

## ASSESSMENT OF THE IMPACT OF COVID-19 PANDEMIC ON THE SERVICE SECTOR IN LITHUANIA

Milena Seržantė<sup>1</sup>, Algimantas Pakalka<sup>2</sup>

<sup>1</sup>*Vilnius Gediminas Technical University, Vilnius, Lithuania, E-mail address: milena.serzante@vilniustech.lt, ORCID: orcid.org/0000-0002-2919-115X*

<sup>2</sup>*Vilnius Gediminas Technical University, Vilnius, Lithuania, E-mail address: algimantas.pakalka@gmail.com, ORCID: orcid.org/0000-0002-4842-7754*

Received 30 September 2022; accepted 17 November 2022

### Abstract

**Research purpose.** This study aims to assess the impact of selected economic indicators (independent variables) on the turnover of food and beverage service companies in Lithuania.

**Design / Methodology / Approach.** In order to achieve the intended goal of the study, an analysis of scientific articles was performed, with the primary aim of finding out the consequences of the COVID - 19 pandemic on the Lithuanian economy and selecting five independent variables that could affect the turnover of food and beverage companies. After analysing the literature, five independent variables were highlighted: the number of tourists accommodated, the statistics of Vilnius Airport flights, the number of employees hired, the unemployment rate and inflation.

**Findings.** The correlation and regression analysis results show that the turnover of catering and beverage enterprises and the number of accommodated tourists are strongly correlated ( $r > 0.90$ ). Meanwhile, the linear correlation between the number of Vilnius Airport flights and the number of hired employees with the research variable is average ( $0.60 < r < 0.70$ ). However, the linear correlation of macroeconomic factors such as unemployment and inflation with the turnover of food and beverage enterprises is statistically insignificant.

**Originality / Value / Practical implications.** The originality of this article is that it studies the valuable topic of the COVID-19 crisis in service sectors, which substantially impacted Lithuania's economy and adversely affected the economic performance of the region in general. The results of this research will contribute to future monitoring and crisis planning in particular sectors.

**Keywords:** COVID-19 impact; service sector; economic impact; tourism.

**JEL codes:** M15; M21.

### Introduction

The fast-spreading coronavirus, which was initially discovered in Wuhan, China, at the beginning of 2020, struck the whole world. The virus quickly spread around the world. On February 28, 2020, it was determined that Lithuania had its first verified case. As time has passed, the virus has spread over the world, and Lithuania has become one of several nations that have declared a state-wide quarantine. The quarantine, limits on contact activities, and restrictions on enterprises that have been imposed as a result of this virus have had a substantial impact on the economy of Lithuania and have had an adverse effect on the economic performance of the region. During this time period, a lot of people's lives have been turned upside down; some of them have been fired off from their positions, while others have begun working from home. The limits imposed by quarantine have had an effect on the commercial sector. Various measures, including as sectoral lockdowns, school closures, and restrictions for specified age groups, were implemented to limit the spread of the disease after the first case was reported.

In addition, fears of infection led to a decline in consumption demand in some sectors, particularly the service industry (Aldan et al., 2021). On the other hand, individuals have started putting away some of

their discretionary money or, alternatively, investing it. People's spending, and frequently their incomes, have dramatically decreased as a result of the restricted options that are available during a pandemic. All economies worldwide have suffered as a result of the quarantine and suspension of non-essential activity used to control the COVID-19 epidemic. Small and medium-sized enterprises (SMEs) in developing countries have been particularly impacted because of their low resources, weak supply chains, and weak business-to-business and business-to-client connections (Caballero-Morales, 2021).

The analysis of (Menezes et al., 2022) demonstrates that the effects of COVID-19 are distinct from those of prior crises, such as the global financial crisis and the recession of 2014. The COVID-19 pandemic is best seen as having an impact comparable to that of a natural disaster, with supply interruptions leading to income declines, which ultimately contribute to lower aggregate demand. Clearly, the lockdowns have had an increasingly significant effect on commercial activity such as retail and services. Contrarily, the global financial crisis (and recessions more generally) is linked to a decline in total demand, which is reflected in industrial activity. The COVID-19 pandemic has had a devastating effect on the worldwide economy, as well as on the tourist sector. The findings of (Pham et al., 2021a) indicate that the pandemic impacts a variety of sectors and professions outside the tourist industry. The authors recommend that the government has to provide robust assistance for the tourist industry, as its recovery may have positive effects on other industries and the whole range of jobs in the labour market. The effect of the COVID-19 epidemic on the travel and tourist industry has been devastating. Due to the significance of tourism in rising economies and the uniqueness of their infrastructures and healthcare systems, tourist sites in developing nations are much more vulnerable to unfavourable trends (Cambra-Fierro et al., 2022)

