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**PhD School of Management and Business Administration**

**THE EXAMINATION OF THE PROFITABILITY OF THE GRAPE AND WINE  
PRODUCT PATH**

**Thesis of the doctoral (PhD) dissertation**

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# **1 INTRODUCTION**

## **1.1 The actuality of the topic, its scientific background**

The grave situation of the grape and wine sector is the overall result of several factors. The economic impact of the change of the regime, the global over-supply, the reduction of consumption, the alteration of market needs, the extension of the group of grape and wine producing countries, global warming and the global economic crisis that aggravated the difficult financial questions have all contributed to it. The decrease in integrative connections, unpaid grape production and problems of sales can result in the farmers' cutting out their vineyards. The increasing difference of industrial-agricultural products, low production price and income make the competition even worse. The great wine making countries of the EU have realised the opportunities hidden in vertical coordination and long term cooperation while studying the successes of the New World. The cooperation between the phases of the Hungarian wine verticum is weak, that is why the share in the income generated in the product path is decided by the dominant players by taking advantage on their market power.

## **1.2 Defining the topic**

The actuality of the topic is justified by the agriculture and food industry's losing ground to the dominance of commerce and also the sharpening disagreement between grape producers, wineries and commerce. During my research carried out within the framework of my doctoral dissertation the examination of the basic tensions of the wine-grape product path, the prices formed in the certain stages of the verticum and their impacts, integrative connections and the system of entering into contractual relationships were emphasised. To meet my objectives, in my opinion it is essential to explore the price and power relations between the different stages of the product paths. The intensive competition resulting from the market segmentation and increased supply after the regime change made the situation of the Hungarian wine-grape sector difficult so consequently, the imbalanced power relations among the viticulturists, viniculturists and commercial units created opportunities to acquire disproportionate profit between the single stages.

## **1.3 Objectives**

- The complex sectoral analysis of the grape and wine verticum, pointing out its costs and revenues on the level of the producers, processors and commerce.
- Exploring the relations between the prices of the stages in the product path. Expressing the symmetry, direction and extent of the price change regarding its temporal relations reflected in the prices of the next successive phase by using price transmission.
- Examining the coordinating strategies of the stages of the product path and the analysis of the contractual practice on the basis of the results of the questionnaire.

## 2 MATERIAL AND METHOD

### 2.1 Research hypotheses

On the basis of the experience of the professional literary review the following **research hypotheses were formulated** and analysed in my dissertation with regards to my objectives:

*Hypothesis 1 (H<sub>1</sub>)* There is disproportionateness between the single stages of the product path regarding the profitability of the wine and grape verticum.

*Hypothesis 2 (H<sub>2</sub>):* The product path is characterised by lack of cooperation and integration. The viticulturists are in a vulnerable situation and their position for negotiation is minimal.

*Hypothesis 3 (H<sub>3</sub>):* There is asymmetrical price transmission in the grape and wine verticum and the unsatisfactory market position of viticulturists can exactly be expressed in numbers.

I have chosen the method of asymmetric price transmission that is based on the co-integration theory and already accepted but not widely used in agriculture with the help of which the price setting and following situation of the players of the wine and grape verticum is analysed and the dominance of the more powerful one expressed in forints is defined.

The thematic layout, the database creation and the applied methodological procedures were compiled while taking the verification of the problems outlined in the hypotheses and typical of the entire grape and wine sector into consideration.

The databases used to justify the hypotheses and the methods applied are listed as follows.

### 2.2 Defining sources of data, methodology

In my dissertation *secondary and primary data* were made use of. The range, content and structure of the information necessary to carry out the examination were defined by the method of the vertical analysis of the grape and wine sector. The vertical analysis embraces grape production, wine making and commerce and the relations between the stages of the product path alike. Gathering and processing information followed the entire process of defining price, cost and profit relations as the single analyses required new and, to a certain extent, different information.

The data on the situation of the grape and wine sector were collected starting from 1990. The analysis of the verticum embraces the period between 1990 and 1999 and also the one between 2000 and 2009.

Regarding **the selection of the methods used** it was important that they would be applicable when justifying my hypotheses depending on the type and professional nature of the hypotheses. The principles below were formulated with regards to the selected methods:

- They should provide an opportunity of forming groups in the case of both the variables and the observed persons.
- The procedure should make the analysis of bi-and multi-variable stochastic relations possible.  
There should be an opportunity provided for the examination of the temporal changes of factors.
- The result gained should economically be interpretable and generalised.

As there were not any procedures that could have met all the requirements listed above, several analytical instruments were used during the examination. I have chosen

- correlation and regression analysis to examine the relations between qualitative factors,
- stochastic procedures of time series to present temporal changes,
- factor analysis to reduce the number of variables and
- cluster analysis to form groups

in order to meet the principles above by considering the nature of the variables. The methods applied are described in more details in the single topics examined.

### **2.3. Statistical methodology**

Data processing was carried out through SPSS 16.0 (PASW Statistics 18) statistical programme package and MS Excel spreadsheet programme. The time series were arranged in tables and data processing was started by calculating the descriptive statistical indicators (mean, deviation, relative deviation etc.)

Of the linear, exponential and power functions tested in regression analyses I chose the one whose application resulted in the best fitting regarding relative residual spread (Vse) and determining coefficient ( $R^2$ ).

I also examined the system of contractual relations and its anomalies in the grape and wine product path. To this end, in 2010 a survey based on questionnaires was carried out and supplemented by in-depth interviews conducted with viticulturists and viniculturists. The number of the questionnaires sent out was 514 and the returned ones were 453 in which the questionnaires containing negative answers or some lacks were also considered. The processing of the questionnaires was accomplished by using the procedure described above.

The sample based on the questionnaires is representative. The selection of the responding viniculturists and viticulturists was carried out through the stratified sampling based on the method of TELEGDI (1993, 2004). The strata were made up by considering the number of enterprises and the cultivated area per wine region and size of enterprise so in this way more homogenous groups with less deviation were selected in the single strata.

The method of Varga-Tunyoginé-Mizik (2007) was applied to measure value transfer and price transmission that took place through prices during which the results of the correction model were directly used. I followed the methodology of Varga et al. (2007a), i.e. I examined that in what proportion the values of the price set by the co-integration equation that can be regarded as a price centred series were above and below the value of the price centre during the entire period examined. Both equations of this indicator result in the same value. Afterwards I examined the values of the speed of price restoration gained from both equations and the values differed. Dominance was contributed to the market player whose price can be independent of the impact of price changes to a greater extent. In other words, which reached the values above its price centre permanently to a greater extent than below and furthermore, could rather slow down the restoration of the more favourable price than speed up and vice versa, i.e. could rather speed up the restoration of the unfavourable price.

I defined the following ones of the indicators formed by Varga et al. (2007b) to express dominance:

- **Price difference:** the difference between price losses and gains per examined period expressed in monetary terms.
- **Average price deviation:** expresses the volume of the average price deviation (gains or losses) typical of the entire examined period in monetary terms.
- **Rate of price deviation:** an indicator that expresses the direction and extent of deviations that exceed 50 percent from the price centre. It indicates the dominance of gains if it is positive and the dominance of losses if it is negative. Its value expresses the share of the given price deviation of the total price deviations in percentage.
- **Price deviation frequency:** expresses the number of occurrences of the dominant price deviation (gains or losses) during the entire period examined in percentage.
- **Ratio of price change:** the ratio of average price deviation relative to price.
- **Price deviation stability:** the quotient of the ratio of price deviation and the price deviation frequency.  
Value domain:  $0.5$  and  $price\ deviation\ stability \leq 100$
- **time of price restoration:** the duration of price margin equalisation (in the examination) expressed in months.

