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Changes of Agricultural Farm Enterprises in the EU27 and Northern Hungary

The number of farmers in Hungary is constantly decreasing, similarly to other European countries, while replacement of small and medium-sized farms by large and giant farms is a global trend. The process of land concentration in Central and Eastern Europe is very fast. Residents displaced from land ownership and land use have to look for a different livelihood. The residence registry of the farmers and the seat registry of the concerned agricultural enterprises do not reveal their actual location, and therefore distorts rural economic data. If we extend the examination of territoriality to land use, we can get a more realistic picture with the help of area subsidies granted to local farmers and non-locals.
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JEL classification: Q10, Q15, Q19

Introduction

In rural economy, multifunctional agriculture and the countryside also has ecological-environmental, societal, economic, social and cultural functions, besides food production. Nowadays, raw material production is only one of the functions, which is complemented by a number of complementary tasks that all can contribute to the development of disadvantaged areas (see Ritter et al., 2013). However, some of these functions can only be implemented to a limited extent with large plant sizes and large plots. A previous primary research among producers revealed that among the primary objectives of the EU area subsidies landscape maintenance, income security, and preservation of the rural population have been prioritised, which appear to be achievable for small and medium-sized farms (see Lipcsei, 2020).

According to Magda and Szűcs (2002) due to the compensation lands a holding structure was created with an average area of 2.88 ha per owner, which was just sufficient for a mere survival of the landlord. Because of their size, the established smallholdings were impossible to run sustainably and could not ensure a fair standard of living for the owners. As a result of this process, small and medium-sized farms found themselves in a competitive disadvantage after the compensation, and the concentration of holdings began. The situation was exacerbated by the outflow of labour from the agricultural sector, which, according to research, was also a consequence of territorial inequalities (see Ritter, 2009).

The key elements of the current EU agricultural policy, similarly to the United States, are the reduction of acreage in order to reduce production, and the decoupling of support from production. Compensation for losses may be replaced by a fixed amount of income support, regardless of the volume of production. Surveys also show that in America, as a result of quantitative crop regulation and decoupled support, 20% of cereal farms received two-thirds of payments. Most of the support budget is allocated to large farms, but the importance of subsidies compared to total sales is insignificant, and as the size of the economy increases, the role of support decreases in both sales and income (Popp, 2002). In addition, it should be emphasized that, according to the relevant literature, large farms, which receive the majority of subsidies, hardly need income support because they yield higher-than-average incomes and wealth (Popp, 2013).

Optimisation of farm size and support for small and medium-sized farms is possible by designating a ceiling for support. Although regulation can be circumvented by artificially fragmenting farms, it does not change the fact that its effect hinders the growth of farms (Popp, 2013). In the EU, the support of outstanding worth has been absorbed by the most fertile farms, and this practice is still continued as of today, which results in these farms gradually buying up

small estates that are unable to take advantage of technical development and intensive production (Popp-Oláh, 2016).

In order to determine the optimal farm size, in order to achieve favourable economies of scale, personal ambitions and income goals of the farmer must also be taken into account, besides conditions of production. If the farm manager estimates that the disposable income provides the same standard of living as a non-agricultural occupation, they can aim for such an income (Castle at al., 2012). Following this line of reasoning, it can be assumed that the number of farmers could be increased with the help of land use support equal to local wages, possibly at the expense of large and giant farms.

The decrease on the number of small and medium-sized farms can also be observed in the EU27 Member States (Table 1). Above all, the number of farms between 0-20 hectare in area declined between 2010 and 2016, with the exception of the Czech Republic and Slovakia.

