What's Next? What about the Famous Hungarian Apple?

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Abstract: Agriculture is a special industry with a lot of external influences that sometimes occur unexpectedly, so full rationalization is almost impossible. The machines are expensive and require great economies of scale to use them. The year of 2018 has more and more highlighted the serious problems which are faced by apple farmers in Szabolcs. In the modern market economy, the focus of the production process is on the farmer who manages his own or rented land, relying heavily on the family's workforce. The paper introduces the past transformation of the sector, the possible directions for farmers' organization and development, which are absolutely necessary to lay the foundations for the way out.

Keywords: agriculture, apple in Szabolcs, network, bio-farming, competitive agriculture, technology development, competitive agriculture, machinery park, over-mechanized agriculture, hungarian agriculture, agricultural production

1 Situation of Hungarian agriculture

According to the government public information, generational change in agriculture is seen as a national affair, supporting young people with a significant amount to choose rural life, which has been promoted through a multi-stakeholder policy program. They want to help farmers to implement economically and environmentally sustainable irrigation management, preparing an act for undivided land ownership management, and continue to support the capacity expansion and efficiency enhancement [MTI (2019)].

The agriculture of those countries is more efficient and competitive which products are on the international markets, where the mechanization and the level of mechanization are higher. The productivity and the mechanization are affected by the land structure and the production structure. On smaller, more fragmented estates, machines are less able to produce efficiently and with good capacity utilization than larger lands and farm sizes. In the latter, the results of farming are

also higher, which makes it possible to raise the level of mechanization more quickly [Hajdú (2018)].

The parallel phenomenon in Hungarian agriculture is a significant excess capacity and inefficacy at the economic level. Particularly the small producers' use of assets is wasteful, although the low utilization of resources can be seen in all sizes of manufacturers. At the same time, farms with a lack of capacity acquire the necessary resources in the form of wage services rather than in some other way of cooperative solution [Baranyai - Tóth N. - Vinogradov - Kovács - Vásáry (2014)].

The outcome and profitability of agricultural production are greatly influenced by the form and effectiveness of cooperation between producers [Takácsné – Takács, (2003); Takács, (2017)]. Trust in transition economies is particularly important, as in these countries, the legal system is often not effective enough, for example the costs of enforcing the contracts are very high [Baranyai - Szabó (2017)].

2 Material and method

My research is based on a primary database, but at the same time I called for the available secondary data. A questionnaire survey was carried out regarding to the farm mechanization. The questions of the questionnaire compiled in the course of empirical research - among others - covered the following topics: education, family background, level of mechanization, farming profile, irrigation, organic farming, cooperation with other farmers, group membership, expectations of a farmer organization. During my secondary research, I used statistics from machine sales.

3 Quantitative research

As a quantitative research, I prepared an online questionnaire, which helps to confirm and refute my hypotheses based on the opinion of the respondents. During the sampling period, the majority were those farmers who were interested in agricultural production, either as their full time job or just a few hours a day. The target of the sample was 150-200 respondents, which was not initiated by random sampling techniques. The questionnaire used to compile the data was compiled with the help of Google Questionnaire Maker, which was used by social media to get quick and more responses. The questionnaire was filled by 201 farmers, which did not change after the data cleaning. During the sampling, I was interested in the opinion of those working in Hungarian agriculture, so the sample is not representative.

