Comparative analysis of commercial partnership in the context of changes in Polish tax law

Agnieszka A. Janus

Department of Institutional Economics and Microeconomics, University of Lodz, Poland
ORCID: 0000-0002-3958-2293

The aim of the article was to examine the implications of changes in the rules of taxation of the income of limited joint-stock partnerships (LJSP) and limited partnerships (LP) for their dynamics and structure, especially against the background of other commercial partnerships. The hypothesis is that the changes in the rules of taxation of the income of limited joint-stock partnerships and limited partnerships negatively influenced their attractiveness as legal forms of running a business. The research methods used in the article were the analysis of the dynamics of time series, the Fisher-Snedecor test to verify the hypothesis of equality variance and the least squares method. It turns out that the amendment to the tax laws of legal persons/ entities (01.01.2014) by equalising the tax status of the LJSP with the status of legal persons/entities contributed to the increase in the tax burden of those companies, the decline in their numbers in both the commercial partnerships (CP), as well as companies in total in Poland, and in this way the decrease of the structure and dynamics indices. In turn, further changes from 1 January 2021 meant that not only the LJSP ceased to be attractive as a tool to minimise the tax burden for the owners, but also LP. In 2020, the highest decrease in the number of all companies in Poland, amounting to 6.8%, was recorded by LJSP, while in 2021 – LP (7.1%). The results of the Fisher-Snedecor test for the difference in the number of companies calculated year on year confirmed that after 2014 there was a large change in the level of differentiation in the number of limited joint-stock partnerships compared to the previous years. The number of companies decreased rapidly from year to year, which proves the decline in interest in this form of business, and the decline was manifested by a significant increase in data variability, as demonstrated by the Fisher-Snedecor test. The author observed a similar situation for limited partnerships as the change in their number year-on-year was also very differentiated before and after 2014. However, such a conclusion cannot be drawn in relation to general partnerships and partnerships, which indicates that the change in regulations introduced on 1 January 2014 did not affect the trend to create these activities. Additionally, the estimation of regression model parameters for CP group companies showed that the change in the number of LJSP year on year did not change the number of companies of other types.

Keywords: tax optimisation, commercial partnerships, tax law

1. Introduction

The choice of the legal form of running an enterprise is one of the first decisions that a potential entrepreneur is obliged to take. This decision is conditioned by many endogenous and exogenous factors, as well as other specific factors, resulting from individual preferences and beliefs of the owner of the newly created enterprise. The identification of these factors and their analysis allow the entrepreneur to choose the optimal legal form of running a business in the given legal and market conditions and taking into account its current status quo. This choice should not be accidental, because from the point of view of broadly understood economic practice, the construction of each legal form within which a given enterprise is run carries certain consequences for its stakeholders, for example in the area of shaping intra--organizational relations, the scope and type of responsibility of its owners and the shape of financial policy, including tax policy (Koźmik, 2011, pp. 60-61; Stolarski, 2012, p. 284; Matejun, Kaczmarek, 2010, pp. 208-209).

The aim of the article was to examine the implications of changes in the rules of taxation of the income of limited joint-stock partnerships and limited partnerships for their dynamics and structure, especially against the background of other commercial partnerships, and the hypothesis is that the changes in the rules of taxation of the income of limited joint-stock partnerships and limited partnerships negatively influenced their attractiveness as legal forms of running a business.

The testing of the above hypothesis requires the knowledge and understanding of the taxation rules of the income of limited joint-stock partnerships and limited partnerships in force before 1 January 2014 and after that date, and the use of such research methods as the analysis of the dynamics of time series, the Fisher-Snedecor test to verify the hypothesis of equality variance and the least squares method.

2. Taxation of the income of limited joint-stock partnerships and limited partnerships and the income of their owners under the applicable law

Interest in the issue of taxes as such, and taxes in the field of economic activity in particular, is growing all the time (Baumann et al., 2020, pp. 467-504; Riedel, 2018, pp. 169-181; Červena, Románová, 2018; pp. 767-779, Sosnowski, 2012, pp. 68-69). This is because each obligatory public levy affects the final level of financial resources at the disposal of the taxpayer. Therefore, striving to minimise the tax burden is perceived today as a common phenomenon, present in every sphere of human activity (Iwin-Garzyńska, 2016, pp. 98-99). In the case of business operations, this is of particular importance as the size of tax liabilities affects their current financial condition, the ability to compete on the market or to build development potential in

the future (Wyciślok, 2013, p. 2; Król, 2018, pp. 309-310). Currently, the problems of tax avoidance by enterprises are examined especially in connection with their market value, cost of capital or the concept of corporate social responsibility (Assidi et al., 2016, pp. 177-184;Tang, 2019, pp. 615-638; Goh et al., 2016, pp. 1647-1670; Zeng, 2019, pp. 244-257). At the same time, the adoption and implementation of a specific tax planning strategy in an enterprise should not be an end in itself. The goal should be the implementation of such tax optimisation tools as part of tax planning in the enterprise which are legal in light of the applicable law and which enable the reduction of taxes for the sake of the level of the net financial result in the short term, and in the long term – for the increase in the value of the enterprise. "The result of tax optimisation measures is therefore the achievement of tax savings. Optimisation activities can be performed as part of tax avoidance, so they should comply with the mandatory provisions of law and should not be performed to circumvent tax law (Werner, 2013, p. 58)."

Pursuant to the Act of September 15, 2000, Code of Commercial Companies (Ustawa z dnia 15 września 2000), commercial partnerships (abbreviated as CP[1]) include general partnerships (abbreviated as GP), limited partnerships (abbreviated as LP), professional partnerships (abbreviated as PP) and limited joint-stock partnerships (abbreviated as LJSP). Until recently a commercial partnership was perceived and used by entrepreneurs as a form of running a profit-making enterprise, as desired by the legislator, and/or as an instrument of tax optimisation. This situation in the case of limited joint-stock partnerships continued until the end of 2013, and in the case of limited partnerships until the end of 2020. The entry into force on 1 January 2014 of the Act from November 8, 2013 amending the Income Tax Act from legal persons, the Income Tax Act on personal income and the Act on tonnage tax (Ustawa z dnia 8 listopada 2013), as well as on 1 January 2021 of the Act from 28 November 2020 amending the Act on personal income tax, the Act on corporate income tax, the Act on flat-rate income tax on certain revenues earned by natural persons and some other acts, meant that both LJSP and LP have ceased to be attractive as tools for minimising the tax burden for their owners (Ustawa z dnia 28 listopada 2020; Janus, 2016, p. 8). Legislative changes introduced by the provisions of the last of the above-mentioned acts also included general partnerships.