During the recession, offline micro businesses (OMB) activity in China dropped immediately and dramatically by 50 per cent. Seven weeks following the COVID-19 outbreak, the businesses had recovered to around 80 per cent of their pre-outbreak levels and maintained at this level until the end of our time frame (Guo et al., 2022). The findings by (Uddin et al., 2022) reveal a significant, positive correlation between the analysed markets and the COVID-19 epidemic.

Due to contagion and other markets' spillover effects, market efficiency, diversification advantages, and hedging were questioned. Further study is required to analyse and reduce the effects of market correlation and investor irrationality, which may contribute to such financial contagion (Iyer & Simkins, 2022).

Both the economy of Lithuania and the economies of the rest of the world were significantly impacted. The purpose of this study is to investigate the effects that the worldwide spread of the coronavirus pandemic has on the economic indicators of Lithuanian companies that operate in the food and beverage sector. The situation in Lithuania during the epidemic will be analysed using both a theoretical examination of the scientific literature and a practical investigation of the economic data. The research problem that was established for this investigation referred to the economic effects of the COVID - 19 pandemic shock. An economic indicator known as "Turnover of Food and Beverage Service Enterprises" will serve as the primary focus of this investigation. The rate, which defines the change of indicator of the service sector, will be a reflection of the impact that the coronavirus has had on the economy of Lithuania.

## **Literature review**

As the topic of the COVID-19 pandemic touched extensive areas of economic sectors, so it is natural that there is plenty of research regarding this theme (Christophe et al., 2022; Hokama et al., 2022; Nurmohamed et al., 2022; Pinchera et al., 2022; Schmidt et al., 2022; Su et al., 2022; Wang et al., 2022). Lots of these researches are investigating the impact of COVID-19 on the economy (Atsız & Cifci, 2021; Hyman et al., 2021; Keogh-Brown et al., 2020; Malik et al., 2022; Pham et al., 2021b); others are making the prognoses (Atsız & Cifci, 2021; Hyman et al., 2021; Keogh-Brown et al., 2020; Malik et al., 2022; Pham et al., 2021b) or giving recommendations (Atsız & Cifci, 2021; Hyman et al., 2021; Keogh-Brown et al., 2020; Malik et al., 2022; Pham et al., 2021b), and only some of these scientific publications are dedicating the research about the impact of COVID -19 on a food and beverage service enterprises (Atsız & Cifci, 2021; Hyman et al., 2021; Keogh-Brown et al., 2020; Malik et al., 2022; Pham et al.,

2021b) In order to conduct an analysis of the mass of published work, a selection of research and scholarly publications on the state of the situation in Europe, Canada, the United States, and Malaysia during the epidemic have been chosen. As the COVID - 19 pandemic is a worldwide issue, the preventative plans and procedures of the various nations are more or less similar. The most common approaches for preventing the spread of COVID - 19 were movement and mobility limitations, purification, and quarantine. Consequently, the food and beverage industry was one of the industries most impacted by the COVID - 19 epidemic. During the pandemic, the service industry had a particularly severe economic blow, both in Lithuania and globally. Due to the consequences of the COVID - 19 pandemic, individuals and government prohibitions have avoided human interaction. Consequently, the service sector has sustained enormous losses, as the vast majority of its activities relied on face-to-face communications. This study examines the influence of the COVID - 19 pandemic indicators on the activities of restaurants and cafés, which will be represented as an economic indicator in this empirical study. Several prospective indicators are examined scientifically in the following subsections in order to evaluate the relationship between the turnover of food and beverage service businesses and those indicators. The purpose of the further literature review that will be conducted on each specific economic factor relating to the COVID-19 pandemic is to conduct an analysis of the core factors that the researchers see as being the most significant. Readers would have a better understanding of the current state of the art in the sphere.

