

by Head Assist. Prof. Krasimir Georgiev Kulchev, Ph.D.

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Monograph

Kulchev, K. (2023). *Assessment of the insolvency risk of enterprises*. Svishtov, Tsenov Academic Publishing House, 176 pages, ISBN 978-954-23-2412-6

Foreign models for assessing the insolvency risk of enterprises are an effective way of forecasting the financial position, therefore, they should not be directly excluded from the analytical tools used in Bulgaria. At the same time, these models, developed in socio-economic conditions that differ from the Bulgarian ones, suggest that they should not be immediately applied without a thorough and targeted study. Such studies contribute to the application of foreign analytical models with relatively high prognostic capabilities in their original form, as well as the adaptation of empirical equations with lower prognostic capabilities to a specific business environment, and the construction of new models. In this way, the theory of financial analysis is enriched and favourable conditions for increasing the degree of certainty are created when assessing the insolvency risk of enterprises in practice.

All this gives reason to define the topic of the research as *relevant*, especially under the conditions of intensifying competition, where financial

sustainability is a necessary prerequisite for preserving and expanding market positions.

The **object** of research is *insolvency risk assessment of capital commercial non-manufacturing enterprises through special analytical models*.

The **subject** of research is the *prognostic capabilities of analytical models for assessing the insolvency risk of enterprises*.

The **research thesis** developed in the monograph is the following: *the logic of creation and the elements of existing models for assessing the insolvency risk of enterprises can serve as a solid basis for constructing new analytical models, tailored to the Bulgarian business environment, which have higher prognostic capabilities compared to their prototypes*.

Searching for solutions to the problems related to the use of analytical models is a prerequisite for setting the research **aim** – *testing existing models for assessing the insolvency risk of enterprises, as a result of which to gain insight into the possibilities for applying them in our country in their original or adapted form and to incorporate their elements in constructing new analytical models*.

The **methodological basis** of the research is the general economic theory and the particular scientific method of economic analysis, which are used in accordance with the inductive and deductive approaches. In addition, the following research methods are applied: analysis; synthesis; comparison; description; grouping; classification; modelling and graphical method. Discriminant analysis is also used, which belongs to the techniques of multidimensional statistical analysis and is embedded into the specialized software product PAST. The theoretical statements and empirical data are presented in tables and illustrated with appropriate figures. The construction of the graphs and a significant part of the calculations are done using the software product Microsoft Excel.

The research in **chapter one** leads to the formation of the following important conclusions:

- The combination between a low relative share of enterprises declared insolvent and an upward trend in the opened insolvency proceedings, observed in Bulgaria, is a problem of *macroeconomic importance*. It is the reason why insolvency proceedings in our country are considered slow and inefficient, and the amount of costs of the procedure and its duration are unknown quantities. The consequences of insolvency (including unemployment) and ineffective procedure affect not only legal entities, but also natural persons. *The most risky enterprises from an economic point of view are those performing non-manufacturing activities.*

- *From a legal point of view, the enterprises most at risk of insolvency are capital commercial companies*, and the main signs of early recognition of insolvency are payment problems and an increase in indebtedness.

The simultaneous threat to capital commercial companies from insolvency and over-indebtedness, combined with the fact that approximately one third of the enterprises declared insolvent in Bulgaria carry out non-manufacturing activities, determine *insolvency risk assessment precisely in non-manufacturing capital commercial companies as the subject of research.*

Chapter Two states the following:

- *Two approaches can be distinguished in assessing insolvency risk – without the formation of a specific integral indicator or with the formation of such an indicator. The second approach has greater cognitive capabilities compared to the first one, at the same time being its logical continuation.*

- The models constructed according to the second approach are designed specifically for forecasting the risk of insolvency in subsequent accounting periods. *Three analytical models of this type are selected for testing in the practical section of the study;*

- *Twenty-two key financial ratios are highlighted, which can be combined with one another in their role as main components in the construction of new analytical models for assessing the insolvency risk of enterprises.*

In order to make timely and well-grounded managerial decisions, it is necessary to use analysis tools, including specialized analytical models, which will give an idea of the degree of risk not only at the present moment and in past accounting periods, but will also have sufficiently good prognostic capabilities. Systematic monitoring and measurement of the risk of insolvency by means of similar analytical tools create prerequisites for limiting it within relatively acceptable boundaries.

