

# ACCOUNTING FOR THE COSTS AND ACTIVITIES OF WINERIES: METHODOLOGY AND INDUSTRY MODELS

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**Abstract.** The article discusses the peculiarities of creating cost accounting models for the winemaking industry, considering its specific characteristics and the current regulatory requirements. The *study focuses* on the cost accounting systems of wine producers, which are influenced by technological, organisational and regulatory factors. The *study aims* to determine the most effective model for accounting for wine production costs, by critically analysing and generalising existing national and international models for accounting for these costs. The *problem* lies in the lack of a unified cost accounting model that is tailored to domestic wine production conditions. *Methodology.* The classification of enterprises is based on a comprehensive analysis of legislation, statistical data and enterprise practices. The types of enterprises are divided according to their accounting obligations. The dynamics of the development of the grape and wine sector in Ukraine is determined, and the implementation of accounting principles in choosing a cost accounting model is investigated. The following comparative characterisation of cost accounting models is presented, with consideration given to the industry-specific nuances of production. The sequence of calculating the cost of crop production is illustrated, and the accounting transitions in the winemaking process, in particular at the stage of wine bottling, are described in detail. Proposals have been formulated to integrate normative and pre-distribution methodologies within a unified cost accounting model. The primary *findings* of the study suggest that a combined approach to cost accounting, integrating regulatory and permissive methods adapted to the technological cycle of winemaking, is a viable proposition. The application of this model facilitates the consideration of seasonality in production, the unique characteristics of fermentation processes, and the intricacies of product cost formation. The implementation of rational accounting models has been demonstrated to enhance the efficiency of cost management, provide a rational basis for pricing decisions, and improve the financial statements of wineries. *Value/Originality.* The proposed methods can be used to develop accounting policies, improve management accounting systems, and develop internal standards for wine-producing enterprises.

**Keywords:** accounting, costs, winemaking, production cost, accounting models, per unit method, accounting methodology, wineries, analysis, financial statements.

**JEL Classification:** M41, M11, D40, Q13

## 1. Introduction

As a specific branch of agriculture, wine production has its own technological features that combine crop production and processing cycles. These features determine the complexity of technological processes and the specifics of cost formation. In the current economic climate, characterised by economic instability,

increased competition, shifting consumer preferences and the growth of the premium product sector, it is imperative for wine producers to adopt robust cost planning and accounting strategies. An effective accounting system in the industry functions not only as a tool for controlling the use of resources, but also as a factor in ensuring the competitiveness, economic

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stability, and strategic development of the producer. The objective of the present study was to provide a comprehensive justification of methodological approaches to accounting for costs in wine-producing enterprises, with a particular emphasis on the integration of industry-specific and technological characteristics.

The specificity of winemaking can be attributed to the combination of long-term biological processes of grape cultivation, seasonality of production, the presence of many stages in the technological process and separate sub-processes, each of which forms a separate set of costs. In this regard, it is imperative to adapt conventional cost accounting models to the particularities of wine production, whilst concomitantly exploring optimal methodological approaches that facilitate the acquisition of pertinent information for cost management and decision-making. In this context, the following research tasks have been identified: analysis of the regulatory, legal and accounting prerequisites for wine production enterprises; study of cost formation logic at different stages of production; systematisation of existing accounting models; and development of an applied cost accounting model.

The production of wine necessitates a distinct approach to cost accounting and management. In the context of a dynamic economic environment characterised by intensified competition and a shift in demand towards a diverse range of products, meticulous planning and cost accounting assume paramount importance. These practices represent pivotal factors in enhancing production efficiency and ensuring the financial stability of an enterprise. The methodological basis of the study is rooted in economic analysis, structural and logical generalisation, comparison, grouping of costs, regulatory and legal interpretation, and elements of modelling production processes. This multifaceted approach ensures a comprehensive assessment of the subject under study.

A critical analysis of extant approaches to the organisation of cost accounting in the wine industry is of particular importance, since their compliance with the technological features of production determines the reliability of cost formation and the effectiveness of management decisions. It is also important to take into account both the specifics of the legal regulation of the activities of wine producers and the peculiarities of the application of accounting principles when formulating accounting policies. These affect the structure of costs, their grouping, and the order of reflection in the accounting system. The logic of presenting the research in the article is structured in such a way as to move from a general analysis of the regulatory and accounting environment to the characteristics of industry technological processes, an overview of cost accounting models, and the

presentation of an applied author's model that reflects the formation of costs in the "Wine Bottling" division.

The selection of optimal cost accounting models has been demonstrated to contribute to the reduction of costs, whilst also exerting a direct influence on the enhancement of product quality, the establishment of an effective pricing system, and the analysis of business processes with the aim of increasing production profitability.

## 2. Literature Review

A substantial volume of research has been dedicated to the accounting procedures necessary to monitor the costs of quality control and quality loss in wine production. In their work, Blake John, Amat Oriol, Moya Gutiérrez and Soledad (1998) considered the fairness of the level of excise duty on wine for high-quality and low-quality wines, and the treatment of wine in comparison with other types of wine. In the study by Dierkes and Siepelmeyer (2019), a material flow cost accounting system was developed to plan for efficient and inefficient costs in arbitrary production processes. This accounting system is based on a material flow model in which waste and rejects are the main cause of material losses. This model is used to determine the efficient and inefficient demand for materials at the level of the quantity centre and the unit of production. Notarnicola B., Tassielli G. and Nicoletti G. M. (2003) described the most important and common winemaking processes and emphasised the need for extensive knowledge to produce quality wine.