### **The situation of the labour market in relation to the COVID–19 epidemic**

The epidemic impacts almost every element of economic activity, but labour markets are particularly vulnerable. Activities associated with the labour market, such as physical contact at the job, commuting, and other activities, directly contribute to the spread of the illness. Moreover, the pandemic might disrupt the current labour market systems and alter the wage and unemployment patterns (Kopicki & Rupert, 2022).

Researchers (Svabova et al., 2020) conducted a study of the unemployment rate in different sectors of the Slovakian economy. The months of November 2019 through October 2020's monthly statistics were analysed. The analysis suggests that the COVID-19 shock had the most significant effect on the accommodation and food service industries, as well as the leisure and entertainment industries. In April 2020, the unemployment rate in Slovakia was 8%, up 30% from the previous month (6.2 per cent). Comparing April 2020 to March 2020, the number of job searchers in Slovakia's accommodation and food service industry doubled in April. In order to mitigate the negative impacts of the demand and supply shock brought on by COVID - 19, the government of Slovakia has decided to become involved in the economy of the nation by providing assistance to both businesses and the general public.

When comparing the joblessness rates in Lithuania throughout the same time period, from November 2019 to October 2020, there are some remarkable similarities to be found. Even though the quarantine had already been raised by this point, the rate of unemployment in Lithuania began to climb during this time period. The highest rate of unemployment (15-74 years) after seasonal adjustment was 9.9 per cent in September 2020, even though the quarantine had already been lifted by that point.

The implementation of a national quarantine on March 16, 2020, had a substantial influence on the labour market in Lithuania, as well as the delivery of food and beverage services to commercial enterprises. The association between the aforementioned signs may be detected by looking at the date when the quarantine started. At the end of the first quarantine, which took place on June 17, 2020, the percentage of people who were unable to work did not recover and stayed at over 9 per cent. However, the turnover rate of restaurant enterprises started to revert to the turnover rate it had before the pandemic. Restriction of contact activities has resulted in a decrease in the number of consumers attending restaurants, which, in fact, has had an impact on the labour market in the service industry.

Researchers (Dube et al., 2020) state that the restaurant and service sectors are significant sectors of the social economy but that these sectors are also very sensitive and are strongly influenced by a variety of global risks, such as the coronavirus. After analysing the data, the authors concluded that restaurants in the majority of nations have nearly completely lost all of the customers who are served locally. As a direct consequence of this, the service industry experienced a significant drop in income, which in turn

resulted in an extremely high rate of unemployment in catering facilities. According to the data gathered by the source, it can be shown that according to the statistics of March 18, 2020, the number of direct consumers of restaurants declined by around 90 per cent in the United States of America, Germany, Canada, Great Britain, Mexico, Australia, and Ireland. The majority of employees were laid off as a result of the COVID - 19 pandemic, which impacted the worldwide service industry.

Because there was such a high turnover rate in restaurants during the COVID - 19 epidemic, current employees were unable to be kept on, and there was not much preparation done for the recruitment of new employees. It is also widely known that servers and bartenders who work in businesses that provide food and beverage supply get a significant portion of their earnings from tips received by customers. There is no question that the limits that were enforced during the COVID - 19 epidemic affected the monthly turnover of food and beverage businesses. When looking at the months of February and April 2020, when the quarantine started, it is clear that the turnover rate of restaurant establishments has dropped by a three-fold amount. In light of these findings, it is reasonable to draw the conclusion that workers in the service industry, the majority of whose money comes from gratuities, have had a significant portion of their pay cut as a direct result of the reduction in the number of clients. Because of the current financial environment, firms have not only been forced to cut down the number of workers they employ but they have also been forced to reduce the pay of those who still were employed.

### **Inflation in the context of the COVID – 19 pandemic**

The authors of the scholarly work (Erdogan et al., 2020) researched the reasons for an inflation in European countries from January 2020 to July 2020. Their findings were published in 2020. In the framework of COVID - 19, an examination of the factors that determine inflation was carried out using regression models. The most significant contributors to the recent increase in inflation have been identified as being exchange rates and the amount of money in circulation. Because the effects of the imbalances have been passed on to each other, regional cooperation is important for economic stability. However, this does not guarantee that it will prevent future shocks. The study has shown that macroeconomic imbalances have been identified in all countries and that the effects have been passed on to each other.

