Review on Agriculture and Rural Development 2023 vol. 12 (1-2) ISSN 2677-0792
DOI: 10.14232/rard.2023.1-2.94-105

SUSTAINABILITY IN HUNGARIAN VITICULTURE - ECONOMIC SUSTAINABILITY OF VINE GROWING FARMS IN HUNGARY

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Abstract: In our globalised world, humankind is increasingly realising that we have consumed the Earth's resources, and it is necessary to change our own mind and attitude. Economic, social and ecological sustainability has become a fundamental goal in every sector, including vine and wine growing. Hungary is ranked 16th and 7th in the wine growing of the world and the European Union respectively (OIV 2022 forecast). Thus, global goals need to be increasingly enforced also in this sector in order to be able to keep our competitiveness. Markets are becoming more and more concentrated. New World countries are developing exponentially. So tradition and expertise are no longer enough to maintain and develop the sector. There is a need for collaborations and integrations, for which cooperatives and clusters serve as a model most of all. Since, however, their implementation is difficult in Hungary, it is necessary to put more emphasis on scale efficiency, cost minimization and sustainability. The latter one represents higher customer added value and meets the demand of conscious consumers. This study is intended to deal with costs and buying-in prices by farm sizes, and to show which sizes may be economically sustainable.

Keywords: price of grape, economic sustainability, profitability, problems of the grape-wine vertical

1. Introduction

There is a broad consensus that spreading of sustainable practices is a challenge for the sector, which takes into account economic viability in addition to environmental and social sustainability (Mariani & Vastola, 2015). In Hungary still lot of growers are struggling with economic sustainability, mainly among those who are engaged only in vine growing. But "... by now vine growers sell more than 70 % of wine grape as grape. Vineyards without cellar give the bulk of the vine growers." Szabó & Molnár (2017).

Takácsné (2020) holds that at least the income required for simple reproduction should be provided by the growing units also at individual level. However, for farms dealing only with vine growing even economic sustainability causes problem due to the coexistence of several factors:

1. 84 % of the registered vine growing farms in Hungary has an area of less than 3 hectares, which reduces the benefits of scale efficiency. (KSH, 2020) Albeit Clavel (2011) remarks that the whole European wine market is fragmented, and it did not change by 2020, since at European level the average size was less than 1 hectare (Eurostat, 2020). According to Rainer (2016), while we should foreground scale efficiency for the majority of farm produces, in the case of quality wine growing it is worth following a different logic. Overton & Murray (2013) as well as Overton &

Banks (2015) take also this view. In their opinion, wine growing is closely linked with cultural capital, lifestyle and social status.

2. The national average of the vineyards' age is about 20 years, which makes it difficult to introduce new technologies, and in this way also to replace the labour shortage by mechanization (KSH, 2020). In the Europe relation 36.7 % of vineyards are older than 30 years, while 41.3 % is between 10 and 29 (Eurostat, 2020).

3. The average age of those directing vine growing is relatively high. According to a study in 2016, 34.8 % of the vine and wine growing plant managers is older than 65 years in the EU (as well as in Hungary), while the rate of those under 40 is only 8.8 % (Hamza, 2022). Although it is worthy of note that in this sector farmers older than 65 years generate two and a half times more net added value per unit area than those under the age of 40 (in other sectors it is the opposite).

4. Hungarian input prices are rising exponentially (the level of minimum wage rose 6.5-fold in the last 20 years, the price of fertilizers increased by 60 % in a year, the price rise of diesel oil was more than 70 % in 4 years without price cap), while the average buying-in price of grape does not even stagnate in some years, but even decreases (see grape prices of 2019), i.e., it gets reduced in nominal value without taking into account the inflation rate.

According to Mező & Kelemen (2018) it is possible to realize a loss of up to HUF 200 thousand per hectare, because of the depressed prices. It is further fuelled by the pandemic and the war having negative effects on input prices.

"As every player of the product chain is suffering from the ongoing price increase, and they can not pass on the rising costs in the prices correspondingly, an urgent solution must be found" (Laczkó, 2021).