The world scientific literature actively studies approaches to cost accounting in winemaking. For instance, Blake, John, Amat, Oriol and Moya Gutiérrez (1998) highlight the effect of quality on accounting method changes in winemaking, while Bisson et al. (2002) stress the importance of adapting accounting to the biological variability of raw materials and lengthy production cycles. Rui Couto Viana and Lúcia Lima Rodrigues (2006), as well as Singh et al. (2024), demonstrate the specifics of accounting regulation in wineries within the context of legislative and industry constraints. Studies by Notarnicola et al. (2003) and Ana Trigo et al. (2024) add to the discourse by focusing on environmental sustainability and management based on enterprise assessment, while Dierkes S. and Siepelmeyer D. (2019) focus on the transparency of material flows in the context of cost accounting. Within the national context, the contribution of Marchuk U. et al. (2024) is significant, emphasising the importance of accounting in pricing.

The following scientists have dedicated their research to the study of wine products in the world scientific community: Porter M. E. (1985) posited that competitive advantages for the wine industry can

be formed through the integration of modern technologies into production and control.

The challenges confronting the development of the wine industry and its enterprises have been the focus of a study by Shymanovska-Dianich L. M. and co-authors (2024). The study noted that the functioning of wineries has a significant impact on the development of the country's economy and the filling of state and local budgets.

In the seminal work of Bisson L. F., Waterhouse A. L. and others (2002), it is asserted that the production of wine is both an art and a science, a combination of individual creativity and innovative technologies. Concomitantly, the economic factors influencing wine production practices must be recognised, necessitating the integration of all facets of wine production and a comprehensive understanding of the internal and external factors that underpin consumer purchasing motivations. As Coates (1997) emphasises, the quality of the final product is contingent on the quality control measures implemented during the stages of grape ripening and fermentation.

The following Ukrainian scientists have devoted their research to viticulture: A. M. Avidzba (2000), O. M. Garkusha (2002), I. I. Cherven (2008) and L. Hutsalenko and U. Marchuk (2020). These scientists have focused their research on analysing the most important theoretical and practical problems in the industry.

Jernigan D., Ross C. S. (2020) compare international experience in the formation of policies for controlling the quality and labelling of alcohol, and the study by Havrylyshyn V. V. and Sapozhnyk D. I. (2024) focus on the Ukrainian context, pointing out the challenges of state regulation of the wine market in the context of hybrid aggression and an unstable legal environment.

In the field of accounting, Kolawole, Olowookere & Esther, Adenle & Muhammed, Ijaiya & Onyekachi, Anyanwu (2024) assess approaches to the formation of accounting theory and areas of disagreement.

V. B. Mossakovsky (2008) considered the methodological principles of cost formation and product costing in the wine industry, examining them in the context of accounting regulations and other relevant frameworks.

Ana Trigo, Ana Marta-Costa and Rui Fragoso (2024), as well as Singh A., Soni T. K. and Bhusan S. (2024), considered sustainable wine assessment tools for improving the sustainability of the wine industry. These tools would ensure that sustainability indicators met strict criteria for accuracy and reliability, and that the assessment system promoted transparency and accountability.

In their work, Marchuk U., Hutsalenko L., Bondar M., Tsaruk N. and Renkas Y. (2024) revealed the peculiarities of controlling the formation of prices

for wine products on the world market, taking into account their qualification categories.

In their article, Rui Couto Viana and Lúcia Lima Rodrigues (2006) noted that the wine industry is no exception when it comes to the difficulties of implementing a traditional accounting system, given that this industry and similar ones are characterised by high-quality products and long-term inventories.

### 3. Aims, Objects and Methods

The objective of this study is to ascertain the most suitable models for accounting for the costs of producing winemaking products. This will be achieved through a critical analysis and generalisation of existing national and international models for accounting for these costs. In order to achieve this objective, it is recommended that the following tasks be identified:

To consider the types of enterprises engaged in winemaking activities in accordance with the current legislation and to analyse the dynamics of their development according to Classification of Economic Activities (CEA) 01.21 and 11.02 in 2016-2023;

- to study the peculiarities of implementing accounting principles in the formation of accounting policies of wineries;
- to study the stages of formation of production cost in winemaking, taking into account the cost of crop production;
- to generalise and systematise the typical cost accounting models used in winemaking, taking into account industry specifics;
- to present a model of cost accounting and to reflect the procedure for their accounting on the example of the "Wine bottling" section.

In the course of preparing the article, the authors employed a range of scientific and special research methods, which provided a systematic and comprehensive approach to the study of cost accounting models in winemaking and the specifics of the methodology for accounting for wineries. In addition, the dialectical method was utilised to elucidate the contradictions between prevailing approaches to cost accounting and the realities of winemaking. The method of induction and deduction was employed to formulate generalisations and draw logical conclusions. Furthermore, content analysis was used to study scientific publications, standards and guidelines governing accounting and the industry.

The legislative framework was analysed and synthesised in order to establish a robust foundation for the development of cost accounting models. The method of comparison enabled a comparative analysis of the number of enterprises operating in the activities of CEA 01.21 (grape growing) and 11.02 (wine production) in the dynamics of 2016-2023, which made it possible to assess the trends in the

development of the wine industry in Ukraine and compare the peculiarities of applying costing models in different accounting systems (Ukrainian, international and industry).