Table1: Structure (number) of agricultural holdings in the EU-27, 2010 and 2016

	2010 0-20 ha	2016 0-20 ha	2010 20-100	2016 20-100	2010 <100 ha	2016 <100 ha
Belgium	21660	16410	18950	18020	2260	2470
Bulgaria	356050	184630	8940	12010	5490	6060
Czechia	11660	14610	6790	7200	4420	4710
Denmark	18170	15310	15130	12040	8080	7680
Germany	137830	125050	127690	114390	33620	36680
Estonia	14150	11460	3740	3340	1720	1900
Ireland	59050	49590	76120	72890	4720	4920
Greece	690520	655490	31000	28330	1540	1130
Spain	778390	740200	160210	152870	51190	51940
France	235550	193740	186300	162850	94250	99930
Croatia	222200	122980	10220	9860	850	1620
Italy	1488590	1009060	116820	119810	15490	16840
Cyprus	37860	33990	880	830	120	120
Latvia	68450	55050	12360	11640	2570	3250
Lithuania	178770	127290	17340	17740	3800	5290
Luxembourg	770	560	1000	850	440	480
Hungary	547560	397740	21800	23490	7450	8760
Malta	12520	9210	10	10	0	0
Netherlands	41780	27190	28350	25890	2210	2630
Austria	106640	90610	40690	39150	2850	2730
Poland	1384840	1275050	112120	123650	9650	12010
Portugal	283070	235070	16100	17690	6110	6220
Romania	3819880	3385180	25420	24530	13730	12310
Slovenia	71180	65860	3370	3930	100	120
Slovakia	20040	20400	2210	2860	2210	2400
Finland	27490	18410	32570	26180	3820	5120
Sweden	38930	35250	24240	19640	7930	8060

Source: Own edition based on Eurostat data, 2020

479530 agricultural holdings were wound up in Italy and 434700 in Romania. There was an increase in the farm size category of 20-100 hectares for Bulgaria, the Czech Republic, Italy,

Lithuania, Hungary, Poland, Portugal, Slovenia and Slovakia. The number of farms over 100 hectares has increased in most Member States, with the exception of Denmark, Greece, Austria and Romania.

According to the data of the Hungarian State Treasury (MÁK), the decrease in the number of employees during the period of the current Common Agricultural Policy of 2014-2020 mostly affected small and medium-sized economies. In the 0-20 hectare category, 10782 farms were closed down (Figure 1), while in the 20-100 ha category, 2063. Farm sizes above 100 hectares appear uniformly in European statistics – according to this, the large and giant category grew by 1324 farms in Hungary. Between 2014 and 2020 the number of giant farms increased from 2109 to 2480, with an increase of more than 16%. The concentration of farms and the unfavourable rural processes are aggravated by the decrease in the number of farmers, the majority of whom quit in search for a new means of living and because of inhibitory effect of remote stakeholders with concentration ambitions.
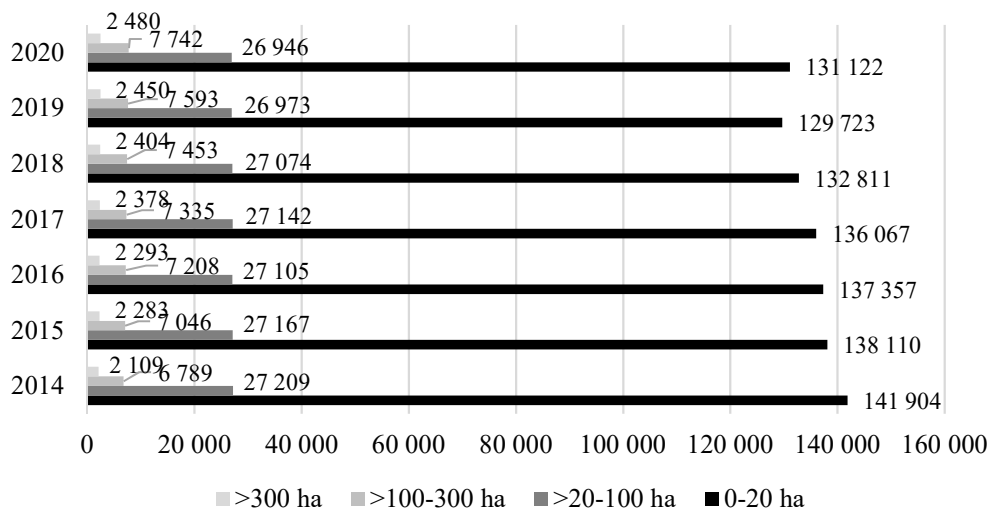