As of 1 January 2021, the limited joint-stock partnership ceased to be the only partnership with the status of a corporate income taxpayer – this status was also granted to limited partnerships and many general partnerships. The obligation to calculate and pay corporate income tax applies to the general partnership which: has its registered office or management board in the territory of the Republic of Poland, if its partners are not only natural persons and if it does not submit, before the beginning of the financial year, information about CIT and PIT taxpayers

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[1] All abbreviations of company names adopted in this article are of contractual nature and refer to Polish legal forms of running a business.

holding direct or through non-taxpayers of income tax, the right to participate in the company's profit (Article 1 (3) (1a) (a) of the Personal Income Tax Act in the wording from 1 January 2021) or the submitted information will not be updated within 14 days counting from the occurrence of changes in the composition of taxpayers (Article 1 (3) (1a) (b) of the Tax Act in the wording from 1 January 2021) (Ustawa z dnia 15 lutego 1992). The general partnership will have the status of a taxpayer from the first day of the financial year referred to in the above-mentioned art. 1 clause 3 point 1a letter a), or from the date of changes in the composition of the taxpayers referred to in the above-mentioned art. 1 clause 3 point 1a letter b) until the company's liquidation or deletion from the relevant register (Article 1 (5) of the IAA Act, reading from 1 January 2021, Article 8 (2b) and Article 9 (2e) of the IAA Act, reading from January 1, 2021). The regulations formulated in this way determine that only general partnerships with the exclusive participation of natural persons will not be CIT taxpayers. However, companies with the participation of, among others a legal person, e.g. a limited liability company, are obliged to provide the Tax Office competent for the registered office of the general partnership with additional information in order not to obtain the status of a CIT taxpayer (Mentel, Wyrzychowska, 2020).

3. A comparative analysis of the number of companies in Poland in 2002-2019[2]

Although since 2012 the dominant legal structure of running an enterprise in terms of the number of people in the Polish 'legal forms market' has been a limited liability company, commercial partnerships are becoming more and more important in the economy. Over the past 20 years their number increased almost 4.5 times, while the number of limited liability companies increased almost 3 times, joint-stock companies (excluding simple joint-stock companies) – slightly more than 15.6%, and civil partnerships – by about 40.4% (see: Appendix, Figure 1.).

The preliminary analysis of the total number and dynamics of commercial partnerships in comparison to other companies in Poland over the period under review confirms the growing interest of entrepreneurs in these legal forms of running a business, with the differences in these indicators in the CP group. The smallest group of companies as at 31st December 2021 in the CP group, as well as in the group of all companies, were professional partnerships, although this state did not appear until 2012. Earlier, i.e. in the years 2002-2011, the smallest number on the market limited joint-stock partnerships was noted.

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[2] As part of the analysis, sole entrepreneurs were omitted, as the author's intention was to show how the number, dynamics and structure of commercial partnerships (in total and within their segment) in comparison to all companies in Poland over the selected period. Due to the fact that a sole entrepreneur, as the name suggests, is not a company, it was not included in the study.
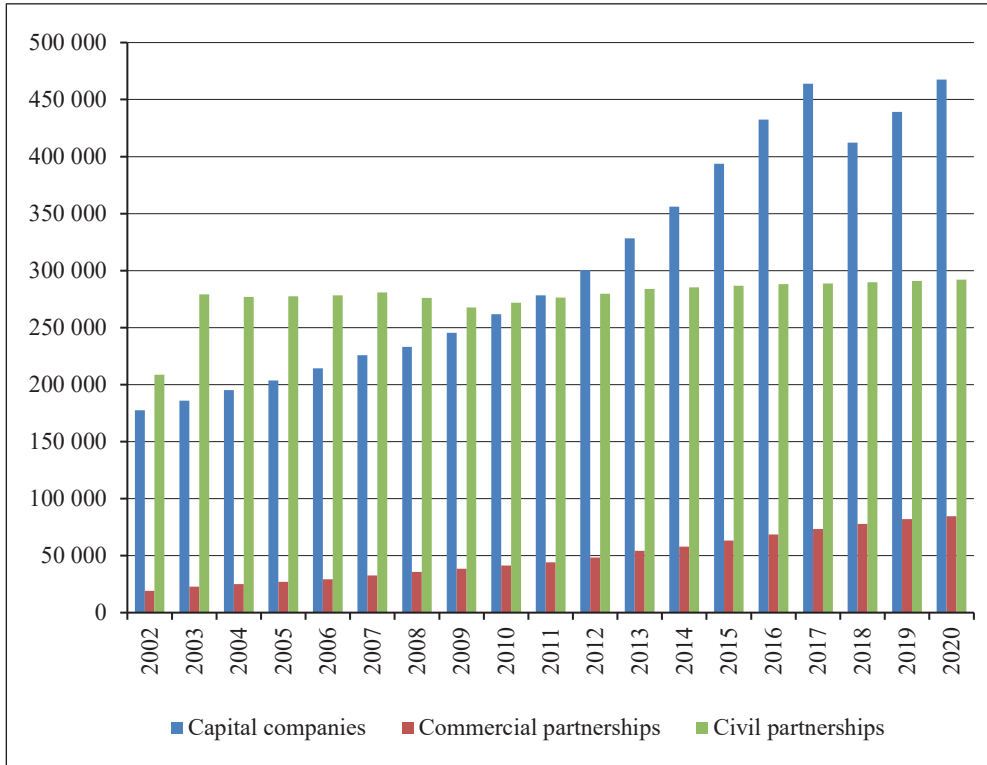
Fig. 1. Graph depicting data from Appendix

Source: own work.