In the framework of COVID - 19, it is unavoidable for there to be either inflation or depreciation of money. As the country of Lithuania, like the majority of other nations, struggled to overcome the impact, additional money was added to the offer, and citizens were provided help. The majority of the funds came from member states of the European Union. The economic recovery will receive a total of 2,364.3 billion euros from the European Union. The purpose of this is to provide assistance to European nations in their struggle against the COVID–19 epidemic as well as the economic impact. As a result, higher inflation during the heat of COVID-19 is a natural economic component.

An article written by an American researcher (Shapiro, 2020) states that social distance has significantly decreased consumer expenses in industries where usually human interaction is present. There is a discussion of the restaurant and hotel industries. Shapiro and A.H. conducted research in which they analysed the COVID - 19 inflation in impacted industries throughout the United States for 18 months, beginning in January 2019 and ending in June 2020. The limits imposed by the government to slow the spread of the epidemic have impacted inflation in these areas. According to the findings, the drop in PCE inflation of 1 per cent from the prior threshold of 2 per cent results from falling consumer demand for goods and services.

As a result, it may get the following conclusion: the COVID - 19 sector that is most impacted by inflation has an effect that is counter to what it has on the economy as a whole. According to the data that was obtained, the rate of inflation in Lithuania began to climb noticeably during the second month, and it reached 1.4 per cent in September 2021. A jolt was given to the economy due to the rationale for such high inflation, which was an increase in the money supply to tackle COVID-19. On the other hand, diners and coffee drinkers spent less money at restaurants and cafes as a direct result of the tight limitations that were placed on them during the quarantine. Therefore, an increase in the money supply does not always result in inflation across the board. Since the turnover of Lithuanian catering enterprises

demonstrates that consumers spent less in this sector during the pandemic, inflation had to have very little effect on the operations of restaurants and cafes.

### **Decreased tourism due to mobility restrictions**

Researchers (Wasiul et al., 2020) revealed that as a result of the COVID - 19 pandemic, the government of Malaysia enacted a Movement Control Order (MCO) at the beginning of 2020 in an effort to stop the virus from spreading further. The order's purpose was to cut down on flights to Malaysia, which had a negative impact on the hospitality and food service industries in the region. Also, prior to the outbreak of the pandemic in the year 2020, the tourist industry in Malaysia was recognised as one of the most productive and rapidly expanding industries on a worldwide scale.

The COVID–19 epidemic has been a significant source of economic stress for a number of nations, including Malaysia and Spain, both of which depend on a sizable percentage of their GDP from tourism and other service-based industries. It is reasonable to suppose that the economy of Lithuania and the revenue of catering companies have suffered less than they have in Malaysia or Spain due to the fact that the tourist industry in Lithuania is not as established as it is in Malaysia or Spain.

These researchers (Ozili & Arun, 2020) have written a scholarly article discussing how the global health crisis has evolved into a worldwide economic crisis. As a direct consequence of this, industries and the companies within them that depend heavily on regular interaction with humans have been obliged to either shut down or alter the ways in which they conduct their operations. In order to stop the epidemic from spreading further, the worldwide tourist sector has suffered a loss of \$200 billion. During the outbreak, the hospitality and food service industries had a major economic setback due to fewer tourists and more stringent movement restrictions. The most severe impact was seen by small enterprises operating in the service industry, the majority of which were unable to continue operating normally as a result. In addition to this, an experimental investigation was carried out, with data spanning from March 23, 2020, to April 23, 2020. According to the findings of the research, the duration of the quarantine had a considerable and detrimental effect on the pricing of stocks as well as the economy as a whole.

As a result, there have been limits placed on people's ability to move about in several countries, including Lithuania. Statistics on airline traffic and the number of visitors visiting each country have been significantly influenced by international travelling. According to the scientific studies that were reviewed and analysed on the subject of travel and mobility constraints brought on by the COVID-19 pandemic, the pandemic had a substantial effect on two indicators that were relevant to the subject—statistics on both the number of tourists and flights.