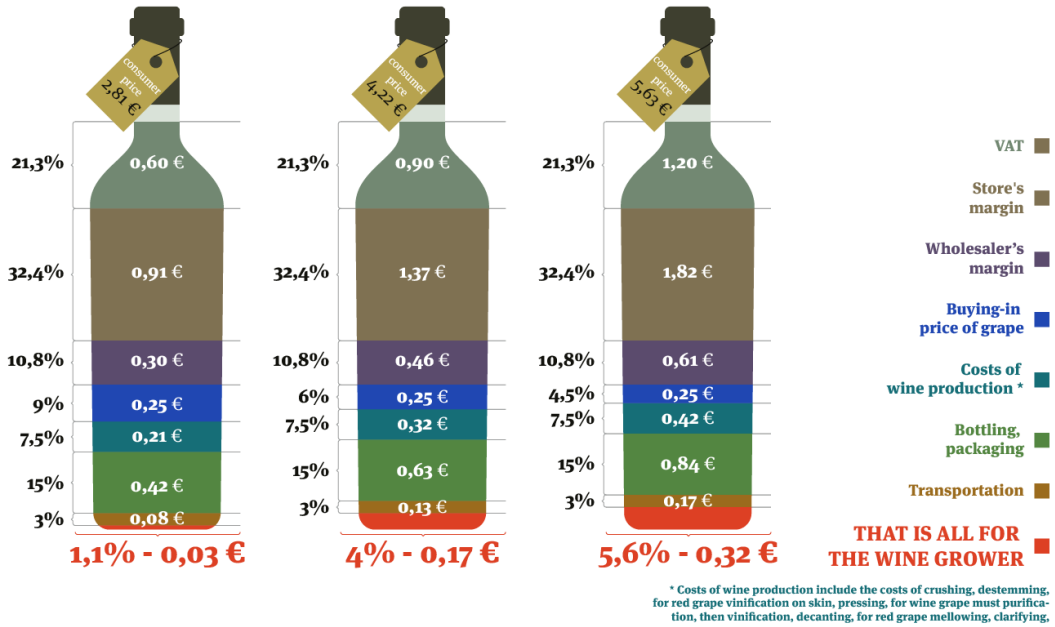
5. Low buying-in prices for grape."Due to a drastic increase in production costs the buying-in price for grape should be increased significantly, however the wineries can do it not until then the traders acknowledge it in transfer prices. Unfortunately, there is not much hope for it" (Köpöncei, 2022).

In an article in the Magyar Nemzet (27-07-2022) he also mentions that although the retail chains have increased the consumer price of wine by 10-15 %, the wine growers do not benefit from it, only the traders' margin increases (Köpöncei, 2022). Légli (in Kabarcz-Horváth, 2022) calls it unfair economic practice. Brazsil (in Viniczai, 15-07-2022) words it in such a way that not only the increased input prices, but also the HUF-EUR exchange rate has effect on costs. In his opinion the trade chains do not accept an increase in farmgate prices (*Figure 1*). According to Viniczai (28-06-2022) the buying-in price for grape has not or only slightly increased for a good 10-15 years. If the low buying-in prices for grape remain or may even decrease, it leads also to a reduction in the growing areas of vine. The parallel between the buying-in price of grape and the change in the growing areas of vine is well detectable in 2019 (*Figure 2*).

6. Still the large volume vine growing stands in the limelight among the farms dealing only with vine growing, since their growing can be profitable only this way (Szamosköziné, 2019). However it is not in line with the changed qualitative needs of consumers including sustainable production or organic growing. Although the

conditions make for quality wine growing (KSH, 2020), there are other priorities, from which the survival of the farm is the first standpoint. A study of Delmas (2021) shows that even those dealing with organic growing or sustainable vine growing do not mark this activity on the labels of their wines, because they carry out this type of growing not for marketing purposes, but to protect their lands for future generations. They do not mark organic growing even though consumers are willing to pay more for it (Mazzocchi et al., 2019). In another study, Delmas with his co-authors (2016) proved that the quality of wines made organically and biodynamically has improved significantly, at the same time this method of growing is 15-20 % more expensive compared to the traditional one.

Figure 1: How much does a wine grower have in his pocket from the price of a bottle of wine?