Figure 1: Structure (number) of agricultural holdings in Hungary, 2014-2020
Source: Own edition based on Treasury data, 2020

It should be noted that the data of applicants for subsidies from the Treasury do not include farms under 1 hectare. Furthermore, as compilers of the 2020 Agricultural Census, we found an issue with registration, namely that the number of registered Hungarian producers exceeds the actual number of active producers, because all economic actors with any connection to agriculture, as well as those registered as farmers are considered active, according to the Chamber of Agriculture. One of the fundamental problems in the EU Member States is the growing concentration of agricultural land. Today 3% of farms control more than 52% of the EU's total agricultural area, while 76% of farms use only 11% of the total land area. Thus, the Gini coefficient of uneven land use in the EU is already 0.82, almost like in Brazil, Colombia or the Philippines. Unequal distribution of agricultural land leads to inefficient distribution of support under the EU Common Agricultural Policy (CAP), as direct payments are calculated per hectare of utilized land and not per agricultural holding (European Parliament, 2017).

Two thirds of EU farms (10.5 million farms in 2016) have an area of less than 5 hectares and the average farm size was 16.6 ha in 2016. Out of the total 10.5 million, 4 million farms had a production value of less than € 2000, while 3 million farms had a production value of between € 2000 and € 8000. In 2016, these "very small" and "small" farms accounted for two-thirds (67.6%) of all EU holdings. At the same time, the annual income of 304000 farms, which accounts for 2.9% of all farms, was € 250000 (Eurostat, 2019).

Large farms between 100 and 300 hectares, and above 300 hectares take up 72.1% of the total land area, but account for only 1.2% of farms (Kerek-Marselek, 2009). The problem is further exacerbated by the fact that the owner of the fragmented land tends to have no affiliation to the countryside and the rural way of life (Maurel, 2012).

Based on other farm size groupings, studies also show a declining trend in the number of farms and small farms, especially in countries with a fragmented farm structure. An increasing trend in the number of farms between 20 and 50 ha and above 50 ha has been observed in these countries (see Bożek et al, 2020).

According to the relevant literature, large estates established for industrial land use with minimal input for maximum output, produce raw materials that meet the quality standards on large scale for cheaper than the world market price, while also transforming agriculture into a sector subordinate to these ambitions. The economic and other kinds of consequences of the large estate structure inevitably result in a severe decline in employment, unemployment, loss of rural livelihoods, deterioration of villages, outflow of population, disintegration of local communities, decreasing quality of life, degradation of social solidarity, growing issues of living conditions of urban residents, proliferation of crime, depression, suicide, drugs, etc., and the destruction of cultural values and community preserving traditions, and thus the elimination of life prospects through domination of capital (Tanka, 2004).

Based on the above, the current study seeks how large farms are growing and how they take the place of small and medium-sized farms in the rural economy. The dissertation investigates the basic concern that land ownership is constantly concentrated as a result of area subsidies. Proponents of the concentration process promote the increasing competitiveness of agriculture, job creation, and raw material production as a reason. The present study, on the other hand aims to point out that the international and domestic processes of land concentration inevitably imply shrinkage of the rural economy.

Material and method

In the research process, we aimed to find out how area subsidies are distributed between local (residential) and non-local land users in the Northern Hungary Region, and whether territorial differences can be established with regard to these data. As farmers in Borsod-Abaúj-Zemplén County, we found that distribution of area subsidies between individuals and companies is unfair with territorial inequalities. The Hoover Index is an adequate tool to determine regional differences in Area Payments, Greening Aid, Coupled subsidies, Agri-Environmental Management and Organic Farming Payments. The calculated data were tabulated, plotted with QGIS open-source GIS software at NUTS2 and LAU1 levels. Only data of public interest available on the Internet from the online pages of the Hungarian State Treasury and the Land Registry were used. Based on the European Commission's Implementing Regulation (EU) No. 908/2014, data on land use were calculated using public disclosure lists. Based on the published list, the number of residential and local applicants for support were determined in three item categories (Area support, Coupled subsidies, and Agri-environmental management combined with Organic farming), on the basis of which it was possible to calculate non-local applicants for support.

