number of exits or forms of exits of start-ups. It is obvious from the above that the research on exits in the Czech Republic is indeed lagging behind and the research gap stems mainly from the identification of the number of exits, the valuation of the company at the time of the exit, the age of the start-up before the acquisition, the industry of the company and the industry in which the acquirer operates, including its nationality, or the evaluation of the most significant exits in the Czech Republic with regard to the valuation of start-ups at the time of the acquisition. To the best of my knowledge, this research will be the first ever to provide comprehensive information on the underlying investment profile of the exit of Czech tech start-ups.

Based on the identification of the research gap, the research objective of this paper was determined, which is to identify the main characteristics of the exits of Czech tech start-ups and statistically significant relationships between the individual determinants. Describing these areas will lead to the "closing" of the research gap and the expansion of the current state of scientific knowledge in the field of exits of technology start-ups in the Czech Republic. The objective will be achieved by descriptive and inferential statistical analysis of a research sample of 100 exits of Czech technology companies from the Czech Founders database. In the inferential statistical analysis, hypotheses based on the literature research of this paper will be tested. The chi-square test and F-test are used to test the hypotheses, including the significance of the relationships between variables. The results indicate that exits in the form of acquisitions between Czech companies in the consumer goods and services sector are usually carried out in the Czech Republic, with the most frequent exits taking place within 10 years and valuations up to 12,000 thousand euros.

The structure of this paper is as follows. In the initial part, literature research is conducted and based on the empirical evidence, and the hypotheses for the inferential statistical investigation are subsequently defined. After the chapter with the theoretical basis of the paper, the methodology of the work is described, including research approaches and techniques. Following the evaluation of the results of the descriptive and statistical analysis, the discussion and finally the conclusion sections are provided. The benefits for science and practice stem mainly from the expansion of the current state of scientific knowledge and the identification of further research gaps, in order for start-ups and investors to adjust their behaviour and actions to maximise the effectiveness of their own operations. In addition, policy makers can set appropriate support for the start-up ecosystem not only in the area of exits.

2.   THEORETICAL BACKGROUND

The definition of start-ups is problematic and there is no general agreement on what the term means. Benziane and Houcine (2021) state that start-ups are most associated with new businesses that enter the market with minimal capital and no prior experience (Skala et al., 2019, Xia & Roper, 2016). Creativity

and dynamic or even exponential growth are also inflected in relation to the characteristics of start-ups (Bonaccorsi, 2011). All definitions are linked by the element of innovativeness, which is most associated with research on start-ups (Spender, Corvello, Grimaldi & Rippa, 2017; Benziane & Houcine, 2021). For example, Skala A., Skala, B. and Barlow (2019) state that start-ups are emerging businesses based on innovative technologies. Benziane and Houcine (2021) add that the business model of start-ups is based on creativity, disruptive or scalable solutions and exponential growth, where the start-up is associated with minimal financial and personnel resources, which in the case of growth requires the availability of external capital (Bonaccorsi, 2011). Start-ups are distinguished from conventional businesses mainly by their ambition to become a global player, the continuous updating of the business model or the capital structure that results from raising external capital from venture capital funds or business angels (Benziane & Houcine, 2021). Another element that distinguishes start-ups from conventional business is the prospect of an exit (Pisoni & Onetti, 2018).

Regarding the typologies of start-ups, the literature is slightly divergent in classification. The most common classifications are those that define start-ups according to the industry in which they operate, e.g. information and communication technologies, healthcare, financial services, materials and resources or energy (e.g. Lyu, Ling, Guo, Zhang, H., Zhang, K., Hong, Ke & Gu, 2021). Furthermore, most authors agree that there are high-tech start-ups and non-high-tech start-ups (Félix, Pires & Gulamhussen, 2014; Scarmozzino, Corvello & Grimaldi, 2017; Grimpe et al., 2019).

Exit is an integral part of the life cycle of a start-up firm (Hoffman, 2001; Pisoni & Onetti, 2018; Brown & Coverley, 1999), or investment by founders, early investors (business angels), or other venture capitalists (e.g. VC funds). In this case, exit is the last stage of the life cycle of venture capital investment in emerging or start-up innovative businesses (World Bank Group, 2018). It is a dynamic part of the investment process, which is examined at two levels with respect to the individual actors. The first one includes the view of founders and investors, i.e. early investors or venture capitalists, the second one is the impacts at the start-up (also investee firm) level in relation to changes in the ownership structure of the company (DeTienne, 2010). At the individual level, an exit is usually understood as the sale of a stake by founders or early investors who participated in the formation of the company in the early stages of its life cycle (pre-seed, seed, and start-up) and who seek to maximise the value of the invested capital. Exits are interpreted as successful unless they involve the liquidation or even bankruptcy of start-up firms (Harrison, Botelho & Mason, 2020). In general, the goal of start-ups is a successful exit, but the question is which determinants contribute to its success? Schumacher (2022) even links the success of a start-up to the chosen business model and the presence of venture capitalists in the venture. The findings show that the business model is not a key determinant of success, while the early concept of the business plan is. Among other things, success is positively correlated with active communication and interaction with venture capital investors. It is the interaction with venture capitalists or business angels in

the early stage of business development that is considered valuable for improving the initial business plan (Mason, Botelho & Harrison, 2019; Schumacher, 2022).

Founders and early investors generally reinvest resources after successful exits from start-ups as business angels or founders of venture capital funds, with the aim of creating further wealth (Aernoudt, 1999; Sohl, 1999; Becker-Blease & Sohl, 2007; Šimić Šarić & Krstičević, 2018). Pisoni & Onetti (2018) report that founders and investors' stakes in start-ups are held for a limited period, typically between 5 and 10 years. Reinvestment of investors in globalised world takes place at an international level. However, deciding in which country to invest is an extremely complex, costly, and time-consuming process. The final choice is influenced by the economic activity of the country, its taxation, investor protection options, social environment, or business culture. This explicitly reflects the fact that some countries are more attractive to investors than others. Specifically, in the CEE region, countries such as Poland, Czech Republic, Romania, Hungary, and Bulgaria are attractive to investors, while Croatia lags behind these countries (Šimić, 2015).