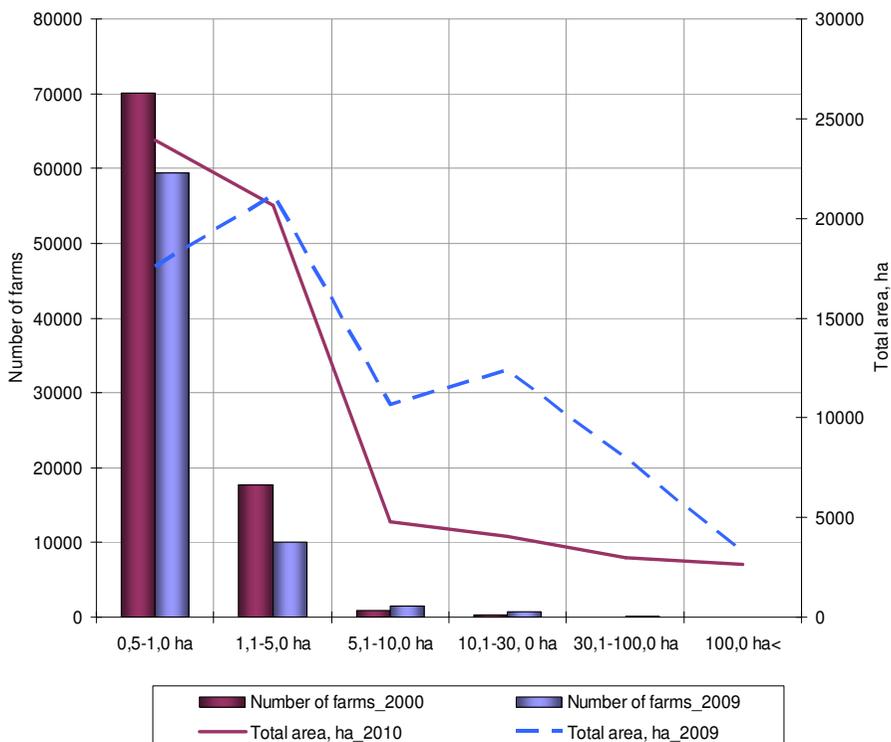
In my calculations I used the data between January 2001 and December 2010 deflated by monthly core inflation data and counted with the monthly retardation of co-integrated equations increased till 12. In this way I estimated 282 equations of which I would have had to select the six acceptable ones by means of the tests mentioned above (three and three respectively, of the white and red wine verticum). In order to avoid the test producing a great number of and mostly rejected results I started testing co-integrated equations from the most likely versions on the basis of the economic content and the first significantly acceptable ones were selected.

### 3 RESULTS

#### 3.1 The general managerial questions of grape and wine verticum

In the process of the review of the national and international professional literature primarily the relations that helped in meting my research objectives were explored. I would highlight the figure representing the typical ‘scheme’ of oligopoly of them whose vertical narrowings and broadenings indicate the different number of market players and the extent of their concentration on the vertical levels. It also typifies the Hungarian grape and wine verticum. The extent of concentration can significantly influence the market position and prices.

In 2009 the production area of grape was almost 60-65 thousand hectares and only 550 thousand tonnes of grapes were produced. Wine consumption decreased and oversupply was typical of both the world and the Union market. The existing stocks, the economic crisis and the grater price difference of industrial-agricultural production make the situation of the single players of the product path even worse. Farm concentration started but still the ratio of farms below 1 hectare is great, the owners of whom hope to earn extra money in addition to their salary (Figure 1.) It is favourable that between 2000 and 2009 the number of farms above 10 hectares increased together with their cultivated area.



**Figure 1: The breakdown of the number of grape producing farms and their area in 2000 and 2009**

Source: compilation based on the data of NCWC (National Council of Wine Communities)

### 3.2 The profit relations of grape production

When analysing the profit relations of grape production I concluded that the extent of the annual average growth of production cost was double the amount relative to production value in the case of private farms. In the case of joint farms the great volume of cost rise resulted in the decrease of revenue. The sectoral profit decreased between 2000 and 2009 regarding both private and joint farms.

Returns per 100 HUF cost was 19.7 Ft/ha in 2000, only 1.2 HUF/ha in 2009 in the case of private farms while during the same period it was 104.2 HUF/ha in joint farms that means a -11 HUF/ha loss by 2009. The revenue per unit was formed in accordance with it, i.e. it brought along negative returns (-8270 and -24860 HUF/ha) between 2000 and 2009 in the case of both types by the end of the period.

When analysing **the sales price and production cost** I concluded that the reason for this unfavourable situation on a national level was that sales prices did not cover production costs. In 2000 the average sales price in the case of both private and joint farms exceeded the production cost so they were able to earn income to a certain extent. By 2009 this tendency was reversed when unit costs were not covered by the purchase price of wine grapes. However, there is a difference between production cost and the sales price of wine grapes at different organisational forms but the tendency is the same everywhere. Prices follow the rise in the costs of grape production only later and to a significantly smaller extent. Therefore, they are in an asymmetric relationship regarding pace and proportion. It does not only refer to price transmission but also to the natural phenomenon according to which the results of grape production in the given year will prevail in next year's production in the production price of wines.

Consequently, **the sectoral returns** in the case of both private and joint farms significantly fluctuated. A significant loss occurred in the case of both types in two years. The returns were annually more than 30 percent (5190 HUF/ha) lower during the examined period in the case of private farms despite the fact that the gains were 11 percent greater relative to the beginning of the period. The returns of joint farms decreased by 10.5 percent (30.789 HUF/ha) annually on the average although the gains that could be made were reduced by 140 percent relative to the base year.

### 3.3 The cost and revenue structure of the grape and wine product path

The cost and price structure of the verticum, the process of agricultural production, food industrial processing and distribution must be interpreted as on single system. During my research I tried to find an answer how the costs incurred in making the examined wines and transporting them to the consumers were shared between the single stages of the verticum and to what extent the income generated served the direct interests of the different stages of the grape and wine verticum. There is no proper existing database in Hungary to make the calculations above. That is why the cost and revenue analysis of the levels of the product path was carried out within the framework of a case study.

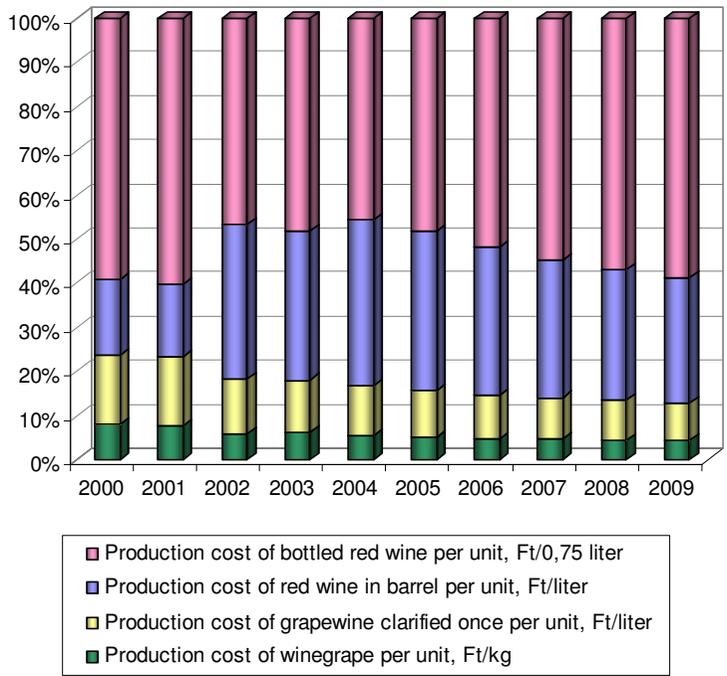
I analysed the cost structure and profitability of a Kékfrankos (Blue Frankisch) from Villány and an Olaszrizling (Italian Riesling) from Balatonfüred-Csopak based on the technological and cost-revenue data of family farms. I also analysed what costs and profits can arise at the single stages of the product path. Both farmers processed their own grapes and purchased grapes to satisfy wine market needs. Processing took place at the same time, so that is why the buying price of grape was considered in the calculations. In the thesis I will present the example of the Kékfrankos.

