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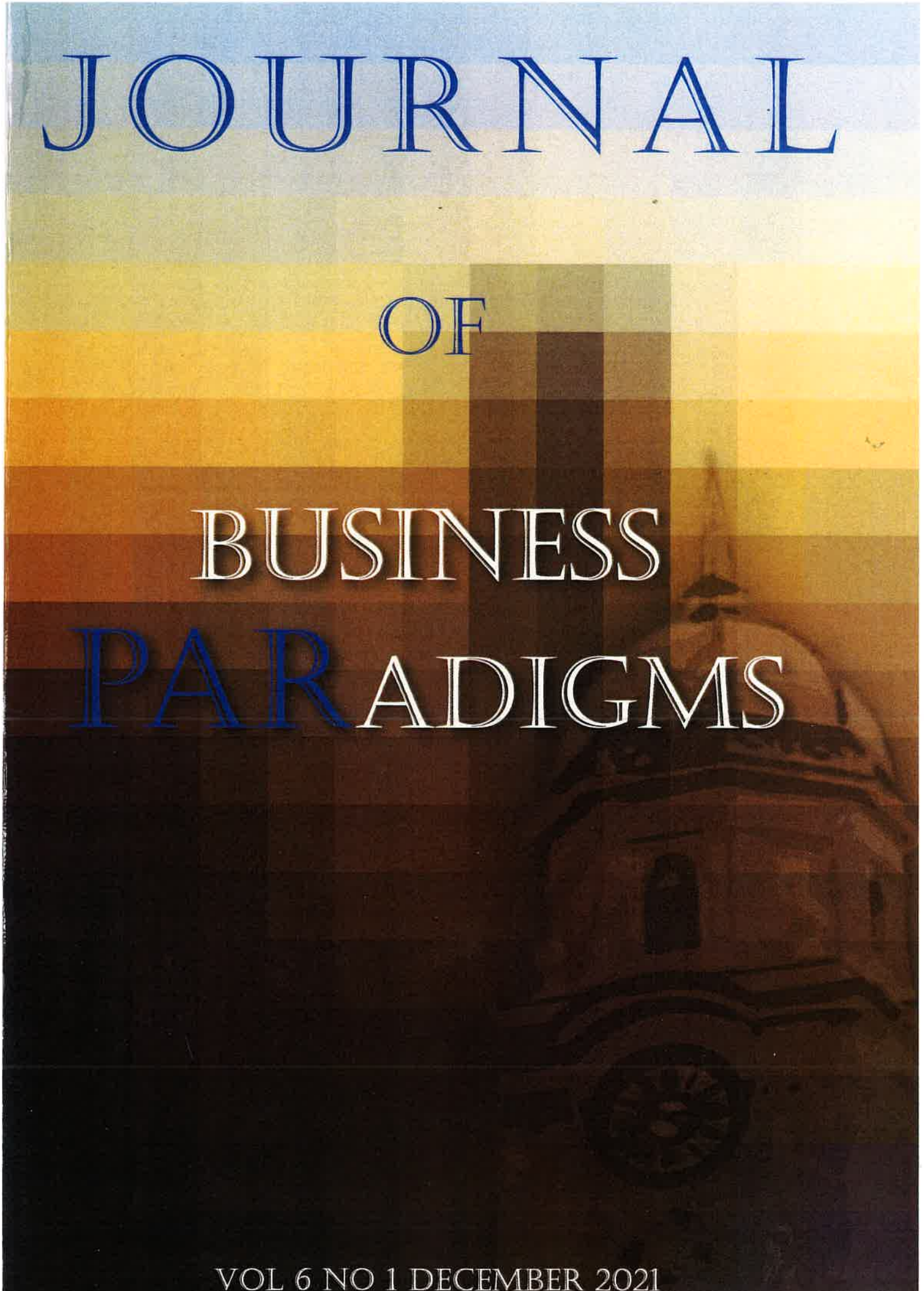

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Contents

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ABSTRACT

COVID-19 pandemic has placed huge pressure on the national economies in almost entire world. It cannot be denied that COVID-19 had dramatically changed the economic environment including local start-up ecosystems. Given that technology incubator is one of the building blocks of the start-up ecosystems, COVID-19 pandemic had dramatically impacted

