
The Establishment of New Businesses as a Seasonal Phenomenon: A Polish Example

Submitted 21/09/21, 1st revision 12/10/21, 2nd revision 05/11/21, accepted 25/11/21

Dorota Jegorow¹, Maria Paździor², Paweł Marzec³, Krzysztof Bednarz⁴

Abstract:

Purpose: The aim of the article is to analyse the phenomenon of seasonality in the context of registration of new economic entities in the form of a sole proprietorship based on the data from the Central Registration and Information on Business (CEIDG) in the years 2012-2021.

Design/Methodology/Approach: The research method and tools applied in the article are subordinated to the identification of the occurrence of statistically significant differences between average values of numbers of applications filed with CEIDG in the assumption category on a month-to-month basis. As part of the research process post hoc tests, preceded by the one-way analysis of variance, ANOVA, were used. Due to the imperfection of statistical tests and the nature of deterministic methods for the verification of the research hypothesis the Kruskal–Wallis was also used. The ANOVA was preceded by the verification of meeting the distribution normality criterion (by means of the Kolmogorov–Smirnov test and the Shapiro–Wilk test) and of the variance uniformity (the Levine test).

Findings: A stable economic situation in a macroeconomic aspect together with an unchanging regulatory, economic and financial, technical and organisational as well as market environment translates to a statistical repeatability of market behaviours. In this context, a projection of the number of applications filed with CEIDG including seasonal fluctuations was developed.

Practical Implications: The knowledge of seasonality in terms of undertaking economic activity may prove helpful in selecting the right economic policy tools, in organising entrepreneur administrative service processes as well as useful for companies providing outsourcing services (inter alia, within the scope of marketing, bookkeeping and human resources service or recapitalisation) for new businesses.

Originality/Value: This type of analyses have not been conducted to date on such a wide and diversified time spectre. In addition, the situation related to the COVID-19 pandemic, and to be exact, the observation of correlation between future decisions of entrepreneurs with respect to continuing or establishing business activity and a specified seasonality also seems extremely significant.

Keywords: COVID-19, entrepreneurship, seasonality, start-ups.

JEL codes: C54, L26, M13, O10.

Paper Type: Research Paper.

¹Associate Professor, The John Paul II Catholic University of Lublin, Faculty of Social Sciences, Institute of Economics and Finance, e-mail: dorotajegorow@kul.pl;

²Assistant Professor, PhD, the same as in 1, e-mail: mariapazdzior@kul.pl;

³Associate Professor, the same as in 1, pawelmarzec23@kul.pl;

⁴Assistant Professor, PhD, the same as in 1, e-mail: kfbednarz@kul.lublin.pl;

1. Introduction

Undertaking gainful activity on one's own each time involves making hard decisions and almost always the necessity to incur expenditure. More often than not, these are very high costs reflected both in refundable and non-refundable funds. Success in business is a product of numerous factors encompassing both the internal and the external environment of a company. As far as an entrepreneur may, to a large degree, shape the first area, their possibilities are significantly limited in the case of the external environment of the conducted activity.

The article analyses a time series of the number of newly registered businesses in Poland. Economic activity conducted by physical persons in the form of a sole proprietorship was selected. It is a dominating form among microenterprises. According to the data for 2019, this type of units registered in Poland amounted to over 3.21 million, which constituted almost 71.26% of the general number of the national economy entities with a 74.30% share in the private sector. In 2020, there were more such entities, namely almost 3.33 million (71.34%; 74.47%). In over 99%, they are microenterprises whereas, in the meantime, a share of this type of entities oscillates around 92% in the entire private sector.

The formal and legal environment of businesses may create extremely different constitutive conditions for entrepreneurial initiatives and the functioning of registered entities. Optimising solutions, including the building of structural organisational and financial relations is the domain of large entities or, apparently large entities, based on complicated relations networks. The use of the most advantageous, market-wise, operational conditions for the functioning of enterprises, as part of which the financial aspect ought to be pointed out, is not the domain of physical persons running business activity, although this type of entities constitute the foundation of the national economy. A simple legal form encompassing a registration dimension and financial settlements constitutes a huge incentive for amateurs of entrepreneurship, who, due to the benefits that they bring to the national economy, ought to be referred to as leaders of entrepreneurship.

The figures being the subject of the present analysis are made up by the number of applications filed with the Central Register and Information on Business (CEIDG), which begin the process of a business registration in the form of the so-called "sole proprietorship". The time series under analysis encompasses the period from January 2012 – August 2021. An essential analysis was limited, however, to the period from January 2012 – April 2018. The time period adopted stems, on the one hand, from reporting data available as entered into the system of the Polish public statistics, and, on the other hand, the choice was dictated by the introduction of new provisions regulating the functioning of the analysed form of running economic activity in 2018 and the COVID-19 pandemic, which officially appeared in Poland at the beginning of 2020.

The transitional periods of a decrease in the before-outlined trends identified from May 2018 to August 2021 excluded the observations given from the analysis. The legal regulations introduced in 2018, namely exemptions from obligatory contributions paid by active entrepreneurs to the Social Insurance Institution (ZUS), with the exception of the health contribution for newly-established businesses and the possibility of running a limited business activity without registration⁵ they formed new, as a matter of principle, more financially advantageous conditions for undertaking economic activity. In turn, the subsequent years are a period of adapting those solutions and the effect of the COVID-19 pandemic on entrepreneurial attitudes on a global scale.

The research method and tools applied in the article are subordinated to the identification of the occurrence of statistically significant differences between average values of numbers of economic activities undertaken on a month-to-month basis (based on the number of applications for the establishment of business activity as filed with CEIDG). In the research process, post hoc tests were used, preceded by the ANOVA analysis and by means of the Kruskal–Wallis test, seasonal fluctuations of additive and multiplicative nature were selected, and a correlation analysis was carried out. The cognitive dimension of the carried out research is methodological in nature, encompassing the applied set of tools possible to be used in economic analyses. In turn, the application dimension of the study comes down to the verification of the hypothesis on the occurrence of seasonality in undertaking business activity accompanied by the determination of existing differences in this scope under the conditions of a relatively stable regulatory economic and financial, technical and organisational as well as market environment.