Wages and the price of raw materials mean the heaviest burden of the costs of grape production. In wine making the cost of raw materials amounts to almost half of the costs incurred. Nearly 50 percent of the costs of bottling are made up of raw material prices, whose volume is also reflected in the cost structure of the finished products. It is only worthwhile bottling their wine for the farmers if the market prices (together with the revenue) cover their expenses. The red wine of excellent quality can be offered on sale at the cellar and in wine tourism, which also means profit for them.

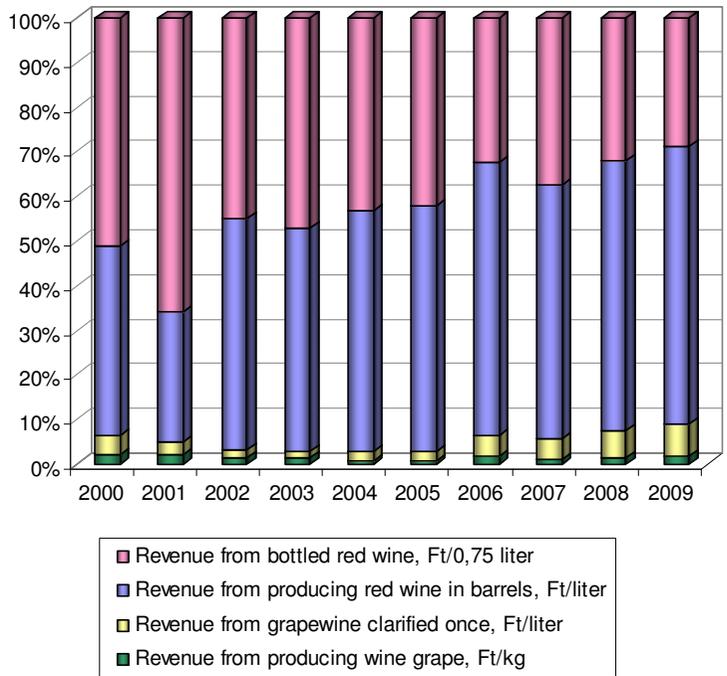
When analysing the cost and revenue structure of the single stages of the product path (Figure 3 and 4) we can see that the biggest costs are not incurred by grape production despite the fact that the greatest risk is taken by maintaining long life plantations. The generated income relative to this is minimal. The costs of wine making result in a greater scale profit and the sales price paid can hardly cover the extra costs of bottling. The key question and also the objective of the vertical level examinations are to present the positions of profitability between the different players that highlights the root of the tensions within the product path.

The conclusions drawn can only moderately be generalised as costs, prices and indirectly profitability are also affected by the natural conditions and reputation of the wine region but first of all, by the opportunities of the variety and the market. During the in-depths interviews there was such an opinion according to which costs are not dependent on variety. I strongly disagree with it as in fact, most of the production costs are fixed disregarding the extra costs of pesticides due to the weather but there are less resistant varieties that require greater care and therefore higher costs.

To sum it up we can conclude that significant investment and expenditure must be made on the grape and wine product path for wine making in addition to producing raw materials. Production costs return depending on the all-time negotiating position of the players in the verticum or result in greater or smaller revenue. Taking the amount of revenues into account on the basis of my examinations the enterprises producing bottled wines are in the most favourable position while regarding the profitability level that shows the return of costs the agricultural plants that produce wine in barrels are in the most favourable position. As a result, the producers of raw materials for wine must strive not to sell their products in the form of grape, rather, they must improve their position of negotiation through organising different cooperations and partnership and establishing common processing and bottling plants.



**Figure 3: The cost structure of the grape and wine product path (Kékfrankos red wine)**  
 Source: calculations

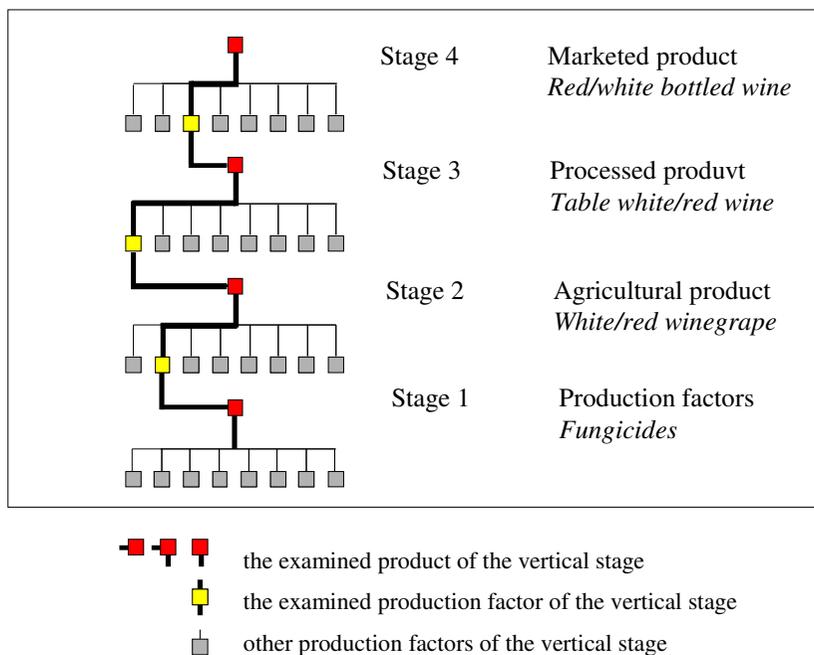


**Figure 3: The revenue structure of the grape and wine product path (Kékfrankos red wine)**  
 Source: calculations

### 3.4 The analysis of price transmission in the grape and wine verticum

The prices corrected with inflation that belong to the single stages of the verticum suggest oligopoly. According to the econometric analysis the prices on the market of grape and wine production have a down-top effect while at the upper part of the product path their effect is top-down. The price transmission between the two ends of the verticum and the stages of the single product paths is asymmetric and delayed in time, which has a significant impact on the crisis of the grape and wine market hit by oversupply in the Union.

Vertical price transmission was performed backwards, i.e. with the help of the prices of the marketed product (bottled wine), the processed product (wine in barrels), the agricultural product (winegrape) and the decisive production factor of the latter one (fungicide). (Figure 5)



**Figure 5: Defining the stages and the product of the vertical price transmission analysis of the wine verticum**

Source: Nagy-Kovács - Varga (2010)

The input and the examination of the price of the winegrape both in the case of white and red wine show that the price of the winegrape was above the price centre for a long time at the beginning of the examined period. However, it could not follow the expenditures of investment with its own prices so that is why only the most necessary investments were made by the farmers during the production, which can result in a loss of revenue and quality degradation in the long term. There were 14.4 HUF returns per kg on fungicides selected as a production factor, which amounts to 23.22 percent of the

price. Returns occurred in 78.1 percent of the ten years and amounted to 91.5 percent of the total price difference. The price movement of fungicides was characterised by an acceptable level of stability in price difference and price restoration within 293 months. In the analysis of the purchasing price of grape and prices in viticulture it can obviously be seen that production prices are pushed by the processors but its dominance was not striking during the examined period as the price of winegrape was below and above the price centre in several cases. Certain circumstances such as poor yield due to weather conditions can also result in asymmetry. In this case production price will be restored but it takes a long to balance the effect of the shock. The relationship between the sales price of winegrape and the processing price of table white wine is expressed in the price loss of 0.5 HUF in the price of winegrape. This price loss corresponds to 1.1 percent of the price of the grape and was maintained in 58.3 percent of the examined months representing a share of 53.7 percent of price differences. Price differences can be regarded stable (0.92) and prices were restored within 33 months. The same price relationship in the case of the processing price of table red wine incurred a price loss of winegrape. Price loss here was 0.3 HUF, i.e. 0.7 percent of the grape price. The ratio of months with a price loss was 58.3 percent, the ratio of price loss amounted to 52.2 percent while the value of the stability of the price difference reached 0.90. The average price restoration took 31 months.

