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Investigating the Activities of Hungarian Vineyards in the Light of the Data from the Test Enterprise System 2005-2014

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The aim of our analysis is to examine how the profitability of wine-growing estates has changed according to plant size and business form in the period of 2005-2014, after Hungary joined the EU. We also examined whether the profitability proportional to production value, total equity, own equity and labour has changed in the industry.

Our analyses were performed based on the FADN data of the Agricultural Research Institute.

The gross production value per hectare was the highest in all the enterprises in the sector in 2011. The operating expenses were the most significant in the same year, but the increase in expenses was lower than the production. Consequently, the stakeholders of the grape and wine industry could realize the second highest pre-tax profit in the period. However, 2013 was the most favourable year for pre-tax profits. Producers could achieve lower production with much lower expenses, therefore profitability ratios were the best in 2013.

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The income generated fluctuated for enterprises of different sizes. For large farms, 2007 was the most favourable year, but the same year was the worst for medium-sized enterprises. For small farms, 2013 can be considered the most successful, while they experienced the biggest loss in 2010. In the period examined, large and medium-sized wine-growers were profitable, but small farms had to book three years of losses.

Both vertical and horizontal integration is inevitable in the industry; accordingly it is necessary to coordinate vine-growing and viticulture, as well as the activities of grape growers and wineries.

Keywords: grape and wine production, profitability, tangible assets, gross investment, net investment, investment subsidies, net liabilities.

I. Introduction

Prior to 1989, 30 state farms and 50 farm cooperatives were involved in vine-growing and wine production. In 2000, almost three-quarters of the nearly 120,000 vine-growers farmed areas of less than 0.5 hectares and sold the grapes they produced. Since 2003, Hungary's total vineyard area has decreased by 15.1%. This decline has mainly occurred in areas growing white grape varieties, which have decreased by 18.6%, but the area planted with blue grapes has also decreased by 5.8% (Hill Communities National Council, 2016).

The control, unification and coordination of the sector is made difficult by the large number of sectoral actors (3,486 in 2005, 3,071 in 2013). In 2013, the use of vineyards was 18% for individual farms and 10% for economic enterprises (KSH, 2014). The average agricultural area used by individual farms is increasing, while there is a decrease in the area used by economic enterprises (Valkó, 2014). The fragmentation was also promoted by the subsidies for the restructuring and conversion of vineyards, amounting to HUF 6,312 million from EU funds in 2013, with HUF 4 million provided for removing vineyards. (Government of Hungary, Report B/3566 on the state of the agricultural economy in 2013)

On 22 June 2006, the European Commission published its position on the reform of community wine-growing. An EC Council Regulation (EC No 429/2008) was issued relating to grants for removing vines and to the 'national envelope' System. The support for the modernization of horticulture from the 1st axis of the NRDPH (National Rural Development Plan of Hungary) was HUF 78.6 million, and the aid for the modernization of horticultural plantations amounted to HUF 27.9 million (Judge - Nemes, 2014).

The state of the wine sector is shown by the fact that although in 2009 10% less wine was produced, the overcapacity of the sector was not resolved. Due to the unfavourable weather, in 2010 only half the amount of grapes was produced and the quality lagged behind the average. In the 2010-2014 period, production did not reach the previous level of 3 to 3.5 million hectolitres, but was 2 million hectolitres in unfavourable years, and 2.5 million hectolitres in favourable weather conditions (Hill Communities National Council, 2016).

In the second half of the 1990s, in the small farms, when examining the cost and income relationship for wine grapes, it was found that - when the owner's labour was calculated at the average hourly wage rate - practically no income was generated (Popp, 2004, Radóczné-Erdész, 2000). The profit-generating capacity

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of vine-growing can only be increased by improving quality and consequently by increasing prices. It can be said that the individual dominant positions which have formed at various levels of the wine-grape market may also have a significant effect on price evolution (Varga, 2007). In the improvement of the market position of vineyards and wine production, the support for plantation development and the establishment of cellar cooperatives had a vital role (Magda-Gergely, 2004, Radóczné, 2008).

Purchase prices almost doubled, but the increase in costs resulted in the majority of farmers making a loss. On the domestic market, foreign buyers appeared, also looking for grapes and musts, promising high prices and instant payment. 60% of the grape production of the wine region of Eger went to other domestic wine regions or abroad. Grapes and must were partly bought to improve the quality of the purchasers' own products. Some of these products appeared on domestic shelves with foreign labels. In 2010, 1,645 million hectolitres of wine were produced in Hungary, which is half of the average of a typical year.

Examining horticultural crops, between 2007 and 2011, wine grapes showed the least cost increase per hectare, at 5%. In 2010, the specific yields declined due to the extremely wet weather. The average yield of grape wines did not reach 5 tons/hectare in 2010, which is just over half that of 2008. In 2011, spring frost damage caused losses to the crop (7.28 t/ha). Looking at the average sales price for wine grapes, after falling in 2008 (64.2 HUF/kg) they increased significantly in 2011 (90.6 HUF/kg) but did not exceed the level of 2007 (92 HUF/kg) (Borbélyné et al., 2013). With regard to the 2007-2011 period, the sales price did not cover production costs on two occasions. In 2010, the sector's profitability was the lowest (-171 882 HUF/t). The cost of production increased by 7.6% between 2010 and 2011, but the cost decreased (4.88-7.28 t/ha) due to the increase in average production (Borbélyné et al., 2013).