2. Literature Review

The issue of entrepreneurship is inscribed in the rich literature output, and there are as many definitions of entrepreneurship as there are authors who attempted analyses in this scope (Dollinger 2008). In the article, a classical approach to entrepreneurship is applied. From this perspective, entrepreneurship is identified with an entrepreneur, namely a person who undertakes risk, initiates actions by using appropriate characteristics and is the creator of the economic activity (Say, 1960). Among numerous publications tackling qualitative and quantitative issues of entrepreneurship it is difficult, however, to find the issues of seasonality in undertaking business activity with the exception of sectors that are seasonal in nature

⁵*From 30 April 2018 onwards, the provisions of the Entrepreneurs Law (Act) began to apply, which completely replaced the then applicable Act on the Freedom of Economic Activity. The new provisions introduced many new solutions. The most important ones were the cancellation of the obligation to register the smallest businesses and a six-month exemption from the payment of ZUS contributions, that is the so-called “start-up relief” (pl. “ulga na start”). The relief was directed at the entrepreneurs who were running economic activity for the first time or who were beginning it again after 5 years of its suspension or closing down the previous business.*

by definition. Entrepreneurship, which is defined as the “discovery and exploitation of profitable opportunities” (Shane and Venkataraman, 2000), is often exhibited within smaller enterprises (Kassicieh *et al.*, 2002; Katila, Chen, and Piezunka, 2012).

Previous research has shown that the creation of ventures by itself does not contribute to economic growth (Valliere and Peterson, 2009). The driving force behind economic growth in every country is the development of small and medium enterprises (Petrunenko, Khmarska, Tkachenko, Koptieva, and Komandrowska, 2021). The vast literature on the subject of the significance of small companies in economy consistently shows that the creation of new enterprises drives economic prosperity. New enterprises are of key significance for the economic growth.

Thus, entrepreneurship is the driving force behind economy (Ribeiro-Soriano, 2017). There is evidence showing that microenterprises might be able to fight poverty and increase social welfare (Sutter, Bruton, and Chen, 2019; Si *et al.*, 2020). Nevertheless, the existing knowledge of entrepreneurship in developing countries is very limited (Govindarajan and Ramamurti, 2011; Kiss, Danis, and Cavusgil, 2012). However, researchers agree that the institutional environment has a substantial effect on the “how” and “how many” aspects of entrepreneurial activities in a given country (Chiles, Bluedorn, and Gupta, 2007; Gupta *et al.*, 2014). The latest research results prove that the ability to create new economic entities has strong social and family connotations (Soluk, Kammerlander, Darwin, 2021).

One of the very important and up-to-date issues having impact on entrepreneurship of the entire globe is the COVID-19 pandemic. The epidemiological problem appeared towards the end of 2019 and quickly impacted societies and economies (Parnell *et al.*, 2020; Ratten, 2020). The pandemic turned out to have a negative impact on newly-forming enterprises, especially from the developing countries, where the governmental support is limited (Nasar, Akram, Safdar, and Akbar, 2021). The academic literature pointed towards the fear factor as a significant ratio limiting entrepreneurial activity of potential and emerging entrepreneurs (Li, 2011; Morgan and Sisak, 2016).

The subject of the conducted research was to affirm the fact of the occurrence of seasonality in the registration of new entities based on the applications for the establishment of a new entity as filed with CEIDG. Another research matter was the determination of the nature and size of the seasonal fluctuations, which was carried out in a simplified manner based on the moving average model. The issues based on analytical modelling form a separate open cognitive area for subsequent analyses. The justifiability of the carried out research is inscribed in the conviction that the knowledge of the frequency with which new enterprises emerge may lead, *inter alia*, to a more rational use of the institutional environment and to making decisions on the establishment of new enterprises in the context of competition and potential aid programmes.

3. Methodology and Hypotheses

The economic modelling based on the seasonality analysis is of a great economic significance (Hylleberg, 1992). The procedure involves the identification of constituent parts of a time series in the form of a trend and seasonality with respect to their occurrence and size and, ultimately, the structure of the projections (Jęgorow, 2018a). The main research problem concentrated around the verification of the hypotheses affirming that the tendency towards the registration of new companies is seasonal in nature. Such approach, based on an incremental analysis remaining without connection to the motivation inscribed in entrepreneurship, treated as a separate scientific discipline, meets the criterion of a strictly economic approach (Smith, McMullen, and Cardon, 2021). The performance of the research aim assumed was based on the verification of the main hypothesis:

H1: The registration of new enterprises is of seasonal nature under the conditions of a relatively stable formal and legal as well as socio-economic environment (based on the number of applications for the establishment of business activity as filed with CEIDG by physical persons),

as well as the supporting hypotheses:

H2: The number of applications for the establishment of business activity as filed with CEIDG is of relatively stable nature on a year-to-year basis.

H3: The new formal and legal regulations, introducing financial preferences for newly-established enterprises (introduced in 2018) resulted in an increase in registration applications as filed with CEIDG.

H4: In its initial phase, the COVID-19 pandemic significantly halted the registration of new enterprises with CEIDG, however, the process was not permanent in nature.