The literature distinguishes four categories of exit strategies: (1) financial harvest strategies, such as initial public offering (IPO) or merger and acquisition (M&A), or trade sale (Giot and Schwienbacher, 2007; Carpentier & Suret, 2015; Reverte & Badillo, 2019); (2) stewardship strategies in the form of employee buyout, or family succession (Ambrose, 1983); (3) voluntary cessation strategies such as liquidation (Wang & Sim, 2001; Félix et al., 2014); (4) non-voluntary cessation strategies, e.g. bankruptcy (Cumming, 2008; DeTienne, McKelvie & Chandler, 2015). The M&A or trade sale represent the main form of the ownership transaction. In this case, the exit strategy designation is again linked to two levels of inquiry. The M&A is a transaction by the investee firms as a whole, whereas trade sale is the designation of the exit strategy of the investor, where, as in the M&A, there is a transformation of ownership rights (Wenhui, 2016). In an M&A exit, there is a supply-side start-up in the form of founders and venture capitalists and a demand-side investor in the form of a strategic buyer whose goal is to create synergies from the combination of the companies. To a lesser extent, the exit takes the form of IPOs (Montanaro et al., 2021). An IPO is an important milestone in the life cycle of a company, both from the perspective of the investor and the company. The going public strategy significantly expands the volume and range of resources available from the perspective of investee firms. A founder, like an investor, can fully or partially exit within an IPO to diversify their investment portfolio (Pisoni & Onetti, 2018) and thus their investment risk (Salamzadeh & Kesim, 2016). The decision to undertake an IPO is related to the pursuit of high returns on invested capital, which is particularly accentuated when venture capital funds, whose primary objective is to maximise market value, are in the position of shareholders (Montanaro et al., 2021). It should be noted that the most common form of exit consists of the dissolution of companies, whose share in the total number of exits represents around 80% (Nobel, 2011). Dissolution is not much explored in the literature as the issue of dissolution appears to be taboo to actors (Wang & Sim,

2001). For this reason, it is also problematic to express the relative frequencies of individual exit strategies in the total number of exits of venture capital firms.

Specifically in the context of the Czech Republic, the exit of technology start-ups is considered in the broader context of the start-up ecosystem, where, rather than the exit itself, studies are devoted to mapping the start-up scene, including descriptions of the supply and demand side, issues of sustainability or capital structure, innovation or technology or factors (e.g, Meluzín, 2008; Chmelíková & Sumerlíková, 2014; Meluzín, Zinecker, Balcerzak & Pietrzak, 2018; Pavlák & Petrů, 2018; World Bank Group, 2018). There are no studies focused on exit research in the conditions of the venture capital market in the Czech Republic. An exception includes a study by the World Bank Group (2018), which, based on a descriptive analysis of data from the Mergermarket database, concludes that the Czech Republic is dominated by M&A strategy, with IPOs playing a marginal role. Investing in start-up projects in the Czech Republic is still a relatively young field, so it is not surprising that data related to the exit of Czech tech start-ups is not extensive (World Bank Group, 2018).

The results of a study by Ferrati and Muffato (2021) suggest that between 2000 and 2021, 17,213 acquisitions of technology start-ups were made in the USA, of which about 40% were in the ICT sector, 74% of the acquirers carried out only one acquisition, 23% made 1-5 acquisitions, and finally 2% completed 5-10 acquisitions. The average time to exit with respect to the life cycle of a business is approximately 8 years, or 95 months. The fastest exit in this case is, for example, for companies in the ICT sector, specifically software or application developers (66 months), followed by companies in the B2C sector, specifically social media (69 months). In contrast, the longest pre-exit lifecycle times are found for firms in the healthcare (103 months) or financial services (105 months) sectors.

The trend in the number of acquisitions is increasing. Pisoni and Onetti (2018) report that the volume of acquisitions almost tripled in 2016 compared to 2012 with a total of 155 exits. The analysis also showed that European technology start-ups are generally not older than five years when acquired, specifically 36% of the total number of European M&A transactions, with 29% of contracts concluded in the age category of 6-10 years. European and American acquirers are targeting increasingly younger companies, i.e. the older the start-up, the less likely the acquisition (Pisoni & Onetti, 2018). In relation to time, Ferrati and Muffato (2021) argue that time is a key factor affecting the exit of start-ups, both with respect to the specific requirements of each sector (Pisoni & Onetti, 2018) and the capital intensity of the financing rounds undertaken (Ferrati & Muffato, 2021).

The above empirical evidence serves as the basis for the formulation of the following hypothesis:

- *H1: "There is a statistically significant relationship between the sector of a start-up and the timing of the start-up exit.*" In this case, the authors assume that there are industries where the exit of founders and venture

capitalists occurs more quickly, i.e. the time horizon of time in the firm before ownership transition is shorter compared to firms in other industries.

On the basis of studies carried out in the area of start-up exits (e.g. Félix et al., 2014; Ferrati & Muffato, 2021), it may be concluded that there is a relationship between industry and exit valuation. Valuation of a start-up means determining the current value of the business including its assets. Standard valuation models such as cost approach, income approach and market approach do not work in the case of start-ups, and it is necessary to use innovative methods, e.g. the real option method, the venture capital method, the scorecard method, or the risk factor summation method (Montani, Gervasio & Pulcini, 2020). For instance, the information and communication technology sector, in which there is a disproportionately large number of high-tech start-ups, is positively correlated with higher rates of valuation of invested capital (Félix et al., 2014). For example, in the United States, the average amount of investment received in start-ups is USD 9,416,931, with biotechnology companies receiving the largest amount of investment (USD 34 billion). On the other hand, the least investment was in consumer goods, i.e. USD 2 billion (Ferrati & Muffato, 2021). The authors further state that geographical distance is an important factor influencing investment decisions. In this case, Pisoni & Onetti (2018) compared M&A of technology start-ups operating in Europe and the USA, based on a descriptive analysis of 5,744 M&A transactions from the Crunchbase database, with 1,232 European transactions. The authors focused on identifying the number of acquisitions in 2012-2016 for companies founded after 1995. In particular, the aim was to determine the number of acquisitions, the country of origin of the acquirer or, for example, the age of the start-ups at the time of acquisition. The results show that acquirers of start-ups in Europe and the USA prefer to buy local companies. Of the total number of European acquisitions, 56% were by European companies (n = 685), with the remainder by US acquirers, showing that acquisitions are mainly regional (Pisoni & Onetti, 2018).

The above empirical evidence serves as the basis for the formulation of the following hypotheses:

- *H2: "There is a statistically significant relationship between the location of the start-up and the location of the investor."* In this case, the authors assume that there is integration of firms in geographic proximity, specifically at the national or local level.