A systematic approach was also adopted in order to comprehensively assess the implementation of accounting principles in the selection and construction of a cost accounting model. This approach enabled the establishment of logical links between theoretical provisions and practical aspects of accounting policy. This in turn formed a comprehensive vision of the relationship between theory, practice and regulatory support for cost accounting. Furthermore, it helped to identify the impact of industry factors on the choice of accounting approaches. The modelling method has become the basis for constructing theoretical cost accounting models that reflect the specifics of the per-unit method in the context of winemaking, particularly in the example of the "Wine bottling" process. The observations and generalisations are disclosed through the utilisation of empirical methodologies employed for the analysis of wineries' practices and the formulation of proposals for the enhancement of their accounting systems.

The application of these methods enabled the development of a holistic perspective on contemporary cost accounting methodologies employed in the wine industry. This analysis identified effective models that ensure consistency in compliance with industry-specific characteristics, thereby fostering transparency, reliability and relevance in accounting information.

#### 4. Results of Research on Determining Optimal Models for Accounting for Wine Production Costs

##### 4.1. Types of Enterprises Engaged in Winemaking Activities

It is imperative to acknowledge the pivotal role that models play in the formulation of management decisions and the development of productive strategies for business entities. In order to ensure the effective implementation and use of optimal cost accounting models, it is necessary to carefully study the regulatory framework in this area. It establishes the fundamental principles, methodologies and requirements for the organisation of cost accounting.

The foundational model of accounting in agriculture is predicated on national accounting standards, which, in turn, are based on international principles laid down in international financial reporting standards. It is acknowledged that the Law of Ukraine "On Accounting and Financial Reporting in Ukraine" stipulates the principles and provisions of accounting in Ukraine. It is important to note that the conceptual document defines expenses as a reduction of economic benefits by reducing assets or increasing liabilities that cause a decrease in equity (The Law of Ukraine "On Accounting and Financial Reporting in Ukraine", 1999).

It is imperative that all legal entities established in accordance with Ukrainian law comply with this legislation; in the case of branches and representative offices of legal entities established in accordance with foreign law, the keeping of accounting records and submission of financial statements is obligatory. In accordance with the prevailing legislation, enterprises are categorised into four distinct groups, namely micro, small, medium, and large (Table 1), with respect to capital (The Law of Ukraine "On Accounting and Financial Reporting in Ukraine", 1999). This classification is of significance as it will determine the accounting model that will be applied in the future.

As demonstrated in Table 1, the classification of enterprises enables the determination of the scope of business entities' activities, the selection of the appropriate accounting and reporting system, and the establishment of approaches to the analytical evaluation of their activities. The manner in which costs are determined, accounted for and managed will vary according to the nature of the enterprise, with the particulars of this variation being contingent on the enterprise's objectives, requirements, strategic directives and the specifics of its activities, amongst other factors.

When analysing the number of enterprises operating in the field of grape growing and wine production, it is important to consider the classification (Table 1), as the size of the enterprise significantly affects its operating activities, production volume, level of mechanisation and automation, and the possibility of financial support for innovative solutions.

The analysis of the data by region facilitates the identification of regional peculiarities in the development of the wine and grape industry, the determination of the production potential of

Table 1

**Types of enterprises according to the Law of Ukraine "On Accounting and Financial Reporting in Ukraine"**

Enterprise type	Balance sheet value of assets	Sales net income	Average number of employees
Microenterprise	up to 350 thousand EUR	up to 700 thousand EUR	up to 10 people
Small enterprise	up to 4 million EUR	up to 8 million EUR	up to 50 people
Medium enterprise	up to 20 million EUR	up to 40 million EUR	up to 250 people
Large enterprise	over 20 million EUR	over 40 million EUR	over 250 people

Source: compiled by the authors based on data from Capital (The Law of Ukraine "On Accounting and Financial Reporting in Ukraine", 1999)



individual administrative units, and the acquisition of an understanding of the market structure involving enterprises of different sizes (see Figure 1).

As illustrated in Figure 1, a comparison of the size of enterprises with data on the number of operating business entities that, in the period 2016-2023, carried out activities by types of economic activity RDTL 01.21 "Grape growing" and CEA 11.02 "Production of grape wines" facilitates a more profound comprehension of the structural changes that have occurred in the grape and wine industry. The analysis by region facilitates the identification of the spatial concentration of enterprises, the determination of the dynamics of their quantitative composition, and the delineation of trends in industry development, with consideration for the role of small, medium, and large business entities in ensuring regional economic potential.

#### 4.2. Implementation of Accounting and Financial Reporting Principles when Forming the Accounting Policy of Wine-Making Enterprise

The principles set out in the Law of Ukraine of July 16, 1999 No. 996-XIV (The Law of Ukraine "On Accounting and Financial Reporting in Ukraine", 1999) have a direct impact on the methods and approaches to cost accounting, including in the wine industry. This legislation stipulates the overarching principles that govern the domain of accounting and reporting, with the overarching objectives of ensuring transparency, comparability and reliability of financial data. This, in turn, serves as a foundational element for the formulation of management decisions. This approach has been shown to assist in the optimisation of costs and the enhancement of business entity efficiency. The principles that directly affect cost accounting are outlined in Table 2.

The above principles ensure that the high accuracy and objectivity of cost accounting and financial

reporting are maintained and ensure efficient resource management and transparency of data for stakeholders.

An important regulatory document that forms the methodological basis for the presentation of cost data in accounting and reporting is National Accounting Regulations (Standards) (NR(S)AU) 16 "Costs" (The Order of the Ministry of Finance of Ukraine "On Approval of National Accounting Regulation (Standard) 16 'Costs'", 1999).