Source: Kabarcz-Horváth (2022): How much does a wine grower have in his pocket from the price of a bottle of wine? Comment: The original figures in the graph were given in HUF on 15.02.2022. Conversion to euro is

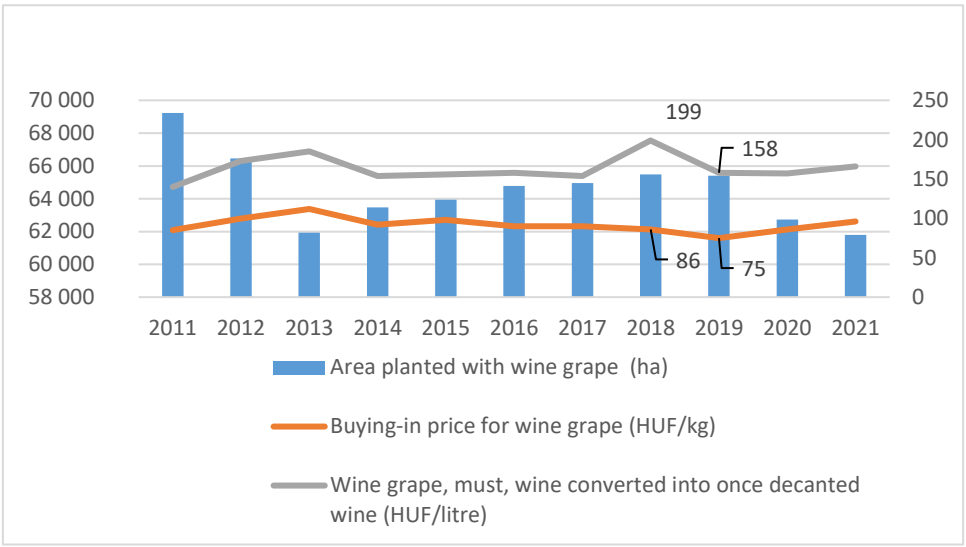
based on the average mid-rate of the Bank of Hungary on 15.02.2022.

Delmas' assertions are true also in Hungary: organic and sustainable vine growing would indeed require further investments and would not be profitable whatever happens, because the majority of wine consumers is price sensitive. Unfortunately, the segment being able and willing to pay the higher price for these wines is very small. So this alternative can not provide the secure living of large-scale growers and processors in the long run. In addition, the authorization of labelling organic wine denomination is a tortuous and expensive process in Hungary.

So even those, who make their wine in this way do not necessarily state this distinction on the label. The reason for this is that the increased selling price can not always compensate the amount paid for authorization and the energy spent on it.

Although, cooperation can be a certain kind of solution to the problem, my previous researches have already pointed out that willingness to cooperate is too small in this sector, which is caused mainly by the distrust arising from previous experiences.

Figure 2: National data of average grape and wine prices in Hungary from 2000-2021



Source: Hungarian Central Statistical Office (KSH) and National Council of Wine Communities (NHT), edited by the author

7. The number of cooperation is few, where the win-win position has been really established. The reason for this on the one hand is the lack of the necessary confidence between the parties and the participants have many negative experiences (Szamosköziné, 2019). According to Szabó, G. & Barta (2014) in addition to the lack of confidence small market share and financing are also problems.

As Mariani & Vastola (2015) write: in compliance with fair trade principles the wineries should provide their workers with competitive wages and appropriate conditions. Moreover they should pay a fair price to the growers for the grape to cover the costs of eco-friendly vine growing as well as a premium price necessary for investing into the social programmes within the local community. A statement of Brazsil (in Viniczai, 2017) is also linked with it, by which "the price of grape that should ensure the growers enough to live on is the basis and at the same time the neuralgic point of the sustainable vine growing" (*Figure 2*).

At the same time the majority of those involved in Hungarian vine growing is happy, when they realize profit, because the vine growing activity has been in crisis for decades. This latter makes it difficult for farmers to pay attention to further factors

such as environmental and social view. Vágási (2007) writes that "the customers' money is the most important resource of the market". However, in this particular case the purchasers are those, who provide this money.

Darnhofer et al.(2016) calls the attention to the fact that the versatility of growers is affected significantly by that what kind of opportunities the growers have, and how react to uncertainty and changes. According to him, it is necessary to take into account wider social environment, politics, norms, power asymmetry and that how all these affect the adaptability of farms.