The analytical tools applied as part of the research performed were restricted to an instrumentarium enabling to affirm the fact of the occurrence of seasonal fluctuations in the time series of the number of applications for the establishment of business activity as filed with CEIDG on a month-to-month basis. The ANOVA analysis was based on a one-factor analysis of the ANOVA variance (test F), which was preceded by the verification of meeting the criterion of distribution normality (by means of the Kolmogorov-Smirnov test and the Shapiro-Wilk test) and variance uniformity (by means of the Levene test). For the selection of month groups differing significantly from one another, that is affirming the fact which pairs of means are significantly different from one another, the Tukey post hoc test was used (the application of the analysis is determined by a statistically significant test F result). Due to the imperfection of statistical tests and the nature of deterministic methods, the Kruskal-Wallis (KW) was used for the verification of the research hypothesis, namely nonparametric analysis of variance, which is often used instead of a standard one-way ANOVA when data are from a suspected non-normal population. The KW omnibus procedure tests for some differences between groups, but provides no

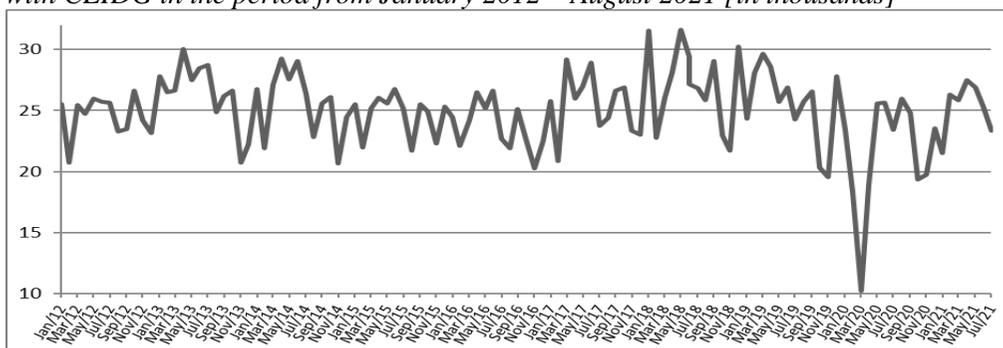
specific post hoc pair wise comparisons. Also, selecting seasonal fluctuations based on the model of the 5-period moving central average was inscribed into the analytical process. Several times, in different aspects, the correlation analysis was used.

The figures being the subject of the carried out analysis are formed by the number of applications for the registration of a new business filed with CEIDG in the period from January 2012 – August 2021. The time series of the assumption feature January 2012 – April 2018 was covered by the seasonality analysis. The time scope assumed was preceded by numerous experiments with respect to the change in the length of the series examined. The purpose of the analysis is to determine the existence of a statistically significant difference among group means determined by subsequent months for the assumption feature. Detailed analyses were conducted on the basis of own calculations, using analytical software: SPSS (Predictive Solutions), and MS Excel spreadsheet.

4. Results

A very high share of physical persons running a business among the general number of national economy entities is the outcome of many factors of organisational and legal as well as financial nature. The attractiveness of this organisational form of an enterprise is supported by the fact that the number of this type of entities increased by over 14% from 2012 – 2020 with a relatively stable share, slightly exceeding 71% of all the entities registered on the domestic market altogether. A stable economic situation in a macroeconomic aspect together with an unchanging regulatory, economic and financial, technical and organisational as well as market environment translates to a statistical repeatability of market behaviours. The graphic illustration of the time series for the assumption feature in the period from January 2012 – April 2018 provides the grounds for formulating the hypothesis on the stable number or applications filed with CEIDG on the basis of a pattern based on repeated average values in particular months, namely seasonal fluctuations.

Figure 1. *The number of applications for the registration of a new business filed with CEIDG in the period from January 2012 – August 2021 [in thousands]*

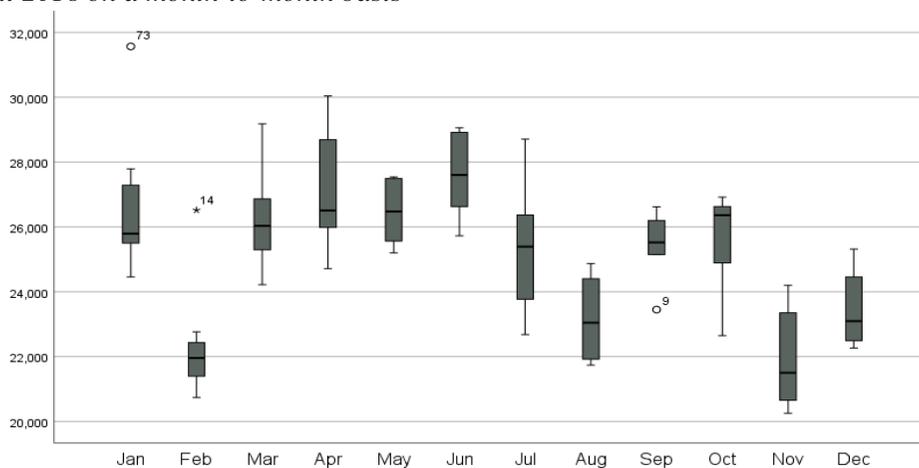


Source: Own analysis.

The assumption regarding the occurrence of seasonal fluctuations was formulated based on the observation of graphic presentation of particular features in the absolute system (Figure 1). The high uniformity value of the assumption feature analysed in particular months in the period from January 2012 – April 2018 is reflected in relatively low values of the random variation coefficient for particular subsets. The highest value was recorded for the data grouped in January: 8.84%, and the lowest in the case of May: 3.81%. In the case of the generality of the analysed data encompassing the years 2012 – 2021, the highest level of differentiation was recorded for the month of February whose random variation coefficient amounted to over 28.69%.

Deviations from the average values of the assumption feature determined for subsequent months appear in the form of one extreme value (February), having impact on the value of the above coefficient and three deviating (untypical) ones (January, May and September) (Figure 2). Thus, the relative coherence of the analysed set of data can be assumed, treating the values grouped in particular months as independent sets.

