Bulgarian Journal of Agricultural Science, 27 (Suppl. 1) 2021
Agricultural Academy

Financial stability analysis in the wine sector at the companies from republic of Moldova based on the integral indicator procedure usage

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Abstract

Muntean, N., Muntean, I., Sevov, A. & Turcan, R. (2021). Financial stability analysis in the wine sector at the companies from republic of Moldova based on the integral indicator procedure usage. *Bulg. J. Agric. Sci., 27 (Suppl. 1)*, 44 –54

The financial stability is one of the most important aspect faced by the entity during the pandemic situation created by COVID 19. The purpose of this report is to introduce and expand the fundamental problems concerning financial stability assessment on the Moldavian entities. The last time the financial stability assessment issues in different branches of national economy, are the subject of scientists' research, a single model for estimating the level of financial stability for the Moldavian companies has not been developed yet. Under such conditions increases significantly the need for the quantitative measurement of this phenomenon. In the present article, we intended to present the integral indicator procedure that can be used to measure the financial stability level, emphasizing at the same time the limits of this method. Thus, the following study, developed as a fusion of existing knowledge and authors own research, aims to provide a basis for reflection and discussion with theorists, practitioners and analysts within the financial domain.

Keywords: bankruptcy risk; integral indicator method; assessment; wine sector

Introduction

Taking in consideration the profound changes that have taken place in recent decades under the strong movement of technological innovation, liberalization and globalization in the national economy, the achievement of the financial stability became one of the new challenges in the wine sector, which should be faced by the contemporary economies.

In countries with developed economies, the concept of financial stability in economic theory firstly appeared in the second half of the nineteenth century – the first quarter of the twentieth century, when the capitalist relations began to develop rapidly in the peasant households from these countries. The founders of this theory are economists: Jerome Klapka and L. Brentano (Allen & Wood, 2006). In Central and Eastern Europe, due to, among other factors, the geopolitical situation and the introduced economic system, the concept of financial stability began to function and became the subject of researcher interest in the first half of the 1990s. According to literature analysis made by Prusak (2018), it means that even though the institution of financial stability was introduced in Central and Eastern Europe relatively late, in terms of research on enterprise bankruptcy risk forecasting, some countries currently do not depart from global patterns. The literature review shows that the best world practices are reflected in the research provided in Poland, the Czech Republic and Slovakia. Advanced models have also been developed in Estonia, Hungary and, to smaller extent, Ukraine. In Romania and Lithuania, mainly classical techniques were used to create bankruptcy forecasting models, using only financial

indicators. Bulgaria and Latvia were ranked the weakest. In these countries, there have been single attempts to develop national models using the simplest statistical techniques and applying only financial indicators as explanatory variables (Prusak, 2018).

Thus, dealing with the issue of financial stability in the corporate sector is not a novelty for economics, but the attention it enjoys from specialists in recent times is special.

The goal of the article is to introduce and expand the fundamental problems concerning financial stability assessment on the Moldavian entities, with reference to the wine sector, and to present the quantitative measurement of this phenomenon, empathizing the integral indicator procedure.

In order to analyze the financial stability we selected 10 entities from the Republic of Moldova, namely the wine sector.

The wine industry in the Republic of Moldova is one of the main branches of the country's economy, as practically 85 – 90% of the total volume of wine produced goes to export, thus constituting an important source of income for the state budget. Currently, the wine sector accounts for 2.7% of gross domestic product, 8% of total exports from the Republic of Moldova and employs about 250 thousand citizens in the 186 wine enterprises. Today, Moldova has the highest density of vineyards in the world, 3.8% of the country's land area and 7% of arable land. With about 128 000 ha of vineyards, Moldova ranks 13th in the world and 6th in Europe.

Against the background of the pandemic, the situation in the wine sector "is not simple but it is not catastrophic". The harvest of 2020 is estimated at 150 – 200 thousand tons, decreasing by about 25-40% or the equivalent of 10 – 12 million deciliters. The size of the harvest is at the level of the wine year 2010-2011.

Severe drought, spring frost, low temperatures in May and hail are the factors that will cause the loss of about 30-50% of the amount of grapes.

Against the background of the pessimistic forecasts of the harvest, the wineries' stocks are estimated at the level of the previous year – about 18 million dal or 35% higher compared to the average of the multiannual stocks.