Unfortunately growers are vulnerable as if they do not sell the grape, it goes off. This is exactly the reason why they are affected by asymmetric price transmission (Meyer & Cramon-Taubadel, 2004) and inadequate information flow, which could be somewhat mitigated by size efficiency. Therefore present study takes into account the income resulting from size efficiency and takes the Hungarian factors of sustainability approach one by one, which may increase competitiveness in both the Hungarian vine and wine sector.

2. Materials and methods

The applied method is based on the fact shown by Ábel & Hegedűsné Baranyai in a study in 2017 that the profitability indicators of vine growing farms move in a hectic way and vary by farm size. According to the results of our study the largest vine growing farms generated the highest incomes at that time, when the worst year of the study period occurred for the medium-sized farms. They also confirm that although the buying-in prices might have doubled, but due to the increase in costs the majority of growers booked losses.

For the methodology we used basically raw data obtained from the fellow workers of Research Institute of Agricultural Industry (now AKI, Institute of Agricultural Economics) Szilárd Keszthelyi and Eszter Porkoláb. As far as we know this kind of analysis has not been conducted on this database yet, that is why it counts as primary research. The database contains sizes of vine growing farms, costs and buying-in prices for the years between 2001 and 2016 both at farm level and at sectoral level. Historical data are not available, because the test operation started in 2001. I wanted to update the data, but unfortunately, I did not receive the figures for the past years from the competent institution referring to lack of capacity.

We have formulated the following hypotheses:
1. Vine growing has an uncertain profitability.
2. Hungarian vine growing can be profitable.

It is important to note that for the second hypothesis the condition applies only to farms dealing only with vine growing, who can not produce value by means of grape processing. After cleaning the database, we filtered out the missing data and narrowed the base so as to avoid distortion. On that basis we did not take into account the figures above HUF 200 per kilo and HUF 800 per litre for grape and wine

respectively in the case of cost prices. With the buying-in prices we also ignored the figures above HUF 400 per kilo and HUF 10,000 per litre for grape and bottled wine respectively, because in practice they are negligible or unrealistic. First, we applied descriptive statistics, then we conducted the variance homogeneity test of the costs and buying-in prices both for grape and for wine to see whether we can conduct the analysis. We considered the sample being normally distributed relying upon Székely & Barna (2002). I carried out the cost-income comparisons by means of SPSS software package and Windows Excel.

3. Results

The whole database contained 1913 and 807 data for cost prices of grape and wine respectively, which provided the basis for the analysis of variance. We calculated with 3343 and 194 values for the average sales prices of grape and bottled wine respectively, for which we conducted the analysis.

According to the result obtained there is a significant difference in the cost price of both grape and wine, which means that the cost price of grape fluctuated significantly during the study period and was difficult to plan. Weather factors also play a part in it surely. The cost price of wine changed also in a hectic way, which may derive also from the change in the cost price of grape.

There was a significant difference in the buying-in price of grape, which shows the substantial change, On the other hand, in the buying-in price of wine there was not a decided change statistically. It proves that the profitability of grape is really uncertain, while the price of wine is plannable or at least more plannable. The latter shows a steady increase based on the descriptive statistics. Relying upon these findings we accept the first hypothesis.