When studying expenses, it is necessary to analyze the concept of "cost price". For goods sold, it is determined in accordance with NR(S)AU 9 "Inventories" (The Order of the Ministry of Finance of Ukraine "On Approval of National Accounting Regulation (Standard) 9 'Inventory'", 1999). The cost of goods sold comprises three elements: the production cost of goods sold during the reporting period; fixed overhead costs that have not been allocated; and production costs in excess of the normal range. Expenses that are not included in the cost of products (works, services) sold but are related to operating activities are divided into administrative, selling and other operating expenses.

#### 4.3. Stages of Product Cost Formation in Wine Production

With regard to the allocation of expenses, the totality of expenditure is categorised into five distinct economic elements: material, labour, social security, depreciation and amortisation, and other operating expenses.

The list of cost items varies considerably between agricultural sectors. In the context of crop production, the following cost elements are commonly identified: labour costs, seeds, fertilisers, plant protection products, fuel and lubricants, works and services, repairs, maintenance of fixed assets, unproductive costs, general costs, and other costs. The planned cost of production is determined on the basis of technological maps. The objects of calculation are certain types of products, as well as the current year's work for future harvests. The calculation of the cost of production in crop

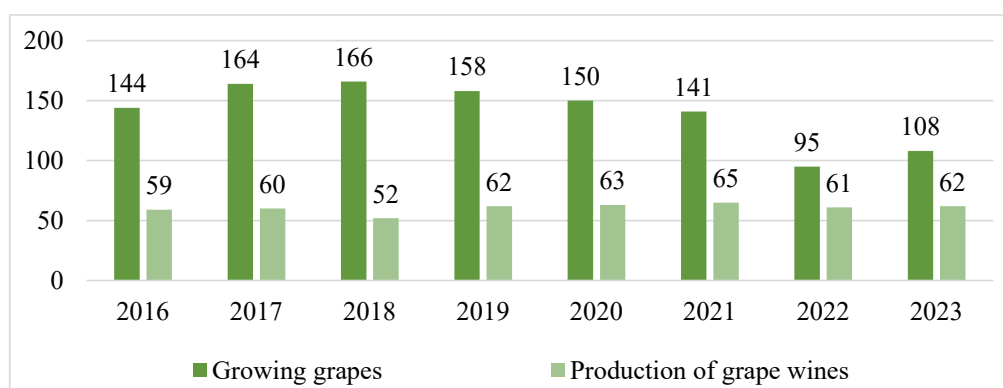


Figure 1. Number of operating enterprises in CEA 01.21 and 11.02 in Ukraine, (2016-2023)

Source: The State Statistics Service of Ukraine, 2024

Table 2

**Implementation of accounting and financial reporting principles when selecting and building a cost accounting model**

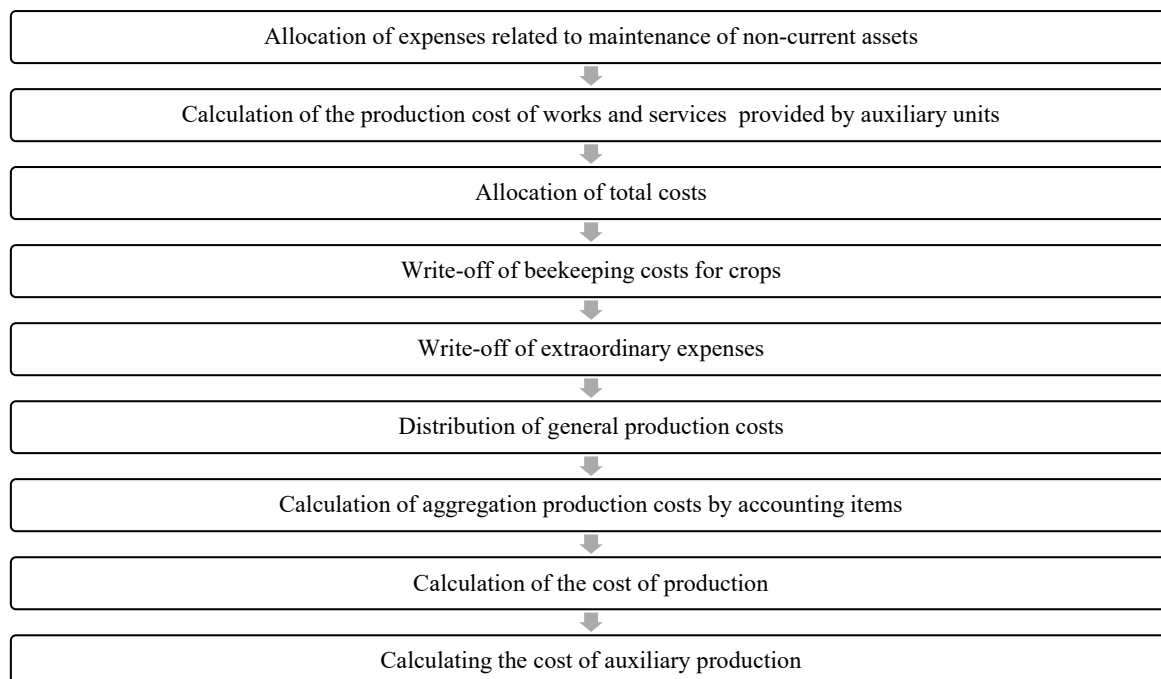
Principle	Linkage to costs
Full coverage	All expenses of the company, including actual and potential (e.g., future liabilities), should be presented in the financial statements. This approach provides stakeholders with the necessary information about expenses to make management decisions.
Autonomy	The company's expenses should be separated from the owner's expenses. That is, the owner's personal expenses should not affect the elements of the financial statements for the accuracy and objectivity of the information.
Consistency	Companies are required to use the same cost accounting methods for several periods. Changing methods may lead to incorrect data and, accordingly, their comparison in different periods.
Continuity	Expenses should be recognised based on the prospects of the company's future operations. For example, depreciation and amortisation expenses or provisioning expenses should be allocated based on the use of assets over a long period of time.
Accrual	Expenses should be recorded in the period of their incurrence, not in the period of their monetary confirmation.
Substance over form	Expenses should be accounted for based on their real nature, not just their legal form.
Single monetary measure	All expenses should be recognised in a single monetary unit, which facilitates the analysis and comparison of expenses from different periods or entities once they are presented in a single monetary measure.