- *H3: "There is a statistically significant relationship between exit valuation and start-up sector.*" In this case, the authors hypothesise that there are industries where start-ups obtain higher exit valuations compared to companies in other industries.

In a situation where there is an exit of venture capital investors in addition to the exit of founders, the acquirer usually becomes a supplier, customer or competitor with the aim of achieving horizontal, vertical or conglomerate integration (Rigamonti, Cefis, Meoli & Vismara 2016; Rozen-Bakher, 2018).

Firstly, horizontal integration means the merger of undertakings competing in the same market. In relation to the company, the horizontal M&A has a high likelihood of smooth integration with the resulting realisation of synergies, as well as higher corporate profitability (Tremblay V. J. & Tremblay C. H., 2012; Rozen-Bakher, 2018). Studies indicate that most companies pursue horizontal integration, as they assume higher synergy efficiency and higher profitability (Gugler, Mueller, Yurtoglu & Zulehner, 2003). Secondly, vertical integration occurs when a manufacturer buys its supplier, or a company buys another firm purchasing its product (Rozen-Bakher, 2018). Finally, conglomerate integration occurs when companies from different markets merge. This type of integration may be considered the most complex, as significant differences between companies result in higher costs to the process (Tremblay V. J. & Tremblay C. H., 2012; Rozen-Bakher, 2018).

Within M&As, two situations may occur: firstly, the target company merges with the acquirer and the legal form is transferred to one of the companies involved, i.e. acquisition; and secondly, in an acquisition, both companies are dissolved and a new entity is created, i.e. merger (Wenhui, 2016). For a strategic buyer, buying start-ups is the fastest way for their company to grow, enter a new market, or acquire new technologies and innovations (Pisoni & Onetti, 2018). This means that mergers and acquisitions are a key means of fulfilling companies' growth strategies in terms of international expansion, innovation and new technology acquisition, as well as diversification. Ferrati and Muffato (2021) identified the most important acquirers in the USA based on the number of completed acquisitions, specifically including Google, Cisco, Microsoft, Oracle, IBM, Yahoo, Apple, and Amazon in the list. The data point to the fact that long-established companies mainly seek start-ups from the same industry for their growth, which helps them to accelerate the introduction of new products or expand their product offerings, or generally strengthen their market position (Pisoni & Onetti, 2018).

The above empirical evidence serves as the basis for the formulation of the following hypothesis:

- *H4: "There is a statistically significant relationship between the business sector of the start-up and the business sector of the investor.*" In this case, the authors assume that there are acquisitions or mergers between companies in the same industry, i.e. horizontal integration. The reason lies in the resulting synergy effect, including the increased profitability of the company.

3.   METHODOLOGY

The research in this paper is based on a quantitative approach and descriptive and inferential analysis of secondary data from hundreds of exits in the form of acquisitions of Czech technology start-ups or investee firms. In this case, the supply side consists of the start-up in the form of founders and venture capitalists and the demand side is represented by the investor in the form of a

strategic buyer. In the context of the Czech market, an angel investor is present in approximately one-third of all exits. Most often, however, it is the VC fund that is the venture capitalist in a start-up when it exits (Czech Founders, 2023). The basic pillar for working with data consists in the generally applicable methodology of recommended data processing for scientific purposes according to Hendl (2005), which includes cleaning, categorisation, coding, identification, and interpretation. The necessary data were obtained from the Czech Founders database, which regularly collects and records data of Czech technology start-ups, both from publicly available information from venture capital platforms or from mandatory published information of Czech companies, and from internal sources of their own operations. The database includes data on the basic characteristics of the enterprise and the life cycle of the organisation, i.e. the establishment of the enterprise, the financing of the enterprise, or the individual investment rounds and exit. Specifically, this paper's research uses the variables of the start-up age, industry of the start-up, industry of the buyer, location of the start-up, location of the buyer, and exit valuation. This paper is the first ever to analyse secondary data on the investment characteristics of Czech tech start-ups. In the past, in this context, the Czech Republic has mainly used a qualitative approach and primary data with the aim of a general description of the investment of innovative enterprises (e.g. Chmelíková & Sumerlíková, 2014; Pavlák & Petrů, 2018; Petrů, Pavlák & Polák, 2019), or to determine the share of individual exit strategies in the total number of exits (e.g. World Bank Group, 2018).

4.   VARIABLES

In order to satisfy the objective of this paper, data and basic and investment characteristics of hundreds of exits of Czech technology start-ups between 2007 and 2021 were extracted into Microsoft Excel in December 2022. In this respect, the available data for 2022 could also be used, however, exits are recorded with a certain degree of delay, so the data for this year would be incomplete. In addition, the data this year are affected by geopolitical developments on a global scale, the impact of which on the exits of Czech tech start-ups is not the subject of this examination. The research sample was cleaned, categorised and coded in Microsoft Excel according to the current data handling methodology. Regarding data cleaning, the sample was not found to be duplicated or erroneous anywhere, so all 100 observed phenomena were included in the final analysis. For the purposes of subsequent descriptive and inferential statistical analysis, the individual variables were categorised into nominal and ordinal forms, respectively. In relation to the subsequent expression of absolute and relative frequencies, the first step was to identify the real numbers of each variable under study (Table 1). Specifically, both available and unavailable values were marked with the appropriate categorical code, with the unavailable ones marked with the number 0, i.e. missing value.

Table 1

Identification of the size of each variable in the research sample

Variable	Age _startup	Industry _startup	Industry _buyer	Location _buyer	Exit _valuation
N	92	100	98	98	66
Missing	8	0	2	2	34

Source: Author's calculation

The coding or categorisation of the analysed variables is shown in Table 2. The duration of the start-up before its exit and, in part, the locations of the buyer were categorised according to Pisoni and Onetti (2018). The industry of the start-up and the industry of the buyer were split using the Invest Europe (2022) methodology, due to the research being conducted in a European environment. There was a problem with exit valuation classification as previous research on technology start-ups does not categorise exit value for our purposes. For this reason, categorisation was performed using the IBM SPSS 28 software to a predetermined number: five groups, which corresponds to the median of the remaining variables. The division was based on the distributional approach of interval or continuous variables.