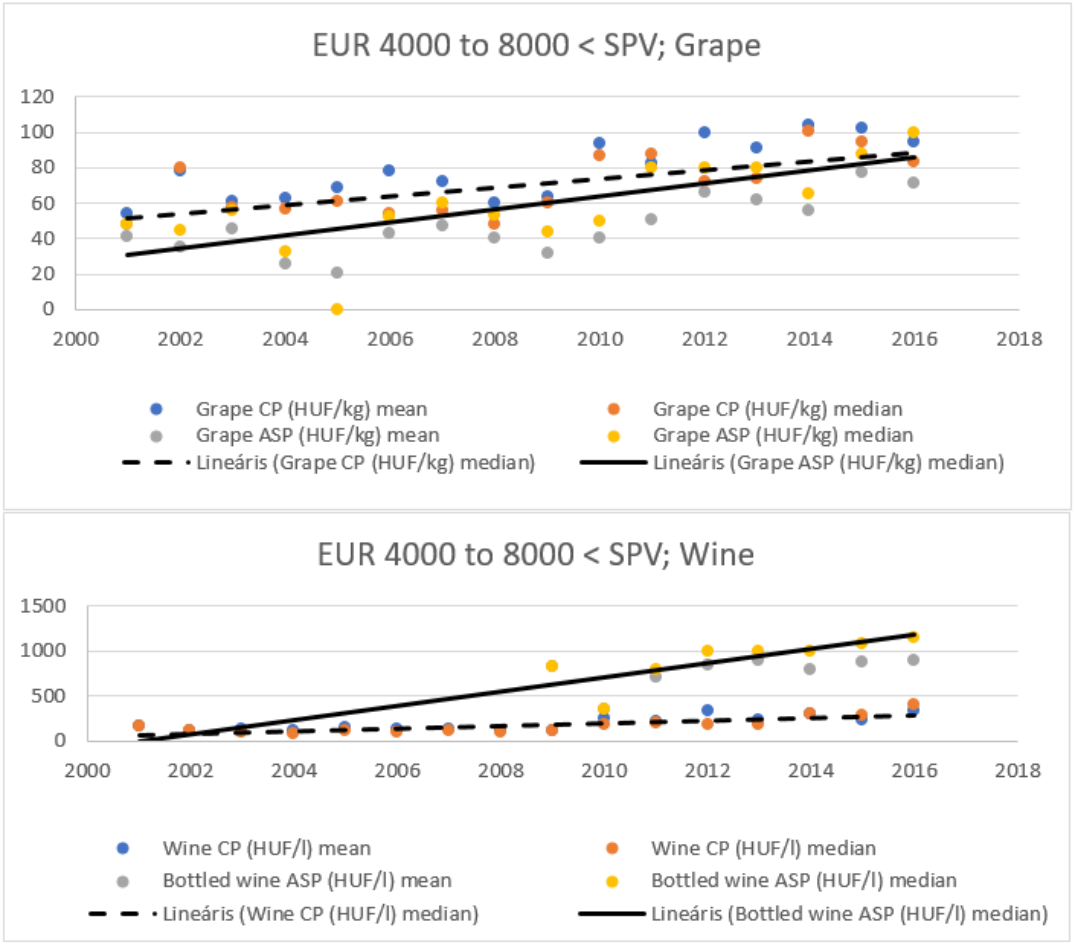
After that, we calculated the mean and the median for the average buying-in price and cost price of grape and wine by farm sizes, which clarifies the profit and loss of the sector. We used these two indicators because the mean is suitable for substituting the real data, while the median shows also that what is not shown by the mean realistically, that is why it is called the “average of statisticians”. We prepared a scheme for all data, which is shown in Table 1. We still cleaned it by copying from SPSS to Excel for the appropriate analysis.

Of the 6866 cells we left out the smallest (EUR 2000 to 4000 Standard Production Value - SPV) and the largest plant size (EUR 250,000 to 500,000 < SPV) as well as those farm sizes where there was not enough continuous data or there was no reason for analysing. From the table, we created a chart for all size categories by fitting a trend line to the medians. For lack of space we present altogether three ones from the farm sizes, which visualize small, medium and large farm categories well.

Figure 3 shows the relatively small farm size that is the second from all farm sizes. According to it, while the selling price of grape (continuous line) only goes to the cost (dashed line) from below but does not reach it, the selling price of wine shows a rapidly increasing trend when omitting the period before 2002 (*Figure 3* below). It also affirms the hypothesis that the profitability of grape is doubtful, at

this size there is no profit for grape. The indicators of wine call the attention to the fact that its values do not necessarily result from the values of grape.

