

BUSINESS RISK AND UNCERTAINTY OF INVESTMENTS IN THE GRAPE PRODUCTION

POSLOVNI RIZIK I NEIZVESNOST INVESTIRANJA U VINOGRADARSKOJ PROIZVODNJI

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Abstract: Biological character of grape production influences the existence of numerous risks. Therefore, the research on risk and uncertainty is one of the key problems of the investments into this kind of production. These risks are appearing both during the vineyard establishment and during its exploitation and they are influenced by the state of soil, application of agrotechnical and pomotechnical measures, diseases and pests appearance, the way of yields realization as well as the market risks. Perception of risk is a precondition for business success and the higher profit realization. This is the reason why risk management (identification, analysis and monitoring) should be a part of management policy. One of the methods for the risk and uncertainty assessment in the case of the grape production investments is the sensitivity analysis method. This method could show to investor how much the investment effectiveness indicators are sensitive onto the possible changes of variable starting parameters (prices, production volume, expenditures, level of investments etc.), i.e. this method enables constitution of the so-called certainty limits of particular starting parameters, which are considered as critical ones in the investment effectiveness evaluation. By application of the sensitivity analysis method in the case of two analyzed economic models of vineyard farms, it has been monitored development of the investment effectiveness indicators in relation to the changes of starting parameters and there have been determined their certainty limits.

Apstrakt: Biološki karakter vinogradarske proizvodnje uslovljava postojanje brojnih rizika. Zato je istraživanje rizika i neizvesnosti jedno od ključnih problema kod investiranja u ovu proizvodnju. Ovi rizici se ispoljavaju kako pri zasnivanju zasada, tako i u toku njegove eksploatacije i uslovljeni su stanjem zemljišta, primenom agrotehničkih i pomotehničkih mera, pojavom bolesti i štetočina, načinom realizacije ostvarenih prinosa i tržišnim rizicima. Sagledavanje rizika je preduslov poslovnog uspeha i ostvarivanja većeg profita. Zato upravljanje rizicima (identifikacija, analiza i nadzor) treba da bude satavni deo menadžerske politike. Jedna od metoda pomoću koje može da se oceni rizik i neizvesnost kod ulaganja kapitala u vinogradarsku proizvodnju jeste metoda analize osetljivosti investicija (senzitivna analiza). Ova metoda može da pokaže investitoru koliko su osetljivi pokazatelji efektivnosti investicije na moguće promene varijabilnih polaznih parametara (cena, obima proizvodnje, novčanih rashoda, visine investicionih ulaganja itd.), tj. ona omogućava utvrđivanje tzv. granica sigurnosti pojedinih polaznih parametara, koji se prilikom procene efektivnosti investicija smatraju kritičnim. Primenom metode senzitivne analize, kod dva posmatrana ekonomska modela vinogradarskih gazdinstava, praćeno je kretanje pokazatelja efektivnosti investicija u odnosu na promene polaznih parametara i utvrđene su njihove granice sigurnosti.

Key words: risk, uncertainty, grape production, model, sensitive analysis

Ključne reči: rizik, neizvesnost, vinogradarska proizvodnja, model, senzitivna analiza

INTRODUCTION

A risk can be defined as an uncertainty of a future outcome. A risk implies a spectrum of uncertain future outcomes regardless of whether or not such outcomes are positive or negative for the risk bearer. Risk is more or less predictable and manageable, but uncertainty

represents the impossibility of accurate foreseeing of an outcome in the future (**Umihanic, 2003**).

In economic terminology word 'risk' is used to describe the types of situations where distribution of variables is known but the conditions for their implementation are not.

Word 'uncertainty' is used when it is not possible to predict the frequency of events, i.e. outcomes of planned or undertaken activities (**Grbic, 1996**).

Vineyard production is of a biological character and is influenced by natural conditions. Consequently numerous risks are introduced and are inherently higher than in other economic sectors. These risks are present on both starting a vineyard and during its exploitation. They are influenced by the soil condition, application of agro-technical measures, outbreaks of diseases, vermin and harvest.

Risks and uncertainties are particularly numerous in vineyard production and can be inherent in:

Starting a vineyard – and are related to the development of a vineyard. They start with the selection of the location for and the type of vineyard. In addition to this, they influence the selection of vine, soil and type of production. Specific market conditions can determine the viability of a particular type of grape, and where market conditions change necessitate changing the grape type used. Additionally, technical development can alter the production processes from manual to mechanical (especially in terms of pruning and harvesting), which subsequently leads to the change in the labour and production costs.

Production risks – change of natural conditions favourable for the grape production (for example climatic change), incidence of diseases and vermin which can influence the production outcomes regardless of the type of production and the advanced technology.

Market risks and change of economic policy – can influence the prices of the production inputs, prices of grapes, interest rates, tax levels, government incentives for further production, etc.

MATERIAL AND METHODS

This research has been conducted based on formulated economic models of vineyard production, established practices, investment projects and input-output norms used in production planning.