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this building block as well. In this paper we present results of the Business incubator Novi Sad for the period 2011-2019 and projections for 2020 and 2021. We also present real data for the year 2020 (impacted by COVID-19 pandemic) and we analyze the difference between projected and real data. As the Business Incubator Novi Sad is considered one of the pillars of innovation activities in the Republic of Serbia, the consequences of the COVID-19 pandemic on its results could be considered representative of the wider region. Taking into account the available literature and presented data, this paper is a step further in an attempt to understand the impact of the COVID-19 pandemic on technology incubators in the Western Balkans.

Key words: *high-tech incubator, innovation, start-up, COVID-19*

JEL classification: M13, L26, O32

INTRODUCTION

In the last few decades, we are witnessing significant rise in the interest for high-tech entrepreneurship and development of start-ups. Global crisis resulting from COVID-19 pandemic has affected all segments of business including development of new high-tech start-ups. In contrast to the previous economic crises such as the 1987 "Black Monday" stock market crash, the dot-com bubble burst of 2000-2001, and the 2007-2008 financial crisis known as United States housing bubble, COVID-19 crisis is not only economic in scope but it also has horrific human impact (Gauthier et al., 2020). Gravity of the impact of COVID-19 on the economy as a whole can be seen in the report (Gauthier et al., 2020). In that report the authors cite data which shows that in the mid 2020 just in a single week 3.3 million workers in USA requested unemployment insurance. Such a large number of newly unemployed hasn't been seen since 1967 when the Department of Labor started publishing these figures.

Despite the undeniable devastating impact of the COVID-19 pandemic, there may be potential benefits, reflected in increased demand and urgency related to innovation on global level. Not only businesses, but the whole societies are being challenged to develop solutions that leverage innovation to mitigate the effects of the pandemic.

Given the definition that start-ups are temporary organizations searching for profitable, repeatable and scalable business models (Blank, 2013) under conditions of extreme uncertainty (Lean Startup Co. Education Program, n.d.) the question is how these organization cope with additional level of uncertainty caused by COVID-19 pandemic (Hudecheck et al., 2020; Buheji & Ahmed, 2020). Since most of the start-ups start their development in technology business incubators (TBIs) where the key factors for innovation come together technology, science, education, knowledge, entrepreneurial talent, and capital (Smilor & Gill, 1986; Mian et al., 2016), that means that TBIs are also impacted by this crisis.

The goal of this paper is to analyze the impact of COVID-19 pandemic on the results of TBIs measured by the number of new start-ups and newly opened jobs.