The number of applicants and the amount of Hungarian Forints (HUF) used allowed for the calculation of the Hoover index in order to reveal territorial inequalities. The difference in the spatial distribution of the two quantitative criteria was measured using the following formula.

$$h = \frac{\sum_{i=1}^{n} |x_i - f_i|}{2}$$

where x_i and f_i are the two distribution ratios (number of farmers, paid subsidies in HUF). Based on the method, the percentage of area subsidies (f_i), to be relocated between territorial units, has been determined so that its territorial distribution should be equal with the number of applicants (x_i).

Results

By processing the online published data list of the Hungarian State Treasury, the number and the land use of local farmers and locally based companies in the micro region of the Northern Hungary Region was determined. By comparing the obtained data with online land registry data allowed for the calculation of land use and subsidy use of non-local applicants for support. Table 2 summarizes the amount of the Area-Based Support and the Greening Aid, based on the HUF amount of area payments in the autumn of 2020, with a value of HUF 75000 / ha.

Table 2: Distribution of land use among agricultural holdings in the Northern Hungarian Region, 2020

LAU1 area	Total area (ha)	Area used by			Support for locals (HUF)	Support for non-locals (HUF)
		local farm (ha)	local agricultural holdings (ha)	non-local farmers and holdings (ha)		
Cigánd	27371	17067	5376	4928	1 683 252 945	369 592 043
Edelény	37369	16026	5088	16255	1 583 565 112	1 219 132 703
Encs	24551	8089	6226	10235	1 073 683 657	767 654 318
Gönc	24222	10863	3040	10319	1 042 703 889	773 911 866
Kazincbarcika	14523	4811	342	9371	386 435 461	702 825 344
Mezőcsát	26729	13518	6271	6940	1 484 178 335	520 524 505
Mezőkövesd	48090	17703	18827	11560	2 739 759 652	867 005 678
Miskolc	46833	29432	14840	2561	3 320 397 052	192 042 856
Ózd	13872	4791	29	9053	361 449 265	678 961 745
Putnok	15972	4777	5016	6178	734 510 881	463 352 639
Sárospatak	25279	10436	6297	8546	1 254 951 852	640 941 393
Sátoraljaújhely	11532	5503	1645	4384	536 095 804	328 781 689
Szerencs	34331	15272	15259	3799	2 289 839 154	284 952 254
Szikszó	24282	8011	11005	5266	1 426 190 266	394 955 482
Tiszaújváros	16899	10251	3727	2921	1 048 340 544	219 068 736
Tokaj	15042	5951	1453	7638	555 300 767	572 825 871
Bélapátfalva	6070	2118	0	3953	158 817 063	296 444 607
Eger	29200	17421	5996	5783	1 756 262 349	433 727 196
Füzesabony	39992	25570	10978	3443	2 741 162 389	258 230 299
Gyöngyös	39901	24070	7183	8648	2 343 941 523	648 605 337
Hatvan	27611	12881	7168	7562	1 503 667 135	567 186 830
Heves	57258	34454	17167	5638	3 871 566 891	422 813 469
Pétervására	14251	5474	711	8067	463 827 452	604 999 686
Balassagyarmat	29467	12549	7668	9250	1 516 228 300	693 780 763
Bátonyterenye	7121	2062	797	4263	214 419 273	319 688 360
Pásztó	32452	10602	6101	15748	1 252 745 946	1 181 117 844
Rétság	19292	9317	1844	8131	837 073 644	609 812 181
Salgótarján	19990	7700	1690	10599	704 285 449	794 953 744
Szécsény	16006	7395	1521	7090	668 695 930	531 754 618

Source: Own edition based on MÁK data, 2020

According to the data, in the micro regions of Kazincbarcika, Ózd, Bélapátfalva, Tokaj, Pétervására, Bátonyterenye and Salgótarján, more agricultural land is used by non-local applicants for land subsidies. Due to the differences in the size of the micro regions, data on a hectare basis

were presented. 4219 ha in Kazincbarcika micro region, 4233 ha in Ózd micro region, 234 ha in Tokaj micro region, 1,835 ha in Bélapátfalva micro region, 1882 ha in Pétervására micro region, 1404 ha in Bátonyterenye micro region and 1209 ha in Salgótarján micro region are non-local agricultural land users. In the former micro regions, less land is used by local farmers and holdings compared than non-locals. It can be stated that the subsidies for land use (Table 2) are not realized locally in the above-mentioned micro regions, therefore they do not contribute to the local rural economy.