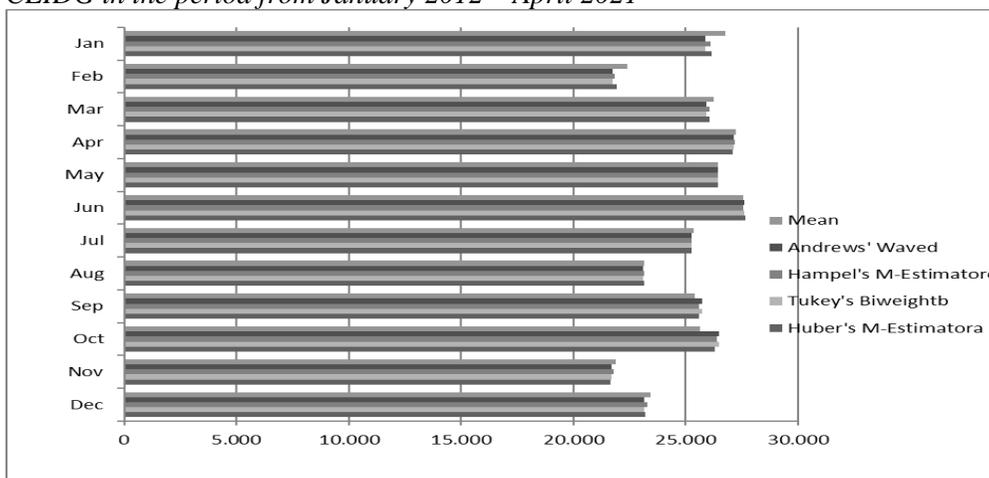
Figure 2. The diagnostics of the dispersion of the number of applications for the registration of a new business filed with CEIDG in the period from January 2012 – April 2018 on a month-to-month basis



Source: Own analysis.

The months in which the largest number of new enterprises were registered were April and June. In turn, the months in which the lowest number of enterprises were registered were February and November. In no month can one talk about a significant dispersion limiting the analytical process. The assumption regarding the occurrence of periodicity in the registration of businesses with CEIDG is strengthened by the graphic presentation based on the values of arithmetic means and M-estimators corresponding to subsequent reporting periods (Figure 3).

Figure 3. The arithmetic mean and M-estimators presented on a month-to-month basis for the number of applications for the registration of a new business filed with CEIDG in the period from January 2012 – April 2021



Source: Own analysis.

The very fact of finding that there are significant differences in the values of means in particular reporting periods does not authorise one to formulate a thesis on their statistical relevance. The situation requires verification by means of an appropriate test. In the analysed case, the recommended test is the test of one-way analysis of variance, ANOVA, the application of which requires the normality of distribution and uniformity of the variance of the analysed feature.

4.1 ANOVA Analysis

The criterion of distribution normality verified by means of the Shapiro-Wilk test does not yield to a positive verification only with respect to the month of February (Sig.>0.05). This fact does not limit the possibility of further analysis. An analytical experiment consisting in rejection of an extreme value no. 14 recorded in February 2013 from the analysed set produces positive results of the distribution normality criterion verification.

Table 1. Tests of Normality

month	Kolmogorov-Smirnov ^a			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Jan	.232	7	.200*	.838	7	.096
Feb	.285	7	.090	.777	7	.024
Mar	.157	7	.200*	.956	7	.784
Apr	.216	7	.200*	.937	7	.613
May	.188	6	.200*	.895	6	.343
Jun	.232	6	.200*	.882	6	.279
Jul	.154	6	.200*	.979	6	.945

Aug	.169	6	.200*	.928	6	.561
Sep	.239	6	.200*	.909	6	.432
Oct	.281	6	.150	.808	6	.070
Nov	.266	6	.200*	.894	6	.340
Dec	.267	6	.200*	.900	6	.374

Source: Own analysis.

The variance uniformity criterion was positively verified by means of the Lavene test, is not dependant upon the normality of distribution (Sig.>0.05) (Table 2).

Table 2. Tests of Homogeneity of Variances

	Levene Statistic	df1	df2	Sig.
Based on Mean	.616	11	64	.808
Based on Median	.359	11	64	.967
Based on Median and with adjusted df	.359	11	37.895	.964
Based on trimmed mean	.586	11	64	.833

Source: Own analysis.

The results obtained as part of ANOVA do not provide any grounds for adopting a hypothesis on the equality of means in the analysed subgroups. Thus, the test results authorise one to a claim that the means in particular months differ from one another in a significant way with respect to at least one pair (Sig.<0.05) (Table 3).

Table 3. ANOVA analysis

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	261618151.753	11	23783468.341	8.501	.000
Within Groups	179051199.024	64	2797674.985		
Total	440669350.776	75			

Source: Own analysis.

At the same time, it ought to be noted that the Welch and Brown-Forsythe test results also point to the occurrence of significant differences between group means (Sig.<0.05) (Table 4).

Table 4. Robust Tests of Equality of Means

	Statistic ^a	df1	df2	Sig.
Welch	7.782	11	25.073	.000
Brown-Forsythe	8.757	11	53.522	.000

a. Asymptotically F distributed.

Source: Own analysis.

Distribution normality of the feature analysed in the February data subgroup requires verification of the analysed hypothesis by means of the Kruskal-Wallis test. In this

case, the obtained results confirm the existence of significant differences between the means of defined groups on a month-to-month basis (Sig.<0.05) (Table 5).

Table 5. Test Statistics Kruskal-Wallis

Kruskal-Wallis H Test ^{a,b}	44.833
df	11
Asymp. Sig.	.000

a. Kruskal-Wallis Test

b. Grouping Variable: month

Source: Own analysis.

4.2 Post Hoc Analysis

The values of means and M-estimators grouped on a month-to-month basis indicate that the first half of the year is characterised by a relatively larger tendency towards the registration of new businesses. The month that clearly stands out from the remaining ones is February. The final determination of the fact of the occurrence of statistically significant differences between the means in the analysed groups takes place based on the post hoc tests. Two tests were used in the post hoc analysis, namely the Tukey test (the test requires equipotency, however, a difference of one data piece is admissible in this case) and the Scheffe test. The results of both post hoc tests indicated the occurrence of a statistically significant difference of the means in the case of all the months in relation to at least one month (Sig.<0.05). The 21 identified differences in the largest scope concern November (8 differences), whereas the next in the sequence classified month was February (6 differences). Both these months are characterised by a relatively least number of applications filed with CEIDG (Table 6).

