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ANALYSIS OF UNDERTAKINGS PERFORMING FOOD RETAIL ACTIVITIES AS GROCERY STORES IN THE NORTHERN GREAT PLAIN REGION

Review
Article

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Abstract

The Hungarian food trade significantly changed during the privatization taken place in the '90s. As in other developed countries in the turn of millennium, the so-called modern distribution channels (hypermarkets, supermarkets, discount stores) took the leading role in Hungary as well, throwing the traditional trade channels into the shade. The turnover of domestic retail trade has shown a downturn since 2007, though the food retail trade has regressed less but the unfavorable trend also prevails here. The earnings before taxes of the Hungarian food retail trade considerably decreased between 2005 and 2010 while the regression was substantially less in the wholesale trade. ROA (Return on Assets) of the Hungarian food trade was very low between 2005 and 2010. In the present study, by means of R statistical system, the statistical analysis of data from the annual reports of undertakings performing food retail activities as grocery stores in the Northern Great Plain region, in the period between 2013 and 2018 are presented.

INTRODUCTION

In Hungary, before the change of regime, the state property dominated in the food retail as well: in 1989, 60% of the trade turnover was still provided by state companies and the other one third by co-ops. After the change of regime, the former trading units owned by the state or co-ops fell to pieces due to the privatization and the newly established business companies, and sole traders opened numerous new units. In doing so, the number of food retail stores increased from 25 066 to 50 966 between 1990 and 1998 (Jankuné Kürthy, Stauder & Györe, 2012). The unfavourable tendencies of sales are reflected in the development of food stores as well (Fenyves, Tarnóczy & Bács, 2016; Kristóf & Harangi-Rákos, 2016; Zsarnóczyai & Zéman, 2019). Especially, the number of shops decreased between 2000 and 2011, the floor area stagnated or even increased in some years; this fact indicates that shops with smaller floor area stopped the operation. According to the information of the Central Statistics Office, the number of food grocer's shops regressed mainly between 2000 and 2011, and the number of specialized shops increased. And, due to the large number of food retail stores, the analysis of undertakings dealing with this activity is regarded as very important.

MATERIAL AND METHOD

The examined database included the undertakings performing food retail activities, which marked the "Food retail activity as grocery store" as main activity, whose registered office can be found in the Northern Great Plain region, which were established before 1 January 2013 and which have six business years with reports. The undertakings were selected from the OPTEN Company Database and the annual reports of companies involved in the analysis were downloaded from Electronic Report Portal. Annual reports of companies were collected for six years, from 2013 to 2018. In total, 887 pieces of undertakings met the requirements given in the Northern Great Plain region, of which data of 563 undertakings entered the analytical database. Among the 887 undertakings, 96 undertakings went into liquidation/winding-up in the examined period, other 238 undertakings had no annual reports in some years of the examined period or the rows of annual report being important from the point of view of analysis contained zero values. In Table 1, it can be seen that 563 undertakings formed the database in total, which accounts for 63.47% of undertakings meeting the conditions.

For the analysis, Microsoft Excel spreadsheet was used as well as the data handling and calculating possibilities of R statistical system (Everitt & Hothorn, 2010; Tarnóczy, Fenyves, Bács &

Böcskei, 2015). The R statistical system via Excel spreadsheet by means of RExcel (Heiberger & Neuwirth, 2009) was used. R statistical system has all of those functions which can help to group/classify the available data at will, and those program packages (modules) which can be used for the required statistical analyses are available in the system (Bayaraa, Tarnóczy & Fenyves, 2019). R statistical system is an open source and free program which provides innumerable opportunities for analysing, presenting and modelling and it can also be linked with Excel spreadsheet, by means of which the available database can be managed and analysed more easily. Nowadays, R statistical system is one of the most widely used statistical programs in the world and it develops very dynamically.

RESULTS

Broad statistical analysis of undertakings performing food retail activities as grocery stores in the Northern Great Plain region

Bigger part of the undertakings involved in the examination draw up simplified annual report. Based on the data available in this way, all of the asset values were chosen for the first "broad" analysis:

The authors have used the selected feature for being able to make statements about the dispersions of the data and the diversity of individuals of the examination. In the publication, one occasionally may find that e.g. mean is calculated from the inhomogeneous data significantly, in which case this mean gives an inadequately usable statistical feature of the examined population. The essential statistical indicators regarding the four selected characteristics (minimum, first quartile, median, mean, third quartile, maximum, standard deviation, relative standard deviation) were determined, based on which the basic features of the undertakings of the examined counties and the regions were presented. This examination underlies the determination of further examinations and the establishment of forming the acceptably homogeneous corporate groups.