In the wine industry, despite the pandemic, the level of exports is satisfactory, although the global wine market is experiencing a decline of about 15-30%.

In the first 7 months of the year, wine exports registered losses in volume of approximately 5.5 million litters (6.5%) and in value – approximately 87 million lei (6.8%);

The bottled wine market attests a 5% increase in volume and a modest increase of 0.2% in value;

The bulk wine market is the most affected and has decreased by 11% in volume and 16% in value.

Literature Review

It is impossible to formulate some recommendations of financial stability analysis or/and assessment in entrepreneurial activity, with reference to the wine sector, without knowing the justified essence of financial stability concept. The study of different approaches regarding the financial stability concept is characterised by a large variety of theoretical and applicative definitions.

The literature review shows that until now there is not a consistent conceptual definition of the financial stability phenomenon. There are some peculiarities in the financial stability definition; as a result, all the approaches have been conditionally divided into three groups of authors:

- Gilyarovskaya & Vekhoreva (2003), (Pink et al., 2007), Abryutina & Grachev (2007), Fedotova & Belykh (2011) associate the concept of financial stability with the solvency of an entity and understands financial stability as a result of the entity activity achieved through an efficient use and distribution of financial resources. Thus, according to this approach, financial stability is equivalent to the notion of solvency. In the authors' opinion, this approach is not fully correct. We must conclude, therefore, that the financial stability of an entity cannot be analyzed solely from the perspective of solvency, because the concept of financial stability includes both the adaptation of the entity in conditions of variation of external and internal factors, and the way how company is dealing with these variations. Therefore, when estimating the level of financial stability, it is necessary to take into account all the factors that influence on it.
- Thomson (2005), Kovalev & Melnik (2007), Sheremet (2014), Efimova (2011), Savickaya (2012) consider that financial stability is closely linked to the concept of sustainable development and is one of its causes. They associate the concept of financial stability with the process of carrying out an economic activity. In the authors view, this approach actually reveals the essence of financial stability. Because the emphasis is not put only on the calculation of solvency, i.e. on the entity's ability to meet its obligations, but also on the capacity of the company to recommend itself to the creditors in the future.

In addition, this approach also takes into account the adaptation of the entity in conditions of variation of external and internal factors, as well as the way to deal with these variations, without disturbing the economic activity, i.e. ways to minimize risks to solve predetermined tasks.

- Bocharov (2005), Ionova & Selezneva (2006), Mouriaux & Foulcher-Darwish (2006), Crowther & Aras (2009), Yudanov (2007) define financial stability through the concepts of balance and risk. This approach is the least developed one, but it is very interesting and deserves as much attention as those described above. That approach treats financial stability as the entity's safeguard mechanism against risks. In a market economy, any entity is exposed to all kinds of risks that may affect its financial stability. The vector of that meaning invokes a level of permissibility of the company in the process of minimizing the risks associated with its activities. However, since this approach is not yet sufficiently developed, in the authors view, it should be included in the second approach, rather than isolated as a separate one. Optimizing and minimizing the risks of reducing an entity's financial stability is necessary to ensure that the entity's long-term business is not disrupted and that it meets all of its current and strategic objectives.

Without a justified understanding of the financial stability essence, it is impossible to make recommendations for its analysis. By concluding the above approaches, the financial stability in the corporate sector, according to the authors, requires such a distribution and use of financial resources to ensure balance in the short term and ensure long-term sustainable development.

Regarding the research in the field of estimating the financial stability of a company, it is important in the context of streamlining restructuring and insolvency proceedings. Under such conditions, the need for a complex analysis of financial stability in the corporate sector increases significantly, as an integral part of the analysis of the financial position of the entity.

One of the main tasks of analyzing financial stability in the corporate sector is to study the indicators that characterize financial stability at the entity level. Commensuration of financial stability is difficult because of its multidimensional nature, making it almost impossible for its focus into a single indicator. Thus, taking into account the multitude of indicators for measuring the financial stability, different ranges of safety thereof, as well as the difficulties encountered in this connection in the assessment of the degree of liquidity and solvency of the entity, the majority of specialists recommend that in assessing financial stability there should be used the following models:

- Analysis of financial stability based on absolute indicators – Sheremet (2014), Kovaliov (2007), Saviţskaya (2012);
- Assessment of financial stability based on the correlation between equity and borrowed capital – Achim (2017), Mironiuc (2018);
- Analysis of financial stability based on the correlation between financial and non-financial assets – Graciov & Abriutina (2001), Saviţskaya (2012);
- Models of multidimensional rating – Muntean (2017);
- Scoring Models – Dontova & Nikiforova (2004);
- Discriminant Analysis – Altman (1968), Beaver (1966).