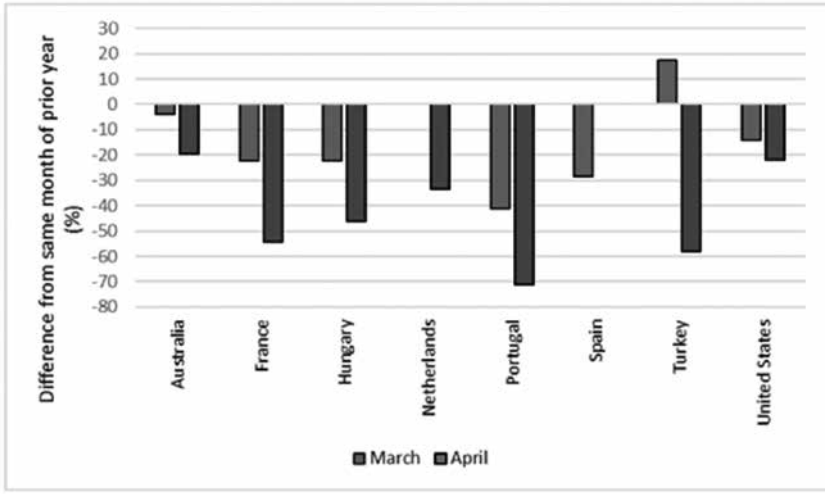
LITERATURE OVERVIEW

As the term `incubator` is associated with fresh growth and the first days of life after hatching, the innovative and entrepreneurial ideas are exactly what the humanity needs right now, as economies everywhere are slowly stabilizing to the post-pandemic world (McIver-Harris & Tatum, 2020). Businesses everywhere are being challenged to develop solutions that leverage innovation which will help economies to minimize the effects of the pandemic. That is why advice from academic and professional public to organizations, on how to adapt to the COVID-19 constraints, are becoming increasingly important. It is a usual trend that innovators continue to pursue new ideas related to the problems caused by crises for additional one to two years after the global crises stabilize. In the study presented by Kuckertz et al. (2020), the authors suggest that governments should mandate programs targeting innovative start-ups to ensure support for the entrepreneurs developing innovative solutions. One such effort is “Public call for suppression of the effects of the COVID-19 pandemic” announced by the Innovation fund Republic of Serbia (Innovation Fund of the Republic of Serbia, 2020).

It is evident from the past that crisis periods correlate with the decline in the number of new company registrations. The most recent research data published in Calvino et al. (2020) and presented in Figure 1 confirms that company creation has declined significantly across many countries. For example, the decline as severe as 70% in April 2020 in Portugal compared to the same month in the previous year,

and 46%, 54%, and 58% in Hungary, France, and Turkey, respectively. Somewhat milder, but still serious declines are evident in Australia, United States, and Netherlands.

Figure 1 Declines in business formation during COVID-19



Source: Calvino et al. (2020)

The impact of COVID-19 on the economy and entrepreneurship in the Republic of Serbia can be seen through the numbers of newly registered companies and proprietorships published by Serbian Business Registers Agency. According to official data for 2020 there were 121,619 registered companies, and 278,956 proprietorships. According to the same source during 2020 there were 9,176 more registered companies than in 2019, and 29,810 fewer proprietorships than in 2019. The process of closing proprietorships is relatively short (around one month) and simple, while the process of closing a company is much more complicated, expensive and time consuming (minimum 4 months). That is the reason why true impact of COVID-19 on the number of closed companies probably won`t be seen until the end of 2021.

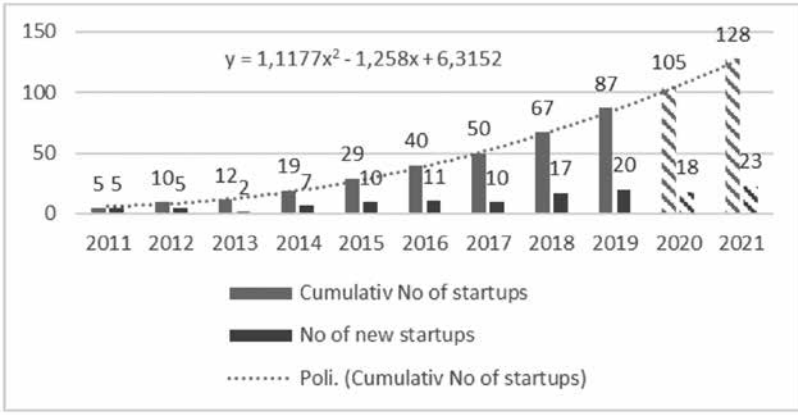
CASE STUDY REVIEW

Business Incubator Novi Sad was founded in April of 2010 by the City of Novi Sad (40% equity), Vojvodina Development Agency (40%), Faculty of Technical Sciences - University of Novi Sad (10%) and public utility company - Informatika (10%) with the aim of supporting development of high-tech start-ups in the city of Novi Sad. Within Business Incubator Novi Sad there is co-working open space for 32 co-working job positions. This space is available to start-ups for the period of pre-incubation, and that segment has been hardest hit by COVID-19 pandemic. Process of incubation is divided into 6 six-month phases and is based on the Stage-gate model (Cooper, 1990). Development of start-ups going through incubation process is followed and evaluated by a committee of 4 to 6 experts. All of the support activities (training, mentoring, consultancy, committee evaluation) were moved online after the start of COVID-19 pandemic.

One of the most significant activities for the development of a local start-up ecosystem is the exchange of knowledge through meet-ups, where local lecturers and field experts share their knowledge and experience with the community of interest. Unfortunately, these activities were canceled since the start of COVID-19 pandemic. Importance of this activities can be seen through the number of meet-ups held in 2019. That year, 94 meet-ups were held, with between 40 and 60 participants per event. But in the first three months of 2020 there had been 12 meet-ups and after that all these activities were canceled, and as of April 2021 they have not resumed.