The identification of quality with price is hampered by the vertical fragmentation of the market, i.e. the separation and fragmentation of the organization and ownership of vineyards and wineries. Raw material producers are in the most vulnerable position, while the farmers with greater security are those at a higher level on the product path. To move forward, i.e. to get to a higher processing level of the product, capital is essential. As a result of the reduction of state subsidies, producers may receive funding from EU tenders, but most of these are post-financing, and hence require the existence of a certain amount of equity (Erdészné et al., 2004).

In the case of family farms, they must realize the gross income to ensure the family's livelihood and to cover development. The cost of work is a function of realized gross income. Profitability and the total gross income must be kept in balance (Vági, 1996). To improve producer interests, Popp et al. (2010) proposes the introduction of income support replacements linked to established pre-conditions, rather than land-based and agri-finance subsidies.

Small and medium-sized food businesses and labour-intensive sectors with high added value play a prominent role in retaining rural population (Bíró-Nemes 2014). In their survival and effective operation, co-operatives have a great significance in that, by increasing the added value of the products, they can cover the entire product line. Cellar cooperatives facilitate integration and control, and simplify administration and the economical use of equipment. Producer co-operatives also represent a protection of interests, increase bargaining power and are also essential in obtaining the information needed to make business decisions (Lakner et al., 2007). Typically, farmers with less than one hectare of vineyards (primary producers) are very vulnerable, either to producers or to sales co-operatives, or in situations where there are no market integrators (Radóczné, 2002; Radóczné-Györe, 2006). Despite this, there is a decrease in the willingness to integrate; membership of producer groups declined significantly between 2006 (2653 producers) and 2012 (1288 producers) (Szabó-Barta, 2014). Small producers are inflexible, have little chance of their interests being defended and promoted, and sometimes they are vulnerable to the relative concentration of the food industry (Ferenczi, 1995; Baranyai-Takács, 2010). One of the alternative solutions to this problem could be the establishment of producer groups recognized by the EU, which are also able to exploit the benefits of co-operation and association, in order to solve the crisis of the low point of wine production. Producer groups may be able to carry out independent tasks under the current EU regulations, such as tendering, joint marketing, and market search (Barócsi et al., 2008). The current producers and professional organizations of the European Union have been established on a voluntary basis. They provide producers with a service enabling them to grow grapes of good quality to meet market needs (Popp, 2014).

The large number of players in the industry (3486 in 2005, 3071 in 2013) makes it difficult to control, consolidate, coordinate and regulate. In 2013, 18% of vineyards were used for individual farms, and 10% for enterprises (KSH, 2014).

The average agricultural area used by individual farms is increasing while there is a decrease in that used by economic organizations (Valkó, 2014). The fragmentation was also prompted by subsidies for the restructuring and conversion of vineyards, amounting to HUF 6312 million from EU funds in 2013, and HUF 4 million for support for removing vineyards (Government of Hungary, 2015).

On 22 June 2006, the European Commission published its position on the reform of Community wine-

growing regimes. An EC Council Regulation (Council Regulation 2008) was issued on removal grants and the national envelope system. From the 1st axis of the NRDPH, the support for the modernization of horticulture was HUF 78.6 million, and the aid for modernization of the plantations was HUF 27.9 million (Bíró et al., 2014).

According to the latest processed 2016 statistics, a total of 41 798 farms were involved in wine production or winemaking, 85.9% only with grape production, 3.1%, only with wine making and 11.0% with both. Vineyards and wineries are divided, despite the fact that four-fifths of wine producers are involved in vine-growing. The division is important, even when we consider that it is often only formal (Hill Regions National Council, 2016).

On a yearly basis, a minimum of EUR 43 million is available to the sector. Wine-making investments and the restructuring of grape production were dominant in the distribution of subsidies (Hill Regions National Council, 2016).

Increasing the competitiveness of agriculture, including grape and wine production, requires the use of state-of-the-art technologies, which is hampered by the low cost of labour, black and grey employment and capital shortages (Harangi-Rákos - Szabó, 2012, Popp, 2014). We must also mention the need to increase employment, which can be achieved by developing highly labour intensive sectors (horticulture, plantation management) that create high added value (Bíró et al., 2014).

II. Aims - Hypothesis

During our research, we sought to find out whether the tangible assets, the investments and the subsidies of the vine-producing farms changed in the period after EU accession, and whether the profitability of their farms differed according to the size and form of the enterprise. We also were interested in how the value of net and gross investment, and profitability in terms of its proportionality to production, total capital, own equity and labour, have changed among those active in the sector.

Our hypothesis was that there are differences in the size of the tangible assets and the profitability in terms of size and corporate form, and that the differently sized grape-producing enterprises react differently to the economic effects caused by the weather.

III. Materials And Methods

During our investigations, we rely on the database maintained by the KSH (Hungarian Central Statistical Office) and the AKI (Hungarian Agricultural Research Institute) Test Enterprise System. The basis of the analysis is the average data provided by the test system. The database shows the data of a 2000 test enterprises which exceed the 4000 Euro Standard Production Value, representing more than 110,000 agricultural commodity producers. More than 3,000 vineyards are represented by 63 test plants.

The methodological background is provided by the tools of economic analysis. We assessed the asset balance between 2005 and 2014 on two levels: economy types (individual and social economy) and farm size expressed in hectares (small <5 ha, medium 5-15 ha, large >15 ha).