Following the analysis of these methods, the authors concluded that most of them estimate financial stability in only one aspect, without reflecting the other aspects. Thus, with the help of these methods is overemphasis either on balance and liquidity or on overestimating the importance of asset / financial sources structure rates, although it is clear that a universal valuation should take in consideration both conditions of financial stability.

Materials and Methods

During the research, the universal method of dialectics has been used, along with its principles: induction and deduction, analysis and synthesis, scientific abstraction, analogy, correlation, as well as the economic-mathematical, and those of economic analysis for information procession: comparison, grouping, etc.

A stable financial situation is achieved when there is a qualitative asset management, a sufficient level of own equity, profitability and liquidity, as well as stable sources of income and multiple possibilities of attracting borrowed sources.

Therefore, in order to ensure a higher level of financial stability, an entity must have a flexible capital structure, to be able to organize its movement to ensure a permanent revenue overrun on expenditure in order to preserve the solvency and ensure the necessary conditions for self-financing.

At present, it is important to analyze not only the current financial situation of the company, but also to predict the level of financial stability, as well as to propose measures to increase it. As a result of the authors' analysis of different methods of financial stability assessment, the conclusion is that a specific company, from a specific field requires a specific method or model of financial stability assessment.

The separate calculation of the financial sources structure ratios, liquidity and performance ratios does not provide significant information in the process of financial stability analysis in the corporate sector. There are a multitude of such ratios, which characterize different aspects of the patrimony

and its financing sources at entity level. As a result, difficulties may arise in the overall assessment of financial stability. At the same time, practically, there are no single criteria for regulating the type of instalments used.

The optimal level of these ratios depends on several factors: branch or sector of activity, lending conditions, financing policy, level of asset turnover ratio, reputation of the company, etc. Therefore, the acceptability of the values of a certain ratio, an assessment of its dynamics and directions of change can only be established for a certain entity, taking into account the specifics of its activity. Some comparisons are possible for entities operating in the same sector of the economy, but they are very limited. It should also be taken in consideration that some ratios are mutually substitutable and provide the same type of information on financial stability, while others are functionally interconnected.

It is clear that a large number of ratios can be used to assess the structure of a company financial sources in different ways. It is therefore necessary to develop a universal valuation model, which must take into account all aspects of financial stability at the same time.

The conclusions obtained are the result of a complex (exhaustive) practical analysis of different methods and models for assessing financial stability in the corporate sector proposed and analyzed by different authors in the literature:

– Liquidity ratios. The calculation of liquidity ratios for assessing long-term financial stability, in the authors' view, is not relevant. By definition, liquidity is the entity's ability to meet its current liabilities, so it is a criterion of financial solvency only in the short term; therefore, its use for the assessment of long-term prospects is only possible under extremely limited conditions, when, in the long run, the probability of changing current trends is low. However, for most entities it is impossible to consider that the factors will remain unchanged for a long time: the terms and conditions of the future contracts may change, level of competition may intensify, etc.

– Turnover ratios. Activity indicators are certainly an important factor in assessing an entity's financial position and financial solvency, as they measure the speed at which the entity's assets are converted into liquidity and characterize the assets' ability to generate revenue. The analysis of particular indicators of asset turnover in order to assess the level of financial stability can provide useful information, such as: the efficiency of resource management, despite the fact that some entities are required to operate only on non-financial borrowed sources.

– Stock ratios. The use of this group of rates in the Republic of Moldova does not make sense due to the absence of the main condition for their calculation – the existence of a truly functional stock market, covering a certain number of market players. Therefore, determining the market value of an entity seems virtually impossible.

– The structural ratios of assets financing sources characterize the degree of protection of the interests of creditors and investors. They reflect the entity's ability to repay long-term debt. According to the authors, the most commonly used ratio in this group of rates is the financial leverage.

– Profitability ratios (efficiency). The long-term survival of entities depends largely on the level of profitability of their business. Profit is the main goal of each activity. Profit represents the attestation of past successes, the guide for the future and the stake that the businessperson risks in a new adventure. This demonstrates the importance of profitability ratios in the analysis and assessment of financial stability in the corporate sector.