The dominance of the commercial sector is obviously reflected in the analysis of the sales price and purchasing price of wines. It was only able to approach its own price centre in the last few months within the period examined. Commerce reacted to rise in the prices of viticulture immediately and to a greater extent while price decreases were followed with some delay and to a smaller extent.

A loss of 29.1 HUF could be booked in the processing sales price of table white wine, which comprises 14.7 percent of the price. Price losses could be experienced in 99.0 percent of the examined period. The ratio of losses was 100 percent of price differences. Price differences were characterised by stability (1.01). It would have taken 1248 months to restore prices. Simultaneously, a 12.4 HUF loss was realised in the price of table red wine. This price loss amounting to 11.5 percent of the price existed in 97.9 percent of the examined ten-year period. The ratio of prices above the price centre was 99.7 percent. Stability was typical of price differences only to a small extent and a frequent, slight price fluctuation could easily shake the position of power. Prices could be restored within 615 months.

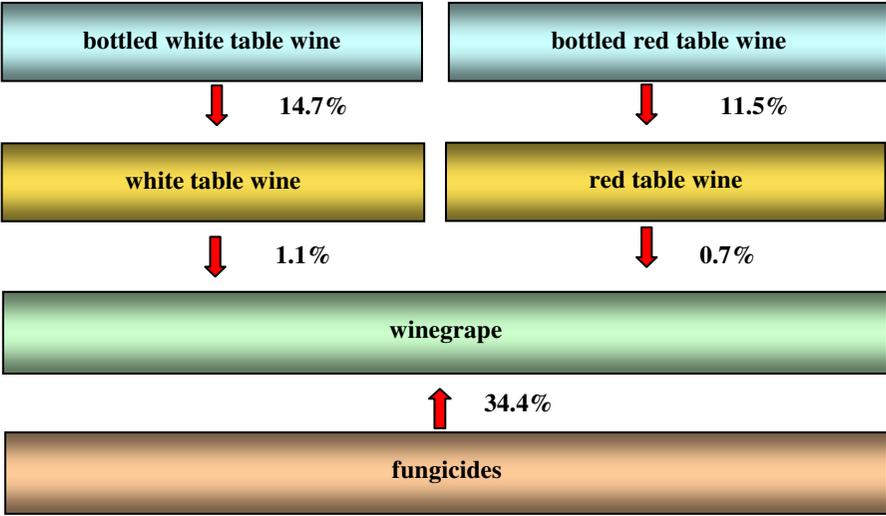
The results of my examination are summarised by Figure 6, which stresses the statement made above, i.e. winegrape producers make up the most vulnerable stage of the verticum. It also can be stated that price transmission within the wine verticum resulted in a dominance contrary to the production stage and both its upper and lower vertical partner. The production stage in the case of both the table white and table red wine had to bear a pressure in price by the distribution stage of the processed product. Grape producers are affected by a strong price pressure directly from the processors above both from the sales side of production factors and wine distributors mostly reduced by the level of processors. My examinations can also prove the existence of such impacts that are felt by the producers through the changes of their purchasing and sales prices. In my opinion expressing these impacts in numbers directs the grape producers' attention to the necessity of cooperation and integration.

In this situation producers cannot count on substantial external assistance and a central interference in the processes in this situation when taking the Union perspectives into consideration. It can be seen that the challenges of the future can only be met by the grape producers and wineries that are able to make alliances, concentrate production and harmonise their product supply with the demand.

The conclusions drawn on the basis of the results are that grape producers are under the dual pressure of the price pressure of their vertical partners coming from the sales part of production factors (price pressures of this nature would need 1.5-2 years to restore on the average) on the one hand and the wineries on the other hand, which can mainly be reduced. However, it is the price pressure coming from the wine distributors that influences the purchasing price of the grape. The restoration of prices of these types would require 2.5-3 years.

During a long period it is most likely that another shock occurs that causes further backlog. Dominance can vary also due to the price differences caused by fluctuating weather conditions.

Wineries suffer from the price pressure of the commercial sector that they try to pass down to grape producers. There is hardly enough time for the total price restorations that follow shock-like price differences till the next price shock.



Code: ↓ direction of dominance % = price gains of the partner suffering price pressure in the percentage of their own

**Figure 6: The extent of market dominance in the table wine verticum between 2000 and 2008**

Source: Nagy-Kovács – Varga (2010)

The result of my examination justified and supported the hypotheses by data that describe the situation of market power relations that are well known by the professionals in the wine verticum. The extent of dominance of the grape and wine verticum was expressed numerically during my analysis.

The grape producers' position of negotiation could be improved by economical farm size, farm concentration and pushing common interests as well as establishing long term integration between the single players of the verticum together with wineries.

### **3.5 Analysing vertical coordinations and contracting in the grape and wine verticum**

The different forms of economic cooperation can be found in the Hungarian grape and wine verticum. The long term relationship forms are mainly targeted at producing and buying winegrape. The cooperation assists the purchase and marketing grape and wine while purchasers ensure the goods base of bigger enterprises. Despite this fact, the permanent relationship that is based on similarity of interests does not guarantee security for the suppliers and have a favourable impact on the profitability of the farmers. Repeated late payment or occasional non payment leads to lack of trust and the absence of cooperation results in a weak position of negotiation, which has an unfavourable impact on the situation of Hungarian viniculture.

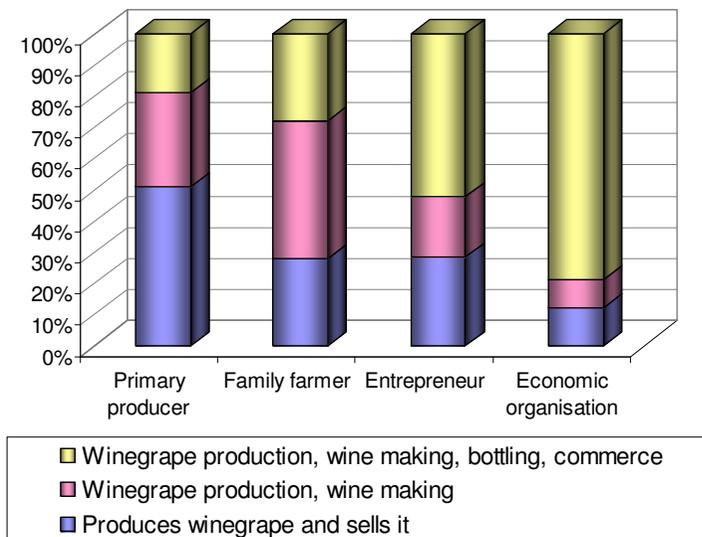
The different forms of economic cooperation were surveyed by questionnaires on the basis of the sample made up on the database of NCWC members. I was striving to include all the stages of the product path in my research but the commercial sector denied responding. That is why I had the opportunity to explore the forms of cooperation and contractual relations between the grape producers and wineries.