Table 2

Determination of the variables

Name of variable	Type of variable	Description
age_startup	ordinal	The variable age of the start-up (in years) indicates the stage of the life cycle of the enterprise. This is the time from the inception of the venture to the exit of founders and venture capitalists.
industry_startup	nominal	The industry of start-up variable defines the categorization of enterprises according to their business area.
industry_buyer	nominal	The industry of buyer variable defines the categorization of investors according to their business area.
location_startup	nominal	The variable location of start-up indicates the established location of the company's business.
location_buyer	nominal	The variable location of buyer indicates the location of the investor's business.
exit_valuation	ordinal	The variable exit valuation (in thousand Euros) indicates the amount for which the Czech start-up was sold to an investor.

Source: Author's elaboration

5.   STATISTICAL TESTING

As already mentioned, another data processing tool was the IBM SPSS 28 software. Using this software, (1) descriptive and (2) inferential statistical analysis of the prepared data set was performed. The research methodology was determined for the case of descriptive statistical analysis based on the data processing approach

by Pisoni and Onetti (2018); Ferrati and Muffato (2021). Inferential analysis uses the procedures of Montanaro et al. (2021), and Petrů et al. (2019). Descriptive statistics is a basic technique for evaluating the analysed data (Holcomb, 2016). According to Hendl (2012), data are described directly using the characteristics of position (e.g. mode or median), variance (e.g. variance or standard deviation), or the shape of values (e.g. skewness or peakedness), or in terms of expressing absolute and relative frequencies within contingency tables (Kozel, 2006). In this paper, the method of location characterisation, variance, and the expression of absolute and relative frequencies is used. Relative frequencies are converted to valid percentages due to missing value. Specifically, with respect to the type of data analysed - nominal and ordinal, the modus, the variance ratio, nominal and ordinal variance, and nominal and ordinal standardised variance are used. Inferential statistical analysis involves testing hypotheses and identifying relationships and linkages or associations between the variables being tested (Rabušic, Soukup & Mareš, 2019).

On the basis of the empirical evidence, the following hypotheses were established in this paper to test the statistical significance or significance between the variables:

- *H1: There is a statistically significant relationship between the sector of a start-up and the timing of the start-up's exit.*

- *H2: There is a statistically significant relationship between the location of the start-up and the location of the investor.*

- *H3: There is a statistically significant relationship between exit valuation and start-up industry.*

- *H4: There is a statistically significant relationship between the business sector of the start-up and the business sector of the investor.*

In order to test the above hypotheses, the Goodness-of-fit Test or Pearson's chi-square Test (x^2) was chosen, including a correlation matrix representation of the results. This test was selected to test the hypotheses for both univariate and multivariate data analysis. Multivariate analysis examines the relationship between two variables, where the results tell how much one variable influences the other. Whereas univariate analysis tests the distribution of values of a single variable, where the results tell whether the empirical distribution of categories of one variable differs from the expected distribution of that variable (Rabušic et al., 2019). For this reason, multivariate statistical investigation was used to test hypothesis H1, H3, H4 and univariate data analysis was used to test hypothesis H2 (categorization of start-up location is always CZ, thus it was necessary to proceed to analysis within one variable, namely the category of investor location).

In the case of incorrectness of using x^2, i.e. in the situation when more than 20% cells have expected count less than 5, the simplified Fisher's Exact Test (F-test) for tables larger than four fields was used. The F-test can be calculated as

the partial probability of the values of the selected table. However, the x^2 or F-test only indicates whether there is a statistically significant relationship between the variables, but it does not indicate their degree of association or contingency if we are talking about the dependence of polytomous variables. For this purpose, the Cramer's V coefficient was used, which, beyond confirming the association between variables, also provides information about the tightness of the relationship, i.e. to what extent we can expect a significant relationship in the base set. The Pearson's chi-square test, i.e. testing for independence and goodness of fit (Mohamed & Awang, 2015) is based on a comparison of empirical and expected frequencies. In principle, there is a comparison between a model of data distribution between which there is no association and a real model of empirically measured frequencies (Rabušic et al., 2019). If the results of the calculated probability of the first type of error or significance level reach a value lower than 0.05, the null hypothesis of no relationship is rejected and, on the contrary, it is assumed that there is a relationship between the measured variables in the base set. The formula for calculating x^2, where O = the number of observations; E = the number of expected observations of one type (Pearson, 1990; Mohamed & Awang, 2015; Rabušic et al., 2019), is as follows:

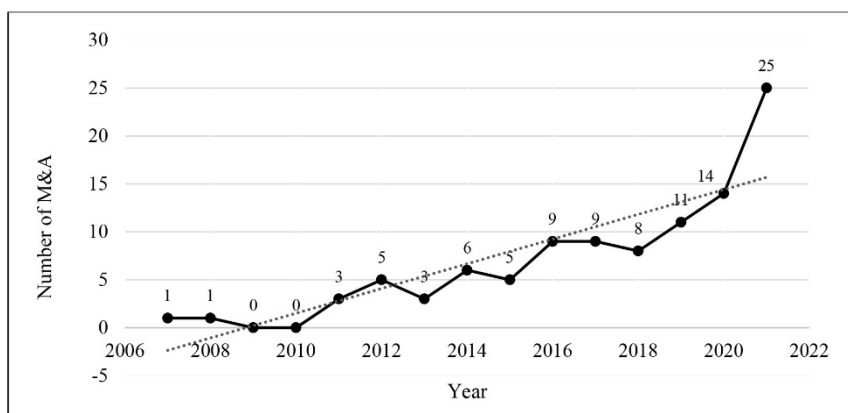$$x^2 = \sum \frac{(O-E)^2}{E}$$

As mentioned earlier, the strength of the relationship of the dependent variables measured was determined based on appropriate coefficients selected according to the type of variables. In the case of polytomous nominal/nominal or nominal/ordinal variables, Cramer's V (V) was selected based on the chi-square statistic and the odds ratio of the measured frequencies. This coefficient takes the value of the interval <0; 1>, where the closer the result is to 1, the more likely it is that there is a dependence between the variables in the base set (Rabušic et al., 2019). In the case of the univariate Goodness-of-Fit Test, the standardised adjusted residuals and sign scheme are used. As already mentioned, this test and the subsequent calculation of standardised adjusted residuals had to be used to test hypothesis H2, as only the investor location variable contains a larger number of different categories, namely CZ, Europe, USA, and Others. The standardised adjusted residuals are calculated as the difference between observed and expected N, with the individual signs (plus and minus) in the plot indicating the error of the first kind. One sign indicates a maximum risk of error of 5%. Two signs indicate a maximum error risk of 1% and three signs indicate a maximum error of 0.01%. A plus sign indicates a condition where the observed phenomenon occurs statistically significantly more often than randomly, while a minus sign indicates the opposite. The formula for calculating V, where n = the total number of scores in the sample; m = the minimum number of rows minus one and the number of columns minus one (Warner, 2012; Rabušic et al., 2019), is as follows:

$$V = \sqrt{\frac{x^2}{n \times m}}$$

6.   RESULTS

6.1.   Descriptive Statistics

There was an increasing trend in the number of acquisitions in the Czech Republic between 2007 and 2021. The lowest number of exits took place in the early part of the period under review, when, for example, in 2009 and 2010, there were no acquisitions completed in the Czech start-up environment. In contrast, 2021 saw the most acquisitions, namely 25 exits, which represents, for example, more than triple the number of acquisitions in 2018 (8 exits); see Graph 1. In relation to the length of time it takes to exit, it can be stated that Czech technology start-ups exit in more than 70% of cases within 10 years (Table 3). The most represented category consists of the time span of 6 to 10 years (the specific value of the validated relative frequencies is 37.0%). On the other hand, investments in the start-up environment are not an exception, when an exit occurs after 11 or 17 years. On the contrary, the lowest frequencies are in the categories of 0-1 and 17-21 years.

Graph 1 Number of Czech start-up M&A from 2007 to 2021.

Source: Author's elaboration from Czech Founders (2023)

Table 3

Age of the Czech tech start-ups at the time of exit (in years)

Start-up age	Frequency	%	Valid %	Cumulative %
0-1	5	5,0	5,4	5,4
2-3	8	8,0	8,7	14,1
4-5	20	20,0	21,7	35,9
6-10	34	34,0	37,0	72,8
11-16	12	12,0	13,0	85,9
17-21	5	5,0	5,4	91,3
22 and over	8	8,0	8,7	100,0

Source: Author's calculation

Exactly half of the samples examined have an exit valuation of up to 12,000 thousand euros (Table 4). The second most represented category consists in the valuation of start-ups at exit of 93,351 thousand euros and over, which may be indicative of the quality of start-up projects in the venture capital market. Significant appreciation may also be identified within the exit valuation above 30.001 thousand euros. Specifically, the category 2,601-12,000 thousand euros is the most represented group. On the contrary, the lowest appreciation is observed in the category of 12,001-30,000 thousand euros.

Table 4

Exit valuation of the Czech tech start-ups (in thousand euros)

Exit Valuation	Frequency	%	Valid %	Cumulative %
0-2,600	12	12,0	18,2	18,2
2,601-12,000	21	21,0	31,8	50,0
12,001-30,000	8	8,0	12,1	62,1
30,001-93,350	12	12,0	18,2	80,3
93,351 and over	13	13,0	19,7	100,0

Source: Author's calculation

The results show that Czech start-ups are usually active in the consumer goods and services or ICT sectors (Table 5). Together with business goods and services, these industries account for more than 90% of all start-ups in the Czech Republic. Specifically, the consumer goods and services sector accounts for 38% and the ICT sector for 35%. There is minimal representation in the sector of financial and insurance activities or biotech and healthcare, where only 1 start-up was active in 2007-2021.

In the case of the buyer, the industry distribution is similar (Table 6); yet in addition, the category of financial and insurance activities is also strongly represented. The consumer goods and services sector has the highest representation within the industry of the buyer, i.e. 33.7%. This is followed by the ICT industry (27.6%) and business goods and services (21.4%). The aforementioned financial and insurance activities sector accounts for 16.3% of the total and, compared to the start-up industry, represents a significant part of the buyer's sector. As in the previous case, only one buyer from the biotech and healthcare sector became a buyer of a Czech technology start-up in 2007-2021.

Table 5

The business sector of technology start-ups

Start-up Industry	Frequency	%	Valid %	Cumulative %
ICT	35	35,0	35,0	35,0
Business goods and services	20	20,0	20,0	55,0
Consumer goods and services	38	38,0	38,0	93,0
Financial and insurance activities	6	6,0	6,0	99,0
Biotech and healthcare	1	1,0	1,0	100,0

Source: Author's calculation

Table 6

The business sector of the start-up's investor

Buyer Industry	Frequency	%	Valid %	Cumulative %
ICT	27	27,0	27,6	27,6
Business goods and services	21	21,0	21,4	49,0
Consumer goods and services	33	33,0	33,7	82,7
Financial and insurance activities	16	16,0	16,3	99,0
Biotech and healthcare	1	1,0	1,0	100,0

Source: Author's calculation

The last variable comprises the region from which the companies involved in the acquisition of domestic start-ups come from (Table 7). As already mentioned, all analysed companies are based in the Czech Republic. In the case of the investor location, however, the list of locations is more extensive. Investors from the Czech Republic are the most represented, accounting for almost 46% of all transactions. Europe (including transactions within the Czech Republic) accounts for nearly 70% of transactions. The representation of investors from the USA is also significant, accounting for around 20%. On the contrary, the representation of investors from other territories (e.g. China, India, or Japan) is around 10%.

Table 7

Investor's location

Buyer Location	Frequency	%	Valid %	Cumulative %
CZ	45	45,0	45,9	45,9
Europe	23	23,0	23,5	69,4
USA	20	20,0	20,4	89,8
Others	10	10,0	10,2	100,0

Source: Author's calculation

Further statistical processing of the data quantified the following location characteristics (Table 8). In terms of age, the research sample is dominated by the category of start-ups that exit between 6 and 10 years. In terms of the "industry", the sample is dominated by the consumer goods and services category. The same category dominates the investor's sector. The results also show that Czech technology start-ups are mainly demanded by investors from the same location, i.e. the Czech Republic. In the case of the exit of a start-up, the most common category in the exit valuation is 2,601-12,000 thousand euros. The characteristics of the variance or the variance ratio, the variance (normvar) and the normalised variance (norm.normvar) for nominal and ordinal data were calculated for each variable, and the resulting values were subsequently analysed in the interval <0;1>. In the case of the nominal variables, i.e. industry_startup; industry_buyer; location_buyer (0.862; 0.923; 0.909), the results show that the values of norm.normvar occur in the upper half of the interval, indicating that the data are not concentrated, but instead are evenly distributed across categories. The values of the normalised variance for ordinal data indicate an even distribution of the categories. Norm.normvar for age_startup

is 0.534 and for exit_valuation is 0.792. When comparing these two variables, it is obvious that the variable indicating the length of time the firm has been in operation is borderline, i.e. more than others, the age of start-ups is concentrated in one category, namely the (6-10 years) category.