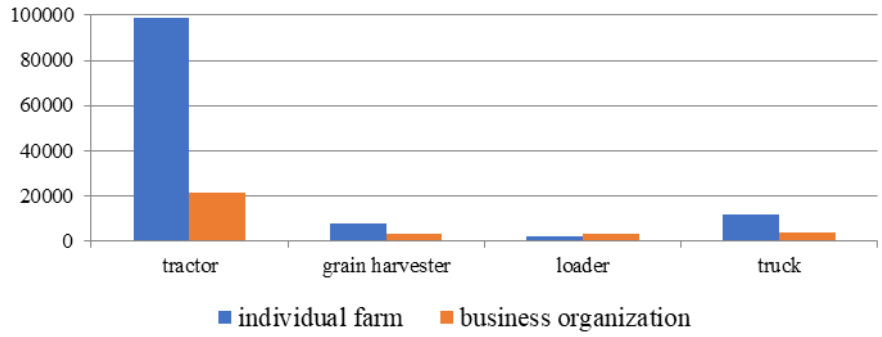
4 Hypotheses

H1: Hungarian agriculture is over-mechanized considering the size of farming

H2: Hungarian farms cannot compete due to their size and revenue

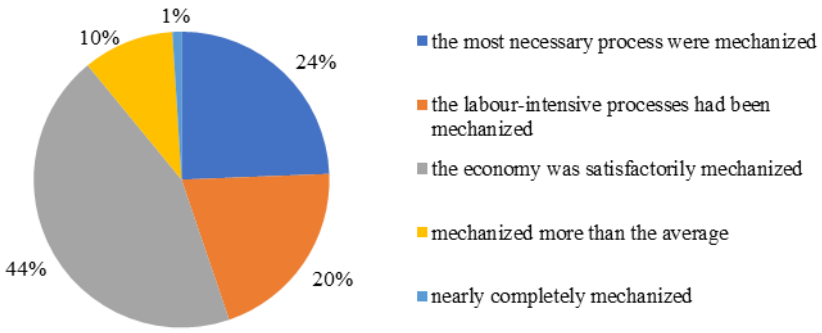
4.1 Examining the hypotheses

Nowadays, Hungarian agriculture is served by 159,000 self-propelled engines, of which 120,160 are tractors and 10,770 are grain harvesters.
82.4% of the tractor park used for production is operated on individual farms, and 17.6% are located in business organizations. In Hungary, an average of 3,200 new tractors are used, with more than 40% of tractors in individual farms and nearly 22% in business organizations are over 20 years old. Regarding the technical upgrading of the tractor park, it is also unfavourable that about 50% of the new tractors are purchased each year are of low-cost, but less modern models.
The second most important key machine in Hungarian agriculture is grain harvesters. Nearly 69% of these operate in private farms and 31% in business organizations. The new harvesters that are purchased annually represent the most up-to-date European standards. In individual farms, 30% of combine harvesters and in business organizations only 11% of them are older than 20 years.
According to the KSH survey, 5,000 self-propelled loaders work in agriculture, 40% of which in private farms and 60% of them in economic organizations. The smaller versions with a lifting capacity of less than 3 tons are in the majority, but at the same time it is favourable that their annual renewal rate is 8-10% on average and in 73% more versatile telescopic variants and more exploitable are being .
The truck park has been halved since the change of regime and approximately one third of these operate in business organizations, two thirds in individual farms. The smaller (supplier, service) trucks are the majority of them. This may also be due to the fact that the price of heavy duty off-road trucks is very high, which is why farms prefer tractor-trailer deliveries.



14. Figure: Distribution of the main agricultural machinery between individual farms and business organizations (source: KSH, own editing)

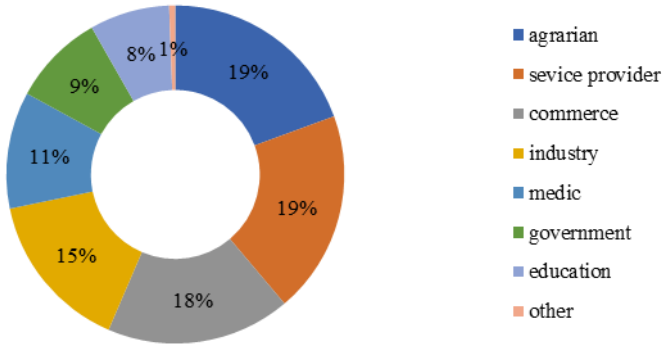
The basis of my hypothesis is that no matter how much the Hungarian farmers have access to various EU or domestic subsidies, the fragmented land and the machinery of different levels of development alone make it harder to prosper than to be cohesive, think as a group and operate accordingly.
Regarding the mechanization of their farming (Figure 2), almost a quarter of those who completed the questionnaire replied that only the most necessary processes were mechanized, and in the case of one fifth of them the labour-intensive processes had been mechanized. 44% of the respondents said that their economy was satisfactorily mechanized, 10% said they were mechanized more than the average, and 1% said they nearly completely mechanized.