Table 6. Post hoc tests

		Subset for alpha = 0.05					
	month	N	1	2	3	4	5
Tukey HSD ^{a,b}	11	6	21,911.33				
	2	7	22,410.43	22,410.43			
	8	6	23,171.50	23,171.50	23,171.50		
	12	6	23,454.33	23,454.33	23,454.33	23,454.33	
	7	6		25,386.83	25,386.83	25,386.83	25,386.83
	9	6		25,411.83	25,411.83	25,411.83	25,411.83
	10	6			25,636.50	25,636.50	25,636.50
	3	7			26,250.43	26,250.43	26,250.43
	5	6				26,460.50	26,460.50
	1	7					26,773.00
	4	7					27,230.71
	6	6				27,590.67	
	Sig.		.888	.085	.069	.084	.461
Scheffe ^{a,b}	11	6	21,911.33				
	2	7	22,410.43	22,410.43			
	8	6	23,171.50	23,171.50	23,171.50		

12	6	23,454.33	23,454.33	23,454.33	23,454.33	
7	6	25,386.83	25,386.83	25,386.83	25,386.83	
9	6	25,411.83	25,411.83	25,411.83	25,411.83	
10	6	25,636.50	25,636.50	25,636.50	25,636.50	
3	7	26,250.43	26,250.43	26,250.43	26,250.43	
5	6		26,460.50	26,460.50	26,460.50	
1	7			26,773.00	26,773.00	
4	7			27,230.71	27,230.71	
6	6				27,590.67	
Sig.		.052	.099	.097	.082	

Means for groups in homogeneous subsets are displayed.

a. Uses Harmonic Mean Sample Size = 6.300.

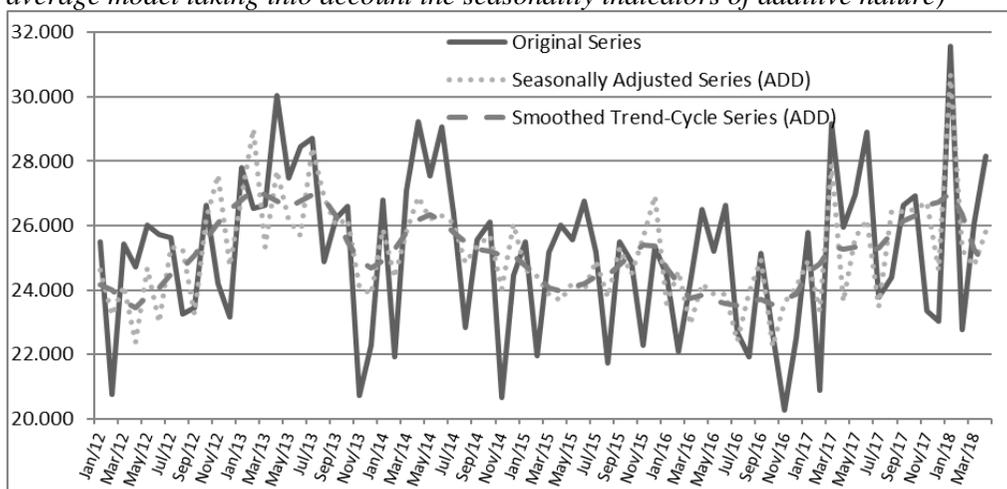
b. The group sizes are unequal. The harmonic mean of the group sizes is used. Type I error levels are not guaranteed.

Source: Own analysis.

4.3 Analysis Based on Seasonality Factors

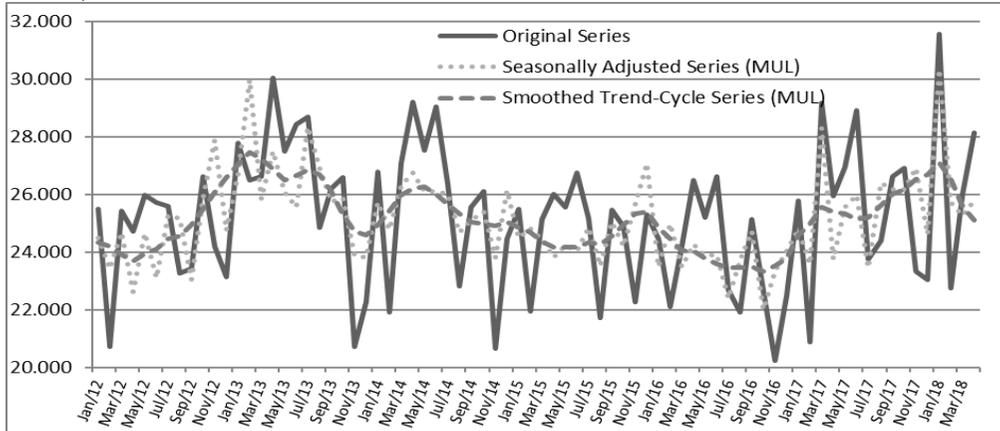
An analysis based on seasonality factors of additive and multiplicative nature forms another confirmation of the hypothesis on the seasonal nature of entrepreneurship. The model based on a 5-period moving central average clearly deviates from the series determined by the data being the subject of the study. The inclusion of seasonal fluctuations in the forecast of both additive and multiplicative nature significantly increases the goodness of the match between the theoretical model and empirical data. This fact is supported by the correlation analysis. The values of seasonal indicators correspond with the post hoc analysis (Figure 4 and 5).

Figure 4. The forecast of the time series values of the number of applications for the registration of a new enterprise filed with CEIDG (based on the five-period moving average model taking into account the seasonality indicators of additive nature)



Source: Own analysis.

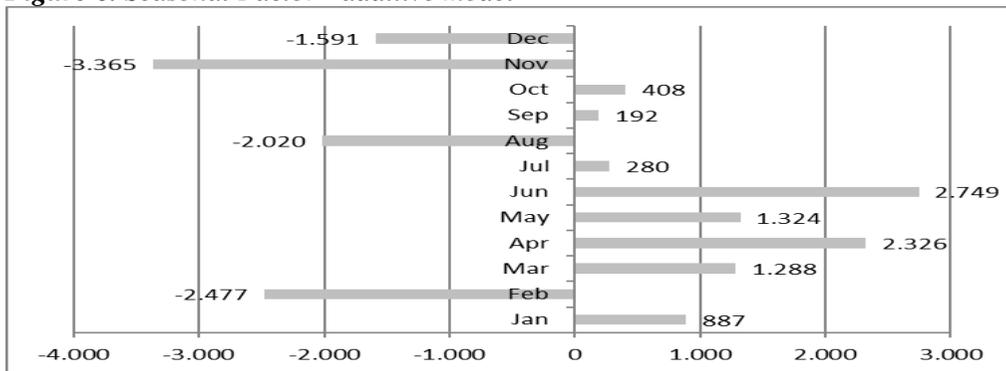
Figure 5. The forecast of the time series values of the number of applications for the registration of a new enterprise filed with CEIDG (based on the five-period moving average model taking into account the seasonality indicators of multiplicative nature)



Source: Own analysis.