The described models are based on the principle of analogy and can replace the original research subject given that they have been produced based on the vital elements of the production in question. Modelling of this particular production is extremely important as it shows both the existing and altering types of vineyard production in time and space.

Due to the fact that it is not possible to manipulate with real economic systems, it is necessary to make representative of systems – the models with which is possible to operate with the aim of finding an optimal solution.

Although there are number of possibilities of use of models, with which vineyard founding could be simulated, in this case, for the needs of this paper, it was started with the following assumptions:

Model A – is based on the assumption that the whole area of vineyard, 50 hectares, founds simultaneously.

Model B – where the substitution of existing vineyard goes successively, that is founding of 3.33 hectares each year.

Basic informational base for making of vineyard production models is taken from the information base of joint stock company "Vršački Vinogradi"-Vršac. There are 1.700 hectares of vineyards in the possession of joint stock company "Vršački Vinogradi".

As a significant source of information for making of models, there were used planning and accounting calculations of “Vršački Vinogradi”, but investment projects as well.

One of the methods which can give the evaluation of uncertainty and risk in vineyard production is the method of sensitivity analysis of investment. It is based on unreliability of foreseeing of value parameters. This method researches the influence of output values changes, appeared as a result of a bad foreseeing, on the evaluation of investment justification.

The advantage of sensitive analysis is in fact that it gives a number of alternative criteria which helps later to choose the solution.

Sensitive analysis represents the additional procedure for evaluation of real economic effectiveness of investment, it should reveal to investor how sensitive are indexes of investment profitability (capital value, inner interest rate etc), to possible changes of starting parameters - price, production volume, expenditure, level of investment etc.

RESULTS AND DISCUSSION

Indicators of economic effectiveness for observed models are based on a cash flow.

Due to the fact that cash flow in this case refers to the future, they represent expected values established on the bases of assumed quantities and prices. That is why cash flows, but evaluation of economic effectiveness of investments as well, more or less, are associated with incertitude, which is uncertainty. In addition to mentioned, evaluation of investment profitability and investment decision making are mostly based on subjective expectations. This problem is particularly expressed in long term investments and long term exploitation (vineyard which was the subject of research in this paper).

There is the question, how to evaluate a possible level of uncertainty and risk in order to obtain as realistic index of economic effectiveness of planned investments as possible?

Of secure expectations can be said in cases when there is none or very little doubt that the assumed events, conditions, starting parameters, that is, expected economic results, will be mostly realized. In case of agricultural investments, especially investments in permanent crops (vineyard production), that is not possible.

When establishing the economic effectiveness of investment in vineyard production one of the most important starting parameters is realized yield during the exploitation period of investment. Taking into consideration the possibility of yields varying in some years, it is not possible to talk about of certain expectations.

By sensitivity analysis it has been calculated for the analyzed "A" and "B" models the level of change in the investment economic effectiveness indicators, i.e. if investment costs and operating costs have been increased by 10% or 5% and if value of production has been decreased by the same percentages.

In the case of "A" model – whereas at the same time there have been established 50 hectares under vineyards, there could be analyzed only fluctuations in the net present value (NPV) as well as internal rate of return (IRR) in the case of increase of investments, value of production and operating costs up to 5%. If investments have been increased by more than 5%, the investment project is on the very edge of positive investment economic effectiveness (as IRR is tending to be equal to the calculative interest rate) or it is economically ineffective.

In the case of "B" model, whereas the replacement of 3.33 hectares of vineyard has been done successively in each year, the calculated IRR amounted to 66.42%. In analysis of this model there could be emphasized three following situations:

1. If investments should be increased by 10% due to increase of prices (for the grafts, wire, posts, chemicals or labour and machine working hour), NPV should be decreased by 30.26%, while IRR should be decreased onto 33.09%, which means

the investment has been still economically justified even with such increase of investment costs.

2. In the case of this model the higher sensitivity appears when operating costs increase by 10% (due to an increase of some input prices, i.e. chemicals or some variable costs). In that case NPV has been decreased by 52.05%, while IRR has been decreased onto 27.56%.
3. When value of production has been decreased by 10%, NPV has been also decreased - by 83.68%, while IRR has sharply dropped onto 14.23%. Value of production could be decreased due to the following reasons:
 - decrease in yields but with the same selling price level,
 - lower quality of production that causes decrease in selling price or
 - decrease in selling price due to drop in demand for that particular grape variety.

In this case it appears the higher sensitivity of the investment economic effectiveness onto value of production decrease.

CONCLUSION

Although on the basis of applied indicators both analyzed vineyard plantations positively satisfy the basis criteria of relative investment economic effectiveness, it could be evaluated that investment into the "B" model is more effective as well as less sensitive onto risk and uncertainty.

Finally, it could be concluded that "A" model is sensitive onto all changes of prices over 5%, while "B" model is the most sensitive one when achieved value of production has been decreased by 10%.

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