Source: compiled by the authors based on the data of the Capital (The Law of Ukraine "On Accounting and Financial Reporting in Ukraine", 1999)

production is a multi-stage process, as illustrated in Figure 2 (The Order of the Ministry of Agrarian Policy "On Approval of Methodological Recommendations for Planning, Accounting and Calculating the Cost of Production (Works, Services) of Agricultural Enterprises", 2001).

The cost of horticulture and berry production is determined by deducting the cost of cuttings, which are valued at selling prices, from the total costs. The cost price of 1 centner of grapes is calculated by dividing the total costs of growing by the quantity of products.

Another regulatory model of cost accounting in winemaking is laid down in NR(S)AU 30 "Biological Assets" (The Order of the Ministry of Finance of Ukraine "On Approval of National Accounting Regulation (Standard) 30 'Biological assets'", 2005). Agriculture is a specific industry characterised by the connection between the production process and biological assets. In viticulture, the biological assets are vineyards, the agricultural product is grapes, the additional biological asset is chubuki, and the processing products are wine and juice. Biological assets (i.e., agricultural products)

**Figure 2. Sequence of calculating the cost of crop production**

Source: systematised according to (The Order of the Ministry of Agrarian Policy "On Approval of Methodological Recommendations for Planning, Accounting and Calculating the Cost of Production (Works, Services) of Agricultural Enterprises", 2001)

can be recognised as assets if, based on past events, it is probable that future economic benefits will flow to the company and their value can be reliably measured (The Order of the Ministry of Finance of Ukraine "On Approval of National Accounting Regulation (Standard) 30 'Biological assets'", 2005).

The international model of cost accounting in winemaking is IAS 41 "Agriculture", which sets out the procedures for accounting, financial reporting and disclosure of information relating to agricultural activities. This is defined as the management of the biological transformation of biological assets (living animals or plants) and the harvesting of these assets for sale, conversion into agricultural products, or the creation of additional biological assets (IAS 41 – Agriculture, 2000).

A direct analysis of the accounting models outlined in national and international accounting and financial reporting standards reveals two key models:

- The model of accounting at cost or historical cost;
- the fair value model of the balance sheet.

In the context of accounting in Ukraine, fair value constitutes one of the alternative values for recognizing assets in financial statements. Prior to the advent of international approaches, the valuation of the property was based exclusively on its historical cost. In other words, all assets were valued and accounted for in the financial statements solely at the cost of their acquisition and production. The conceptual framework of international financial reporting utilises fair value as the basis for measuring assets, and financial statements prepared in accordance with international standards are based solely on such value.

This assertion is substantiated by specific international standards, notably the standard that delineates fair value measurement. Fair value is unambiguously delineated as the basis for measuring property, plant and equipment in the international financial reporting standard. In accordance with the Agriculture Standard, the measurement of biological assets is also based on property, plant and equipment. In the context of financial instruments, including securities and equity interests, the fair value model remains the sole option available for financial reporting purposes.

#### 4.4. Models of Cost Accounting in Winemaking

In considering the technological process of wine production, it is important to emphasise the agricultural component, specifically the production of grapes as a raw material for subsequent winemaking activities. The second aspect is the process of processing grapes into wine.

To summarise the analysis of national and international approaches to the construction of wine production cost accounting, two consistent

accounting models that are inherent and optimal for this industry are worthy of highlighting. The initial factor is attributable to the technological process inherent in winemaking, which encompasses two discrete stages of production, notably the cultivation of grapes as an agricultural product. The second is the industrial processing of this agricultural product, which is considered specific to agriculture, as it is no longer an area of agricultural activity, but belongs to industrial production (Figure 3).

Consequently, in the course of the analysis and critical evaluation of approaches and models of cost accounting for wine production, the authors found that there are two key consistent accounting models, which are determined by the technology of winemaking and the specifics of this industry. The initial stage of wine production involves the implementation of agricultural activities for the cultivation of agricultural products, namely, the cultivation of grapes. The initial stage of the process is to determine the availability of the first accounting model, which is of an agricultural nature. The second model, termed the industrial cost accounting model, is associated with the second stage of winemaking, namely direct processing of grapes and wine production (see Figure 4).

It is evident that both models possess distinct characteristics that diverge from each other. Therefore, a dual-faceted approach is imperative for the deliberation, examination and enhancement of accounting, valuation and reporting methodologies within the framework of these two models.