COVID-19 pandemic has also heavily impacted another key activity of the Business Incubator Novi Sad, such as participation in the implementation of international projects. Since its inception, up to the end of April of 2021, Business Incubator Novi Sad has participated in the implementation of 18 European projects including Tempus, Erasmus+, Cosme, and H2020 projects. All projects in which the Business Incubator Novi Sad takes part are directly linked to entrepreneurship support, development of entrepreneurial ecosystems and start-up services. Given that some of the most common activities in these projects include travel, and the exchange of knowledge and experiences with other European partners through direct contact at meetings, travel restrictions due to COVID-19 have had a huge negative impact on project dynamics.

Figure 2 Total number of start-ups supported by Business incubator Novi Sad for period 2011-2019, and projections (shaded bars) for 2020 and 2021

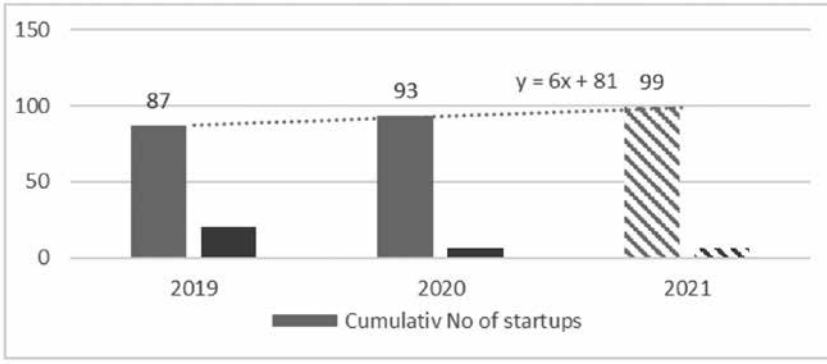


Source: Authors´ analysis according to the data obtained by Business Incubator Novi Sad

Based on our data (Figure 2) on the number of new start-ups from 2011 to 2019, we made a projection on the number of new start-ups in 2020 and 2021 under the assumption that COVID-19 pandemic hasn't occurred, and that the growth trend rate remained as in previous years. The trend line of the total number of start-ups is approximated by a polynomial interpolation curve. These projections show that there should have been 18 new start-ups in 2020, and 23 new start-ups in 2021.

But due to COVID-19 pandemic, in 2020 there were only 6 new start-ups (Table 1). Using only data from 2019 and 2020 and under the assumptions that impact of COVID-19 would continue, we extrapolated the total number of start-ups for 2021 by a linear interpolation curve (Figure 3).

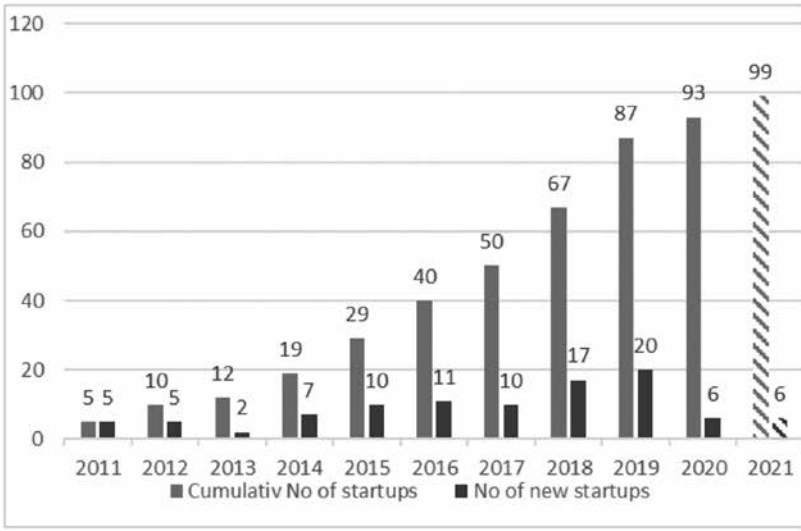
Figure 3 Total number of start-ups supported by Business incubator Novi Sad in period 2019 – 2020, and projection (shaded bar) for 2021



Source: Authors´ analysis according to the data obtained by Business Incubator Novi Sad

The extent of the COVID-19 impact can be seen by comparing the number of new start-ups in 2020 with the assumption of no COVID-19 (18 new start-ups, Figure 2) and the real data for that year (only 6 new start-ups, Figure 3).