In order to determine the relative value, we compared the number applicants for subsidies in a particular micro region and the required Single Area Payment Scheme support. According to the data of Table 3, the use of resources by local applicants can be determined, according to the extent to which individuals and companies receive EU SAPS support. The smallest difference between the relative values is in the micro regions of Miskolc and Szerencs, which is the result of the relatively large number of applicants.

Table 3: Relative value of SAPS in the Northern Hungary Region, 2020

LAU1 area	Relative value of SAPS for local farmers (HUF)	Relative value of SAPS for local holdings (HUF)	LAU1 area	Relative value of SAPS for local farmers (HUF)	Relative value of SAPS for local holdings (HUF)
Cigánd	3 707 606	16 799 638	Tokaj	1 609 567	17 900 808
Edelény	3 074 884	64 164 879	Bélapátfalva	1 443 791	-
Encs	3 508 770	40 402 859	Eger	1 758 020	7 745 129
Gönc	2 600 259	29 765 841	Füzesabony	4 939 031	11 737 741
Kazincbarcika	1 521 399	140 565 069	Gyöngyös	1 956 546	14 100 116
Mezőcsát	5 558 720	28 918 028	Hatvan	2 647 301	25 781 220
Mezőkövesd	5 083 042	27 093 927	Heves	4 681 459	10 066 987
Miskolc	3 323 721	3 200 714	Pétervására	1 763 602	60 499 969
Ózd	1 286 296	226 320 582	Balassagyarmat	2 807 830	28 907 532
Putnok	3 152 407	24 386 981	Bátonyterenye	1 520 704	106 562 787
Sárospatak	2 141 556	17 322 740	Pásztó	3 890 515	62 164 097
Sátoraljaújhely	2 030 666	21 918 779	Rétság	2 299 653	55 437 471
Szerencs	3 069 489	4 523 052	Salgótarján	1 425 679	56 782 410
Szikszó	4 542 007	17 952 522	Szécsény	2 346 302	33 234 664
Tiszaújváros	3 328 065	18 255 728			

Source: Own edition based on MÁK data, 2020

In the following, using the QGIS program, the distribution of area grant applicants at the micro region, on level LAU1 in the Northern Hungary Region were plotted. Based on the publication lists of the Hungarian State Treasury, the number of farmers were determined by simply filtering. Based on the received list, the area subsidies were divided in three groups: Area-based subsidies, Coupled subsidies, Agri-environmental management subsidies together with Organic farming.

First, the proportion of agricultural land used by local businesses was determined in percentages. This descriptive analysis allows to calculate land use data that are otherwise not available publicly. In this aspect the research provides a unique test result. Figure 2 illustrates the large-scale land occupation of local companies in Szerencs and in Szikszó micro regions, in a value of 44% and 45%. It is important for the examination of area subsidies to illustrate residential, locally based and non-local agricultural enterprises separately. In many cases, local businesses can be linked to a resident, so more accurate statistics can be produced in this case. The study found further large-scale land use in the micro regions of Miskolc (32%), Mezőkövesd (39%) and Putnok (31%).