Investigations included tangible assets, current assets, depreciation, investment structure, gross and net investment value, investment subsidies and scrapping. Gross investment refers to the sum of money spent on increasing the holdings of fixed assets in a given year. Net investment is an increase in the portfolio of fixed assets, taking into account scrapping and depreciation (as decreasing factors) (Net investment = gross investment - scrapping - depreciation).

We also examined the changes in the profitability in terms of its proportionality to production, total capital, own equity and labour. The gross production value is the value of the outputs generated by the producer, the service provider and the related ancillary activities (sales revenue, capitalized own revenues, other revenues). The gross production value includes products and area-related subsidies. The return on profitability is the ratio of pre-tax profit to total production value. When calculating total return on profit, we add the paid interest to the pre-tax profit. In the case of own equity profitability, pre-tax profit is expressed as a percentage of own equity. For work profitability, the amount of pre-tax profit and personal income is adjusted to the individual annual workforce. The annual workforce is the unit of measurement of work performance, which is the annual working performance of a full-time employee working full-time, expressed in working hours (2200 hours per year). To aid comparability, the indicators are presented for 1 hectare of agricultural land.

During the study we applied a dynamic ratio for the quantification of the change and a distributional ratio for examining the structure.

IV. Results

When comparing the data of enterprises of different size and corporate form, it is important to consider the size of the farms in which they operate.

Table 1: Average Agricultural Area per Holding (Hectares)

Type	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Large Enterprise	34.2	36.27	23.31	29.22	26.71	31.53	31.89	30.38	30.72	31.83
Medium-Sized Enterprise	8.09	7.77	8.37	8.59	8.88	9.52	9.1	9.16	9.15	8.83
Small Enterprise	3.26	3.34	3.58	3.64	3.65	3.58	3.5	3.53	3.48	3.45
All Enterprises	9.27	9.44	8.29	9.07	10.07	11.23	11.14	10.77	10.71	11.28
Individual Enterprises	6.95	6.91	7.36	6.99	8.19	8.85	9.05	8.46	8.89	9.44
Joint Enterprises	30.96	33.08	17.33	29.28	28.48	26.22	24.37	25.42	22.42	23.26

Source: Authors' own creation, based on Test Enterprise System data

For all enterprises, the average area per enterprise varied during the period under review, increasing by 21.7% in 2014 compared to 2005, with the lowest point in 2007 (Table 1). Small farms farmed an average of 3.2-3.6 ha. The average for medium-sized farms did not rise above 10 ha in any one year. The average size of the agricultural area used by the vine-growing individual farms ranged from 6.9 to 11.2 ha, i.e. the average farm size remained within the medium-sized category. The average area of joint enterprises showed significant volatility during the period under review, but it is clear that after a decline in 2007 in each year it exceeded 22 hectares. The significant downturn in 2007 is due to the decline in the area farmed by joint enterprises. The decline in area in large farms and joint enterprises in 2007 was obviously caused by the 37/2007 (V 11) FVM Decree, which included detailed conditions for granting subsidies for removing vineyards, which several farmers took advantage of.

One of the aims of this paper is to show the development of the tangible assets and the development of the investment activity. This category of equipment includes the machines, plant, equipment and vehicles which are necessary for the maintenance and cultivation of plantations, and for the harvesting and transportation of produce.

With regard to tangible assets per hectare, farms with a small farm size were in a better situation than medium-sized farms (except for the year 2007) (Table 2), because machines must also be purchased when a farm is small, when their utilization is not as favourable as for larger farms. During the period under review, medium-sized enterprises' tangible assets decreased by 8.6% compared to 2005. Their investments did not exceed the depreciation of tangible assets, so their machine fleet became older and became obsolete. The situation is not favourable for large-scale farmers either, as the value of the fixed assets per hectare only reached the 2005 level in the last three years, and this means that we can only talk about asset maintenance. Farmers with small areas reached a low point in 2007, after which the value of their tangible assets per hectare increased, and in the last three years they were of similar magnitude to farms with a large area. In 2014, none of the owners could increase the stock of tangible assets.

Table 2: Tangible Assets per Hectare of Agricultural Land (Thousand HUF)

Type	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Large Enterprise	5 049.0	5 010.5	3 721.8	4 138.9	3 553.3	4 421.7	5 392.4	5 078.1	5 094.7	4859.8
Medium-Sized Enterprise	2 356.5	2 330.9	2 246.3	2 108.7	2 277.4	2 184.9	2 003.6	2 076.8	2 153.6	2093.4
Small Enterprise	3 322.7	2 660.0	1 888.0	2 331.5	2 502.2	3 553.2	5 136.9	4 929.6	5 069.4	4957.0
All Enterprises	3 655.0	3 671.2	2 819.6	3 134.9	2 995.8	3 643.3	4 214.3	4 094.6	4 058.3	3852.1
Individual Enterprises	2 475.0	2 260.1	2 126.9	2 352.4	2 077.6	2 404.0	2 492.0	2 759.9	2 805.7	2652.5
Joint Enterprises	6 131.7	6 424.2	5 687.7	4 957.2	5 569.7	6 273.2	8 276.8	6 914.6	7 280.8	7011.2

Source: Authors' own creation, based on Test Enterprise System data

According to the form of wine producing enterprise, it can be concluded that the tangible assists per hectare of joint enterprises are more than double those of an individual farmer, averaging in excess of 6 million forints over 9 years. The reason for this is that joint enterprises have more favourable financing opportunities from both their own and outside sources.