Fifty-one percent of the primary producers interviewed are compelled to sell winegrape and 30 percent wine in barrels and only the activity of the remaining 19 percent is incorporated in the product path. (Figure 7) The ratio is more unfavourable in the case of family farmers as 44 percent market bulk wine and 28 percent bottled wine. Fifty-two percent of entrepreneurs and 79 percent of economic organisations operate the entire product path.

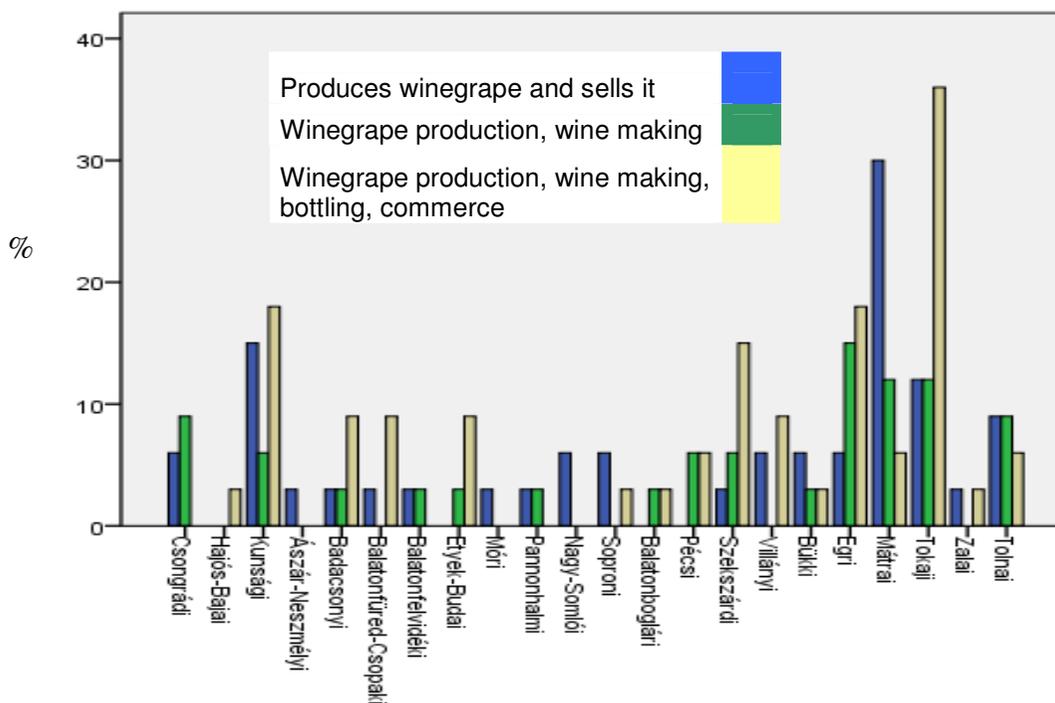
It would be more practical for the primary producers to market products with more added values through cooperation to improve their financial situation. Figure 8 presents the breakdown of the ownership of the single stages of the grape and wine product path per wine region. The wine region of Tokaj is most engaged in marketing bottled wine in the biggest ratio.

#### **The examination of the integration relations of the grape and wine product path**

During my examination I was searching for the answer whether the single stages of the grape and wine product path required vertical integration, what coordinating strategies viticulturists and viticulturists regarded acceptable and how the integration relations to be formed can increase the economic gains of the suppliers and the engrosses.

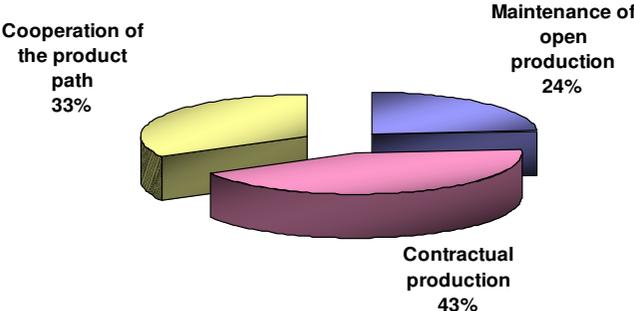


**Figure 7: The breakdown of ownership of the single stages of the grape and wine product path by forms of operation**  
 Source: calculations



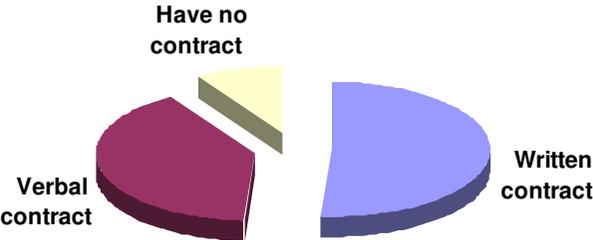
**Figure 8: The breakdown of ownership of the single stages of the grape and wine product path by wine regions**  
 Source: calculations

On the basis of the questionnaires I analysed what coordinating strategy viniculturists and viticulturists regard acceptable. (Figure 9) Forty-three percent of the respondents regarded contractual relations desirable in which both the grape producer and the engrosser are committed to perform the commercial transaction. Cooperation on the product path was chosen by more than one-third of the respondents. In the contractual production both parties run a commercial relation and sales take place on the basis of the price agreed on previously.



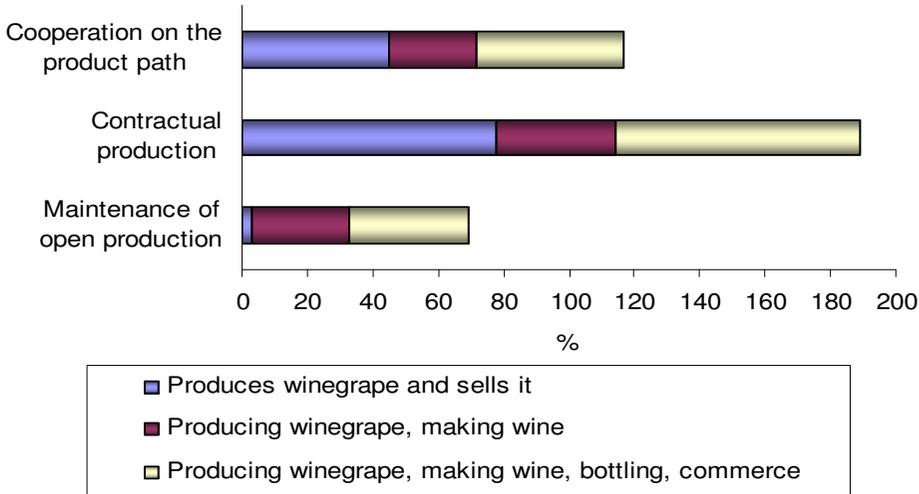
**Figure 9: The coordination strategic ideas of the farmers**  
 Source: calculations

A great part of grape producers sell on the basis of contractual relations. Fifty-one percent of the respondents make written contracts, 40 percent verbally and 9 percent sell the grape produced ad hoc for anyone who pays cash immediately. The willingness to pay is very unfavourable in Hungary according to the experience of the farmers. (Figure 10) As institutional integration has become non-viable, most producers are in a contact with the engrossed only in terms of transportation. In this case vertical integration does not bring any benefits. Moreover, other types of product sales can be more favourable. The contractual liability is violated if another engrosser promises some forints more. At the same time, however, engrossers take advantage of the vulnerable situation of the producer and it takes half a year or a year to pay for the grape produced, of course, without interest, which can also be the consequence of circular debt typical of the economy. To prevent this, several solutions were created within the framework of long term contracts as an alternative to vertical integration.