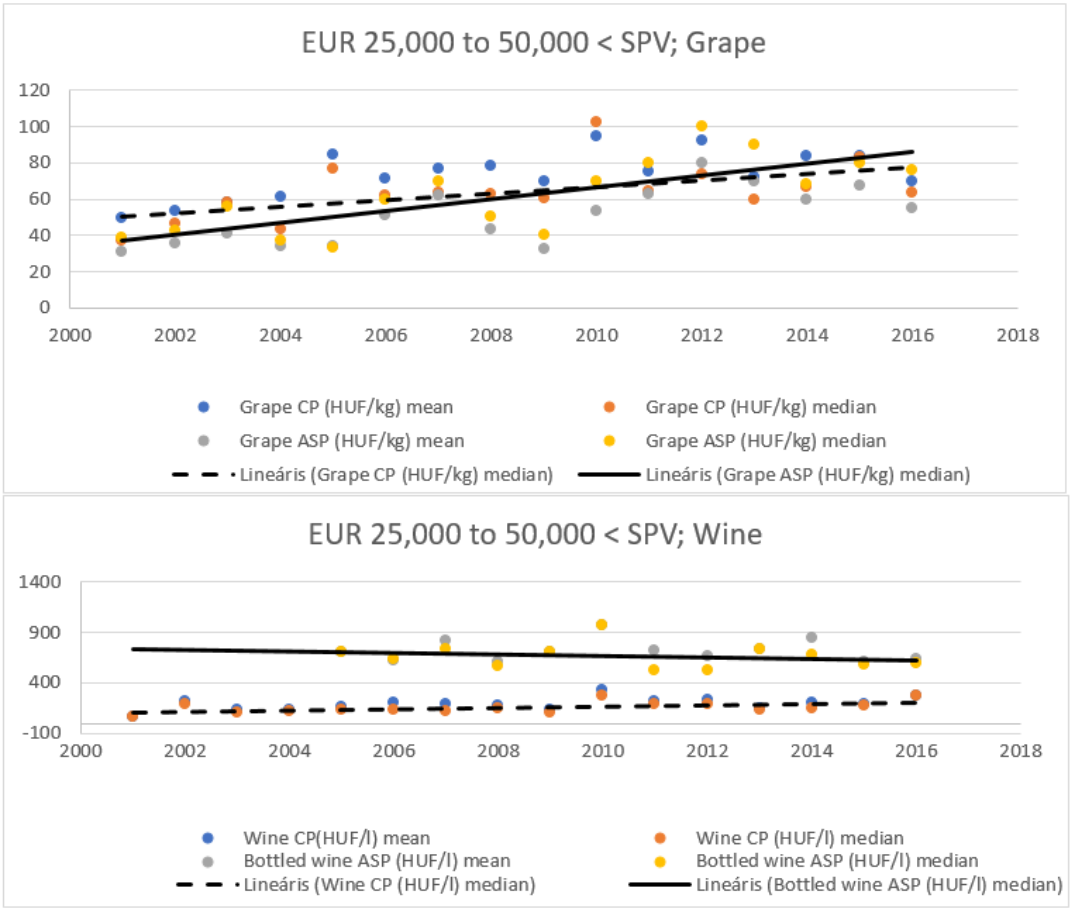
Figure 3: Mean and median data and trends of the relatively small farm size



Source: Based on AKI data, edited by the author

Figure 4 shows the medium farm size that ranks fifth among all farm sizes. Based on that after the economic crisis of 2009 the buying-in price of grape exceeded its cost price, which is basically a positive result for the grower. So it proves that also Hungarian vine growers can make a profit, but to this it is necessary to have at least this size category.