Viticulture constitutes the foundation for the production of high-quality wine. A comprehensive evaluation of viticultural practices, encompassing the quality of grape varieties, in conjunction with an efficacious approach to growing, storage, and processing conditions, facilitates the production of products that align with market demands. As winemaking is closely related to grape growing, this process encompasses the characteristics of the finished product and the stages of its production, from vineyard cultivation to processing. In general, an objective assessment of products forms the basis of financial analysis, ensuring the effective management and development of the industry. The accounting valuation of grape products helps to accurately reflect production costs, determine the value of goods and analyse economic efficiency. Such an assessment should consider all factors affecting the formation of the cost price, including the costs of growing grapes and purchasing materials and raw materials, as well as energy resources, labour, and depreciation of fixed assets. This approach enables accurate accounting and facilitates the preparation of financial statements, which form the basis for analysing the company's financial condition and making decisions regarding pricing, investment, strategic planning, and so on.

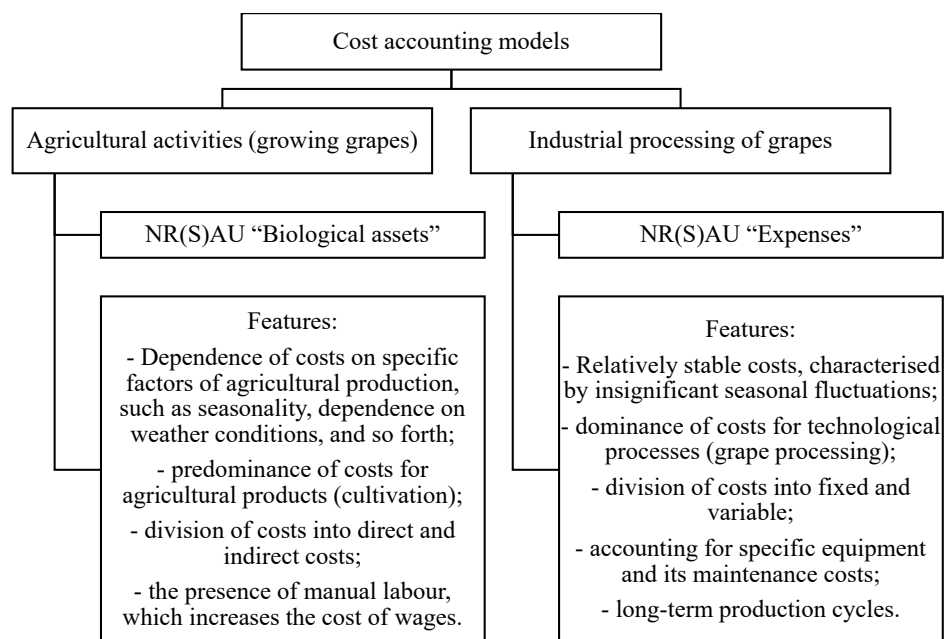


Figure 3. Models of cost accounting in winemaking

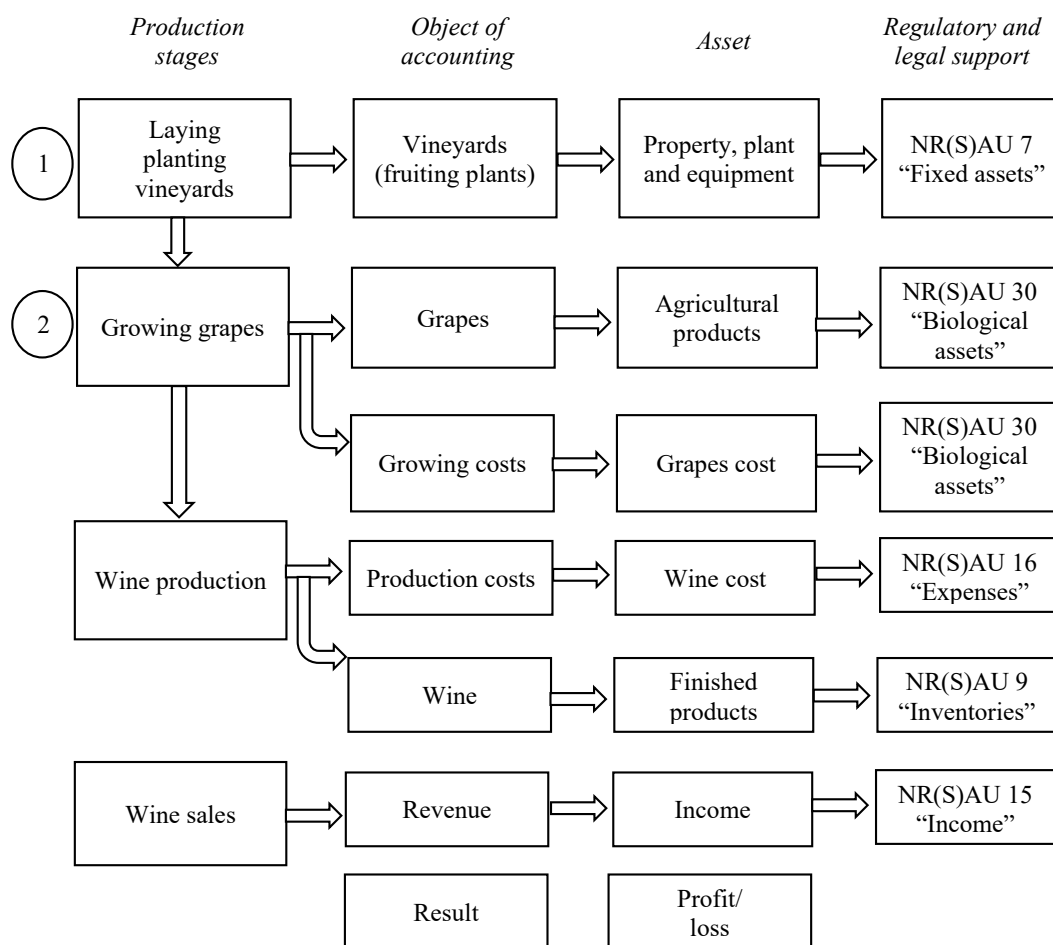


Figure 4. Generalised normative model of cost accounting in winemaking



Enterprises that adhere to international accounting standards allocate a proportion of their administrative expenses, which may be associated with the production process, to production costs.