Table 8

Identification of the location and variance of the research sample

Variable	Mode	Variance Ratio	Normvar	Norm.normvar
Age_startup	4	0,630	1,603	0,534*
Industry_startup	3	0,620	0,689	**0,862***
Industry_buyer	3	0,663	0,738	**0,923***
Location_buyer	1	0,541	0,682	**0,909***
Exit_valuation	2	0,682	1,584	**0,792***

* value of standardized ordinal and nominal variance above 0.50 in the interval <0;1>

Source: Author's calculation

6.2.   Inferential Statistics

Based on the applied correlation matrix (Appendix: Table 12), it was established that there are several statistically significant relationships within the study population, with significance levels at or below 5%. Statistically significant relationships were identified using chi-square tests within the variables idustry_startup and industry_buyer (p < 0.001); industry_startup and location_buyer (p = 0.043); and exit_valuation and location_buyer (p = 0.002). In order to test hypotheses H1, H3-H4, (1) multivariate statistical investigation was used (Table 9; 10), while (2) univariate data analysis was used to test hypothesis H2 (Table 11).

(1) Therefore, the results of the multivariate statistical investigation in Table 9 indicate that hypothesis H4 on the existence of a statistically significant relationship between the business sector of the Czech start-up and the business sector of the investor was confirmed at the significance level of <0.001. On the contrary, hypotheses H1 and H3 were rejected, as the existence of a statistically significant relationship between the Czech start-up industry and the timing of its exit and between exit valuation and the Czech start-up industry was not confirmed.

The values of the selected tests for H4 show the existence of a statistically significant relationship between the business sector of the Czech start-up and the business sector of the investor (x^2 = 177.820; df = 16; p < 0.001). Since 30 cells have expected count less than 5, value and significance were recalculated using F-test. However, the results of this test were similar or identical for the measured values at the significance level (F = 78.036; p < 0.001). The closeness of the statistically significant relationship between the start-up industry and the acquirer industry is also indicated by Cramer's V, where the value of the coefficient is close to 1 (V = 0.674) and the significance is <0.001. On the basis of these facts, it may be concluded that the identified relations are also valid for the base set. This is beyond confirming a statistically significant relationship between the start-up sector and the investor sector.

Table 10 describes the relationships between the categories of variables analysed. At first glance, it is obvious that the purchase of a start-up is usually performed by a company from the same industry (4.5; 3.7; 3.1; 3.5; and 9.8). For the given values, the results show that the observed frequencies are higher than expected. This means that start-ups are statistically significantly more likely to be purchased by an investor from the same industry than by chance (at the $\alpha = 0.001$ significance level). On the contrary, acquisitions between the consumer goods and services and ICT sector (-2.2; $\alpha = 0.001$) or between the ICT and consumer goods and services sector (-2.6; $\alpha = 0.001$) are statistically significantly more frequent than random acquisitions in the Czech market conditions. In other cases, there are no statistically significant differences between the expected and measured values, indicating that they cannot be expected in the base set.

On the basis of the Chi-square test and F-test (Table 9) for H1, the statistical relationship between the start-up sector and the timing of its exit was not confirmed in the Czech market conditions ($x^2 = 13.150/ F = 18.340$; df = 24; p = 0.964/0.917). The findings of testing for hypothesis H3 are similar, where no statistically significant relationship was confirmed between exit valuation and the Czech start-up industry ($x^2 = 21.040/ F = 18.141$; df = 16; p = 0.177/0.231). Similarly, the closeness of the relationships implied by the Cramer's V results (0.189; 0.282) is insufficient to draw conclusions about the associations in the base set.

Table 9

Pearson's Chi-Square and Fisher's Exact Test

Variable	Industry_startup				
	Chi-Square/F-test			Cramer´s V	
	value	df	sig. (2-sided)	value	sig.
Age_startup	13,150[a]/18,340	24	"0,964"/"0,917"	0,189	"0,964"
Exit_valuation	21,040[b]/18,141	16	"0,177"/"0,231"	0,282	"0,177"
Industry_buyer	177,820[c]/78,036	16	**"<0,001"/ "<0,001"**	0,674	**"<0,001"**

a. 30 cells (85,7%) have expected count less than 5. The minimum expected count is 0,05; b. 23 cells (92,0%) have expected count less than 5. The minimum expected count is 0,12; c. 15 cells (60,0%) have expected count less than 5. The minimum expected count is 0,01.

Source: Author's calculation

Table 10

Adjusted standardised residuals of industries with the significance scheme

Industry_buyer	Industry_startup				
	ICT	Business goods and services	Consumer goods and services	Financial and insurance activities	Biotech and healthcare
ICT	4,5 +++	-1,5 -	-2,6 ---	-1,2 o	-0,5 o
Business goods and services	-0,8 o	3,7 +++	-1,5 -	-1,0 o	-0,5 o
Consumer goods and services	-2,2 ---	-1,1 o	3,1 +++	-0,5 o	-0,6 o
Financial and insurance activities	-1,5 -	-0,7 o	0,7 o	3,5 +++	-0,4 o
Biotech and healthcare	-0,6 o	-0,5 o	-0,6 o	-0,2 o	9,8 +++

Explanations: the symbol + means that the observed frequencies are higher than expected, the symbol - means that the observed frequencies are lower than expected. +++ (risk of error is maximum 0.1%, significance is 99.9%); - (risk of error is maximum 5%, significance is 95%); - - - (risk of error is maximum 0.1%, significance is 99.9%).

Source: Author's calculation

(2) The results of the univariate statistical investigation (Table 11) and the one-sample Chi-square test confirm the hypothesis H2, i.e. the existence of a statistically significant relationship between the location of the start-up and the location of the investor at the significance level <0.001 (x^2 = 26.653; df = 3; p <0.001). As this is a one-sample test, the closeness of the relationship is reflected by the adjusted standardised residuals, where within the CZ category, higher actual values (value = 45) were measured than expected (value = 24.5). In this case, the adjusted standardised residual is equal to 20.5, from which we can conclude that the purchase of Czech technology start-ups by Czech investors is statistically significantly more frequent than by chance (at the significance level of α = 0.001). On the contrary, statistically significantly more often than randomly (α = 0.001), Czech start-ups are not purchased by investors from other countries, including China, India, Japan, or the Republic of South Africa. In other cases, there are no statistically significant differences between the expected and measured values, indicating that they cannot be expected in the base set.