Figure 4: Mean and median figures and trends for the medium farm size

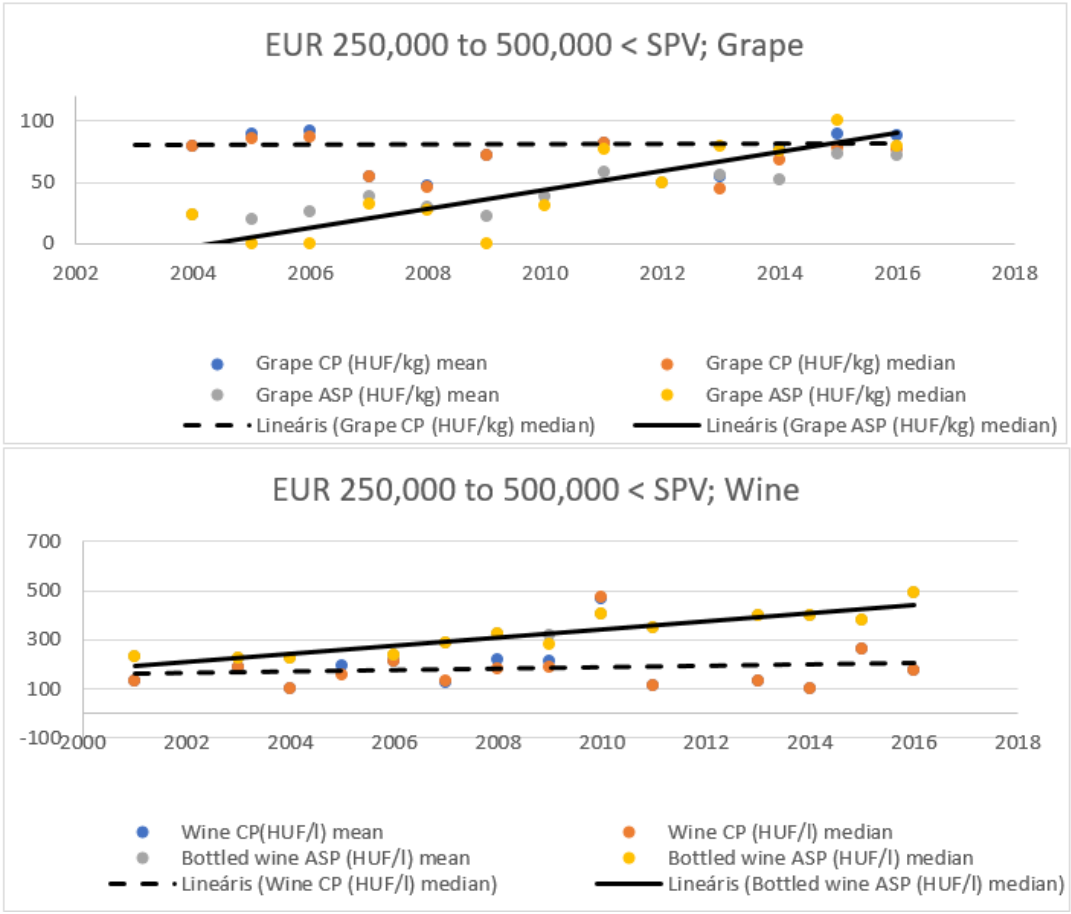


Source: Based on AKI data, edited by the author

The analysis showed as well that the cost price of grape is practically constant for the largest farm size involved in the study (*Figure 5*). For a lay person it may be interesting however the laws of economic supply and demand can be changed many times in practice, as also in this case. Please note that the values included also zero being an entered value entered, not resulting from the lack of data. Summarizing the size categories the result shows that in 2016 the buying-in price exceeded the cost price. The cost price is almost constant also for the wine, but here the average price is always higher than the cost, so a clear trend of growth can be observed.

Analyzing the cost and income data of farm sizes it can be concluded that the small-scale farms can sell the grapes at a relatively higher buying-in price compared to medium and large farms. The medium-scale farms receive the lowest buying-in prices for the grape, however this value fluctuates to the greatest extent at the large farms. Surely it also comes from the fact that if a large farm grows the grape for itself, it can be deducted as an expense, but in order to benefit from the subsidies it is worth making a positive result at the end of the year.

Figure 5: Mean and median figures and trends for the large farm size



Source: Based on AKI data, edited by the author

In 2004 the buying-in price of grape dropped by half due to the EU accession and the large volume of imported wine for the smallest farms. Based on the whole analysis the medium-scale farms can realise the highest profits among vine growing farms in most years, despite the fact that in proportion they are faced with the lowest purchase prices for grape. It results probably from that they make a better use of economies of scale factors, as well as they are able to rationalise and reduce their costs through the existing asset capacity. They are much more flexible than the large-scale farms and ride out the new challenges more easily.