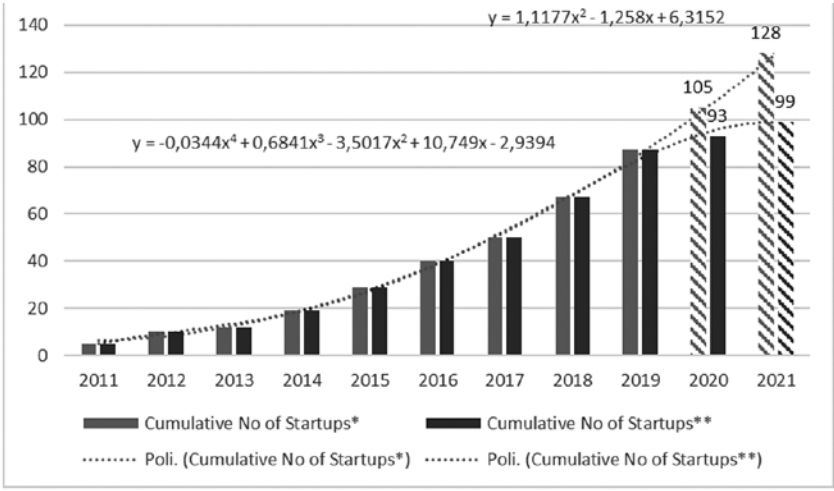
Figure 4 Total number of start-ups supported by Business incubator Novi Sad for period 2011 – 2020, and projection (shaded bar) for 2021



Source: Authors´ analysis according to the data obtained by Business Incubator Novi Sad

Given the growth rate of new start-ups in the period from 2011 to 2019 we would expect 23 new start-ups in 2021 (Figure 2), but taking into account the impact of COVID-19 pandemic (Figure 3), we expect only 6 new start-ups. Using projection of new start-ups in 2021 from Figure 3 we constructed Figure 4 which represents total number of start-ups from 2011 to 2020 and the projection for 2021. The impact of COVID-19 pandemic can be seen graphically in Figure 5.

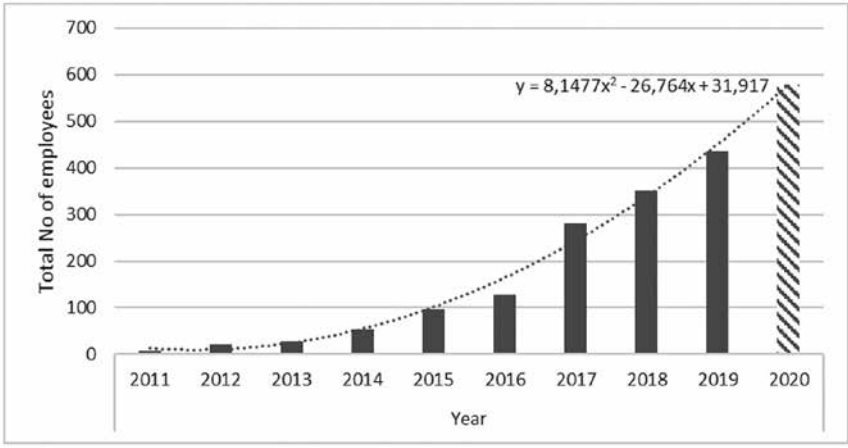
Figure 5 Impact of COVID19 on growth of start-ups



Source: Authors´ analysis according to the data obtained by Business Incubator Novi Sad

In Figure 5 the bars with one star (*) indicate data and projections without COVID 19, while the bars with two stars (**) indicate the impact of COVID-19. As of April 2021, even though we have the official number of new start-ups supported by TBI for 2020, we still don't have the official data on the number of employees. With this in mind, we extrapolated the total number of employees in 2020 (Figure 6).