Average asset value of the analysed undertakings continuously increased in the examined period (Table 2). From 2013 to 2018, the average stock of assets increased by 23.43% which was a 4.9-percent growth per year on average. By means of Table 2, it can also be stated that the growth of asset value was peculiar to the undertakings possessing bigger asset values. At the same time, the consequence of very significant differences of medians and means is that there are significant differences between the companies and the smaller undertakings represent a larger proportion. For instance, the asset value of undertaking giving the value of upper quartile (Q3) was increased by 29%

in 2018 compared to 2009. The undertaking having the largest asset value was also able to increase its asset value by 19.3% in the examined period. The asset value of undertaking giving the lower quartile (Q1) was decreased by 25.9% during the examined period. The aforementioned significant difference is also buttressed up by the relative standard deviation values which can be seen in Table 2; their value is very high and, therefore, the examined sample shows a very heterogeneous image. By examining the values of interquartile range (IQR), it can be seen that it forms a much narrower interval (Q3-Q1) compared to the full range (essentially, it is equal to the value of maximum) which also buttresses up that, in the region, the smaller sized undertakings form more than three-quarters of companies belonging to the given activity. At the same time, it can also be seen that the value of IQR significantly increased (by 39%) by the end of the examined period. This big standard deviation is caused by the value of some undertakings which can be found in the fourth quarter because, for example, the maximum (8 641 000 thousand HUF) is 202.6 times greater than the value of Q3 (42 650 thousand HUF).

Based on the data of Table 3, it can be seen that if the database is sorted by asset value and means are calculated, standard deviations and relative standard deviations of quartiles then, in this case, the tendency will also appear which was observed in Table 2. The undertakings belonging to the upper part of the sorted sample increased their average asset value in the examined period. Average asset value of the undertakings belonging to the lower 25% was decreased and there was no magnitude change in the average asset value of undertakings belonging to the second quarter.

In order to confirm the preceding, the means and standard deviations were calculated by quartile in Table 3. It can be seen in the table that the relative standard deviations have significantly decreased in the first three quarters just by sectioning to quartiles. The relative standard deviation by quartile has also decreased in the fourth quarter but it is still much higher in this category than in the other three ones. The results obtained also buttress up that the fundamental differences can be found in the fourth quarter. At the same time, the means are much smaller than the maximum of Table 2 which indicates that there are more smaller-sized undertakings, even in this quarter. The latter implies that the differences between undertakings are the largest in this category. Taking the preceding into consideration, it is practical to group the data of database examined and to analyse the groups because the consolidated analysis of the total population may generate very misleading results. It may arise that some companies – big-sized ones – should be removed from the analysis for sake of a grounded analysis because these

companies can significantly distort the result of analysis. Knowing the results of later analyses, a decision will be made about the removal.

In Table 2 and 3, it can be seen that, for example, the average asset stock of region was 109 600 thousand HUF in 2018, at the same time, average of Q1 was 1 522 thousand HUF, average of Q2 was 7 574 thousand HUF, average of Q3 was 23 798 thousand HUF while the average of Q4 was 407 439 thousand HUF. If these numbers are examined then it can be seen that the average values are considerably smaller in the first three quarters than in the fourth quarter and averages of the first three quarters significantly lag behind the average of region as well. These numbers also confirm that it may be misleading if the region is intended to be characterized by an only number. It can also be seen that the difference and the growth of dispersion are caused by companies of the fourth quarter because those ones increase the range of dispersion. Total element of the region is 563 companies and the average asset stock of 505 companies of them (89.7%) is under the regional average and only 58 companies (10.3%) reach or exceed the average. Average asset value of companies under average is 20 948 thousand HUF which is 881 050 thousand HUF in case of companies exceeding the average. Similar relations are experienced every year. This also verifies that it is recommended to form more homogeneous groups and to analyse them.

After examining the asset value by county (Table 4), it can be told in summary that similar tendencies are resulted as in case of the whole region. It can also be seen in the table that the average asset stocks were the lowest in Hajdú-Bihar County and the asset stocks were two or three times greater in the other two counties, differently per annum. At the same time, in case of the median values, the differences were much smaller which means that the differences are smaller in the lower half of database and larger in the upper half. This also buttresses up that it is required to group the data of database and to assess the undertakings of each group separately. In the table, it can also be observed the asset value of the biggest company in Hajdú-Bihar County was much smaller than in the other two counties.

By 2018, compared to the base period, the average asset value has not really changed in Hajdú-Bihar County, it has increased by 10% in Jász-Nagykun-Szolnok County while it has increased by 54.5% in Szabolcs-Szatmár-Bereg County. The undertaking located at the upper quartile in Szabolcs-Szatmár-Bereg County was able to increase its asset value by 57.5% in the examined period while the growth was 16.3% in Hajdú-Bihar County and 7.6% in Jász-Nagykun-Szolnok County in 2018, compared to the base period. In all three counties, the asset value of undertakings located at the lower quartile

but at varying levels; the lowest reduction was in Szabolcs-Szatmár-Bereg County (13.8%), and the largest one was in Jász-Nagykun-Szolnok County (29,1%).