Table 3: Gross Investment per Hectare by Size of Enterprise, (Thousand HUF)

Type	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Large Enterprise	639.49	374.57	305.50	412.97	392.61	670.66	746.52	721.57	450.87	656.7
Medium-Sized Enterprise	95.32	167.82	186.57	219.31	186.18	218.35	157.53	100.09	293.15	164.3
Small Enterprise	22.12	43.09	35.10	206.50	233.19	334.74	2 519.80	267.68	336.14	151.38
All Enterprises	320.97	248.43	205.83	309.99	304.17	489.99	769.40	458.01	380.15	422.55
Individual Enterprises	149.42	118.25	117.13	216.31	121.45	196.20	550.17	206.01	249.61	219.4
Joint Enterprises	681.02	502.43	573.17	528.17	816.33	1 113.47	1 286.51	990.41	715.98	957.5

Source: Authors' own creation, based on Test Enterprise System data

Between 2005 and 2007, after the EU accession, the value of investment per hectare for small farms was significantly lower than in other enterprises, but since 2008 there has been a significant increase. As a result of the economic crisis of 2008-2009, the size of the investment per hectare did not decrease in these enterprises, and the value for 2011 was extremely high due to real estate investments. The stock of unfinished investments was also high due to semi-finished buildings and constructions. The upsurge phase of medium-sized farms in development is in the 2005-2010 period. Subsequently, while other farmers made the largest investment in the period under review, these farmers reduced their development. The 2008-2009 crisis had the most negative impact on individual farmers' investments.

Investment per hectare in the year following EU accession averaged over 20,000 HUF for all enterprises, but fell to below 5,000 by 2007 (Table 4), while in 2008 it increased by more than tenfold compared to the previous year.

Table 4: Investment Subsidies per Hectare (Thousand HUF)

Type	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Large Enterprise	35.79	6.6	8.63	46.89	52.45	91.51	174.41	279.79	125.89	165.24
Medium-Sized Enterprise	10.91	12.01	2.57	41.96	19.80	60.31	39.83	75.5	34.11	51.93
Small Enterprise	2.97	0	0	90.59	0	125.14	763.77	26.69	0	58.41
All Enterprises	20.60	7.58	4.68	54.63	33.95	87.29	202.70	178.44	76.84	112.35
Individual Enterprises	11.99	2.34	5.55	60.48	15.81	83.1	174.59	83.29	83.08	89.43
Joint Enterprises	38.67	17.8	1.08	41.01	84.8	96.19	269.02	379.47	60.78	172.71

Source: Authors' own creation, based on Test Enterprise System data

During the period under review, the investment subsidy was the highest in 2011, exceeding 200 000 forints per hectare on average for all farmers, while in 2013 it did not reach the 2010 average. The average for large farms fell from 35 790 in 2005 per hectare to 6 600 in 2006. In the following years, however, it grew year on year. These enterprises received the largest amount in 2012. The average amount of investment subsidy per hectare for medium-sized businesses also varied. The peak was reached in 2012. Small farms did not realize investment subsidies in 2006, 2007, 2009 and 2013. The investment subsidy per hectare in 2008, 2010 and 2011 far exceeded the subsidies for all other farmers. Based on this examination, it can be stated that this high amount was used for real estate investments, since they were able to use large amounts of real estate investment subsidies within the framework of the New Széchenyi Plan announced in 2011.

Based on the method of management, it can be seen that between 2005 and 2007 the amount of subsidy per hectare was very low in both types of economic activity. In the case of joint enterprises in 2007, this amount hardly exceeded 1 000 HUF per hectare. As a result of the 2008 crisis, private farms used significantly less investment support in 2009 than in the absence of their own resources, while in the case of joint enterprises there was no such shift.

In the case of investments, it is important to consider whether the amounts spent on investment are sufficient to replace the assets, and to maintain, renew, and expand the asset stock. If we start from the average of all farms, it can be concluded that during the period under review, the value of the investments was only 75,910 forints higher than the amount per hectare for scrapping and depreciation (Table 5). If we ignore the rate of inflation and the fact that the life expectancy of

real estate is much longer than that of machinery, equipment and vehicles, and so its depreciation is significantly lower, this sum is still very low. In the sector in general, sufficient resources are not devoted to replenishing tangible assets, or obtaining state-of-the-art equipment, so the machine fleet becomes old and obsolete, resulting in a rise in refurbishment costs and lower competitiveness, all factors which affect the decline in profitability.

Table 5: Net Investment per Hectare (Thousand HUF)

Type	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Large Enterprise	18.80	-58.67	-123.90	-107.82	100.85	80.95	118.63	215.18	-23.44	140.98
Medium-Sized Enterprise	-95.45	-124.33	-42.48	48.19	-116.80	8.01	-22.29	-68.44	12.46	17.25
Small Enterprise	-171.32	-167.60	-97.26	89.08	106.15	132.94	1 139.43	-102.65	-250.56	-258.36
All Enterprises	-56.37	-99.28	-90.50	-18.38	36.34	67.22	198.81	79.23	-41.16	53.61
Individual Enterprises	-78.09	-110.29	-65.52	33.48	-21.82	8.97	177.28	-23.85	-18.48	52.75
Joint Enterprises	-10.78	-77.81	-193.96	-139.19	199.38	190.84	249.59	297.00	-99.53	55.86