15. Figure: The level of mechanization according to the respondents participating in the research (own resource, own editing)

Examining the impact of the support system on technical development, several authors stressed that direct aids have no or only indirect impact on agricultural

investments, so their role is not decisive in agricultural innovation processes [Varga (2006, 2008) Vásáry (2008) Mohamed et al. (2010)].
Cost-income relationships are fundamentally influenced by different support and financial regulatory systems. However, in this case, as with most technology changes, the producer is interested in the expected direct profit or indirect profit benefits. In this case, it can be stated that there are two major categories of costs; the variable costs depend on the growth of the farming, while the fixed costs do not change due to the growth of the farming. Precision technology changes in both cost categories [Tamás (2001)].
In economic terms, the slow spread of technology is not only explained by the need for extra investment. Partially targeted support could be used to promote its spread, partly through further support for environmentally conscious farming, but the indirect agricultural innovation preference through the tax system could also help [(Vásáry (2008); Béres (2008)].
According to Zahalka (2010), the widespread use of precision technology in the United States has accelerated, as a significant proportion of producers have come to realize that the adaptation of as many elements of production technology as possible to factors affecting competitiveness is crucial. On the one hand, cost efficiency appears, on the other hand producers are excluded from certain markets due to the lack of complete traceability of the production process. The study of the economic relationships of precision crop production should receive a prominent role in the future, examining the issue primarily at the operational economy level. The exploration of macro- and business-economic relationships can lead to clarification of the tasks of the participants in the related industries. In addition, the financing anomalies of the innovation process can be identified [T. György K. (2011)].
Regarding the examination of the prevalence of precision crop production in Hungary - although we have no knowledge of a representative survey on this subject - based on the experience so far, the proportion of people using multiple elements of precision technology in Hungary should not exceed 5% of farms. The process is still somewhere in the early stages of adopters / introductions. The reasons for the slow spread include the lack of education and expertise [Pecze (2008), Kalmár (2009)].
Precision technology will become more widespread if producers accept that they do not always have to strive for an "independent economy". The use of a service based on consultancy or the development of common forms of machine use assumes that there is a sufficient degree of trust among the participants [(Popp et al. (2002) Takács (2008) Pecze (2009)].
Data from my research shows that the majority of respondents consider agricultural activity as a supplement to earnings. 37.8% of the respondents were women and 62.2% were men. Approximately 85% of those completing the questionnaire have a main job, 80% of whom do not work in agriculture (3.Figure).

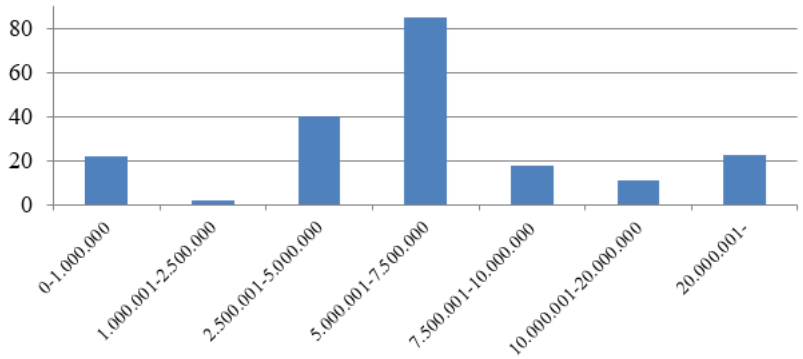


16. Figure: Distribution of main job sectors indicated by respondents

(own resources, own editing)

Earlier research estimates suggest that revenues of 20 million forints will generate annual revenue that can create the conditions for individual farming. More than three-quarters of the farms (77%) do not cross this sales threshold, and only 15% of them meet this "criterion" [Zs. Baranyai - G. G. Szabó (2017)].

Data from the responses to my questionnaire support the above statement, as nearly 89% of the respondents stated that their sales were below HUF 20 million (4.Figure), and even 83% didn't even achieve HUF 10 million revenue. This means that if two people in a family are engaged in agricultural activity, then the two farmers do not reach the HUF 20 million revenue, is according to the previous estimation researches they are not able to create an economically operating individual farming system.



4. Figure: Distribution of the annual sales revenue of the farmers participating in the questionnaire

(own resources, own editing)

Summary

My research has supported my hypothesis, both the sales statistics and the respondents who filled out the questionnaire; confirm that the Hungarian agricultural industry has been over-mechanized. The agriculture of those countries can produce more efficiently and competitively, where these funds are available at a higher level and their utilization is at a higher level [Hajdú (2019)]. Professionals and the government are constantly working on developing the necessary conditions for precision technology: educating and engaging the young generation in the sector, supporting the purchase of agricultural machinery and moving to organic farming, or mentioning the promotion of irrigated areas. But one thing is still missing. The fragmented estate system and the small farms do not allow the possibilities provided by precision farming to be exploited by Hungarian farmers. There is a discrepancy in purchasing machinery. Grants are available for the development of the machine park, but in order to be able to use the technology offered on the tray, there is no need for a machine park of this size; so to say the Hungarian agriculture is over-mechanized but not efficient enough.

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