Taking into account the results of the analysis of the dynamics of civil and commercial partnerships in Poland in the years 2014-2017, negative indicators can be seen only in the case of limited joint-stock partnerships. Within four years their number decreased by 1,729, which can be justified by the introduction of changes in the method of taxation of income obtained by partners of these companies from their business activities. Moreover, regarding the number of LJSP a downward trend can also be seen in the following years. Despite the negative dynamics indexes for LJSP over the period 2014-2021, for general partnerships in 2018-2020 and limited partnerships in 2021, the overall LJSP dynamics ratio up to 2020 was always positive. The positive picture of CP growth in total year on year was due to/the 'merit' of the use of limited partnerships by entrepreneurs. This is the only group of companies among all the surveyed companies that did not decrease in number in the period from 2002 to the end of 2020. It should be noted that in the first half of 2020, most probably due to the pandemic, all the surveyed groups of companies recorded a drop in their number (see: Table 1, Figure 2).

Table 1

Dynamics of civil and commercial partnerships in Poland* from 31/12/2002 to 31/12/2021 (in %)

Year	Total	Partnerships and companies:								
		Commercial								Civil
		Capital companies			Total	Commercial partnerships				
		Total	JSC	LLC		PP	GP	LP	LJSP	
2003	20.4	4.7	0.4	4.9	19.3	39.0	18.9	18.3	100.0	33.9
2004	1.9	4.9	-0.1	5.1	10.4	25.6	9.4	26.3	27.8	-0.8
2005	4.1	4.4	-0.3	4.6	7.4	16.3	6.3	25.8	87.0	0.2
2006	2.7	5.2	0.1	5.4	8.2	14.4	6.4	36.6	153.5	0.3
2007	3.4	5.4	2.8	5.5	11.6	11.8	8.2	58.8	133.0	0.9
2008	1.1	3.3	-0.1	3.4	9.8	10.8	6.0	42.0	103.5	-1.7
2009	1.2	5.2	1.4	5.4	7.4	9.5	3.3	28.7	47.1	1.6
2010	4.3	6.7	3.9	6.8	7.6	9.5	3.3	28.7	47.1	1.6
2011	4.2	6.3	5.1	6.4	6.8	13.5	1.0	28.6	44.1	1.7
2012	5.0	7.9	3.9	8.1	9.9	9.5	2.1	26.8	86.1	1.2
2013	6.0	9.2	3.0	9.4	12.1	8.3	2.0	20.6	102.7	1.5
2014	4.9	8.5	3.9	8.6	6.3	6.5	2.3	23.7	-8.1	0.5
2015	6.4	10.6	4.5	10.8	9.3	5.1	3.0	30.3	-10.4	0.5
2016	6.1	9.8	3.4	10.0	8.5	4.6	1.3	25.8	-9.9	0.5
2017	4.6	7.2	2.3	7.4	7.1	3.7	0.1	19.5	-6.0	0.1
2018	-5.6	-11.2	-17.5	-11.0	6.0	1.8	-1.8	16.9	-3.3	0.4
2019	4.1	6.6	0.8	6.7	5.3	1.1	-1.5	13.3	-3.6	0.4
2020	3.9	6.4	-1.4	6.6	3.3	2.2	-0.6	7.8	-6.8	0.3
2021	5.0	9.2	4.8	9.3	-1.4	4.2	5.5	-7.1	-2.9	0.3

* JSC – joint-stock companies; LLC – limited liability companies; PP – professional partnerships; GP – general partnerships; LP – limited partnerships; LJSP – limited joint-stock partnerships.

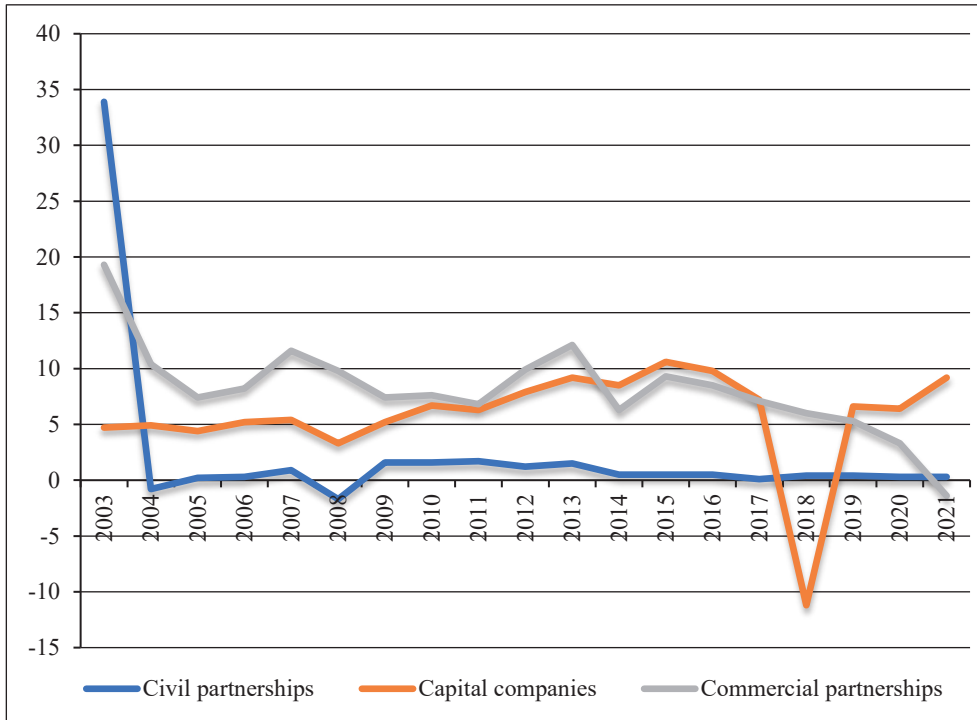Source: own work based on data from Appendix.

Fig. 2. Graph depicting data from Table 1

Source: own study.