When the findings of the literature review on the existing situation due to the effect of some economic variables on the turnover of food and beverage service businesses in the context of the COVID-19 pandemic are summed up, it is evident that some of the variables that were selected made a significant impact, including inflation, the number of tourists, the number of flights, the number of employees hired, and the unemployment rate. The COVID - 19 pandemic has had a significant impact not only on the economy of the entire world but also, in this specific instance, on the selected independent variables that affect the turnover of food and drink companies. These variables include unemployment, inflation, recruitment, airport flight statistics, and the number of tourists staying in accommodations. The variables for the subsequent empirical investigation were chosen with the assistance of the examination of a number of different scholarly journals. Although the articles focus on a variety of countries around the globe, the conclusions they provide are very relevant and have the potential to be applied to the Lithuanian market since the COVID - 19 virus has an impact on economies throughout the world.

### **Research Methodology**

The research samples have been collected based on the literature review and the main results which have been conducted. Throughout that process, five different factors have been identified as potentially having an independent impact on the turnover of food and beverage enterprises. The following is a list

of the factors that are being utilised for this research, taking into mind all of the scientific literature analysis and the statistical data that was obtained specifically for this study:

Dependent variable:

- Y – turnover of food and beverage enterprises.

Independent variables:

- X1 - number of tourists accommodated;
- X2 - number of flights at Vilnius Airport;
- X3 - number of employees hired;
- X4 – unemployment rate;
- X5 – inflation.

The data was collected based on the information provided in two official databases. The Official Portal of the Statistics Department and the website for Lithuanian Airports both provided access to the data that was used in the particular study.

First, a calculation for the correlation analysis is made. This method can be used in this particular case because correlation analysis makes it possible to establish whether or not there is a link between the components being analysed, which are represented by quantitative indicators. The strength and direction of linear relationships between sets of variables can be evaluated by using correlation coefficients. These coefficients are used in statistical analysis. Through this study, we will establish whether or not there is a connection between the component that is dependent and the factor that is independent. On the basis of the data that are currently available, it is being assessed how the variables are related to one another. The correlation coefficient is calculated according to the Pearson correlation coefficient methodology proposed by (Freedman et al., 2007).

After determining the value of the correlation coefficient, two hypotheses are being raised (1):

$$\begin{cases} H_0 : r = 0 \\ H_1 : r \neq 0 \end{cases} \quad (1)$$

When we say that the value of the correlation coefficient is 0 and that there is no association between the variables, we are saying that the null hypothesis is accepted. If the value of the correlation coefficient is not equal to zero, then the alternative hypothesis states that there is a link between the variables and that the relationship does exist.

Calculating the value of the statistical T and the value of the critical T is the first step that must be taken before accepting any of the hypotheses that have been presented.

In accordance with the following formula (2), the statistical value of T may be quantified:

$$T = r \sqrt{\frac{n-2}{1-r^2}}, \quad (2)$$

where:

$r$  is the value of the correlation coefficient;

The value of T that is considered as a critical T may also be identified in the statistical table; all that is required is the selection of the significance level and the value of df, which should be equal to  $n - 2$ .

When these two numbers have been calculated, the significance of the correlation coefficient may next be assessed. Therefore, getting the conclusion that the coefficient is statistically significant if the statistical value of T is bigger than the critical value of T. This means that an alternate hypothesis is

accepted in this scenario. In order to proceed with the analyses, we only need to consider indications that are statistically significant.

Following the examination of correlation, the following stage of the research consists of pairwise regression analysis as well as multivariate regression analysis. It is only carried out using statistically significant independent variables, the existence of which is verified by correlation analysis. The purpose, as well as the goal, is to conduct research into the manner in which the dependent component is impacted by each independent factor in sequence.

The formula that will be used to obtain the linear regression equation is as follows:

$$y = a_0 + a_1x, \tag{3}$$

The formula that will be used to obtain the multivariate regression equation is as follows:

$$y = a_0 + a_1x_1 + \dots + a_nx_n, \tag{4}$$

where:

$a_0, a_1$  - regression line coefficients;

$x$  is an independent variable.

There are three prerequisites that need to be satisfied in order to construct and evaluate a linear regression equation: the coefficient of determination must be higher than 0.25 in order to be considered valid; the significance of the regression must be lower than 0.05 in order to be considered significant;  $P$  value < 0.05.

### Research results

In the first step of the process, a correlation analysis was carried out in order to determine whether or not there is a link between the variables that is statistically significant. The relationship between the primary research variable, which is the turnover of food and beverage enterprises, and the following additional factors: the number of tourists who were accommodated; the number of flights that took place at Vilnius Airport; the number of employees who were hired; the unemployment rate; and inflation, five hypotheses are being tested in this instance.