In **Chapter Three**, the research is based on the following:

- *The capability to prepare a forecast is an indisputable advantage of the analytical models specialized for assessing the insolvency risk, but their development in a business environment different from the Bulgarian one gives rise to the need for additional research on their applicability in our country. These studies are provided with information for four consecutive accounting periods from the financial statements of forty non-manufacturing capital commercial companies (twenty insolvent and twenty financially sustainable enterprises) and with an appropriate statistical software product – PAST, in which discriminant analysis is also embedded, applicable in the construction of models for assessing the insolvency risk of enterprises.*

- *When testing the selected three analytical models with information from the financial statements of the twenty insolvent companies, an idea is gained about their prognostic capabilities in risk assessment in enterprises with already opened insolvency proceedings.*

- *Testing the selected three analytical models with information from the financial statements of the remaining twenty companies gives an idea of their prognostic capabilities when assessing risk in financially sustainable enterprises.*

Testing the models with information from the company reports is necessary because each of the selected analytical models shows different prognostic capabilities in assessing the risk in enterprises declared insolvent and in financially sustainable enterprises. Synthesizing the research in both directions creates conditions for obtaining a generalized idea of the prognostic capabilities of the tested analytical models. This idea, in turn, is the basis for distinguishing the models into two groups – models applicable in their original form and models with relatively lower prognostic capabilities, subject to adaptation to the Bulgarian business environment.

In **Chapter Four**, the following results are available:

- *A generalized idea of the prognostic capabilities of each of the selected analytical models is obtained. It is concluded that two of them can be applied in their original form when assessing the insolvency risk of enterprises in Bulgaria. The third tested model shows relatively lower prognostic capabilities, which is a prerequisite for the search for options for its adaptation to our socio-economic conditions.*

- *Two options for adapting the model with lower prognostic capabilities are outlined. In the first option, the analytical model is adapted by adjusting the limit value of its integral indicator. The second adapted option is developed by modifying its original form, changing the weight coefficients of the financial ratios (the main components, the key financial ratios) included in the analytical model.*

- *Based on the logic of creation and on some of the elements of the existing models, five new analytical models are constructed for assessing the insolvency risk of enterprises.*

The research thesis is considered proven because the prognostic capabilities of the new five analytical models exceed the prognostic capabilities of the rest of the analytical models (the three existing models tested in their original form and the two adapted options of the analytical model with lower

prognostic capabilities – the option adapted through adjustment and the option adapted through modification).

5. A published book based on a defended dissertation for the award of the educational and scientific degree “Doctor” or for the award of the scientific degree “Doctor of Science”

Kulchev, K. (2023). *Theoretical-applied problems of the analysis of physical distribution (Book based on a defended dissertation for the award of the educational and scientific degree “Doctor”)*. Tsenov Academic Publishing House Svishtov, 157 p. ISBN: 978-954-23-2449-2 (soft cover), ISBN: 978-954-23-2450-8 (online).

<https://dlib.uni-svishtov.bg/handle/10610/4894>

The improvement of the quality of provided services has a favourable effect on the company’s competitiveness. To the highest degree this applies to physical distribution, which is directly related to the service of trading partners and customers. The strategic importance of physical distribution requires its timely improvement, based on the results of a systematic and in-depth economic analysis.

The *object* of research are the theoretical, methodological and applied problems of physical distribution analysis in terms of improving the efficiency of its management.

The *subject* of research are the possibilities for development and improvement of the methodological apparatus and the technical tools of the physical distribution analysis.

The *aim* of the book is to develop and test the analytical tools in real conditions, in which to create a comprehensive picture of the state of the studied

physical distribution systems, which serve as a basis for making informed managerial decisions.

The book defends the *thesis* that the methodological apparatus and techniques for physical distribution analysis are effective tools in making informed managerial decisions aimed at improving the efficiency and quality of physical distribution.

As a result of the conducted research, it is concluded that they contribute to the improvement of the tools of economic analysis. In addition, they give reason to draw the following conclusions:

First, the improvement of any economic activity is unthinkable without its detailed study, i.e. without analysis. This also applies to physical distribution, which should be considered as a tool for increasing the competitiveness of the manufacturing enterprise. Its improvement based on an in-depth analysis would contribute to increasing the efficiency of managerial decisions in this area of economic activity;

Second, determining the basic elements of physical distribution is a key issue in applying appropriate analytical tools. Solving it creates the necessary conditions for the development of a system of indicators, factor systems and technological models. Researching them through the proposed analysis techniques after their improvement provides the company management with information about the overall state of the physical distribution system. The information thus obtained gives an idea of the dynamics of the physical distribution system and the quality of the physical distribution from two points of view – of the company management of the production enterprise and of the customers and trading partners;

Third, in using the physical distribution analysis tools, conclusions are reached that affect not only the individual enterprises, but also the studied branch (baby food production);

Fourth, when assessing the quality of physical distribution, it is found that there is no enterprise with a physical distribution system characterized by optimal levels of all the studied indicators. Each of the physical distribution systems has strengths that contribute to the defense of market positions and weaknesses that can be improved;

Fifth, more detailed information about the strengths and weaknesses of physical distribution systems is obtained after their generalized characterization. On this basis, specific recommendations are made for improving the physical distribution in the studied enterprises.