In order to analyze the financial stability with the help of integral indicator procedure, we selected 10 entities from the Republic of Moldova, namely the wine sector, for which we have processed the financial statements for a period of 5 years (2014-2018). Entities in the sample are dispersed throughout the national territory, are the entities that generated the highest sales revenue during this period. Thus, they fall into the category of the largest enterprises being representative of the sector they are part.

The detailed study of the economic and financial activity of the companies from the wine sector of the Republic of Moldova allowed the authors to identify those particular indicators of profitability and assets financing sources structure that can provide the most significant information for a correct financial stability assessment in this sector. The objective of such a quantitative model is to obtain a realistic assessment of the level of financial stability in the wine sector. The systematization of the results of this analysis allowed the authors to identify the specific indicators that may be used in order to develop this model for financial stability assessing in the companies from the wine sector of the Republic of Moldova. A source of information for the analysis of the financial stability can be the data of the Financial Statements or the data of the Trail Balance. Because the Financial Statements data is the most available and prevalent source of information. The information obtained from the analysis performed is relevant for both internal and external users.

According to the study, authors' confines to the following five indicators (Table 1).

The number of indicators in the table can be extended, because not all compartments of the financial statements are included. However, the problem of expanding the number of indicators will be solved when stakeholders realize that indicators for assessing the financial stability of an entity should

Table 1. Relative indicators of financial stability

No	Indicators	Formula of calculation	Interpretation	Optimal level
1.	Financial leverage	K1 = Total debts/Owners equity	Shows the value of borrowed sources that return to 1 monetary unit of equity.	< 0,5
2.	Current liquidity	K2 = Current assets/Current debts	Reflects the possibility of settling current liabilities through current assets	≥ 1
3.	Inventories turnover	K3 = Sales revenues/Average value of inventories	Reflects the rotational speed of inventories.	≥ 3
4.	Return on sales	K4 = Profit before tax/Sales revenues	Shows the value of the profit before tax obtained at 1 monetary unit of sales income.	≥ 0,2
5.	Share of working capital in current assets	K5= Working Capital/Current assets	Reflects the degree of insurance of the entity with current assets financed from its own sources.	≥ 0,1

not involve a set, but a system, i.e. not contradict each other, not be repeated, not to leave "white spots" in the activity of the entity.

From the all five mentioned indicators, only three of them have a universal application, regardless of the nature of the activity and the structure of the entity's assets and liabilities, namely: the correlation ratio between borrowed and own sources, the liquidity ratio and the share of working capital in current assets.

As a result of the study, it has been shown that the change of financial stability is a dynamic process that depends on certain factors. The extension of a simple analysis in dynamics to a multidimensional level is a multivariate analysis. Thus, as a result of a qualitative analysis, the factors k (S1, S2, S3, ... Sk) have been identified, which influence the change of the resultant indicator I (financial stability indicator).

Next, the significance of each particular criterion is determined in accordance with its effect on financial stability:

$$S(K1) = 20;\ S(K2) = 25;\ S(K3) = 25;$$
$$S(K4) = 10;\ S(K5) = 20;$$
$$\sum S(Ki) = 100, \quad (1)$$

where S (K1..i) – the significance of particular criterion that influence on financial stability.

The entity's experts, taking into account the activities carried out and the production structure, should determine the significance of each particular criterion.

Then the correlations between the actual values of the indicators and their normative values (optimal level) (or average indicators per sector) are calculated:

$$X1 = K1 : K1n;\ X2 = K2 : K2n;\ X3 = K3 : K3n;$$
$$X4 = K4 : K4n;\ X5 = K5 : K5n, \quad (2)$$

where K1..i – actual values of indicators,

K1..in – normative values of indicators,

X1..i – correlations between the actual and normative values of the indicators.

Thus, the integral indicator of financial stability is formed as follows:

$$I = S(K1)*X1 + S(K2)*X2 + S(K3)*X3 + + S(K4)*X4 + + S(K5)*X5 \quad \text{or}$$
$$I = 20*X1 + 25*X2 + 25*X3 + 10*X4 + 20*X5 \quad (3).$$

Based on the obtained results, the financial stability of the company from the wine sector can be assessed, and can be attributed to one of those three groups, depending on the level of stability: financially stable, financially acceptable, financially unstable. The criteria for referring to one of the groups are presented in Table 2.