Figure 6 Total number of employees in start-ups supported by Business incubator Novi Sad for period 2011-2019, and projection (shaded bar) for 2020



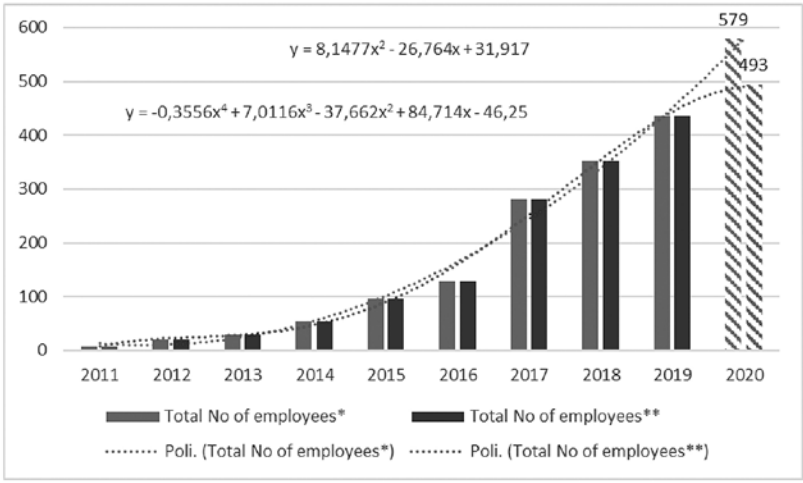
Source: Authors´ analysis according to the data obtained by Business Incubator Novi Sad

Based on the data (Figure 6) on the total number of employees for the period 2011-2019, we made a projection of the number of new employees in 2020 assuming that COVID-19 pandemic hasn't happened, and that the growth rate trend has remained as in previous years. The trend line of the total number of employees is approximated by a polynomial interpolation curve. This projection shows that in 2020 there should have been 143 new employees.

In Figure 6 there is a noticeable jump in the total number of employees in 2017. That was due to additional incubation office space that became available at the TBI, and the new incubation cycle. Taking into account the average number of employees (5.3) per start-up for period 2017-2019 (Table 1), and the actual number of new start-ups in 2020 we estimated the total number of employees in 2020.

Comparing the estimated total number of employees with the projected number of employees under the assumption that COVID-19 pandemic hasn't happened, we can notice significant decline in the total number of employees in 2020 as a direct consequence of COVID-19 pandemic (Figure 7).

Figure 7 Impact of COVID19 on growth of number of employees



Source: Authors´ analysis according to the data obtained by Business Incubator Novi Sad

In Figure 7 the bars with one star (*) represent data (up to 2019) and projection for 2020 without COVID-19, while the bars with two stars (**) represent data (up to 2019) and projection for 2020 taking into account the impact of COVID-19.

Table 1 Results of Business incubator Novi Sad – 2011 – 2020

	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Cumulative No of Start-ups	5	10	12	19	29	40	50	67	87	105*	128*
Cumulative No of Start-ups	5	10	12	19	29	40	50	67	87	93	99**
Total No of employees	8	21	29	53	97	128	282	351	436	579*	
Total No of employees	8	21	29	53	97	128	282	351	436	468**	
Average No of employees per start-up							5,64	5,24	5,01		

Source: Authors´ analysis according to the data obtained by Business Incubator Novi Sad

Table 1 continuated
Legend:
* Extrapolated values without the impact of COVID-19 pandemic
** Extrapolated values with the impact of COVID-19 pandemic

CONCLUSION

The negative impact of COVID-19 pandemic on the number of newly registered start-ups and on the total number of employees in those start-ups supported by TBI Novi Sad is evident from the data given in the previous section. The authors did not analyze financial impact of crisis because the official financial data for 2020 was not available at the moment of publishing this paper. The authors plan to revisit this topic when the complete data sets become available for both 2020 and 2021. But the impact of COVID-19 on the financial results of start-ups could be found in the paper published recently by Kuckertz et al. (2020) where they investigated the financial impacts of the crisis on start-ups, and overlooked the other essential challenges.

ACKNOWLEDGEMENT

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