Table 11

Adjusted standardised residuals of buyer location with the scheme and X^2

Location_buyer	Observed N	Expected N	Residual	Scheme
CZ	45	24,5	20,5	+++
Europe	23	24,5	-1,5	o
USA	20	24,5	-4,5	o
Others	10	24,5	-14,5	---
Total	98			
Chi-Square; df; sig.	26,653ª; 3; "<0,001"			

a. 0 cells (0,0%) have expected frequencies less than 5. The minimum expected cell frequency is 24,5.

Source: Author's calculation

7.   DISCUSSION

In the Czech business environment, the number of exits of start-up companies in 2007-2021 shows an increasing trend. Moreover, the number of exits has tripled in the last 5 years. 35.9% of Czech start-ups exit within 5 years and 70% of all exits take place within 10 years. This shows the potential of the Czech start-up market. For example, for the supply side, the number of exits and the age of the company at the time of execution is a signal of interest in start-ups, i.e. founders are motivated to establish start-ups with the vision of increased investor interest in the exit phase. The buyer of Czech start-ups is a Czech investor in 46% and in almost 70% the investors are located in Europe. Based on these findings, the supply side is able to predict a potential buyer with a higher probability of a local investor when the M&A implementation in geographic proximity is valid. On the other hand, this situation may hinder the inflow of foreign capital into individual countries.

In the Czech Republic, 38% of acquisitions in 2007–2021 were in the consumer goods and services sector. On the other hand, the ICT sector accounts

for 35% of the total number of exits. The results are favourable for start-ups, as venture capital investors will not prefer primarily the ICT sector in the Czech Republic with the vision of quick appreciation of the invested funds, but other sectors will also be supported. From a general perspective, the findings are also favourable for the investor as the results suggest that there will be no concentration of investors in one sector. In relation to the sector, a statistically significant relationship was identified between start-ups and investors in the Czech Republic. This leads to the general conclusion that it is more efficient for both the supply and demand side to seek an investor or start-up in the same sector when there is a higher probability of a transaction and the creation of synergy.

In the global context, the trend in the number of acquisitions of start-ups is increasing. Pisoni and Onetti (2018) report that the volume of acquisitions almost tripled in Europe and the US between 2012 and 2016. Similarly, the findings are consistent when evaluating the research samples over the last 5 years of the chosen period. For both Europe and the US, the number of exits tripled. European and US acquirers are targeting increasingly younger companies (Pisoni & Onetti, 2018). The average time before an exit occurs with respect to the life cycle of a US company is approximately 8 years (Ferrati and Muffato, 2021). In the European context, Pisoni and Onetti (2018) even report that 36% of M&A transactions were no more than five years old. It is evident that the Czech Republic does not lag other European countries or the US in the trend of growth in the number of exits and the age of start-ups at exits. Moreover, the age of start-ups at exit is also similar compared to other European countries and the USA, i.e. within 10 years.

According to the results of the study by Ferrati and Muffato (2021), the acquisitions of start-ups in the USA between 2000 and 2021 were mainly in the ICT sector, namely in 40% of all exits. This is not surprising, as this sector is widely known to experience exits of younger companies compared to other sectors. The results of this paper differ slightly. On the other hand, the ICT sector in the Czech Republic accounts for 35% of the total number of exits, which is not a diametric difference given the concentration of technology start-ups in the US within the Silicon Valley region. Furthermore, the authors Ferrati and Muffato (2021) identify a relationship between the start-up sector and the timing of its exit in the USA, with ICT start-ups, specifically software or app makers, exiting the fastest. For the Czech Republic, a statistically significant relationship between the sector and the timing of start-up exits was not confirmed. This may result from the size of the Czech capital market, or rather its small size, where the specific requirements of the sector and the capital intensity of the financing rounds may not play a significant role in relation to the time horizon.

In relation to the sector, the data also point to the fact that long-established firms mainly seek start-ups from the same sector for their growth, which helps them to accelerate the introduction of new products or expand their product offerings or generally strengthen their market position (Pisoni & Onetti, 2018). Félix et al. (2014) report that the ICT sector is positively correlated with higher rates of appreciation of invested capital. However, this relationship has not been confirmed

for the Czech Republic, which again signals to start-ups and investors to avoid concentration in one sector. In general, it can be concluded that in the Czech Republic the highest valuation at exit is not the rule in the ICT sector. On the other hand, where the Czech Republic does not differ from foreign players is the fact that the investor usually comes from the same sector.

M&A transactions are usually carried out between companies in close geographical proximity. Moreover, Ferrati & Muffato (2021) state that geographic distance is already a significant factor influencing investment decisions. There is a huge interdependence with venture capital, or the attractiveness of a given country for an investor and explicitly the success of the start-up, which also leads to a successful exit. According to the research of Schumacher (2022), it is the cooperation with early venture investors at the early stage of the business plan that leads to the successful completion of the whole project and its ending with an exit. In relation to the attractiveness of the country, research by Šimić (2015) showed that the Czech Republic is a top performer for investors in the CEE region. Which is a significant finding, as we can expect an increased inflow of foreign capital, and with it an associated increasing number of exits of start-ups and subsequent reinvestment of the raised funds in the capital market in the Czech Republic.

Finally, Pisoni and Onetti (2018) show that businesses in both the European and US start-up markets buy local companies. This is significantly more common in Europe, where 56% of M&A transactions are completed on a local level. For the Czech Republic, the results are similar, even statistically significant. Specifically, nearly 50% of the investors in Czech start-ups are also from the Czech Republic. On the other hand, the share of foreign start-ups buying in the US is significantly higher compared to Europe (Pisoni & Onetti, 2018). However, this is a consequence of capital market development in the USA, the level of which has not yet been achieved by European countries. It is undeniable that geographical proximity has its incontestable advantages.