When analysing the level of LJSP structure indicators in the period under study, it can be seen that the highest share of the LJSP number in the total number of companies took place in 2019 and amounted to 10.1%. Most likely, this trend, favourable for LJSP, was to some extent halted by the pandemic, and to some extent also by the announcement of changes in the tax law with regard to limited partnerships and general partnerships. It can also be observed that the share of civil partnerships in the structure of all companies was clearly decreasing from period to period – in 2002 the structure ratio for these companies was 51.5%, whilst as 31 December 2020 it was only 33.0%. It is also worth emphasising that limited liability companies enjoy a consistently high and growing interest among entrepreneurs – I at the end of 2021 they accounted for 56.4% of the total number of companies operating in Poland. In turn, in the period 2002-2021 the smallest difference in the level of the structure index was recorded in the case of professional partnerships, 0.2%, which means that their share in the overall structure of companies was characterised by the highest stability (see: Table 2, Figure 3).

Table 2

Structure of civil and commercial partnerships* in the period from 31 Dec2002 to 31 Dec2021 (in%)

| Year | Commercial partnerships | | | | | | | | | Civil partnerships |
| | Total | Capital companies | | | Commercial partnerships | | | | | |
		Total	JSC	LLC	Total	PP	GP	LP	LJSP	
2002	48.5	**43.8**	2.1	41.7	**4.7**	0.1	4.4	0.2	0.002	**51.5**
2003	42.8	**38.1**	1.8	36.3	**4.7**	0.1	4.4	0.2	0.004	**57.2**
2004	44.3	**39.2**	1.7	37.5	**5.1**	0.1	4.7	0.2	0.005	**55.7**
2005	45.4	**40.1**	1.7	38.4	**5.3**	0.2	4.9	0.2	0.008	**54.6**
2006	46.6	**41.1**	1.6	39.4	**5.6**	0.2	5.1	0.3	0.02	**53.4**
2007	47.9	**41.9**	1.6	40.2	**6.1**	0.2	5.3	0.5	0.05	**52.1**
2008	49.3	**42.8**	1.6	41.2	**6.5**	0.2	5.6	0.7	0.09	**50.7**
2009	51.5	**44.5**	1.7	42.9	**6.9**	0.2	5.7	0.9	0.1	**48.5**
2010	52.7	**45.5**	1.6	43.9	**7.2**	0.3	5.6	1.1	0.2	**47.3**
2011	53.9	**46.5**	1.6	44.8	**7.5**	0.3	5.5	1.4	0.3	**46.1**
2012	55.5	**47.8**	1.6	46.2	**7.7**	0.3	5.3	1.7	0.4	**44.5**
2013	57.4	**49.2**	1.6	47.7	**8.1**	0.3	5.1	1.9	0.8	**42.6**
2014	59.2	**50.9**	1.6	49.3	**8.3**	0.3	5.0	2.2	0.8	**40.8**
2015	61.4	**52.9**	1.5	51.4	**8.5**	0.3	4.8	2.7	0.6	**38.6**
2016	63.5	**54.8**	1.5	53.3	**8.7**	0.3	4.6	3.2	0.5	**36.5**
2017	65.0	**56.2**	1.5	54.7	**8.9**	0.3	4.4	3.7	0.5	**34.9**
2018	62.8	**52.8**	1.3	51.5	**10.0**	0.3	4.6	4.6	0.5	**37.2**
2019	64.2	**54.1**	1.2	52.9	**10.1**	0.3	4.3	5.0	0.5	**35.8**
2020	65.4	**55.4**	1.2	54.2	**10.0**	0.3	4.1	5.2	0.4	**34.6**
2021	67.0	**57.6**	1.2	56.4	**9.4**	0.3	4.2	4.6	0.3	**33.0**

   * JSC – joint-stock companies; LLC – limited liability companies; PP – professional partnerships; GP – general partnerships; LP – limited partnerships; LJSP – limited joint-stock partnerships.

   Source: own work based on data from Appendix.

Taking into account the internal structure of commercial partnerships, until the end of 2017 general partnerships were the dominant group. In 2018 the general partnerships and limited partnerships achieved the same levels of structure ratios, amounting to 46.0%, and then from 2019 the leading position among CP was taken by limited partnerships, reaching a 48.7% share in the CP market by the end of 2021. In 2002 the share of GP in the total number of CP was as high as 94.4%, while as on 31 Dec 2021 it was only 44.2% – over the analysed period, the above indicator

recorded a difference of 50.2%. It is also worth noting that the smallest number of companies on the Polish market were professional partnerships – at the end of 2021, 2,556 entities were registered in the National Court Register. This, however, does not change the fact that the existence of such a legal form as a professional partnership in the Polish economic space is fully justified – they are characterised by their permanent, though slow, dynamics (see: Table 3, Figure 4).
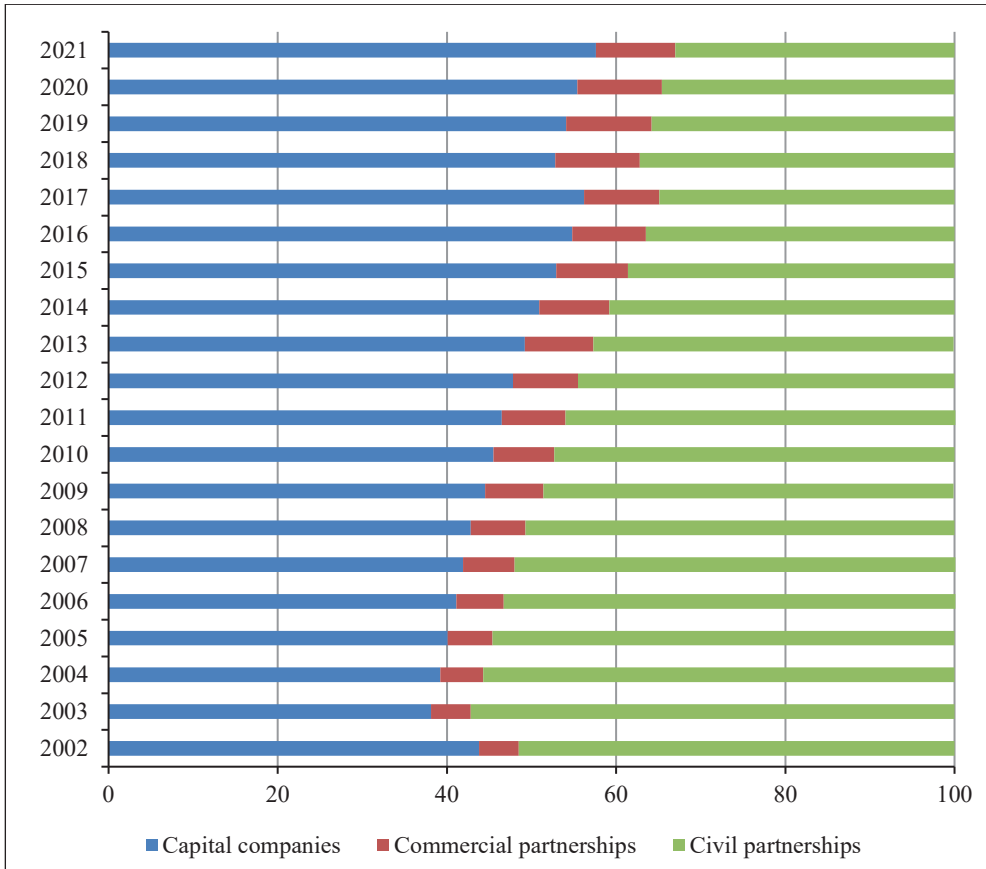