Source: Authors' own creation, based on Test Enterprise System data

The net investment per hectare was negative in the first four years of the survey period, which means that the amount of investment did not even reach the value of depreciation and scrapping. Although a minimal increase in 2009 was achieved, and the highest value was reached in 2011 - which is likely to be due to the large amount of real estate investment by small farms - it again showed a downward trend, and again in 2013 was negative. We also see a similar trend for large area farmers, with the exception that the indicator was positive in the first year. In the nine years overall, the sector had a positive balance of 220 580 HUF/hectare. Medium-sized farms show the worst picture, the amount of investment per hectare totalling 401 130 forints on average over nine years, including scrapping and depreciation. For small farms, a total of 678 210 HUF is the positive balance of the indicator during the period examined, but this figure is disappointing as this was caused by the 2011 real estate investment, and if we ignore this, then the investment position of these farmers is no better than the medium sized farms. Examining the form of farm management, the average of individual farmers for the nine years overall was negative: -98 320 forints. In 2011, we see a higher value compared to the other years (the investment was nearly HUF 178 000 higher), probably also due to the real estate investment. With regard to the creation of resources, joint enterprises were in the best position, but in terms of the trend the increase from 2009 was broken in 2013, and the indicator also became negative for these farmers.

Table 6 shows the values of the profitability indicators for all vineyards.

Table 6: Profitability Indicators for Vine Growers (All Farms)

Type	Unit of Measurement	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Gross Production Value	1000 Ft/ha AL	1451.6	1744.2	1118.1	1231.7	961.9	1485.9	3508.3	2074.3	1744.9	1556.1
Personnel Expenses	1000 Ft/ha AL	250.5	272.8	186.3	228.9	208.5	284.2	395.1	327.5	333.2	328.7
Of which : Wage Costs	1000 Ft/ha AL	178.6	206.5	141.4	170.9	154.8	213.2	295.2	254.7	257.2	249.8
Other Personnel Payments	1000 Ft/ha AL	18.8	6.7	1.9	6.6	9.2	12.3	20.5	12.5	11.4	14.6
Total Agricultural Operating Costs	1000 Ft/ha AL	1277.1	1458.9	851.9	1025.7	902.3	1388.3	3145.0	1827.0	1311.4	1250.2
Pre-Tax Profit	1000 Ft/ha AL	92.4	267.4	277.9	206.0	49.9	85.1	300.4	230.9	407.5	292.7
Own Equity	1000 Ft/ha AL	3730.8	4066.1	2683.1	3845.9	3634.2	4465.5	5450.0	5449.4	5438.3	5381.4
Proportional Profitability	%	6.4	15.3	24.9	16.7	5.2	5.7	8.6	11.1	23.4	18.8
Profitability of Capital	%	3.0	5.3	7.5	4.9	1.6	2.0	5.2	4.0	6.5	4.9
Profitability of Own Equity	%	2.5	6.6	10.4	5.4	1.4	1.9	5.5	4.2	7.5	5.4
Work Profitability	1000 Ft/AUL	1078.4	1803.0	2153.6	1801.1	1229.2	1580.9	2301.8	2252.7	3206.1	2768.0

Source: AKI Test Enterprise System data

With regard to gross production value, we saw a very high value in 2011. This year, early frosts caused serious damage, but rising prices compensated for this unfavourable effect. In terms of the trend, gross production fluctuated. During the first two years of the period there was an increase, and a further increase was recorded after a slight decline in 2007. The lowest value was recorded in 2009.

Viticulture is a labour-intensive sector, so it is very important to consider the development of personnel costs within the overall costs. The cost of wages per hectare also show great fluctuations in the 10 years under review. An outlying value can be seen in 2011, similarly to the gross production value. From 2010, the wage costs incurred increased significantly, one reason for which is the rise in the minimum wage.

Analysing the operating costs it can be stated that the 2011 value is also the highest. In 2007 and in 2009 it was possible to reduce operating costs, so we can observe a value below 1000 HUF per hectare. However, these years also show a low value for gross production.

For the pre-tax profit, the years 2005, 2009 and 2010 can be said to be unfavourable due to low returns and higher operating costs. In 2011, high production was associated with high costs, so this year cannot be said to be outstanding for pre-tax profit. On a per hectare basis, vine-growers enjoyed the highest pre-tax profit in 2013, thanks to the fact that production was lower than in 2012, and to cost-saving farming.

Favourable values of the proportional profitability - production ratio are linked to years when the gross production value was not outstanding. However, thanks to cost-effective management, in 2007 and 2013 the index rose to over 20. In 2005 and 2006 we see the lowest profitability, with the value of the indicator barely above 5, indicating that the after-tax profit is only 5% of the gross production value. The reason for this is the low production value in 2009 and the high operating costs associated with a moderate production value in 2010.

Regarding the trend of the profitability of capital and own equity, production tracks profitability in a proportional way.

Examining labour productivity in labour-intensive sectors is of the utmost importance. The highest earnings of the workforce were produced in 2013, at which time the pre-tax profit was highest, and the personal income tax paid was also significant.

We have investigated the variability of the profitability indicators of the vine-producing enterprises according to the type of farm operated (Table 7).