The structure of seasonality in the dimension of particular periods determined by subsequent months and the values of occurring fluctuations are illustrated by seasonality factors of additive and multiplicative nature accordingly (Figure 6).

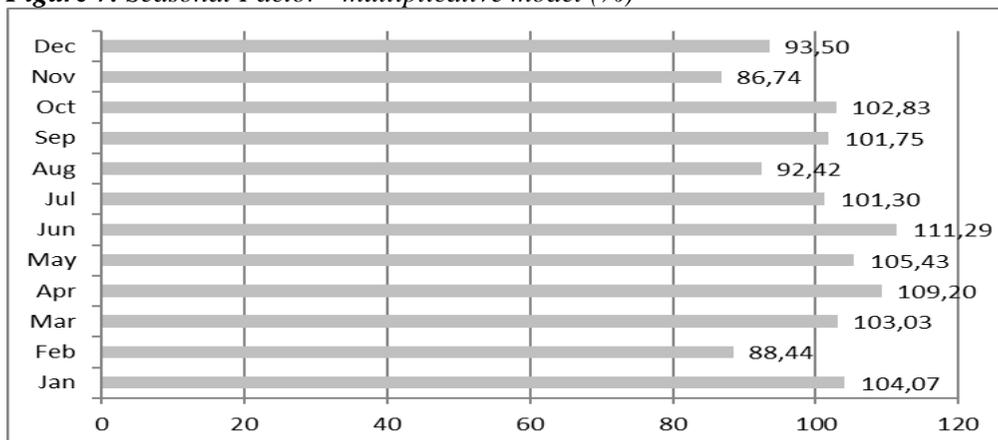
Figure 6. Seasonal Factor - additive model



Source: Own analysis.

Theoretical ones taking into account seasonal fluctuations of additive and multiplicative nature with the analysed empirical series allows one to find both forecasts to be well-matched to the data coming from the CEIDG register. A relatively best match to the original series is exhibited by the seasonally adjusted series including seasonal factors of multiplicative nature. In the case of both Smoothed Trend-Cycle Series the dependency is slight, which constitutes another confirmation of the occurrence of seasonality in undertaking economic activity in Poland (Figure 7 and Table 7).

Figure 7. Seasonal Factor - multiplicative model (%)



Source: Own analysis.

Table 7. Correlations analysis with original series

	Seasonally Adjusted Series_ADD	Smoothed Trend-Cycle Series_ADD	Seasonally Adjusted Series_MUL	Smoothed Trend-Cycle Series_MUL
Pearson Correlation	.635**	.418**	.609**	.441**
Sig. (2-tailed)	.000	.000	.000	.000
Kendall's tau_b	.450**	.288**	.440**	.299**
Sig. (2-tailed)	.000	.000	.000	.000
Spearman's rho	.611**	.420**	.598**	.436**
Sig. (2-tailed)	.000	.000	.000	.000

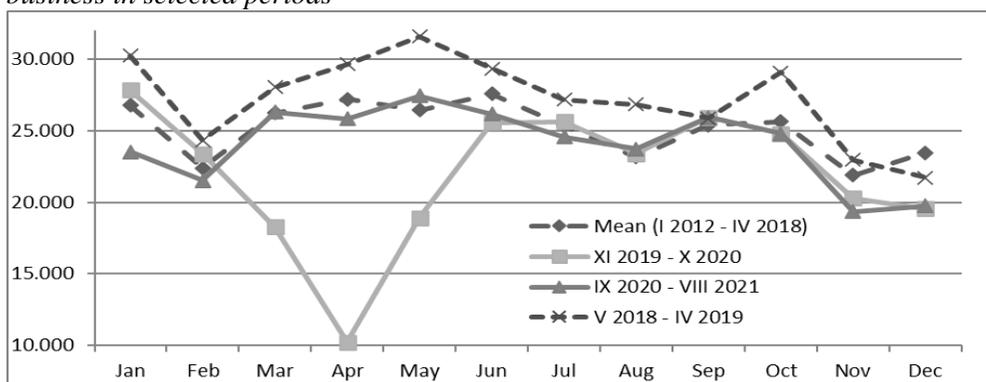
** . Correlation is significant at the 0.01 level (2-tailed).

Source: Own analysis.

4.4 Convergence of Entrepreneurship Seasonality Pattern in Selected Periods

The comparative analysis based on the observation of the course of the time series and the value of correlation coefficients points to a high convergence of values indicated by the observations from the period between January 2012 and April 2018 along with the time series, May 2018 – April 2019 (formal and legal changes related to running economic activity, inter alia, lesser financial burdens for persons newly-registering their businesses); September 2020 – August 2021 (current records).

The new formal and legal regulations offering practical solutions in the form of lower financial burdens for new entrepreneurs brought about an increase in the number of newly-registered businesses. The increase was relatively proportional in nature. Except for the observation recorded in December, the remaining months saw an increase in comparison with the values of means determined on the basis of the data encompassing the period: January 2012 – April 2018 (Figure 8).

Figure 8. The number of applications filed with CEIDG for the registration of a business in selected periods

Source: Own analysis.

The lack of statistical convergence combines the series of values of means developed based on the data from the period, January 2012-April 2018 with the time series: November 2019- October 2020, namely the outbreak of the COVID-19 pandemic all over the world and its transposition to Poland in March 2020. In this case, the distorted statistical image of the correlation was inscribed into three deviating observations encompassing March, April and May. The force of the fear was of a fleeting nature. In the case of the remaining observations, there are no significant deviations from the average values determining the pattern of a monthly level of registration of new entities with CEIDG. This is confirmed by the correlation analysis carried out on time series reduced by three observations (Table 8).