According to MÁK, the only one of the 29 micro regions is Bélapátfalva where no-one requested area support in 2019.
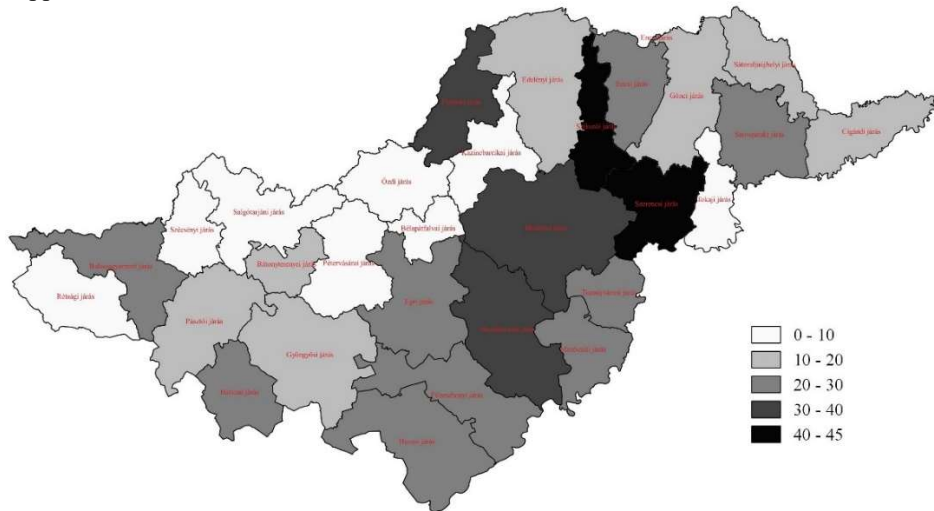

Figure 2: Rate of the land used by local agricultural holdings in 2019 (%)
Source: Own edition based on MÁK data, 2020

In the case of non-local land users (Figure 3), the land use in the micro regions of Ózd, Kazincbarcika and Bélapátfalva is 65%. As a result, the low number of local farmers was 281, 254, and 110, respectively. In this case, it can be stated on level NUTS2 that the dominant role of non-local land users negatively affects the number of local farmers. In the northern micro regions of the Region, it can be established that a higher proportion of land is used by non-local farmers.
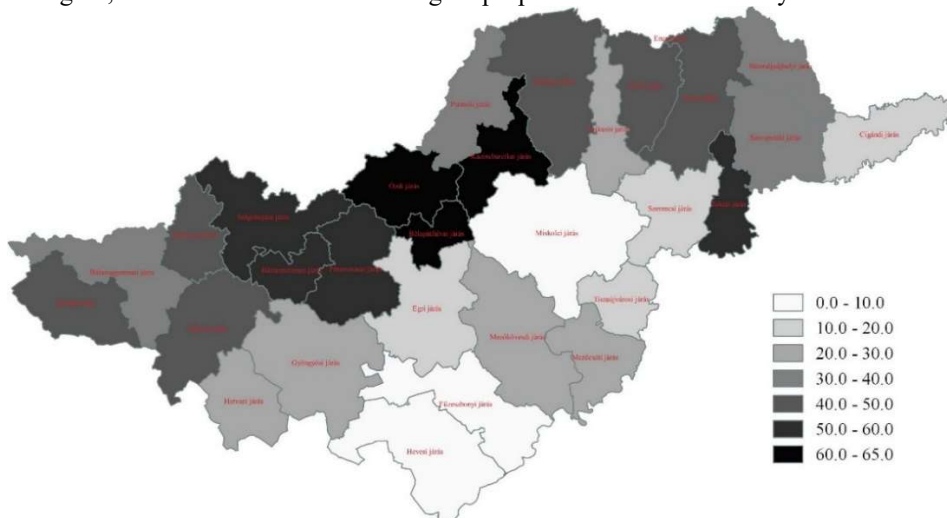

Figure 3: Rate of the land used by non-local farmers in 2019 (%)
Source: Own edition based on MÁK data, 2020