Fig. 3. Graph showing data from Table 2

Source: own work.

When analysing further the numerical share of individual commercial partnerships in the overall LJSP structure, it can be observed that the share of limited joint-stock partnerships has been decreasing since 2014, which is probably due to a change in the legal regulations applicable from 1 January 2014 regarding their tax status. The entrepreneurs from the so-called transparent companies have become

companies that are taxed in the same way as legal persons/entities (e.g. capital companies). At the end of 2021 they constituted only 4.0% of all commercial partnerships, while at the end of 2013 – 10.5%. Most likely, the decline in the attractiveness of limited joint-stock partnerships resulted in the increased interest among business owners in limited partnerships and limited liability companies in 2014-2019, as these companies showed the highest dynamics and structure rates in the analysed period. The gradual reduction of the share of LJSP in the total number of CP in the period 2014-2021 can certainly be an incentive to conduct research on the causes of this phenomenon.

Moreover, it seems that due to the unification of the tax status of three companies belonging to the CP group, a similar tendency will be observed in the case of general

Table 3

The structure of commercial partnerships* from 31 Dec 2002 to 31 Dec 2021 (in%)

Year	PP	GP	LP	LJSP
2002	2.2	94.4	3.4	0.05
2003	2.5	94.0	3.4	0.08
2004	2.9	93.2	3.8	0.09
2005	3.1	92.2	4.5	0.2
2006	3.3	90.6	5.7	0.4
2007	3.3	87.8	8.1	0.8
2008	3.4	84.7	10.5	1.4
2009	3.4	81.7	13.0	1.9
2010	3.5	78.4	15.6	2.5
2011	3.7	74.1	18.8	3.4
2012	3.7	68.9	21.6	5.8
2013	3.5	62.7	23.3	10.5
2014	3.5	60.3	27.1	9.1
2015	3.4	56.9	32.3	7.4
2016	3.3	53.1	37.4	6.2
2017	3.2	49.6	41.8	5.4
2018	3.1	46.0	46.0	4.9
2019	3.0	43.0	49.5	4.5
2020	2.9	41.5	51.6	4.0
2021	3.1	44.2	48.7	4.0

* PP – professional partnerships; GP – general partnerships; LP – limited partnerships; LJSP – limited joint-stock partnerships; CP – commercial partnerships.

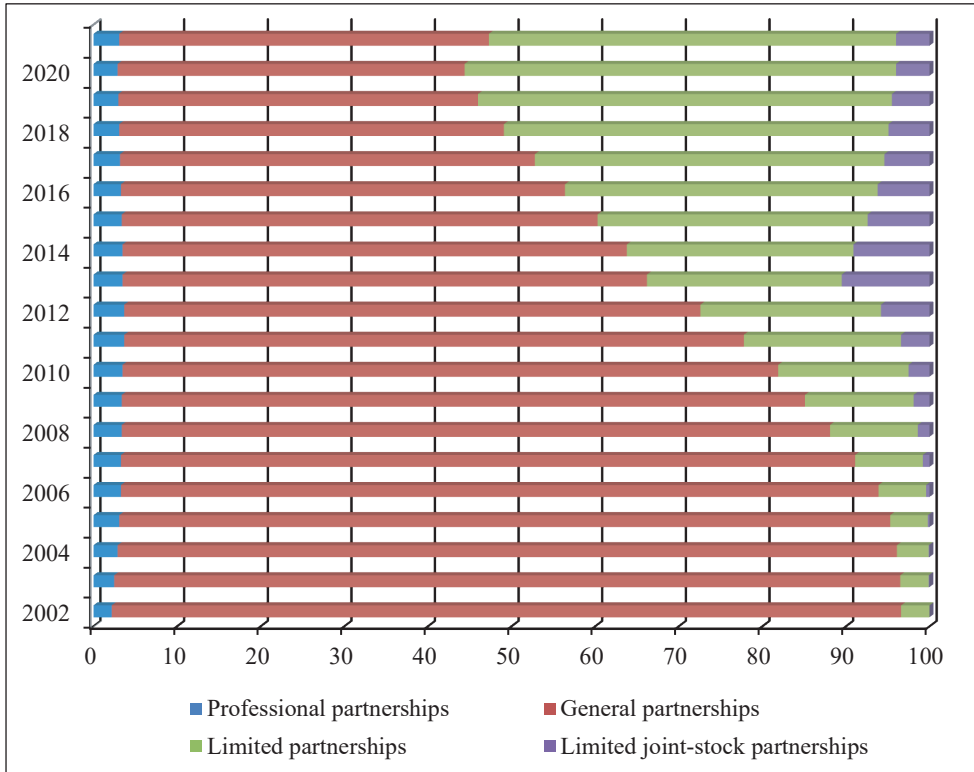Source: own work based on data from Appendix.