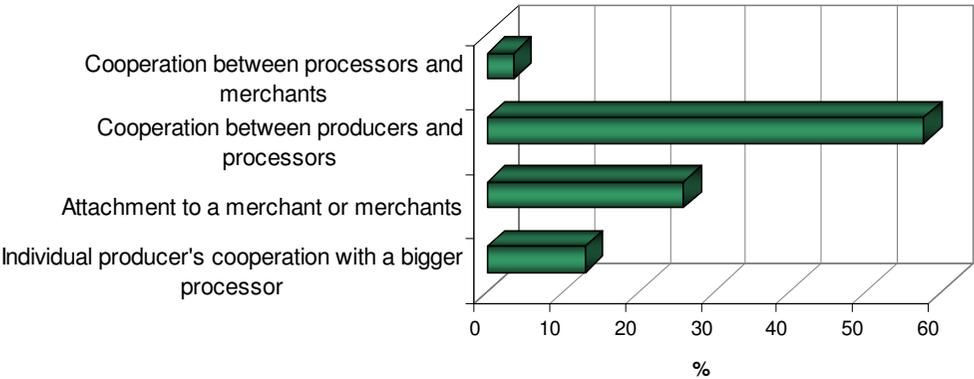
**Figure 10: The breakdown of contracts used by grape producers in sales**  
 Source: calculations

The breakdown of coordinating mechanism was also analysed from the point of view of enterprises that embrace the different stages of the product path. Those engaged only in grape production feel the maintenance of open production the most risky. (Figure 11) The contractual production is the most frequent on the grape and wine product path.



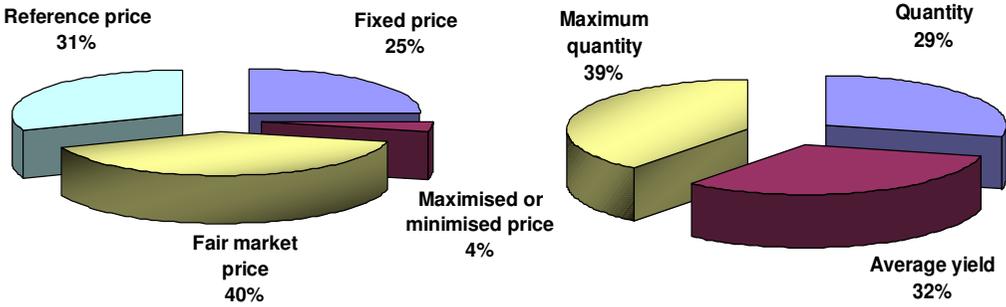
**Figure 11: The judgement of contractual coordinations on the grape and wine product path**  
 Source: calculations

Furthermore, I wished to explore the ideas of the farmers on establishing integration. (Figure 12) Most of the grape producers find the security of sales in the cooperation between viticulturists and viniculturists. Despite my expectations only 26 percent voted for cooperating with merchants although the opportunity of phasing out intermediaries between the producers and consumers was also suggested in the answer. Cooperation between the viniculturists and merchants was selected by one quarter of the viniculturists and 75 percent stressed the strong cooperation created with commerce.



**Figure 12: Breakdown by the type of integration**  
 Source: calculations

The quantity (29 percent) typical of the given type was recorded at the examined purchases but also the maximum limit of production that influences quality (39 percent) and average yield (32 percent). More than 41 percent of the contracts maximises quantity. (Figure 13)

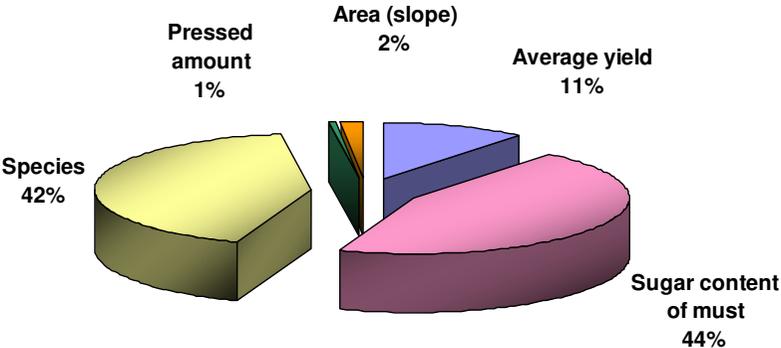


a) The method of price fixing

b) Factors in the econtract

**Figure 13: The contextual factors of contracts**  
Source: calculations

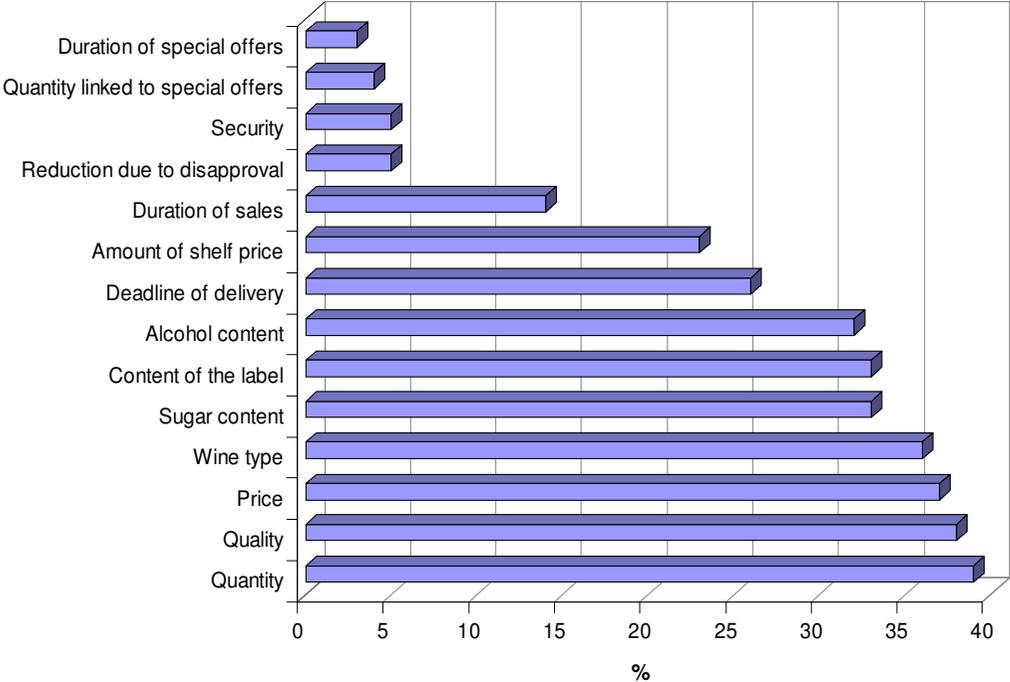
Price forming mostly depends on the sugar content ( $M^{\circ}$ ) and qualitative (species) classification (Figure 14), which are already published by the engrossers when announcing the prices of the given year. There are wineries where good quality is aimed by regulating average yield although according to some experts green vintage is not proved to be effective and the cost of extra labour does not return in revenues. To ensure grape production of excellent quality the dynamically developing wineries produce wines selected by slopes and forth excellent grapes they are willing to pay extras. Very rarely but does happen that they purchase must (grape juice) and in this case the pressed amount is decisive.