Table 7: Profitability Indicators for Individual Farmers and Joint Enterprises

Indicator	Unit of Measurement	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Individual Farms											
Gross Production Value	1000 Ft/ha AL	549.5	800.0	767.0	825.6	596.7	0.2	894.2	956.8	1138.8	940.2
Personnel Expenses	1000 Ft/ha AL	116.8	129.8	143.7	141.9	127.8	123.7	143.3	156.8	170.1	155.7
Of which: Wage Costs	1000 Ft/ha AL	96.3	107.7	112.3	113.1	100.2	66.9	113.5	124.4	135.8	124.5
Other Personnel Payments	1000 Ft/ha AL	0.3	0.0	0.3	0.1	1.6	90.2	1.2	0	0.3	0
Total Operating Costs	1000 Ft/ha AL	547.1	645.1	627.0	659.3	545.3	83.1	658.8	714.2	731.3	667.8
Pre-Tax Profit	1000 Ft/ha AL	-6.6	146.9	136.6	163.3	38.8	-35.7	217.2	234.0	399.4	266.3
Own Equity	1000 Ft/ha AL	2551.3	2357.4	2331.2	2693.2	2326.2	2784.9	2909.7	3375.9	3660.5	3566.7
Proportional Profitability	%	-1.2	18.4	17.8	19.8	6.5	-5.5	24.3	24.5	35.1	28.3
Profitability of Capital	%	-0.1	5.5	5.2	5.4	2.0	-0.6	7.2	6.5	10.0	7.1
Profitability of Own Equity	%	-0.3	6.2	5.9	6.1	1.7	-1.3	7.5	6.9	10.9	7.5
Work Profitability	1000 Ft/AUL	367.4	1037.1	1244.5	1283.8	834.6	510.3	1949.2	2093.0	3073.7	2349.1
Joint Enterprise											
Gross Production Value	1000 Ft/ha AL	3344.9	3 586.3	2572.1	2177.6	1985.4	3255.5	9674.3	4435.3	3304.1	3178.3
Personnel Expenses	1000 Ft/ha AL	531.0	551.9	362.6	431.7	434.9	567.4	989.2	688.4	753.0	784.2

Of Which: Wage Costs	1000 Ft/ha AL	351.1	399.0	261.6	305.5	307.9	417.9	723.7	530.0	569.6	579.7
Other Personnel Payments	1000 Ft/ha AL	57.5	19.7	8.7	21.9	30.5	31.3	66.0	38.8	40.0	52.9
Total Operating Costs	1000 Ft/ha AL	2809.2	3046.6	1783.1	1879.0	1902.9	2909.3	9009.5	4178.1	2804.0	2783.6
Pre-Tax Profit	1000 Ft/ha AL	300.0	502.5	863.0	305.3	81.0	341.5	496.8	224.2	428.2	362.3
Equity	1000 Ft/ha AL	6206.3	7399.5	4140.2	6530.8	7300.7	8032.0	11442.3	9830.5	10012.1	10160.4
Proportional Profitability	%	9.0	14.0	33.6	14.0	4.1	10.5	5.1	5.1	13.0	11.4
Profitability of Capital	%	4.7	5.2	10.0	4.4	1.3	3.6	4.2	2.3	3.6	3.1
Profitability of Own Equity	%	4.8	6.8	20.9	4.7	1.1	4.3	4.3	2.3	4.3	3.6
Work Profitability	1000 Ft/AUL	2228.1	2996.8	6429.4	3053.9	2211.5	3013.3	2586.6	2429.7	3400.6	3394.1

AL = Agricultural Land, AUL = Annualised Unit of Labour

Source: AKI Test Enterprise System Data

In terms of gross production per hectare, jointly-owned enterprises far exceed individual farms. In the case of joint enterprises, the most favourable year was in 2011; in the case of individual farms it was 2013.

When examining expenditure on personnel, it should be said that for individual farms, using a family member to assist as an unpaid worker may distort the comparison. Moreover, farmers take their income out of the year-end result. Partly for the above-mentioned reasons, we can see a much lower wage cost for individual farms than for social farms. Other personnel-related payments are in a similar situation, since the opportunities offered by fringe benefits are usually not enjoyed by private entrepreneurs.

Operating costs show the same trend as personnel costs. Individual farms produce a lower level of gross production at considerably lower costs. This is due to the fact that joint enterprises are characterized by general costs.

Examining pre-tax profit, it can be said that joint enterprises were able to achieve positive results for the entire period under review, while for individual farms, 2005 was unprofitable. The production of joint enterprises is burdened with higher costs, but their revenues are much higher, so their profits exceed those of individual farms. Only one year (2012) was an exception to this rule.

With regard to the ratio between proportional profitability and production, individual farms are clearly in the most favourable position. An exception to this was a 3 year period (2005, 2007 and 2010) when the pre-tax profit was negative or very low.

Alongside the lower production and operating costs, proportionally favourable pre-tax profits could be achieved. In 2014 the production of individual farms was 30% of that of joint enterprises, while pre-tax profits reached 73.5% of those recorded by joint enterprises.

The profitability of total capital and own equity during the period under consideration was more favourable to joint enterprises, due to the higher pre-tax profit. Regarding the trend, the value of these two indicators follows the change in ratio between proportional profitability and production.

The labour productivity indicator is higher for joint enterprises, the reason for which is the higher value of personnel expenses and the pre-tax profits among these enterprises. Individual farmers take far less income out of their business and the work of unpaid family members also affects the value of the indicator.

During our research, we also examined how profitability changed with the size of the grape producers in the agricultural area (Table 8). The vast majority of large enterprises are joint enterprises, while small farms are individually-owned farms, and with medium-sized farms, joint enterprises are the most common form.