Fig. 4. Graph depicting data from Table 3

Source: own work.

partnerships and limited partnerships in the following years, which will result in a systematic decline in the share of CP in the overall structure of companies in Poland and their marginalisation by both current and future entrepreneurs.

4. The testing of selected statistical hypotheses regarding the structure of commercial partnerships in Poland in 2002-2021

The analysis of the number of companies of various types in the following years provides a lot of valuable information. However, the sheer number of companies is the result of not only changes in legal conditions. At the same time, it is influenced by many factors of the internal and external environment – new entrepreneurs appear on the market on the initiative of natural and legal persons, others fail due to insolvency, and their owners do not decide to restart their business. As a consequence of overall economic development, the number of companies increases over time, therefore in order to overcome the influence of the trend on the results of the

calculations, absolute chain increments, i.e. differences in the number of companies from the following years were used. This has another advantage from the point of view of the regression models presented later in the article, namely the switch to increments reduces the time series to stationarity – an extremely desirable feature when checking the existence of relations between variables.

From the point of view of commercial partnerships, 2014 was a very important date, when the regulations significantly reducing the attractiveness of limited partnerships and limited joint-stock partnerships entered into force. Especially in the case of the latter, a clear decrease in the number of companies operating in this form of activity was noticeable.
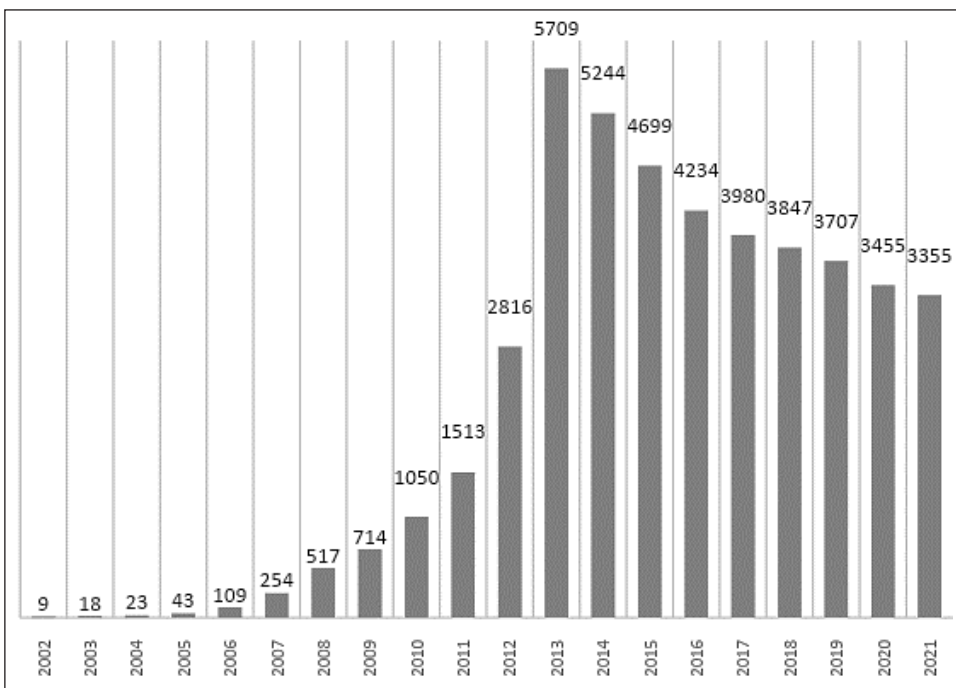

Fig. 5. Number of limited joint-stock partnerships in 2002-2021

Source: own work based on data from Appendix.

The effect of introducing legal changes is already visible in Figure 5. However, two questions arise: how to demonstrate the impact and its strength on the level of analytical methods? Have other CP activities been affected by these changes in a similar way?

Therefore, the study checked whether the number of companies before and after 2014 differed significantly. Probably at least some of the existing limited joint-stock partnerships could be transformed into a different legal form. In addition, the author considered it possible that entrepreneurs setting up completely new companies take

into account the new legal provisions and immediately decide on one of the other forms of CP. It is also possible that after 2014 the number of transformations of companies other than limited joint-stock partnerships increased because the repercussions of the introduced changes began to be also felt by them. If such a situation took place, then one should expect an increase in the differentiation in the number of companies in the coming years. The Fisher-Snedecor statistical test was used to check the equality of variances in two populations. In this test, the null hypothesis is that the variances in the subgroups do not differ significantly from each other. This was contrasted with an alternative hypothesis, namely that one of the variances is greater than the other. The rejection of the null hypothesis would mean that the changes in the taxation rules referred to in the article have had a negative impact on the attractiveness of running a business in the form of LJSP and LP. 'The test of the test' is the F statistic given by the formula (Aczel 2000, p. 378):

$$F_{n_1-1, n_2-1} = \frac{s_1^2}{s_2^2},$$ (1)

where n_1, n_2 – number of sub-samples, s_1^2, s_2^2 – variances in sub-samples. The F statistic has a Fisher distribution with $n_1 - 1$ and $n_2 - 1$ degrees of freedom. The author introduces the variances s_1^2 and s_2^2 into the formula in such a way that the higher of them is in the numerator. Therefore, the test applies a right-handed rejection area, i.e. the value of the calculated F statistic higher than the critical value derived from the distribution means the rejection of the null hypothesis. Next, a significant difference in variable dispersion in the separated subgroups was found.

Table 4 shows the results of the Fisher-Snedecor test for the number of companies up to one year. The entire sample was divided into two sub-samples: from 2003 to 2013, and from 2014 to 2021, with the critical value read from the Fisher distribution for a significance level of 0.05. The table also contains a column with the empirical value of the studied value. The present value of p is not the maximum significance level as there are no grounds for rejecting the null hypothesis. In table 4, p value lower than 0.05 means that null hypothesis should be rejected for CP, LP and LJSP.