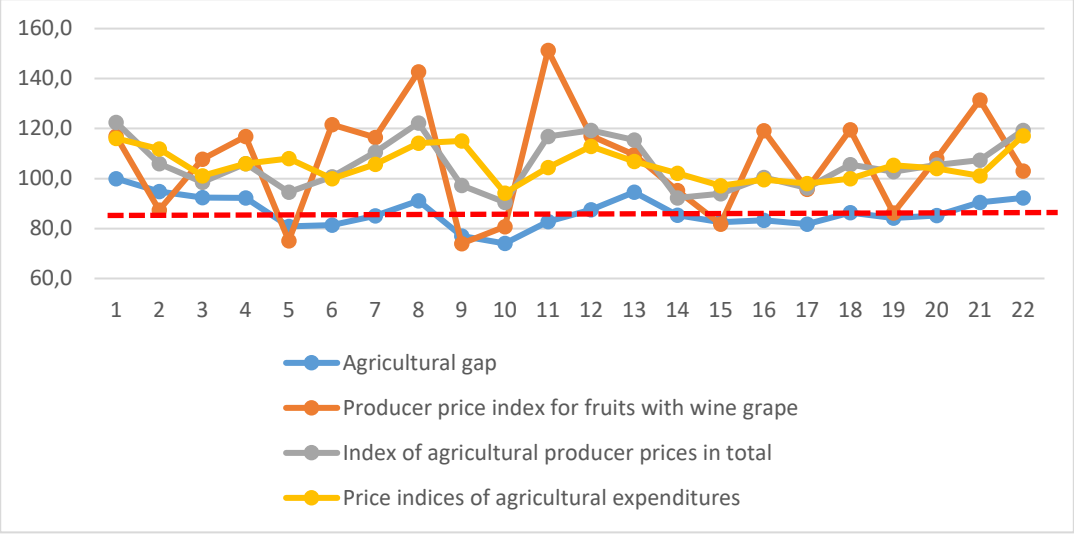
An interesting observation is that the large-scale farms can put to account the grape at a price up to one and a half times as much compared to that they give to the small-scale farms. I think from that it can be assumed that there is some reserve, with which the large-scale farm could give the small- and medium-scale farms more for the grape.

It also confirms that there are many of the players in the sector, who are responsible for that the growers are struggling for living and survival. Szabó (2022, in Kabarcz-Horváth) also agrees with it, since he says that big-buyers have more

lobbying power, and they keep the buying-in prices of grape down deliberately. According to him, the published price forecasts are unnecessary and determine humiliating buying-in prices for grape. Then he continues with the opinion that the cooperation of wine growers is also missing.

If we update the data, it would be outlined most likely that due to an increase in input prices the cost prices increase to a greater extent than the prices of grape or wine. Scilicet *Figure 6* shows clearly that since 2000 the value of agricultural gap has remained below 100, which means that the prices of inputs coming from the industry have increased to a greater extent than the cost prices of agricultural production. It puts the farmers in an unfavourable position, who are taking already a very high risk due to weather anomalies. Although the farmgate prices of fruits seem sometimes to be outstandingly high, these values represent averages, in which wine grape is only a variable.

Figure 6: Agricultural gap and agricultural indices, 2000 = 100 %, 2000-2021



Source: Based on KSH, edited by the author

If we include the cost of labour - showing a similarly continuous and dynamic increase in Hungary - in the formula assuming the minimum wage, we can come to the conclusion that it is worth growing merely vine only if we have at least a medium farm size, and we are also equipped with the necessary machine stock to carry out growing works in due time. Vine grower of Kiskőrös Csővári (2022) has also confirmed it.

4. Discussion

In its entirety we can say that both hypotheses are supported. We proved that the profitability of vine growing is uncertain for Hungarian farmers dealing only with

vine growing, because it is not necessarily moulded according to the laws of supply and demand. The perishable nature of fruit is often exploited from the part of the trade. Furthermore, as well we shown that vine growing can be profitable, but for that at least a medium farm size is necessary. For the vine growing sector it is good if effectiveness and economic viability as well as preservation of natural resources can prevail from the sustainable agriculture formulated by Valkó et al. (2018) in Hungary. For the latter the aim is to keep the size of vineyards to avoid further reductions in area.

Further directions of research may cover subsidies used in the grape and wine sector and their usefulness, methodology of forming grape purchase prices, methods of grape processing, existing and possible collaborations in the grape and wine sector, with which I have already dealt in my previous researches, and they will provide bases for my research also in the future. In relation of the European Union it is worth making comparisons for the entire grape and wine sector, with special regard to that why there is such a big difference between the purchase prices of grape and its cost-effectiveness.

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