Table 8. Correlation analysis

		Mean (I 2012 - IV 2018)	XI 2019 - X 2020	IX 2020 - VIII 2021	V 2018 - IV 2019
Pearson Correlation					
XI 2019 - X 2020	Correlation Coefficient	-.079 ¹	1		
	Sig. (2-tailed)	.807	.		
IX 2020 - VIII 2021	Correlation Coefficient	.825**	-.067	1	
	Sig. (2-tailed)	.001	.922	.	
V 2018 - IV 2019	Correlation Coefficient	.839**	-.026	.832**	1
	Sig. (2-tailed)	.001	.937	.001	.
Kendall's tau_b					
XI 2019 - X 2020	Correlation Coefficient	.030	1		
	Sig. (2-tailed)	.891	.		
IX 2020 - VIII 2021	Correlation Coefficient	.576**	-.030	1	
	Sig. (2-tailed)	.006	.784	.	
V 2018 - IV 2019	Correlation Coefficient	.636**	.091	.545*	1
	Sig. (2-tailed)	.004	.681	.014	.
Spearman's rho					
XI 2019 - X 2020	Correlation Coefficient	.007	1		

	Sig. (2-tailed)	.983	.		
IX 2020 - VIII 2021	Correlation Coefficient	.699*	-.154	1	
	Sig. (2-tailed)	.004	.863	.	
V 2018 - IV 2019	Correlation Coefficient	.853**	.007	.699*	1
	Sig. (2-tailed)	.000	.983	.011	.

** . Correlation is significant at the 0.01 level (2-tailed).

* . Correlation is significant at the 0.05 level (2-tailed).

Note: ¹Apart from the observations from March to May 2019, the correlation coefficients in the tests used have the following values: .793* (.011); .556* (.037), .717* (.030).

Source: Own analysis.

5. Discussion

The carried out non-structural analysis indicated both the occurrence of repeatability within the scope of the number of businesses registered with CEIDG in subsequent months, thus pointing to the seasonality of this phenomenon. The outlined pattern of seasonal fluctuations in the period from January 2012 – April 2018 was not subject to any significant changes both as to the amplitude and as to the distribution of extreme values in particular months. The intensified seasonality is of stable nature ($F=8.501$, $\text{Sig.}<0.000$). The months characterised by the highest activity in terms of the registration of businesses are July and April. In turn, the least registration cases are recorded in November and February. Under the conditions of a stable environment of businesses, the number of newly-registered entities was at the same time relatively stable on a year-to-year basis.

The formal and legal changes introducing relatively more advantageous financial conditions for running economic activity for persons registering new businesses (upon the satisfaction of specific conditions) triggered an increase in the number of registration cases while maintaining the pattern as determined on the basis of the period from January 2012 – April 2018. The clear, statistically significant, distortion of the determined pattern took place in March 2020 and lasted until May 2020. The period is to be linked with the outbreak of the COVID-19 pandemic in Poland. Within the scope of the number of newly-registered businesses, the situation quickly stabilised. In practice, the COVID-19 pandemic had a limited impact on the registration of new businesses. After a clear reduction in the number of applications filed with CEIDG in March 2020, in June 2020 a result was recorded corresponding to the pattern developed in the period from January 2021 – April 2018.

The latest data retrieved from the CEIDG register are clearly correlated with the pattern in the scope of the number level and seasonal fluctuations. The relatively proportional reduction in the average level of the registration of new businesses in relation to the increase resulting from the reforms as introduced in 2018 can be associated with the structural absorption of the novelty effect and the socio-economic effects of the COVID-19 pandemic. These issues require, however, separate research.

6. Conclusions

Under the conditions of a stable regulatory, financial and economic, technical and organisational as well as market environment, making decisions on the registration of new businesses by physical persons inscribes itself in a pattern having the characteristics of a statistical repeatability. The knowledge in this scope is desired by both entrepreneurs and political decision-makers having impact on the creation of a business environment. Taking into account the fact that a business is a basic and, at the same time, very important entity in the contemporary economy of each country, the creation of stable conditions for the emergence and development of this form of economic activity is key to maintaining market duration.

The formal and legal changes introducing relatively more advantageous financial conditions for running economic activity for persons registering new businesses (upon the satisfaction of specific conditions) inspire entrepreneurial attitudes. An assessment of those dependencies requires conducting further research under the conditions of a relatively stable external business environment. The small business cannot activate in developing countries without state stimulation, as distortion of market mechanism does not allow creating necessary competitive environment and eliminating incoming barriers (Kusakina *et al.*, 2016).

The results of the carried out study are to be continued, *inter alia*, within the context of the quantitative and qualitative development of businesses and their survival. Taking into account the results of the carried out studies it turns out that along with an increase in the number of newly-registered businesses in Poland in the years 2005-2014 (reaching 58%) the chances for the survival of those entities have decreased (Jegorow, 2018b). In this context, the problematic issue of non-refundable financing for newly-emerging businesses is dubious from the perspective of the assumed social and economic effectiveness (Jegorow, 2016; Jegorow, 2017). Evidence shows that the commercialization and market entry by start-up companies are not very promising (Rad, Abolhasani, 2020). These results confirm the need to carry out multi-faceted research in the scope of newly-emerging businesses. An extension of the issues proposed herein may also be research taking into account the financial results of businesses.