**Figure 14: Factors that affect price**  
Source: calculations

The contracts between the wineries and commerce contain several stipulations whose categories are illustrated by Figure 15. Reduction due to objections is also recorded in addition to the factors on the quality and quantity of the product and the characteristics of bottling. In

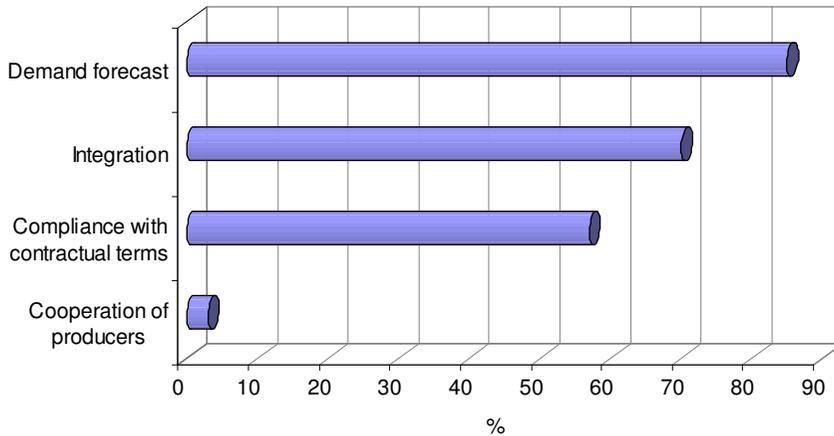
some cases foreign (mainly eastern) partners even debated the best quality so the consignment was rather sold at a lower price as in the form of returns it would have caused a greater loss in revenue.



**Figure 15: The factors of contracting for selling wine**  
 Source: calculations

Commerce negotiates about the terms of the contract with the wineries only once a year in 95 percent of the cases. In contrast with it, a similar ratio of farmers would require negotiation at least twice a year, for example, about forecasting demand, changing market needs and the success of special offers. Figure 16 reflects not only the ratio of the factors regarded to be the most important by the farmers but also expresses a ranking at the same time, i.e. how farmers marked demand forecast that serves their ‘protection’, the more efficient operation of integration and compliance with the terms stipulated by the contract.

Lack of trust that characterises the economic sector is outstriking. Most producers would like something to happen but do nothing to achieve it. Not only vineyard owners suffer disadvantages due to the delay of revenue but also wineries. The great chain stores ask for at least a 30-day deadline for payment starting from the receipt of the invoice or set as certain day as a deadline of transfer. Of course, much greater delays than that can occur to settle the invoice.



**Figure 16: The factors of strengthening the producers' position against commerce**  
Source: calculations

Coordination and integration are necessary for all the players of the grape and wine product path and depending on what situation viticulturists are against commerce, grape producers are held in a similar situation. There is a need for vertical integration to reduce the price and revenue disadvantages of grape producing and wine marketing small farms and increase the position for negotiation for the raw material producers. However, the condition of it is that the number of grape producers who take part in quality goods production should be reduced, farms must be concentrated, or in other words, economical size must be created. Only those who can and willing to contribute to changes positively and actively can count on success in the long term and who are not only the passive participant of the events.

It is not enough to organise the sales of the finished product well as wines must be tailored to the requirements of the consumers. The proper raw material producing base is indispensable for the stable market presence, and consequently, consumers can meet excellent quality wine always of the same quality in great amounts on the shelves of the shops. A properly working vertical integration can make the Hungarian grape producing and wine making farms an internationally significant competitor (thorough advisory and quality assurance).

The market is basically defined by solvent demand and supply, which reflect the customers' and consumers' habits and influence the sales characteristic and traditions of the Hungarian wine sector. The wine communities, different associations and wine knight orders could play a decisive role in this process.

The available resources must be spent on planting grape types that meet the market requirements, establishing modern grape processors and wineries and improving production technologies.

### 3.6 New and novel scientific results

On the basis of my examinations I have formulated the following new and novel scientific results:

- Based on secondary database by applying modern methods I have proved that the balance between the consecutive stages of the Hungarian grape and wine product path has been broken. Farms operate by putting their own interests first almost without a vision for the future and meeting short term market needs. Revenue is made only by the dynamically developing family farms and partnership that perform tasks from grape production to wine selling.
- It has also been proved that integration is required by the producing and processing stages of the product path. However, interdependency without strategic objectives and long term relationships cannot force cooperation. Grape producers are not able to influence the market of grapes and reach a proper income position without cooperation and integrators.
- With the help of the price transmission analysis I have proved that there is an asymmetric price transmission between the players of the grape and wine verticum. The price transmission within the grape and wine verticum against the raw material producers regarding both their lower and upper vertical partners has resulted in a dominance as a result of which the players of the different stages of the verticum have found themselves in different income situations. On the basis of my calculations the profitability ranking (based on the data of Kékfrankos from Villány) is bulk wine clarified twice, bottled wine, wine clarified once and winegrape. The profitability position between the verticum stages has created a different ranking relative to the absolute income data. In addition to this general situation the bottled wines of historical traditions, good brand name excellent quality and high price are in the most favourable position.
- During my research I have proved that contracting does not guarantee either the payment of the price of the grape or the supply of wineries with quality raw material. Lack of contractual discipline is typical of all the stages of the grape and wine product path, which can increase sales uncertainties. Outstanding revenues past the deadline and occasional non-payment can endanger the financing of the next business year, which encourages farmers to give up their activity (cutting down vineyards, purchasing cheap foreign wine) or making the most necessary investment only.

The research results above can also prove the three principal hypotheses that were formulated at the beginning of the research work.

## 4 CONCLUSIONS AND RECOMMENDATIONS

The topics dealt with in my dissertation provide the opportunities of drawing diverse and complex conclusions in connection with which the following statements are made:

The producers of the players in the grape and wine sector are waiting for the solutions of the problems that have been aroused although they hardly do anything to protect their own interests. They are not competitive either in the structure of species or sizes and their willingness for cooperating is low.

The indispensable conditions of maintaining competitiveness are bigger production area, quality product and the opportunity of product differentiation. The connection to the distribution network is almost impossible for the small scale wineries as they should possess wine stocks in bulk and of balanced quality. The position for negotiations of the suppliers is weak as their species composition is bad and the farms are too tiny. Imported goods and substitutes that have gained ground in the market make terms of sales even worse.

It would be practical for the wineries to work out perceptual mapping per consumer segment that would visualise the market strategies in which their products are competing. Their positioning strategy should be built on it and give orientation for the grape producers by establishing integration.

I would suggest breaking down at least account group 5 when continuously paying attention to costs, which could make resource utilisation and cost management rational. When defining production costs the calculation is not totally correct as cost reducing factors are not deducted such as the funds obtained and the revenues from selling must or tartar are not considered.

Grape producers are under the dual pressure of the price pressure of their vertical partners coming from the sales part of production factors (as they are not able to accomplish the increase of costs ) on the one hand and the price pressure of the wine distributors can influence the purchasing price of grapes on the other hand.

The concentration of wineries is bigger and the atomised grape producers' position for negotiation is weaker and they become price followers. Dominance can also alter depending on the price changes that reflect weather fluctuations.

Wineries suffer from the price pressure of the commercial sector that they try to pass down to grape producers. There is hardly enough time for the total price restorations that follow shock-like price differences till the next price shock.

The result of my examination justified and supported the hypotheses by data that describe the situation of market power relations that are well known by the professionals in the wine verticum. The extent of dominance of the grape and wine verticum was expressed numerically during my analysis.

The grape producers' position of negotiation could be improved by economical farm size, farm concentration and pushing common interests as well as establishing long term integration between the single players of the verticum together with wineries.

The sector is characterised by the lack of trust between the players to a great extent and contractual discipline is minimal. The players of the product path of all the stages of the grape and wine product path, which can increase sales uncertainties. The players of the product path operate by putting their own interests first in this way further aggravating the situation of the sector. Although Union projects could help develop the verticum, the broken balance between grape production and viniculture has created an unfavourable trend.

This situation especially misses the vision for the future and involvement in it, the concept of development and the strategy of implementation. Regarding the national and international situation it must be considered whether the national viniculturists and viticulturists would like to participate in the wine market by dealing with wine and grape within the framework of the family (1) as a historical tradition, preserving culture and traditions, as a local speciality or related to other events and activities as a full or part-time job, additional activity or hobby or (2) as a decisive factor of the national consumption in the form of exporting special quality wines or (3) as a combination of the two directions or opportunities part of the wineries and vineyards wish to participate in satisfying a wider range of consumer needs in addition to local traditional needs and exploiting export opportunities. The different versions possible require different solutions, conditions, tasks and support.