The analysis started with limited joint-stock partnerships, with a clear rejection of the hypothesis being verified, as evidenced by the very low p value. As expected, after 2014 there was a significant change in the level of differentiation in the number of companies compared to the previous years, and a similar situation was observed for limited partnerships. Here, too, the year-on-year change in the number of companies was characterised by high diversification before and after 2014.

When it comes to partnerships and general partnerships, at the significance level of 0.05 there is no reason to reject the null hypothesis that the volatility distinguished in the two sub-samples does not differ significantly. It can be concluded that the change in regulations introduced on 1 January 2014 did not affect the tendency to create these forms of activity.

The author also performed tests for the total number of commercial partnerships in order to check whether the changes in limited partnerships and limited joint-stock partnerships had an impact on the overall economic situation, which seems justified because the share of these two types was growing over the following years (see: Table 2). In the case of CP, the null hypothesis was rejected. Therefore, the study concluded that the share of LP and LJSP in CP was already so large that the changes taking place in these activities had a significant impact on the overall economic situation in the sector.

Table 4

Fisher-Snedecor test results for differences in the number of CP

Type of company	F statistic	Degrees of freedom	Critical value	P value
CP	3.6605	(7, 10)	3.1355	0.0317
PP	1.7263	(7, 10)	3.1355	0.2091
GP	1.0248	(7, 10)	3.1355	0.4698
LP	13.2034	(7, 10)	3.1355	0.0003
LJSP	24.9969	(10, 7)	3.6365	0.0002

Source: own work.

The results of the Fisher-Snedecor tests showed that the commercial partnership segment was affected by the changes introduced in 2014. However, the statistical test only allows to confirm or reject the hypothesis being verified. The author has already pointed out that the volatility of the dynamics of the number of limited partnerships and limited joint-stock partnerships differed significantly in both sub-periods. Therefore, it should be checked whether the impact of changes from one activity on another could be observed. In other words, did the entrepreneurs decide to liquidate their business, or did they change the type of company to a different type of company from among those included in the CP group There is a need to investigate the direction and strength of the influence of some variables on others, i.e. the use of regression models.

The data in Table 1 and Figure 5 show that the introduction of the new law was felt most strongly by limited joint-stock partnerships. Therefore, the author decided to estimate the parameters of the regression models in which the number of LJSP appeared as an explanatory variable, and the remaining types of companies were the next explained variables. However, the number of companies of most types also increased over time. In economics, it is normal that time series show a growing trend, the source of which may be, for example, economic growth, technical progress (Gruszczyński 2009, p. 190), was the case here. From the point of vie of econometrics, this phenomenon is perceived negatively because it is the cause of the so-called non-

-stationarity. Building a model based on non-stationary data may lead to incorrect conclusions, therefore first the study analysed the time series of the number of companies in terms of stationarity using the extended Dickey-Fuller test (ADF test) (Gruszczyński 2009, pp. 202-203). In short, the null hypothesis in it assumes that the time series is non-stationary and the first-degree integrated against the alternative hypothesis that the series is stationary.

Table 5

The ADF tests results

Type of company		Free expression test/ Free intercept test	Test with intercept and linear trend
CP	Test statistics	−1.2928	−2.3644
	p value	0.6352	0.3984
PP	Test statistics	−1.0734	−1.7533
	p value	0.7285	0.7273
GP	Test statistics	−5.8829	−2.7738
	p value	2.281e-007	0.207
LP	Test statistics	−7.5884	−4.8604
	p value	7.723e-012	0.0003
LJSP	Test statistics	−1.4344	−1.7998
	p value	0.567	0.7051

Source: own work.

In the ADF test for almost all variables, there were no grounds to reject the null hypothesis at the significance level of 0.05 (Table 5). Only a number of limited partnerships were stationary, moreover all the non-stationary series turned out to be incremental series. After calculating the first differences for them, the study obtained stationary series. A consequence of thi was the selection of variables expressing one-period increases in the number of companies for estimation. The explanatory variable was always the increase in the number of limited joint-stock partnerships, and the explained variables in subsequent models – the increase in the number of companies of one of the other types. During the estimation, it was found that all models showed a very strong autocorrelation and therefore their specification was extended to include the delayed dependent variable as an explanatory variable. In addition, standard error HAC estimators were used, which make the estimation results resistant to the appearance of heteroscedasticity and autocorrelation. This was dictated, among others, by a small number of degrees of freedom, making it difficult to unequivocally evaluate the statistical properties of the model. In addition to the signs and values of the estimated parameters, the author was interested in the verification of the hypothesis of the significance of the estimate for the variable expressing the effect of

the increase in the number of LJSP. Table 6 presents the results of the estimation of the parameters of individual models. The letter d in front of the variable name signifies an increase over the previous year.

Table 6

The results of model parameters estimation for CP group companies

Explained variable	Explanatory variables	Factor	Student test	P value	Coefficient of determination	LM test for first order autocorrelation	
						LMF	p-value
dCPt	const	252.2690	0.2345	0.8178	0.4044	0.4562	0.5104
	dLJSPt	0.7294	2.7820	0.0140			
	dLJSPt-1	0.8193	3.4530	0.0035			
dPPt	const	36.6280	1.6620	0.1172	0.563	0.1582	0.6968
	dLJSPt	0.0086	1.8590	0.0827			
	dPPt-1	0.6321	4.2140	0.0008			
dGPt	const	308.9930	1.1170	0.2815	0.4813	1.4903	0.2423
	dLJSPt	0.0217	0.2759	0.7864			
	dGPt-1	0.5829	3.8260	0.0017			
dLPt	const	273.9920	0.9777	0.3437	0.4714	25.5195	0.0002
	dLJSPt	–0.0339	–0.1393	0.8911			
	dLPt-1	0.8130	6.9820	0.0000			

Source: own work.

At the significance level equal to 0.05, the null hypothesis was rejected for all parameters with the variable dLJSP except for the model for the total increment of commercial partnerships (dCP). This means that these parameters do not differ significantly from zero, so the change in the number of limited joint-stock partnerships year on year did not change the number of companies of other types. Yet, in all the models, the parameter with the delayed explained variable was statistically significant, i.e. the change in the number of a given group of companies in the current year was influenced by their change in the previous year.