Table 2. Criteria for establishing the level of financial stability

Description	Financial Stability	Acceptable financial stability	Financial instability
The integral criterion of the qualitative evaluation	>300	150 – 300	< 150

Source: authors' compliance

Next, we analyzed the financial stability with the help of the integral indicator procedure usage on the selected 10 entities from the Republic of Moldova, namely the wine sector, for which we have processed the financial statements for a period of 5 years (2014-2018). In the Appendix nr.1 we have determined in which group each of the 10 entities fall during this period.

Results and Discussion

The sales revenues of all these entities have tended to increase in the period under review, with the average annual growth of 13.19%, recording a significant improvement in 2018. Additionally, can be remarked the increase of the Assets value, with the average annual growth of 7.50%, reflect-

Table 3. Evolution of sales, assets and employees

Indicators	Year 2014	Year 2015	Year 2016	Year 2017	Year 2018	Annual average
Total Sales Revenues (million MDL)	846.09	957.36	1122.06	1074.63	1360.64	
Dynamic of Sales Revenues		13.15%	17.2%	-4.23%	26.61%	13.19%
Total Assets (million MDL)	1786.82	1972.79	2153.18	2256.2	2384.13	
Dynamic of Assets		10.41%	9.14%	4.78%	5.67%	7.5%
Average number of employees	2072	1982	2390	1966	1652	
Dynamic of employees		-4.34%	20.59%	-17.74%	-15.97%	-4.37%

Note:

year	euro	MDL
2014	1.00	18.93
2015	1.00	21.45
2016	1.00	20.94
2017	1.00	20.45
2018	1.00	19.42

ing a high level of efficiency. The only indicator that recorded a decrease in the analysed period is the average number of employees, reducing its level by an average of 4.37%, thus highlighting a modernization of the production technology. We can say that the decrease of the number of employees has taken place simultaneously with the increase of the level of technology of the sector (Table 3).

Analyzing the evolution of all these 10 Moldavian companies from the wine industry, we can remark an average increase of 13%. The economy growth in the last three years (2015-2018) was on average by 3%. Thus, can be remarked a correlation of the evolution between the sector and the economy national level, this fact denotes that the government of RM emphasis the development of the winemaking sector.

Preforming the financial stability analysis of the 10 largest enterprises from the Republic of Moldova, from the wine sector, by using integral indicator procedure, we have come to the following results that can be seen in Table 4.

Using the integral indicator procedure, we can observe that almost all the companies are placed in the second group during the analysed period. It means that these 10 Moldavian companies from the wine industry, entities that generated the highest sales revenue during this period, have an acceptable level of financial stability. The worst situation was remarked for the company WINE 8 in 2014. At the same time, the most stable one, not risky, accumulating an average score of 397 points is the company WINE 2. This is largely due to the high level of liquidity, the global autonomy rate and the high share of the working capital in the current assets.

Thus, although the situation of some of the companies looks nice, not risky, this method clearly show that the analyzed entities meet financial problems and their activity depends on the government regulations. In this connection, the assessed firms must determine the causes of the reduction of the indicators and take action on its growth.

Conclusions

In the present article, were presented a new method of determining the financial stability: Integral indicator proce-

Table 4. Average results of rating analysis according to multidimensional rating model

Companies	Year 2014		Year 2015		Year 2016		Year 2017		Year 2018		Average	
	amount	group	amount	Place	amount	Place	amount	group	amount	group	amount	group
WINE 1	153	II	133	II	235	II	215	II	249	II	197	II
WINE 2	336	I	393	I	352	I	446	I	460	I	397	I
WINE 3	266	II	250	II	281	II	281	II	334	I	282	II
WINE 4	280	II	347	I	122	III	131	III	224	II	221	II
WINE 5	369	I	262	II	253	II	210	II	323	I	283	II
WINE 6	279	II	254	II	273	II	295	II	283	II	277	II
WINE 7	279	II	254	II	273	II	295	II	283	II	277	II
WINE 8	89	III	196	II	220	II	216	II	223	II	189	II
WINE 9	474	I	227	II	219	II	271	II	248	II	288	II
WINE 10	199	II	240	II	290	II	365	I	397	I	298	II

Source: authors' compliance

dure. The results of this study show that this analysis can be considered as very efficient and relevant because it enables the assessment of financial stability, the possibility of tracing causes of adverse changes in financial stability of the entity, as well as reaching a rational account between equity and borrowed capital, and their efficient use.