The yearly heterogeneity of data regarding the asset stock is well-illustrated by the figures in Table 2 which illustrate the annually averages and the 95-percent confidence bands belonging to them. It can be seen in the figures of annex that heterogeneity of the examined population has increased at region level somewhat. In case of Hajdú-Bihar County, there had been no significant changes during the years till 2018 when the confidence band significantly narrowed. In case of Szabolcs-Szatmár-Bereg County, the confidence band continuously increased, a more significant growth has occurred since 2017 which is also confirmed by the maximum values in Table 4 and it is closely linked with the growth of dispersion range. In case of Jász-Nagykun-Szolnok County, the confidence band had increased in 2016, then it went back near the original level after smaller reductions. The yearly changes of averages can be reviewed well in the figures of annex and the figures graphically confirm the facts previously described.

CONCLUSIONS

Regarding the asset stock, it can be stated in total that, considering its tendency, it shows a growth during the six years. Values of the relative standard deviation are very high but there are no significant yearly differences between them and the fundamental causes of these high values are the big companies being in the 4th quarter.

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Tables

Table 1
Number of those undertakings in the Northern Great Plain region which perform food retail activities as grocery stores and were established before 1 January 2013

Description	Hajdú-Bihar County	Jász-Nagykun-Szolnok County	Szabolcs-Szatmár-Bereg County	Total
Companies went into liquidation/winding-up during the examined period (pcs)	37	43	16	96
Companies having zero reports or no reports in some years of the examined period (pcs)	56	49	36	141
Companies with incomplete data (pcs)	43	29	25	97
Companies which can be involved in the analysis (pcs)	250	131	182	563
Total	386	202	299	887

Source: own calculation based on data of OPTEN company database

Table 2
Main statistical characteristics of assets of the region's examined undertakings

Amount unit: thousand HUF

Description	2013	2014	2015	2016	2017	2018
Min.	169	36	0	10	0	0
Q1	4 956	4 758	4 490	4 344	3 795	3 674
Median	11 240	10 990	11 500	12 080	11 060	11 710
Mean	88 790	91 310	99 770	104 400	107 900	109 600
Q3	33 060	35 170	35 420	39 260	38 770	42 650
Max.	7 244 000	7 222 000	8 268 000	7 816 000	8 035 000	8 641 000
IQR	28 104	30 412	30 930	34 916	34 975	38 976
Standard deviation	487 114	502 840	573 538	591 476	613 845	612 086
Relative standard deviation	548.61%	550.70%	574.86%	566.55%	568.90%	558.47%

Source: own calculation based on data of corporate reports

Table 3

Means, standard deviations and relative standard deviations of assets of the region's examined undertakings by quartile

Quartile	Statistical characteristics	2013	2014	2015	2016	2017	2018
1. Q	mean (thousand HUF)	2 725	2 369	2 134	2 016	1 634	1 522
	standard deviation (thousand HUF)	1 314	1 340	1 273	1 257	1 127	1 145
	relative standard deviation (%)	48	57	60	62	69	75
2. Q	mean (thousand HUF)	7 652	7 752	7 630	7 852	7 538	7 574
	standard deviation (thousand HUF)	1 818	1 818	1 982	2 141	2 034	2 411
	relative standard deviation (%)	24	23	26	27	27	32
3. Q	mean (thousand HUF)	19 562	20 220	21 128	22 125	22 232	23 798
	standard deviation (thousand HUF)	6 129	6 618	7 108	7 462	7 900	8 802
	relative standard deviation (%)	31	33	34	34	36	37
4. Q	mean (thousand HUF)	326 910	336 626	370 109	387 546	402 282	407 439
	standard deviation (thousand HUF)	939 763	970 264	1 109 848	1 143 115	1 186 179	1 181 296
	relative standard deviation (%)	287	288	300	295	295	290

Source: own calculation based on data of corporate reports

Table 4

Main statistical characteristics of asset values of the region's examined undertakings by county

Amount unit: thousand HUF

	Description	2013	2014	2015	2016	2017	2018
Hajdú-Bihar County	Min.	180	61	103	10	15	3
	Q1	4 606	4 121	3 888	3 356	3 244	3 507
	Median	9 837	10 310	10 550	10 670	10 490	11 220
	Mean	55 120	56 730	60 030	61 360	61 220	55 640
	Q3	27 940	29 280	33 110	30 400	31 880	32 490

	Max.	3 275 000	3 244 000	3 353 000	3 285 000	3 257 000	1 692 000
Jász-Nagykun-Szolnok County	Min.	169	144	0	16	45	29
	Q1	4 051	4 146	3 792	3 846	3 082	2 864
	Median	10 430	9 876	9 408	10 980	9 759	9 631
	Mean	137 400	140 200	161 400	156 200	156 900	149 700
	Q3	28 330	31 190	28 120	24 420	28 340	30 490
	Max.	7 244 000	7 222 000	8 268 000	7 816 000	7 764 000	7 376 000
	Szabolcs-Szatmár-Bereg County	Min.	269	36	36	22	0
Q1		6 688	6 572	5 972	6 630	5 807	5 761
Median		15 340	15 830	15 480	15 910	15 050	16 900
Mean		100 100	103 600	110 000	126 200	136 700	154 700
Q3		45 200	48 110	48 720	55 060	63 020	71 220
Max.		5 246 000	5 351 000	5 788 000	7 361 000	8 035 000	8 641 000

Source: own calculation based on data of corporate reports