The gross production value per hectare of agricultural land is the highest in the case of large farms. Only one year (2006) was an exception, when the production of medium-sized farms exceeded the large farms. The performance of small farms in the last 4 years of the survey exceeded that of medium-sized farms (by 45% in 2014).

For large farms, the outstanding production value is coupled with high operating costs. In the case of small farms, in the last 4 years, not only the performance but also the operating costs incurred exceeded the similar values recorded in medium-sized enterprises. In 2014, production costs of medium-sized enterprises were on average 54% of those of large farms, while for small enterprises this figure was 107%. It can therefore be said that the production of small farms was accompanied by extremely high costs in the last year of the investigation.

Large-scale farms also lead in terms of personnel expenditures. Here, it is also possible to pay employees higher fringe benefits. One of the factors of outstanding production costs in the small farms are personnel costs, which exceeded those of medium-sized enterprises between 2010 and 2014.

When examining pre-tax profit, it can be stated that for large enterprises 2007 was a good year (488.6 thousand HUF/ha), as was 2013 (429 thousand HUF/ha), while 2009 was unfavourable, with profits hardly exceeding HUF 40 thousand per hectare. During the period under review, the value of the indicator fluctuates significantly. For medium-sized farms, the lowest profits were recorded in 2005 (60.3 thousand HUF/ha), in 2007 (58.2 thousand HUF/ha) and in 2010 (77.1 thousand HUF/ha), but this was still higher than in large enterprises. The most successful years were 2006 and 2013.

The performance of medium-sized enterprises is different from large ones. 2006 was a remarkably good year, and then - with some minor fluctuations - the gross production value declined, with a slight upswing in 2013 and 2014. In 2011, when large enterprises produced high output, medium-sized enterprises registered average performance. Their personnel expenditures were considerably lower, and in 2014, were 37% of those of large enterprises. Other personnel payments - including sick leave and optional fringe benefits - were also considerably lower. A smaller operating size is also a reason for lower operating costs, since they have to employ fewer administrative staff than large enterprises. For pre-tax profits, the worst years for this type of enterprise were 2005, 2007, 2009 and 2010, when it did not even reach 80,000 HUF/ha. The most successful years, as in large enterprises, were 2006 and 2013. In 2006, 2009 and 2012, the pre-tax profits of medium-sized businesses exceeded that of large enterprises.

The proportional profitability of production is lower than in large enterprises, since the lower operating costs were unable to offset the low revenues. With respect to the labour profitability indicator, with the exception of 2006, they reported slightly lower values.

Table 8: Profitability indicators for grape producers, according to size of enterprise

Type	Unit of Measurement	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Large Enterprises (Area Above 15 Ha)											
Gross Production Value	1000 Ft/ha AL	2055.4	1860	1471.8	1622.1	1052.2	2002.9	5601.8	2892.7	2107.4	1895.8
Personnel Expenses	1000 Ft/ha AL	390.7	402.9	201.2	317.8	248.1	373.3	596.3	462.6	458.5	439.3
Of Which: Wage Costs	1000 Ft/ha AL	266.6	298.4	151.0	229.6	179.2	278.0	442.9	361.3	351.5	329.6
Other Personal Payments	1000 Ft/ha AL	39.6	11.6	3.1	12.0	13.2	16.5	32.7	19.7	17.9	23.8
Total Operating Costs	1000 Ft/ha AL	1725.0	1622.5	1010.2	1367.0	999.1	1816.6	5109.0	2664.4	1632.9	1488.6
Pre-Tax Profit	1000 Ft/ha AL	191.4	221.7	488.6	256.9	40.8	174.5	396.5	201.1	429.0	385.9
Equity	1000 Ft/ha AL	4990.7	5597.2	3020.9	5183.4	4337.0	5561.9	7360.9	6926.5	6916.0	6824.3
Proportional Profitability	%	9.3	11.9	33.2	15.8	3.9	8.7	7.1	6.9	20.4	20.4
Profitability Of Capital	%	4.0	3.7	9.6	4.7	1.3	3.0	5.1	2.9	5.5	5.2
Profitability Of Own Equity	%	3.8	4.0	16.2	5.0	0.9	3.1	5.4	2.9	6.2	5.7
Work Profitability	1000 Ft/AUL	1962.4	2127.0	4126.2	2764.3	1619.5	2491.4	2724.1	2446.5	3834.7	3961.3
Medium-Sized Farms (5 to 15 ha)											
Gross Production Value	1000 Ft/ha AL	1151.2	2023.3	786.9	961.9	947.3	834.4	973.3	934.7	1176.5	1071.4
Personnel Expenses	1000 Ft/ha AL	164.5	171.5	156.4	145.5	176.5	140.5	132.9	147.8	156.4	162.4
Of Which: Wage Costs	1000 Ft/ha AL	125.4	132.2	120.9	112.7	133.6	104.5	99.0	110.3	119.5	122.9
Other Personal Payments	1000 Ft/ha AL	3.8	3.0	1.5	2.7	7.0	9.0	8.0	5.3	5.3	5.4
Total Operating Costs	1000 Ft/ha AL	1042.6	1604.3	724.5	738.8	858.3	737.6	734.3	668.8	805.7	810.9
Pre-Tax Profit	1000 Ft/ha AL	60.3	392.7	58.2	217.3	79.1	77.6	228.6	264.9	366.8	256.7
Equity	1000 Ft/ha AL	2371.9	2386.1	2416.1	2372.4	2820.7	2468.6	2406.4	2970.0	3066.6	3118.2
Proportional Profitability	%	5.2	19.4	7.4	22.6	8.4	9.3	23.5	28.3	31.2	23.9
Profitability Of Capital	%	3.0	9.8	2.2	7.6	2.8	3.1	7.9	8.1	9.9	7.2
Profitability Of Own Equity	%	2.5	16.5	2.4	9.2	2.8	3.1	9.5	8.9	11.9	8.2