As a result, the five null hypotheses  $H_{0i}$ ,  $i = 1, 2, 3, 4, 5$  have been tested. These hypotheses indicate that the variables do not have a statistically significant linear connection with one another. The findings of the correlation analysis are shown in Table 1.

**Table 1. The results of correlation analysis** (source: composed by authors)

		Turnover of enterprises without VAT, M EUR	Number of tourists accommodated in Lithuania	Vilnius airport flight statistics	Employees recruited, thousands	Unemployment rate (15-74 years), seasonally adjusted, %	Inflation, %
Turnover of enterprises engaged in food and beverage service activities without VAT, M EUR	Pearson Correlation	1	.901**	.620**	.694**	-.118	.085
	Sig. (2-tailed)		.000	.000	.000	.514	.638
	N	33	33	33	33	33	33

Number of tourists accommodated in Lithuania	Pearson Correlation	.901**	1	.730**	.592**	-.217	-.142
	Sig. (2-tailed)	.000		.000	.000	.224	.431
	N	33	33	33	33	33	33
Vilnius airport flight statistics	Pearson Correlation	.620**	.730**	1	.509**	-.681**	.006
	Sig. (2-tailed)	.000	.000		.002	.000	.974
	N	33	33	33	33	33	33
Employees recruited, thousands	Pearson Correlation	.694**	.592**	.509**	1	-.136	.386*
	Sig. (2-tailed)	.000	.000	.002		.451	.026
	N	33	33	33	33	33	33
Unemployment rate (15-74 years), seasonally adjusted, %	Pearson Correlation	-.118	-.217	-.681**	-.136	1	-.257
	Sig. (2-tailed)	.514	.224	.000	.451		.148
	N	33	33	33	33	33	33
Inflation, %	Pearson Correlation	.085	-.142	.006	.386*	-.257	1
	Sig. (2-tailed)	.638	.431	.974	.026	.148	
	N	33	33	33	33	33	33
** . Correlation is significant at the 0.01 level (2-tailed).							
* . Correlation is significant at the 0.05 level (2-tailed).							

In this particular circumstance, it is necessary to analyse the first line of the data since it indicates the correlations of the remaining variables with the dependent variable. The findings of the correlation analysis indicate that the variable under investigation and three other factors—the number of tourists who were accommodated, the number of flights that departed from Vilnius Airport, and the total number of employees who were hired—have a linear relationship that is supported by statistical evidence and is significant. In the first scenario, a highly robust linear connection was discovered, with  $r = 0.901 > 0.90$  ( $p = 0.000 < 0.05$ ), whereas in the other two scenarios, a moderately robust linear relationship was discovered, with  $0.50 < r = 0.62 < 0.70$  ( $p = 0.000 < 0.05$ ) and  $0.50 < r = 0.694 < 0.70$  ( $p = 0.000 < 0.05$ ). It is also essential to point out that the correlation coefficients are positive in all scenarios, indicating that a straight linear link exists between the variables. This simply demonstrates that the turnover of food and beverage firms is expanding correspondingly with the rise in the number of visitors who are being accommodated, the number of planes that are taking off and landing at Vilnius Airport, and the number of staff who have been employed. Therefore, three of the null hypotheses,  $H_{0i}$ ,  $i = 1, 2, 3$ , were found to be false, while  $H_{0i}$ ,  $i = 4, 5$  could not be rejected. This is due to the fact that the correlation between the unemployment rate and inflation was found to be  $-0.118$  ( $p = 0.514 > 0.05$ ), and the correlation between inflation and  $r = 0.085$  ( $p = 0.638$ ).

A pairwise regression analysis was carried out with the purpose of conducting an in-depth investigation if a connection exists between the two sets of variables. The findings of this study are shown in the figures that follow. In the first scenario, we investigate if there is a connection between the amount of money made by businesses that provide food and drink and the number of people who stay in hotels.

According to the findings of the regression analysis, the number of tourists who were accommodated and the turnover of businesses that engaged in activities related to food and beverage service have a



statistically significant effect on the turnover of businesses that were engaged in activities related to food and beverage service ( $t = 11.571 > 1.96$ ;  $p = 0.000 < 0.05$ ). (Table 2).