Conclusions

Contemporary economic conditions, burdened with additional risks related to the pandemic and war crises, are not conducive to the dynamic development of many enterprises. Therefore, the owners and/or managers of enterprises are constantly exploring new areas of management, looking for opportunities to continuously increase their financial potential, both in the short and long term. One of the ways of

achieving such a formulated goal is tax optimisation, consisting in planning and undertaking such activities in accordance with the applicable tax law, which will minimise the tax burden on account of the conducted business activity. The range of tax optimisation instruments remains wide, although it continues to shrink. Until the end of 2013, limited joint-stock partnerships, due to their formal and tax subjectivity (especially the lack of double taxation of income), constituted an extremely attractive instrument of tax optimisation for their owners. However, the amendment to the Corporate Income Tax Act by equalising the tax status of LJSP with the status of legal persons contributed to an increase in the tax burden on these companies, a decrease in their number both in the CP group and companies in general in Poland, and thus a reduction in structure and dynamics indicators. The results of the Fisher-Snedecor test for the difference in the number of companies calculated year on year confirmed that after 2014 there was a significant change in the level of differentiation in the number of limited joint-stock partnerships compared to the previous years. The number of companies decreased rapidly from year to year, which proves the decline in interest in this form of business; the decline was manifested by a significant increase in data variability demonstrated by the Fisher-Snedecor test. A similar situation was observed for limited partnerships, where the change in their number year-on-year was also highly differentiated before and after 2014. However, such a conclusion cannot be drawn in relation to general partnerships and partnerships, which indicates that the change in regulations introduced on 1 January 2014 did not affect the trend to create these activities. Additionally, the estimation of regression model parameters for CP group companies showed that the change in the number of LJSP year on year did not change the number of companies of other types.

Regression models are particularly interesting to study. The owners of limited joint-stock partnerships, at best in a limited number of cases, decided to exchange them for another form of activity. Even if this happened, it had no significant impact on limited partnerships (which could have been expected), general partnerships or partnerships. However, the impact of the decrease in the amount of LJSP was noticed in the total number of CP, which confirmed the results of the Fisher-Snedecor test. It can therefore be concluded that the basic reaction to the entry into force of the new regulations in 2014 was the liquidation of activities, at least in the form of a partnership. Naturally, this does not exclude the 'transition' of companies to, for example, a joint-stock company or other forms not included in CP. The significance of the parameters for delayed explained variables proves that entrepreneurs, when deciding on a given type of company, are influenced by the situation in this narrow sector and do not pay attention to the situation of limited joint-stock partnerships.

Moreover, from 1 January 2021, the Act of 28 November 2020 amending the Personal Income Tax Act, the Corporate Income Tax Act, the Lump-sum Income Tax Act on certain income earned by natural persons and some other acts, resulted not only in the fact the LJSP has ceased to be attractive as a tool for minimising the tax burden for its owners, but also LP. In 2020, the highest decrease in the number of all

companies in Poland, amounting to 6.8%, was recorded for a limited joint-stock partnership, while in 2021 – for a limited partnership (7.1%). The legislative changes introduced by the provisions of the last of the above-mentioned acts also included general partnerships.

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Appendix

The number of civil and commercial partnerships in Poland* from 31/12/2002 to 31/12/2021

Year	Total	Partnerships and companies									Civil
		Commercial									
		Total	Capital companies			Commercial partnerships					
			Total	JSC	LLC	Total	PP	GP	LP	LJSP	
2002	405 228	196 681	177 631	8 609	169 022	19 050	418	17 978	645	9	208 547
2003	487 961	208 753	186 021	8 641	177 380	22 732	581	21 370	763	18	279 208
2004	497 059	220 162	195 064	8 633	186 431	25 098	730	23 381	964	23	276 897
2005	508 010	230 588	203 636	8 607	195 029	26 952	849	24 847	1 213	43	277 422
2006	521 675	243 338	214 172	8 614	205 558	29 166	971	26 429	1 657	109	278 337
2007	539 189	258 299	225 740	8 853	216 887	32 559	1 086	28 587	2 632	254	280 890
2008	545 054	268 942	233 187	8 842	224 345	35 755	1 203	30 298	3 737	517	276 112
2009	551 327	283 712	245 324	8 969	236 355	38 388	1 317	31 353	5 004	714	267 615
2010	574 909	303 040	261 733	9 322	252 411	41 307	1 428	32 390	6 439	1 050	271 869
2011	598 854	322 474	278 347	9 797	268 550	44 127	1 621	32 711	8 282	1 513	276 380
2012	628 684	348 952	300 473	10 182	290 291	48 479	1 775	33 388	10 500	2 816	279 732
2013	666 535	382 526	328 189	10 491	317 698	54 337	1 922	34 048	12 658	5 709	284 009
2014	699 261	413 813	356 030	10 895	345 135	57 783	2 046	34 841	15 652	5 244	285 448
2015	743 669	456 910	393 774	11 380	382 394	63 136	2 150	35 896	20 391	4 699	286 759
2016	789 265	501 056	432 558	11 769	420 789	68 498	2 249	36 368	25 647	4 234	288 209
2017	825 876	537 273	463 907	12 044	451 863	73 366	2 333	36 399	30 654	3 980	288 603
2018	779 767	489 908	412 106	9 938	402 168	77 802	2 376	35 753	35 826	3 847	289 859
2019	812 085	521 073	439 157	10 021	429 136	81 916	2 402	35 229	40 578	3 707	291 012
2020	844 014	552 091	467 437	9 880	457 557	84 654	2 454	35 004	43 741	3 455	291 923
2021	886 634	593 791	510 333	10 350[3]	499 983	83 458	2 556	36 929	40 618	3 355	292 843

* JSC – joint-stock companies; LLC – limited liability companies; PP – professional partnerships; GP – general partnerships; LP – limited partnerships; LJSP – limited joint-stock partnerships.

Source: own work based on (GUS, 2012, 2022).

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[3] The number of joint-stock companies includes simple joint-stock companies, which amounted to 393 at the end of 2021.