When designating the directions for development the fact of climate change and the more frequent occurrence of extreme weather phenomena must be counted on when making a vision for the future in the long term. This arouses a great number of answers and questions for decision making as changes impact habitat, species, their composition and features, technologies especially plant protection and the components of wine supply. It is important to emphasise that if the Hungarian viniculturists and viticulturists prepare and act by recognising the fact of the climate change, they can gain advantages that help in getting out of this grave situation and competition.

My calculations on price transmission have proved that the appearance of horizontal integration of the producers and the establishment of a processor and a bottling plant based on the former one in common ownership can mean the basis of the way out of problems.

## SUMMARY

The grape and wine sector is in a crisis. It is characterised by continuous transformation. In 2000 production was carried out on tiny domestic vineyards. In the small-sized enterprises economic considerations do not prevail even if the objective is to gain extra income. In 2004 0.73 percent of producers cultivated an area bigger than 10 hectares (23.4 percent of the total area) while this number amounted to 1.32 percent in 2009, which is 32.4 percent of the total area.

Big enterprises take on the advantages of economies of scale although its condition is that the vineyards should be situated at one place or quite close to one another. Farm concentration has been started but there still are a lot of tiny ones. The number of those smaller than one hectare decreased from 70,085 in 2000 to 59,457 by 2009 although the size of the cultivated vineyard was modified only to a small extent. All this suggests that many of the farm owners who own smaller than 1 hectare areas are trying to supplement their pensions or salaries within the framework of a family run enterprise. There are vineyards just for a hobby that the old owners can no longer cultivate and their successors are not willing to do so at all. There were several attempts made, such as land for perpetuity, although the size of the maximum area was fixed at one hectare like in the case of supporting cutting down the vines. The number of vineyards above 10 hectares is continuously increasing and during the examined period it was fivefold but its share of the total area of the cultivated area only doubled. A big part of them is likely to be one of the dynamically developing family farms that also process grape by embracing the entire product path.

The economic structure of wine and grape production must be created in a way so that both viticulturists and vinticulturists can make a decent living. Otherwise, the balance between the two phases cannot be maintained and unevenness in development can occur. The cost and income relations can more precisely be defined by monitoring the changes and impacts of the product path, their assessment and separate analysis of the single stages. On the basis of analysing the cost and income relations of the verticum I examined the changes in production cost of the single participants, the effect of cost structures on revenues, the decisive factor of profitability and the share of integrated sectoral income that is generated on the product path.

Basically, the income relations of grape production are decided by the sales price of grape, the cost per unit of land and the average yield. Processing grape that was produced with low efficiency and high production cost has a negative impact on the income relations of viticulture.

The decisive factors of production cost are pesticides, labour and mechanical costs in addition to amortisation mentioned before. Costs are on the rise, which is the consequence of the price rise in materials used and energy resources as well as the taxes assigned to wages and salaries. In 2000 average sales price exceeded production cost in the case of both private and joint farms, so they were able to earn income to a certain extent. By 2009 this tendency was reversed when unit costs were not covered by the purchase price of wine grapes. However, there is a difference between production cost and the sales price of wine grapes at different organisational forms but the tendency is the same everywhere. Prices

follow the rise in the costs of grape production only later and to a significantly smaller extent. Therefore, they are in an asymmetric relationship regarding pace and proportion. It does not only refer to price transmission but also to the natural phenomenon according to which the results of grape production in the given year will prevail in next year's production in the production price of wines.

It is feared that grape producers will take on the support provided for cutting down vine stock so the decrease in vineyards will be so huge that wineries will be left without raw material. However, we must admit that the number of those having own areas is growing. A further problem is the drastic decrease in the number of those who are engaged in grape production but find themselves unemployed.

I pointed out differences when examining the cost structure of the product path. The cost of grape processing, wine making and treatment exceeds the cost proportion of producing Kékfrankos grape to a great extent. Viniculture has a share of almost 20 percent in the costs while bottling has 52 percent. Grape producers accomplish the smallest income ratio despite the fact that they take the greatest risks when they maintain vineyards of long life expectancy. Viniculture is able to reach greater profit and the extra expenses of bottling are covered only by the sales price paid for great wines in our country. The structure of the wine market has been modified as a result of the crisis, the turnover of bottled wines has been moderated and, at the same time, demand for lower priced products has boosted wine consumption by 5 percent. In my opinion the greatest profit is realised in trade from which neither viniculturists nor viticulturists benefit. That is why the alliance and integrated relations of viniculturists and viticulturists should be strengthened. Better positions in negotiation with trade could be gained by selecting the ways of sale, helping one another and taking the balance of developments into consideration.

A great part of viniculturists, similarly to viticulturists, produce a lot of grape varieties and make different types of wine as market needs also change. In a year it is white wine, in the next it may be red wine that make such profit which would counterbalance losses or lower income.

Costs, prices and indirectly profitability are also affected by the natural conditions and reputation of the wine region but first of all, by the opportunities of the variety and the market. That is why the conclusions drawn from the case study can only moderately be generalised. During the in-depths interviews there was such an opinion according to which costs are not dependent on variety. In fact, most of the production costs are fixed disregarding the extra costs of pesticides due to the weather but there are less resistant varieties that require greater care and therefore higher costs.

As a consequence of market division and greater demands an intensive competition is present in the wine market both in Hungary and in the member countries of the Union. Furthermore, another problem is that shifting power relations have made the connection between producers, processors and commercial units unbalanced and also the share of profit has become disproportionate between the single stages of the product path (verticum). Due to the disproportionately low production margin the low share of grape producers in the income generated in the verticum is the gravest problem. The significant restructuring of the verticum, the cooperation between grape producers and the

establishment of efficient interest groups are necessary to compete with the processors and merchants successfully. Grape is bought at production cost from the producers but the price of bottled wines marketed is many times the purchase price of grape.

This contradiction became the subject of the examination in which a price transmission analysis that embraces the entire product path was carried out by comparing the prices of the consecutive product path stages. The analysis reflects the extent of repercussions of price modifications, rise or fall, between the single phases. A totally new and novel result of all my research results that has not been pointed out so far is that the income position between the stages of the verticum significantly differs depending on whether the economic objective is directed at generating income or increasing the level of profitability in production costs.

The producers cannot count on substantial external assistance and a central interference in the processes in this situation when taking the Union perspectives into consideration. It can be seen that the challenges of the future can only be met by the grape producers and wineries that are able to make alliances, concentrate production and harmonise their product supply with the demand. The situation of the food verticum is full of contradictions and clashes of interests. The lack of income and current assets primarily hits raw material producers, especially those who operate on a small plot of land. Meeting the continuous market needs for quantity and quality requires greater processing and punctual and continuous timing of transportation. The integration of the grape and wine product path is determined by marketing bottled wine or wine in casks and its capital requirements.

During my primary research that surveys integrated relations I have concluded that viticulturists expect the integrator to secure sales most of all and also to outline market information and sales opportunities. The prerequisite of information technology that makes a quick reaction to consumers' preferences possible is the close cooperation between product paths.

The distribution of income generated in the integration depends on the power relations of business contacts. The players of the product path are differentiated on the basis of their success or failure. The integrator selects business partners by improving his own position when he keeps the suppliers who are capable of producing more reliable, standardised and high quality products in great volumes and gets rid of the uncompetitive ones. That is why producers' alliances and co-operations can play a greater role. For them an urgent task would be stabilising the production of raw materials by improving income position and liquidity. An optimal solution could be if the single integrations were formed in a production region on the basis of volunteerism and common interests.

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