The information obtained, following the analysis provided, is relevant both for internal and external users. In this connection, we can say that our research has important implications, first for corporate governance, for internal users interested to find out in what area of bankruptcy risk is situated the entity in order to see if the financial balance is ensured, and in order to identify improvement mechanisms for the activity. Secondly, our results are useful for investors that wish to obtain the best profitability rate for their investments. They shall consider the level of financial stability of the entity as a very good predictor for the best profitability rate of their investments, aiming at investing capital or withdrawal of capital previously invested. In addition, our results have implications for decision-makers of financial lenders for granting, limiting or cutting off lending.

So, after using this information all listed users have the equal possibility to conclude regarding the entity level of financial stability and its potential for development.

Thus, as limits to this study, we can conjure up the fact that our conclusions could be interpreted because of using almost the indicators from Financial Statements. For a better fundament of obtained results, it is necessary to add and analyse other models of analysis for financial stability in future research, and expand the number of entities analysed and the period of study.

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Received: May, 19, 2021; *Accepted:* June, 25, 2021; *Published:* September, 2021

Appendix 1. The level of financial stability assessment using integral indicator procedure

Indicators	Year 2014	Year 2015	Year 2016	Year 2017	Year 2018
WINE 1					
K_1	1.22	1.35	1.25	1.28	1.09
K_2	1.58	1.38	3.14	2.64	3.93
K_3	0.72	0.79	1.01	0.73	0.73
K_4	0.10	0.00	0.01	0.01	0.02
K_5	0.37	0.27	0.68	0.62	0.75
X_1	2.44	2.71	2.50	2.56	2.18
X_2	0.79	0.69	1.57	1.32	1.96
X_3	0.24	0.26	0.34	0.24	0.24
X_4	0.52	0.01	0.04	0.04	0.09
X_5	3.67	2.75	6.82	6.22	7.45
Integral Indicator (I)	153.16	132.95	234.52	215.14	248.85
WINE 2					
K_1	3.93	3.67	4.21	3.90	3.84
K_2	2.93	6.10	3.27	8.77	9.64
K_3	0.76	0.47	0.65	0.51	0.70
K_4	0.07	-0.02	-0.02	-0.02	0.01
K_5	0.66	0.84	0.69	0.89	0.90
X_1	7.87	7.34	8.42	7.81	7.68
X_2	1.46	3.05	1.63	4.38	4.82
X_3	0.25	0.16	0.22	0.17	0.23
X_4	0.36	-0.08	-0.12	-0.11	0.05
X_5	6.59	8.36	6.94	8.86	8.96
Integral Indicator (I)	335.65	393.39	352.25	446.07	459.73
WINE 3					
K_1	1.77	2.15	3.13	2.70	3.45
K_2	3.78	2.83	2.70	3.03	3.58
K_3	0.37	0.48	0.45	0.49	0.60
K_4	-0.05	-0.10	-0.15	-0.05	0.05
K_5	0.74	0.65	0.63	0.67	0.72
X_1	3.53	4.30	6.26	5.40	6.89
X_2	1.89	1.42	1.35	1.51	1.79
X_3	0.12	0.16	0.15	0.16	0.20
X_4	-0.26	-0.51	-0.74	-0.25	0.23
X_5	7.36	6.47	6.29	6.70	7.21
Integral Indicator (I)	265.54	249.70	281.08	281.45	334.13