#### 4.5. Cost Accounting Model and Accounting Procedure Using the Example of Wine Bottling Redistribution

Primary winemaking entities are responsible for the production and processing of wine materials according to technological requirements. Companies that age or bottle wine may also process wine materials according to technological regulations. Sparkling and gas wines, including Champagne, are produced in any region of Ukraine at the location of the winery (The Law of Ukraine "On Grapes and Wine", 2005).

The activity of wineries is characterised by a number of specific features. These include the harvesting and processing of grapes; the production and technological processing of wine materials; the harvesting and bottling of finished wine; the ageing of cognac spirits; the processing of winemaking waste; and the sale of finished products (The Law of Ukraine "On Grapes and Wine", 2005).

It is imperative to consider the technological stages of production when accounting and valuation are conducted. This is achieved through the implementation of the following redistributions (see Figure 5).

The enterprises under scrutiny in this study predominantly utilised a four-stage framework. In the initial stage (grape processing and primary production), general production costs were considered, encompassing depreciation of fixed assets for general production purposes, labour costs for the management of workshops, sites, maintenance, operation and repair costs, insurance, operating leases of fixed assets, other non-current assets for general production purposes, and direct material

production costs, with the exception of return waste, raw materials. From a temporal perspective, this initial division occurred within the same month (Hutsalenko et al., 2020).

The second stage in accounting (storage, care and technological processing of wine material) occurs in November and includes, in addition to general production costs, direct material production costs other than returnable waste and semi-finished products.

The third accounting transition is scheduled for December, and will concern the long-term ageing of wine materials and technological processing. It is evident that the financial outlay is equivalent to that of the second stage of accounting.

The final stage of the accounting process occurs in February, when the wine is bottled. At this stage, in addition to general production costs, the costs of the main production (if we consider wineries) are also included (see Figure 6).

Thus, the calculation of the cost of production in winemaking, which constitutes the production cost, is carried out by the following cost items (Dobrovsky, Gnylytska, Korshikova, 2005):

- Basic and auxiliary raw materials;
- semi-finished products produced in-house;
- transportation and procurement costs;
- fuel and energy resources used for technological needs;
- expenses related to the maintenance and operation of machinery and equipment;
- salaries and wages of employees engaged in production;
- expenses for the preparation and development of production;
- losses arising from defects;
- general production costs;
- administrative expenses;

Processing of grapes, fruits and berries in the primary production process	•The object of calculation is raw wine and juice materials
Storage, care and processing of wine and juice materials	•The object of calculation is processed wine and juice materials
Production of wort vacuum	•The object of calculation is vacuum wort
Long-term aging of wine materials	•The object of calculation is aged wine materials
Wine bottling	•The object of calculation is wine in bottles or barrels

Figure 5. Accounting and valuation transitions in winemaking

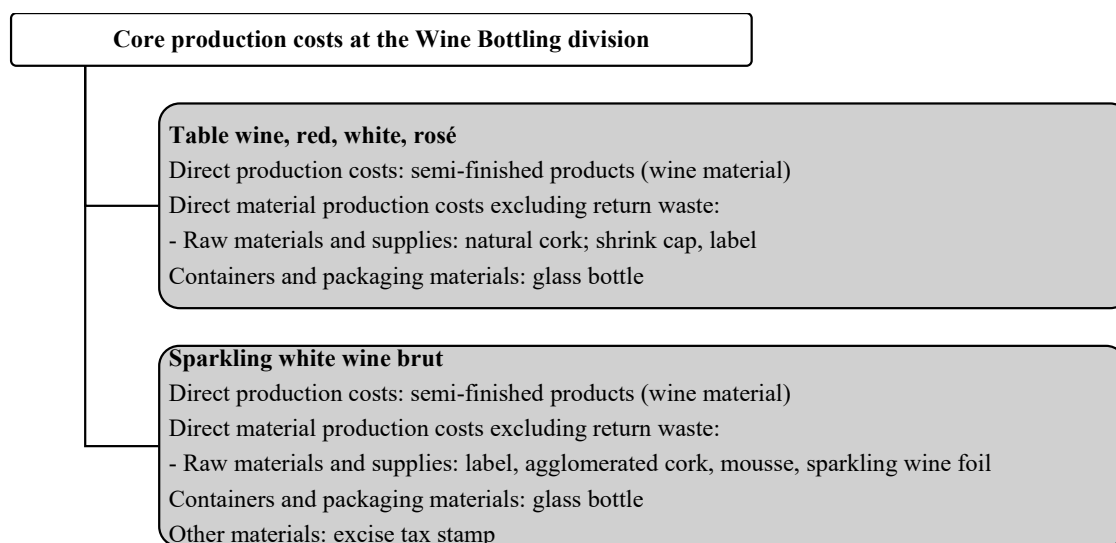


Figure 6. Costs of basic production at the Wine Bottling section

- other expenses related to production;
- costs of commercial activity.