The developed regression model has a coefficient of determination ( $R^2$ ) that is equal to 0.806. This demonstrates that the number of visitors who are accommodated may account for as much as 80.6% of the revenue generated by food and beverage businesses.

There are no exceptions taken into consideration in the data since the value of Cook's measure is less than 1 for any of the observations. The Durbin-Watson statistic is 0.467, which indicates that there is an autocorrelation of the errors.

The equation for the pairwise relationship may be drafted as follows:

$$Y = 31,385 + 0.001 * X_1 \quad (5)$$

This equation demonstrates that there is potential for a one million euro rise in revenue for businesses that provide food and beverages if there is a one thousand person increase in the number of visitors who are accommodated.

The results of the pairwise regression of Vilnius Airport Flight Statistics show that the number of flights has a statistically significant effect on the turnover of catering and beverage companies ( $t = 4.405 > 1.96$ ;  $p = 0.000 < 0.05$ ). This was determined by comparing the number of flights to the turnover value (Table 3).

The analysis of variance (ANOVA) performed on the model revealed that the created model had a high probability of being significant ( $F(1, 31) = 19.404$ ;  $p = 0.000 < 0.05$ ).

The proposed regression model has a coefficient of determination ( $R^2$ ) of 0.365, which indicates that the number of flights at Vilnius Airport explains about 36.5 per cent of the variability in the turnover of catering and beverage enterprises.

There are no exceptions taken into consideration in the data since the value of Cook's measure is less than 1 for any of the observations. Additionally, the Durbin-Watson statistics is 0.380, which indicates that there is an autocorrelation of the mistakes. This can be seen by looking at the graph.

The model of equations in pairwise form is as follows:

$$Y = 36,381 + 0,010 * X_2 \quad (6)$$

In summary, it demonstrates that a one hundred per cent increase in the number of planes departing from Vilnius Airport would result in a one million euros increase in the revenue generated by catering and beverage enterprises. The findings of the regression model of the number of employees revealed that the number of newly hired employees and the turnover of food and beverage businesses are related by a statistically significant linear relationship ( $t = 5.366 > 1.96$ ;  $p = 0.000 < 0.05$ ). This was shown by the results of the model of the number of employees (Table 4).

During this time, the model's coefficient of determination, indicated by the number  $R^2$ , was found to be equal to 0.465. This demonstrates that around 46.5 per cent of the variance in the turnover of food and beverage businesses may be attributed to the number of workers recruited in these businesses.

There are no exceptions taken into consideration in the data since the value of Cook's measure is less than 1 for any of the observations. In addition, the Durbin-Watson statistic is 1,340, which indicates that there is an autocorrelation in the model errors. This can be seen by looking at the distribution of the model errors.

The following is an example of the equation for pairwise regression:

$$Y = -2.041 + 0.001 * X_3 \quad (7)$$

It demonstrates that a one-thousand-people increase in the number of workers employed by food and beverage companies results in a one-million-Euro increase in turnover for those businesses.

Therefore, in order to summarise the findings of the pairwise regression analysis, it is possible to state that the following coincided with the findings of the correlation analysis: the number of tourists who

were accommodated, the number of flights that originated from Vilnius Airport, and the number of employees are statistically significantly related to the turnover of the catering industry; however, unemployment and inflation do not have a direct relationship with the turnover of the sector.

**Table 2. The results of pairwise regression analysis** (source: composed by authors)

Model Summary <sup>b</sup>					
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.901 <sup>a</sup>	.812	.806	9.518	.467

a. Predictors: (Constant), Number of tourists accommodated in Lithuania; b. Dependent Variable

**Table 3. The results of pairwise regression analysis** (source: composed by authors)

Coefficients <sup>a</sup>								
Model		Unstandardised Coefficients		Standardised Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	36.381	6.677		5.449	.000		
	Vilnius airport flight statistics	.010	.002	.620	4.405	.000	1.000	1.000

**Table 4. The results of pairwise regression analysis** (source: composed by authors)

Coefficients <sup>a</sup>								
Model		Unstandardised Coefficients		Standardised Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	-2.041	12.368		-.165	.870		
	Employees recruited, thousands	.001	.000	.694	5.366	.000	1.000	1.000

Multivariate regression analysis was performed by initially including in the model all five independent variables with which pairwise regression analysis was performed.