Appendix 1. Continued

WINE 4					
K_1	10.45	12.37	7.81	6.01	5.98
K_2	0.53	0.55	0.49	0.61	0.84
K_3	0.86	0.77	1.30	1.19	1.46
K_4	0.02	0.03	0.03	0.04	0.03
K_5	-0.76	-0.81	-1.04	-0.65	-0.19
X_1	20.91	24.75	15.61	12.03	11.95
X_2	0.27	0.28	0.24	0.30	0.42
X_3	0.29	0.26	0.43	0.40	0.49
X_4	0.12	0.14	0.16	0.19	0.13
X_5	-7.65	-8.14	-10.41	-6.46	-1.93
Integral Indicator (I)	280.24	346.87	122.44	130.85	224.32
WINE 5					
K_1	0.04	0.05	0.09	2.81	6.05
K_2	13.95	6.85	5.93	1.54	1.40
K_3	0.36	0.57	1.06	0.96	0.75
K_4	0.09	-0.02	0.01	0.00	0.01
K_5	0.93	0.85	0.83	0.35	0.28
X_1	0.07	0.09	0.18	5.62	12.10
X_2	6.97	3.42	2.96	0.77	0.70
X_3	0.12	0.19	0.35	0.32	0.25
X_4	0.47	-0.12	0.04	0.01	0.05
X_5	9.28	8.54	8.31	3.51	2.83
Integral Indicator (I)	369.14	261.81	253.18	209.95	322.75
WINE 6					
K_1	2.82	2.62	2.80	2.36	2.82
K_2	2.66	2.37	2.62	3.84	2.72
K_3	0.28	0.33	0.31	0.43	0.63
K_4	0.11	0.02	0.03	0.02	0.08
K_5	0.62	0.58	0.62	0.74	0.63
X_1	5.64	5.24	5.60	4.71	5.64
X_2	1.33	1.18	1.31	1.92	1.36
X_3	0.09	0.11	0.10	0.14	0.21
X_4	0.55	0.11	0.17	0.11	0.41
X_5	6.25	5.78	6.18	7.39	6.33
Integral Indicator (I)	278.96	253.78	272.74	294.81	282.70
WINE 7					
K_1	0.72	0.97	1.17	1.18	1.34
K_2	1.25	2.55	2.95	2.86	2.77

Appendix 1. Continued

K_3	0.43	0.38	0.35	0.34	0.34
K_4	0.03	0.01	0.02	0.00	0.08
K_5	0.20	0.61	0.66	0.65	0.64
X_1	1.44	1.93	2.34	2.35	2.68
X_2	0.62	1.27	1.47	1.43	1.38
X_3	0.14	0.13	0.12	0.11	0.11
X_4	0.17	0.06	0.10	0.02	0.40
X_5	1.98	6.08	6.61	6.50	6.38
Integral Indicator (I)	89.10	195.86	219.86	215.93	222.60
WINE 8					
K_1	9.73	1.17	1.89	2.10	2.09
K_2	1.45	3.13	2.24	3.38	2.65
K_3	0.40	0.47	0.46	0.39	0.51
K_4	0.03	0.03	0.01	0.02	0.05
K_5	0.31	0.68	0.55	0.70	0.62
X_1	19.47	2.33	3.78	4.20	4.17
X_2	0.73	1.56	1.12	1.69	1.33
X_3	0.13	0.16	0.15	0.13	0.17
X_4	0.14	0.13	0.03	0.10	0.24
X_5	3.11	6.80	5.54	7.04	6.23
Integral Indicator (I)	474.34	227.00	218.57	271.50	247.91
WINE 9					
K_1	0.31	0.28	0.28	0.23	0.15
K_2	2.88	5.04	7.80	13.16	15.52
K_3	0.26	0.35	0.38	0.20	0.40
K_4	0.36	0.06	0.08	0.09	0.14
K_5	0.65	0.80	0.87	0.92	0.94
X_1	0.62	0.55	0.57	0.47	0.31
X_2	1.44	2.52	3.90	6.58	7.76
X_3	0.09	0.12	0.13	0.07	0.13
X_4	1.82	0.31	0.38	0.46	0.68
X_5	6.52	8.01	8.72	9.24	9.36
Integral Indicator (I)	199.20	240.31	290.10	364.91	397.36
WINE 10					
K_1	0.85	1.26	1.38	1.33	1.20
K_2	2.17	1.81	1.37	1.25	1.46
K_3	0.58	0.67	0.59	0.51	0.60
K_4	0.06	0.06	0.13	0.18	0.04

Appendix 1. Continued

K_5	0.54	0.45	0.27	0.20	0.32
X_1	1.70	2.52	2.76	2.66	2.40
X_2	1.09	0.90	0.69	0.62	0.73
X_3	0.19	0.22	0.20	0.17	0.20
X_4	0.32	0.28	0.65	0.88	0.21
X_5	5.40	4.48	2.70	1.98	3.17
Integral Indicator (I)	177.35	170.96	137.86	121.57	137.00

Source: Elaborated by authors