7.1.   Recommendations for Policy Makers

Apart from the usual incentives in the form of support programmes and grants from public budgets, whether national or European, or tax settings in the context of the establishment of start-ups and venture capital investment, it is possible to offer several recommendations for policy makers in the Czech Republic to support the market for start-up projects. First of all, the growing trend in the number of exits implies the need to optimise the capital market in the Czech Republic, which is not favourably set up in the area of start-ups, whether it is the investor's entry into the company or, for example, employee shares, which are standard in Western countries. The capital market in the Czech Republic has not been fulfilling its function for a long time, i.e. there is no effective allocation of free funds from investors to companies demanding financial capital. This situation is caused, among other things, by the lack of awareness of the stakeholder groups, so it is advisable for policy makers to create an information campaign on financing

opportunities on the capital market for both the supply and demand side. The resulting awareness of both groups will lead to a more efficient allocation of financial capital and thus to the development of the market for start-up projects. In this area, double taxation of owners and shareholders of companies is also problematic, i.e. a possible solution consists in reducing the tax rate.

Secondly, it is indisputable that investors and founders expect the ICT sector to generate the highest returns on their investments. Thus, in this respect, it is advisable to focus support on other sectors to avoid concentration in a few sectors.

Finally, and most importantly, it is necessary to attract foreign investors to Czech start-ups. It is indisputable that acquisitions usually take place between local partners. However, in the USA and, by extension, in Western countries, acquisitions among foreign partners are steadily increasing. Thus, the task of policy makers is to create a favourable environment for foreign investors to be motivated to buy Czech companies, which will explicitly lead to faster economic growth.

8.   CONCLUSION

The VC investor's exit is the final stage of the life cycle of a start-up investment. The outcome of an exit transaction serves as a measure of the success of a project from the perspective of the founders, investors, or professional management. In addition, there is an important aspect in terms of the development of the start-up ecosystem, consisting in the fact that the released financial resources are usually reinvested in the start-up projects market. However, research on exits is insufficient, especially in the Czech market. Therefore, the main objective of this paper is to identify the main characteristics of venture capital investors' exits from start-ups operating in the Czech Republic. For this purpose, a statistical analysis of secondary data of 100 domestic start-up transactions from the Czech Founders database for the period 2007 to 2021 was processed. To our knowledge, this paper is the first to use the database to analyse exits. The individual variables included the age of the start-up, the sector of operation of the start-up and the sector of operation of the investor, the location of the start-up, the location of the investor, and last but not least, the valuation of the start-up at its exit. The data were processed using descriptive and inferential statistical methods.

The results of the descriptive characteristics indicate that the number of exits of Czech start-ups has been continuously increasing since 2007. Investors buying Czech start-ups in M&A transactions are primarily from the Czech Republic and the exit, or the transaction between the interested parties, usually occurs when the start-up is between 6 and 10 years old, especially in the consumer goods and services sector. In the case of an exit, the valuation of a start-up most often equals between 2,601 and 12,000 thousand euros.

The inferential statistical analysis tested the hypotheses of the existence of a relationship between the industry of the start-up and the timing of its exit, location of the start-up and location of the investor, exit valuation and industry of

the start-up, and between the industry of the start-up and the investor. The results show that there are statistically significant differences between the sector of the start-up and the location of the start-up. On the other hand, no relationship has been identified between the sector of the start-up and the timing of its exit or the industry and the valuation of the start-up at exit. The resulting findings are significant for the supply and demand side, where both parties are able to make informed adjustments to their behaviour to make the process more efficient, even in a global context. Policy makers are able to adjust market support programmes for start-up projects based on the results and for the academic community, the findings provide information on further possibilities for research in this area.

The limiting element of this paper is perceived as the remaining small number of observations, at least compared to the developed world markets. This is also related to the selected database, as the specific data collection methodologies are related to the fact that part of the market remains hidden.

As for the direction of further research, it will focus on the area of valuation of start-ups at exit. This relationship will be explored in more depth, including the identification of additional links of start-up valuation at exit. Academics are advised to focus future research on exits, particularly on the area of fundamental investment characteristics for other types of exit strategies such as IPOs. In general, it is possible to conduct further research within international comparative studies.

Acknowledgements

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APPENDIX

Table 12

Correlation Matrix

Variables		Age _startup	Industry _startup	Exit _valuation	Industry _buyer	Location _buyer
Age _startup	Pearson Correlation	1	0,013	0,191	0,040	-0,123
	Sig. (2-tailed)	-	"0,903"	"0,136"	"0,709"	"0,246"
	N	92	92	62	91	91
Industry _startup	Pearson Correlation	0,013	1	-0,068	0,684**	-0,205*
	Sig. (2-tailed)	"0,903"	-	"0,589"	**"<0,001"**	**"0,043"**
	N	92	100	66	98	98
Exit _valuation	Pearson Correlation	0,191	-0,068	1	-0,060	0,375**
	Sig. (2-tailed)	"0,136"	"0,589"	-	"0,637"	**"0,002"**
	N	62	66	66	65	66
Industry _buyer	Pearson Correlation	0,040	0,684**	-0,060	1	-0,159
	Sig. (2-tailed)	"0,709"	**"<0,001"**	"0,637"	-	"0,120"
	N	91	98	65	98	97
Location _buyer	Pearson Correlation	-0,123	-0,205*	0,375**	-0,159	1
	Sig. (2-tailed)	"0,246"	**"0,043"**	**"0,002"**	"0,120"	-
	N	91	98	66	97	98

Source: Own elaboration from SPSS

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IZLASCI NOVOOSNOVANIH PODUZEĆA: DOKAZI IZ ČEŠKE REPUBLIKE

Sažetak

Cilj je ovog rada identificirati glavne karakteristike start-up izlaza u Češkoj. Jaz u istraživanju proizlazi iz nedostatka istraživanja izlaza start-upa. U tu svrhu koristi se jedinstvena baza podataka čeških osnivača koja uključuje podatke o 100 transakcija za razdoblje 2007. – 2021. Podaci se vrednuju odabranim statističkim metodama. Rezultati pokazuju da postoje statistički značajne razlike između industrije i mjesta osnivanja. S druge strane, nije utvrđena statistički značajna razlika između sektora start-upa i vremena izlaza ili industrije i vrednovanja start-upa na izlasku. Ovo je istraživanje prvo koje je mapiralo izlaze start-upa u češkom kontekstu. Doprinos proširenju postojećeg stanja znanja jest formuliranje i primjena alata kojima će stvaraoci politika podržati razvoj poduzetničkih ekosustava.

Ključne riječi: start-up, rizični kapital, izlaz, izlazna strategija, Češka Republika.

JEL klasifikacija: G24, G34, M13.