References:

- Chiles T.H., Bluedorn A.C., Gupta V.K. 2007. Beyond creative destruction and entrepreneurial discovery: a radical Austrian approach to entrepreneurship. *Organization Studies*, 467-493. Retrieved from: <https://doi.org/10.1177/0170840606067996>.
- Dollinger M.J. 2008. *Entrepreneurship strategies and resources*. Marsh Publications.
- Govindarajan V., Ramamurti R. 2011. Reverse innovation, emerging markets and global strategy. *Global Strategy Journal*, 191-205. Available online: <https://doi.org/10.1002/gsj.23>.
- Gupta V.K., Guo C., Canever M., Yim H.R., Sraw G.K., Liu M. 2014. Institutional

- environment for entrepreneurship in rapidly emerging major economies: the case of Brazil, China, India, and Korea. *International Entrepreneurship and Management Journal*, 367-384. Available online: [10.1007/s11365-012-0221-8](https://doi.org/10.1007/s11365-012-0221-8).
- Jegorow, D. 2018. Identyfikacja zainteresowania dotacjami jako zjawiska sezonowego. *Metody Ilościowe w Badaniach Ekonomicznych*, 140-150. Retrieved from: <https://doi.org/10.22630/MIBE.2018.19.2.13>.
- Jegorow, D. 2018. Zmniejszająca się perspektywa przeżyć nowo powstałych przedsiębiorstw – niekorzystny prognostyk rozwoju gospodarczego. *Ekonomika i Organizacja Przedsiębiorstwa*, 52-61.
- Jegorow, D. 2016. Uruchamianie działalności gospodarczej przy wsparciu dotacji a rozwój przedsiębiorczości. *Edukacja Ekonomistów i Menedżerów*, 59-74. Retrieved from: <https://doi.org/10.5604/01.3001.0009.4993>.
- Jegorow, D. 2017. Rozwój przedsiębiorczości indywidualnej przy wsparciu funduszy europejskich. *Prace Naukowe Uniwersytetu Ekonomicznego we Wrocławiu*, 65-76. Retrieved from: <https://doi.org/10.15611/pn.2017.475.06>.
- Kassicieh, S.K., Kirchoff, B.A., Walsh, S.T., McWhorter, P.J. 2002. The role of small firms in the transfer of disruptive technologies. *Technovation*, 667-674. Available online: [https://doi.org/10.1016/S0166-4972\(01\)00064-5](https://doi.org/10.1016/S0166-4972(01)00064-5).
- Katila, R., Chen, E.L., Piezunka, H. 2012. All the right moves: how entrepreneurial firms compete effectively. *Strategic Entrepreneurship Journal*, 116-132. Available online: <https://doi.org/10.1002/sej.1130>.
- Kiss, A.N., Danis, W.M., Cavusgil, S.T. 2012. International entrepreneurship research in emerging economies: a critical review and research agenda. *Journal of Business Venturing*, 266-290. Available online: <https://doi.org/10.1016/j.jbusvent.2011.09.004>.
- Li, Y. 2021. Emotions and new venture judgment in China. *Asia Pacific Journal of Management*, 277-298. Available online: <https://doi.org/10.1007/s10490-009-9145-4>.
- Morgan, J., Sisak, D. 2016. Aspiring to succeed: A model of entrepreneurship and fear of failure. *Journal of Business Venturing*, 1-21. Available online: <https://doi.org/10.1016/j.jbusvent.2015.09.002>.
- Nasar, A., Akram, M., Rizwan Safdar, M., Akbar, M.S. 2021. A qualitative assessment of entrepreneurship amidst COVID-19 pandemic in Pakistan. *Asia Pacific Management Review*. Available online: <https://doi.org/10.1016/j.apmr.2021.08.001>.
- Parnell, D., Widdop, P. Bond, A., Wilson, R. 2020. COVID-19, networks and sport. *Managing Sport and Leisure*, 1-7. Available online: <https://doi.org/10.1080/23750472.2020.1750100>.
- Petrunenko, I., Khmarska, I., Tkachenko, T., Koptieva, H., Komandrovskaya, V. 2021. The Importance of Small and Medium Enterprises in the Economic Development of Eastern Europe. *Wseas Transactions on Environment and Development*, 898-910. Available online: [10.37394/232015.2021.17.84](https://doi.org/10.37394/232015.2021.17.84).
- Rad, S.R., Abolhasani A.T. 2020. The Requirements of Successful Market Entry for Startup Knowledge-based Companies (Case Study: ICT Companies in Tehran). *Journal of Technology Development Management*, 185-220. Available online: <https://dx.doi.org/10.22104/jtdm.2020.3607.2248>.
- Ratten, V. 2020. Coronavirus (covid-19) and entrepreneurship: Changing life and work landscape. *Journal of Small Business and Entrepreneurship*, 503-516. Available online: <https://doi.org/10.1080/08276331.2020.1790167>.

-
- Ribeiro-Soriano, D. 2017. Small business and entrepreneurship: their role in economic and social development. *Entrepreneurship & Regional Development*, 29(1-2), 1-3. Available online: [10.1080/08985626.2016.1255438](https://doi.org/10.1080/08985626.2016.1255438).
- Si, S., Ahlstrom, D., Wei, J., Cullen, J. 2019. Business, entrepreneurship and innovation toward poverty reduction. *Entrep. Reg. Dev.*, 1-20. Available online: <https://doi.org/10.1080/08985626.2019.1640485>.
- Shane, S., Venkataraman, S. 2000. The promise of entrepreneurship as a field of research, *Academy of Management Review*, 217-226. Available online: <https://doi.org/10.5465/amr.2000.2791611>.
- Smith, B.R., Jeffery, S., McMullen, J.S., Cardon, M.S. 2021. Toward a theological turn in entrepreneurship: How religion could enable transformative research in our field. *Journal of Business Venturing*. Available online: <https://doi.org/10.1016/j.jbusvent.2021.106139>.
- Soluk, J., Kammerlander, N., Darwin, S. 2021. Digital entrepreneurship in developing countries: The role of institutional voids. *Technological Forecasting and Social Change*. Available online: <https://doi.org/10.1016/j.techfore.2021.120876>.
- Sutter, C., Bruton, G.D., Chen, J. 2019. Entrepreneurship as a solution to extreme poverty: a review and future research directions. *Journal of Business Venturing*, 197-214. Available online: <https://doi.org/10.1016/j.jbusvent.2018.06.003>.
- Valliere, D., Peterson, R. 200. Entrepreneurship and economic growth: evidence from emerging and developed countries. *Entrep. Reg. Dev.*, 459-480. Available online: <https://doi.org/10.1080/08985620802332723>.