Territorial disparities are further exacerbated by the large-scale use of support of non-local farmers or farms in the northern micro regions of the region, which appears as a deduction at LAU1 level. The Hoover index, used to examine the allocation of resources (Figure 4), was calculated by comparing 1) Area-based support with Greening Aid, 2) Coupled subsidies and 3) Agri-environmental management with Organic farming. It has been determined what percentage of area

subsidies should be relocated between territorial units in order to balance their territorial distribution. In the case of subsidies, Area-based support with Greening Aid resulted in the smallest difference of 13.88% among local farmers. Larger differences can be identified for other area subsidies, as the Hoover index resulted in a value over 20%. For locals, 26.24% of Coupled subsidies and 22.7% of AKG + ECO support should be relocated among district farmers. The difference among local companies is higher, 21.58% for Area-Based + Greening Aid, 32.23% for Coupled subsidies and 22.6% for AKG + ECO support. The Hoover index only examined the number of applicants and the amounts of support, but it should be noted that there may be significant differences between districts (e.g. land quality, geographical features, traditions, etc.). Based on our research, it can be stated that there is a large territorial difference between the subsidies.
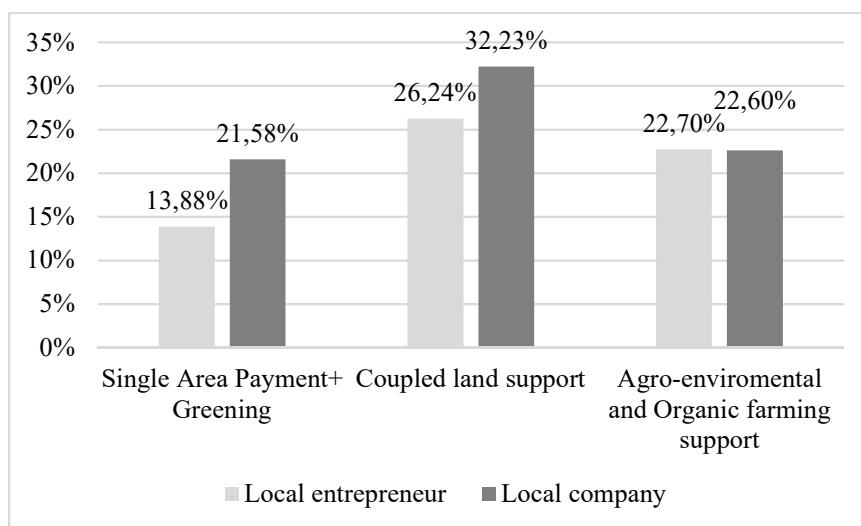

Figure 4: Support inequality based on the Hoover index
Source: Own edition based on Treasury data, 2020

Conclusions

The number of small and medium-sized farms in Hungary decreased by 11045 in the period 2014-2020, while the number of large and giant farms increased by 13%. Similar trends across the European Union are leading to the disappearance of smaller farms.

In addition to the concentration of enterprises, significant territorial differences have evolved, even within the Northern Hungary Region, there is a large number of local companies in the Szerencs and Szikszó micro regions, that cultivate 44-45% of the local arable land. The conditions of the estate structure and the territorial differences were illustrated by a descriptive examination of local and non-local resident-based enterprises. Based on the results, it is established that the northern micro regions of the Region are mostly owned or used by non-local enterprises because of, and, resulting in high levels of migration, and concentration of land ownership and land use, a rather vicious circle. Non-local holdings do not fuel the local economy of a given settlement, area subsidies leak out, thus they do not contribute to the local economic development. Non-resident land users are eminently in majority in the micro regions of Bélapátfalva, Ózd and Kazincbarcika, with 65% land use. In the micro regions of Pétervására, Bátonyterenye, Salgótarján, and Tokaj, more than half of the agricultural area is cultivated by non-local land users.

The Hoover index was used to shed a light on inequalities by examining the number of land users and the territorial distribution of paid land subsidies. At the same time, 13.88% of the Area Aid

and Greening aid and 32.23% of the Coupled subsidies paid to locally based companies should be reallocated among local farmers in the micro regions of the region.

In the rural economy, the presence of small, medium, large and giant farms is essential in such a way that small and medium-sized farms predominate besides large and giant estates. A significant increase in the number of farms under 100 hectares would provide an opportunity to more effectively combat depopulation of the countryside, specialise production, to reverse migration and to increase the effectiveness of environmental protection. Furthermore, EU funds should be used more fairly, equitably and efficiently. Further researches will aim to examine and verify this at the regional level.

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