In the process of organising the generation and distribution of income, it is important to take into account such factors as the size of the company, its form of ownership, organisational and legal structure, and the number of founders. It is recommended that companies undertake regular analysis of the composition and dynamics of income, with a view to enhancing comprehension of its constituent elements and prevailing trends. A fundamental objective of financial planning is the identification and utilisation of reserves to augment income through the effective utilisation of material, labour and financial resources. Increasing the efficiency of sales can also be achieved by finding more profitable partners for the sale of products or improving the quality of customer service (Potryvayeva, Khristenko, Havaleshko, 2017).

To summarise the findings of the study, it is important to note that cost accounting in winemaking necessitates not only the adaptation of widely accepted methods to industry-specific requirements, but also the establishment of an accounting model that is capable of accurately reflecting real costs at all stages of production, from the cultivation of grapes to the bottling of finished products. Consequently, the findings of this study are of both theoretical and applied value, as they can be used as a basis for improving the accounting policies of enterprises, developing standards and guidelines for the industry, as well as further research in the field of management accounting of wineries.

## 5. Discussion

A study of optimal cost accounting models in winemaking found that effective cost management

requires a flexible approach that considers the industry's specifics, the seasonal nature of production, and the biological characteristics of raw materials. Current practice mainly focuses on standard accounting models, which do not always accurately reflect real industry processes. Unlike other industries, winemaking requires the complex structure of production, with its numerous processing stages, to be taken into account. While the introduction of automated accounting systems increases transparency and data accuracy, it requires adaptation to industry specifics. Typical accounting programmes often fail to consider nuances such as fermentation losses, volume changes during the ageing stage and the impact of biological transformations on production costs.

The methodological basis for the valuation of wine products involves an integrated approach that includes both direct production costs and indirect costs, which are distributed taking into account the specifics of the stages of the technological process. A pivotal element in this regard pertains to the precise determination of the moment of transition from semi-finished to finished products, a process that wields a considerable influence on the reliability of financial statements and the efficiency of subsequent economic analysis.

The issue of unifying cost models for enterprises with different scales of activity remains problematic. The potential for integrating elements of regulatory and process accounting to enhance the capacity of the cost management system is also a subject of interest. This provides a foundation for the subsequent investigation of adaptive models derived from data originating from automated systems and digital platforms.

This study summarises the aforementioned approaches and proposes a model adapted to the conditions of Ukrainian wineries. The model takes into

account the batch production structure, the specifics of accounting for semi-finished products, and the integration of digital solutions into internal cost control.

## 6. Conclusions

To summarise the preceding discussion, it is evident that cost accounting models employed in the context of winemaking must be tailored to the unique characteristics of the production process. This entails a consideration of the biological properties of raw materials (grapes), the duration of technological cycles, and the various stages of processing. This necessitates the adaptation of general methodological approaches to the conditions of the industry, with the legal status of enterprises being taken into account in accordance with the requirements of the Law of Ukraine "On Accounting and Financial Reporting in Ukraine". The type of enterprise determines the scope and format of accounting information. The optimal approach for wineries is a combination of normative and preliminary accounting methods, which facilitates cost control at each stage of production and the establishment of a reliable cost of production.

The study allowed solving the tasks set and forming the following conclusions:

In the course of the analysis of the regulatory framework governing winemaking activities, the authors consider the typology of enterprises in accordance with the Law of Ukraine "On Accounting and Financial Reporting in Ukraine". The analysis of the dynamics of the number of business entities under CEA 01.21 (grape growing) and 11.02 (wine production) in 2016-2023 demonstrated a gradual growth of the wine segment. This finding underscores the necessity for the enhancement of the cost accounting system within the industry.

It has been demonstrated that the effective implementation of accounting principles in wineries has a direct impact on the quality of management decisions. The selection of cost accounting method should be grounded in a combination of a normative approach to the technological logic of production, a particularly salient aspect in the establishment of accounting policy.

3. The present study investigates the process of formulating the cost of winemaking products, taking into account the cost of growing grapes. The emphasis is placed on the stages of processing, the need to determine the moment of transition from semi-finished to finished products and the consideration of indirect costs in the preparation of financial statements.

4. The cost accounting models employed by wineries are, by and large, of a generalised nature. It has been determined that the most pertinent for the industry is a combination of the incremental and normative methods, which enable accounting to take into account the stages of the technological process and promptly control costs.

5. The article presents an industry-specific model of cost accounting with a detailed breakdown of redistributions in the practice of the "wine bottling" process. This approach facilitates the structuring of costs within a single stage, as well as the visualisation of accounting processes, the automation of control, and the enhancement of the transparency of information utilised for management decision-making.

The generalised regulatory model demonstrates an effective approach to cost control, taking into account the stages of the technological process and the sequence of cost calculation. This is typical of crop products, which are raw materials in winemaking. Visualising accounting processes and delineating processing stages in winemaking enhances comprehension of the cost structure and streamlines the formulation of industry recommendations for practitioners. The Wine Bottling stage is a particularly pertinent example in this regard, as it demonstrates how the detailed costing of a single stage can facilitate effective operational cost control, thereby ensuring the effective planning and management of resources at the final stage of the production process.

It is evident that the adaptation of accounting methodologies to the requirements of wineries is instrumental in ensuring the reliability of financial reporting, the efficacy of planning processes, and the enhancement of enterprises' competitiveness. The proposed cost accounting model allows for adaptation to industry specifics and digital transformations, thus establishing the foundation for future research in the area of adaptive cost management systems.

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