Work Profitability	1000 Ft/AUL	827.8	2322.6	966.5	1729.7	1258.9	1167.7	2062.9	2230.2	2899.0	2175.0
Small Farms (Area Size Below 5 ha)											
Gross Production Value	1000 Ft/ha AL	485.3	703.9	916.9	732.5	697.2	788.7	1384.7	1547.4	1840.9	1549.4
Personnel Expenses	1000 Ft/ha AL	77.4	105.1	202.3	147.2	138.8	227.1	241.6	222.0	314.9	355.8
Of Which: Wage Costs	1000 Ft/ha AL	67.2	94.3	153.5	121.5	114.6	179.9	192.1	177.1	255.6	293.5
Other Personal Payments	1000 Ft/ha AL	0	0.1	0	0	0	2.9	2.1	1.4	2.3	0
Total Operating Costs	1000 Ft/ha AL	596.9	589.6	729.7	662.9	670.1	1033.7	1240.9	1269.8	1401.6	1592.7
Pre-Tax Profit	1000 Ft/ha AL	-120.2	110.2	192.3	73.6	26.4	-246.6	82.9	267.1	431.3	-49.7
Equity	1000 Ft/ha AL	4011.6	3266.4	2415.1	2929.4	2845.0	4223.5	5482.7	5455.6	5975.3	6068.8
Proportional Profitability	%	-24.8	15.7	21.0	10.1	3.8	-31.3	6.0	17.3	23.4	-3.2
Profitability Of Capital	%	-2.6	3.2	6.8	2.3	0.9	-5.2	2.2	4.4	6.4	-0.6
Profitability Of Own Equity	%	-3	3.4	8.0	2.5	0.9	-5.8	1.5	4.9	7.2	-0.8
Work Profitability	1000 Ft/AUL	-120.2	494.3	1197.0	615.5	522.9	-217.1	849.0	1640.1	2090.5	677.7

AL = Agricultural Land, AUL = Annualised Unit of Labour

Source: AKI Test Enterprise System data

Examining the gross production value of small farms it can be concluded that, with the exception of 5 years (2007, 2011-2014), they performed worse than medium-sized farms. Operating costs in the years 2007 and 2010-2014 were higher than those of medium-sized farms. As a result, their pre-tax profit was negative three times during the period under review. In 2014, the high gross production was associated with such high operating costs that small holdings had to report losses of 49.7 thousand forints.

Looking at the change in their own production inventories, it can be said that there was continuous growth for the period 2005-2009. In 2010, in the case of joint enterprises, this trend remained more or less the same. In the case of small farms, in 2010-2011 significant sales of previously accumulated self-produced inventories were made, while this process was characteristic of joint enterprises in 2012. This shows that small farms can tolerate an unfavourable period for only a short period of time, while larger farms and joint enterprises have sufficient resources to operate for longer periods.

V. Conclusion And Recommendation

During our investigations, it was found that the number and size of the farmers in the grape growing sector decreased during the period under review. The structure of the sector changed only slightly between 2005 and 2014. Vine growers operating with a larger area are in a much better position as regards assets and investment than small farms. Examining the form of farming, we can see that the average position and assets of the joint enterprises are better than those of the individual farmers.

The various groups in the industry are, on average, on a fairly low level, both in terms of assets and investment. The special feature of the industry is that it takes a long time for removed plantations to be replaced by replanting productive vineyards. As a result, up to that point the operation incurs only costs and expenditures, which must be funded. This is why - among other things - economic, agricultural, credit and subsidy systems play a very important role in the life of the sector.

Examining all the vine-growing enterprises, we can say that the gross production fluctuated. Between 2005 and 2010, growth and decrease followed each other regularly, followed by a decline after 2011. Because of the labour intensive nature of the sector, personnel expenditures accounted for 19-26% of all operating costs. Between 2009 and 2011, an increase in own equity was observable, which weakened slightly from 2012, but its rate barely rose above 1%. Overall, the sector was characterized by profitable management during the period under review.

In terms of the form of the enterprises, the picture is more nuanced. Individual farms were forced to record losses in 2005 and 2010. Within the operating costs, the proportion of personnel expenses remained within narrow limits (17-23%), partly due to the work of unpaid family members. Between 2009 and 2013, own equity increased significantly, before decreasing slightly in 2014 (2.5%). Gross production was higher in joint enterprises; in 2005 it was 6 times, and in 2011 it was 10.8 times greater than that of individual farms. The proportion of personnel costs within the total cost varied between 18 and 26%. In terms of the company form, there was also a significant difference in the production cost per hectare: costs in joint enterprises exceeded those in individual farms, being 2.8 times higher in 2007, 13.7 times higher in 2011, and 35 times higher in 2010.

It can be stated, therefore, that large-scale enterprises and joint enterprises generate higher production per hectare at higher costs.

In general, stockpiling is characteristic of grape growing. Apart from raw material producers, we can see an increase in the stock of finished goods in the worst weather years. Smaller sized and individual farms find it more difficult to handle financing in years of unfavourable weather, so they have to sell their stocks at these times.

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