The results of the multivariate regression analysis show that only the number of tourists accommodated ( $t = 7.241 > 1.96$ ;  $p = 0.000 > 0.05$ ) and inflation ( $t = 2.461 > 1.96$ ;  $p = 0.021 < 0.05$ ) are statistically significant variables in the turnover regression of food and beverage service enterprises. The influence of both of these factors on the dependent variable is positive, i.e., as the number of accommodated tourists and inflation grows, the turnover of food and beverage service companies grows accordingly. On the other hand, such a result, when the variables that were statistically significant in the pairwise regression became statistically insignificant in the multinomial regression, could have been caused by the fact that the number of accommodated tourists, the number of flights at Vilnius airport and the number of hired employees are highly correlated.

ANOVA statistics of the model showed that the constructed multivariate regression model is statistically insignificant and suitable for describing the considered data ( $F(5, 31) = 41.613$ ;  $p = 0.000 < 0.05$ ).

Meanwhile, the coefficient of determination of the model is equal to  $R^2 = 0.864$ . This shows that all five variables explain about 86.4 per cent of the turnover of food and beverage companies.

Since the value of Cook's measure does not reach 1 for any observation, it is considered that no outliers were found in the data. In addition, the Durbin-Watson statistic is equal to 0.900, which indicates that there is autocorrelation in the model errors.

The following is presented as an equation for multivariate regression:

$$Y = -4,273 + 0,001 * X_1 + 0,001 * X_2 + 0,001 * X_3 + 3,196 * X_4 + 10,794 * X_5 \quad (8)$$

The equation of the model shows, then all of the variables have a positive influence on the turnover of catering and beverage companies. If the number of accommodated tourists increases by 1 thousand, the turnover of catering and beverage companies will increase by 1 million Euros. Meanwhile, if inflation increases by 1 percentage point, the monthly turnover of catering and beverage companies would increase by 10.794 million. Euros if other factors do not change.

### Conclusions

When looking at the various situations that each country faced in the context of the COVID - 19 pandemic, it is feasible to see that policies that each country implemented to prevent the spread of the virus were and are, to varying degrees, dynamic but mainly the same. In addition, the travel and hospitality industry, along with the service industry, has been particularly hard impacted by global economic and social conditions. It is self-evident that economies in countries whose tourist sectors are more developed have been hit harder by the recent economic downturn than those economies in countries whose economies are less reliant on this industry. The review of the relevant literature led to the identification of five economic factors that, it is hypothesised, might have a substantial influence on the amount of revenue generated by the food and beverage service industry in Lithuania. They are as follows: the number of tourists, the statistics of flights at Vilnius Airport, the number of workers employed, the unemployment rate for those aged 15 to 74, seasonally adjusted, and inflation. To a lesser degree, each of these factors has an effect on the revenue generated by businesses that offer food and beverage services (based on the literature review).

The values of all these indicators hit their nadir in April, which was the lowest value they had achieved during the whole research period. In addition, during the time period under review, the only tourism indicators that reached or surpassed the level they had reached before the pandemic were turnover and the number of new employees hired. Other tourism indicators, such as the number of tourists accommodated and the number of flights at Vilnius Airport, have not yet reached the level they had reached before the pandemic. Meanwhile, the expansion of COVID-19 has caused various responses from macroeconomic statistics. For example, unemployment has been slowly rising until the year 2020, hit its high in September, and has begun to fall since then. Towards the start of the pandemic, inflation came to a standstill; nevertheless, it started to grow at the end of the observation period and eventually reached levels that were greater than they had been before the outbreak.

The findings of the correlation and regression analysis indicate that there is a significant relationship ( $r > 0.90$ ) between the amount of money made by businesses that deal in food and beverages and the number of visitors who are accommodated. The linear association between the number of flights departing from Vilnius Airport and the number of new workers employed is average ( $0.60 < r < 0.70$ ), according to the independent variables. There is no statistically significant relationship between turnover in the food and beverage industry and macroeconomic indicators such as the unemployment rate and inflation. These factors include the rate of unemployment. Multivariate regression analysis showed that the number of accommodated tourists has the greatest influence on the dependent variable, as the standardised beta coefficient of this variable is the highest.

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