6. Articles and papers published in scientific editions, referenced and indexed in worldwide databases of scientific information

Kulchev, K., (2023). Improving the assessment of the solvency of Authorized Economic Operators in Bulgaria. *World Customs Journal*, 17(2), 79-92. ISSN: 1834-6707 (Print), ISSN: 1834-6715 (Online).

<https://worldcustomsjournal.org/archive/> Indexing: SCOPUS (Elsevier)

In achieving a balance between the ever-increasing requirements on customs administrations regarding the security and safety of international trade on the one hand, and on the other – the desire of merchants for easy and quick customs clearance of their goods, the so-called “simplified customs procedures”, and in particular the “Authorized Economic Operator” status, have an important role. To obtain the status, a number of requirements (criteria) must be fulfilled by persons wishing to access specific facilities in the course of customs procedures covering their activities. Such requirements include the fulfillment of the proven financial solvency criterion. At the moment, Bulgarian customs administration has not developed a single methodology that allows reaching a more accurate assessment of solvency, which is why the present article proposes an analytical methodology designed to achieve this aim. Summarizing the issues

discussed in this paper, it can be concluded that to a certain extent they are manifested not only on a national but also on a pan-European scale. The main reason can be the need to expand the analytical methodology for the needs of control over the financial solvency of the persons with the Authorized Economic Operators (AEO) status in the EU Member States. The proposed methodology can contribute to increasing the efficiency of customs control with regard to the proven financial solvency criterion of the Authorized Economic Operators, while at the same time allowing the complete automation of the process through the development of a specialized software application. In this way, on the one hand, the problem with the qualification of customs officials in the field of financial analysis can be solved, and on the other hand, the possibilities of making mistakes when applying the criterion and making incorrect decisions regarding the granting of the status would be reduced to an objective minimum.

7. Articles and papers published in non-refereed peer-reviewed journals or published in edited collective volumes

7.1. **Kulchev, K.** (2021). Tools of economic analysis when researching the tourism market. *Business management*, 2, 22-39. ISSN: 0861-6604 (Print); ISSN: 2534-8396 (Online). <https://bm.uni-svishtov.bg/title.asp?title=2633>

The study aims to test tools of economic analysis from different classification groups by using real data in order to derive the main characteristics of the Bulgarian tourism market serving as a basis for making informed managerial decisions. Tools for factor and structural analysis are used in compliance with the aim of the article. It is argued that a tourism market research approach combining in a balanced way the tools typical of economic analysis with those applicable to other fields of knowledge has the potential to provide the necessary information environment for effective management of

tourism activities at macro and micro levels. As a result of the study, it is concluded that the use of a similar balanced research approach makes it possible to reveal both the strengths and weaknesses of the Bulgarian tourism market and the gaps in the information presented. The outlined information deficit hinders the analysis and, respectively, the timely development of operational, tactical and strategic decisions. Summarizing the results of the study, in terms of making strategically important managerial decisions in the field of tourism in our country, two problems can be brought to the fore: first, classical tools of economic analysis have a very limited application; second, there is a lack of detailed statistical information on the development of the tourism industry. A possible solution to the first problem is adopting an approach of a balanced combination of analytical tools from different classification groups and such an approach is used in the present study. The balanced combination of analytical tools also contributes to reducing the degree of uncertainty, partially compensating for the lack of detailed statistical information, i.e. indirectly assists in solving the so called second problem thus derived. In terms of economic analysis, the most significant finding is that the classical techniques of economic analysis, the “Elimination” technique in particular, are effective tools at both micro and macro levels.

7.2. **Kulchev, K.** (2021). Polish analytical models applicable in assessing the financial sustainability of enterprises in the Republic of Bulgaria. *Sustainable Development and Socio-Economic Cohesion in the 21st Century: Trends and Challenges. International scientific and practical conference. Conference Proceedings*, Volume I, 620-627, Tsenov Academic Publishing House Svishtov. ISBN: 978-954-23-2067-8 (Print); ISBN: 978-954-23-2068-5 (Online). <https://dlib.uni-svishtov.bg/handle/10610/4505>

Forecasting the financial sustainability of enterprises is a priority problem. Analytical models, including the Polish ones, which are constructed through discriminant analysis, provide an opportunity to predict financial sustainability. Testing them in our country would contribute both to the enrichment of the theory of economic analysis and to the timely detection of the risk of deteriorating financial sustainability of existing enterprises. The conducted research shows that the tested analytical model of the Institute of Economic Sciences of the Polish Academy of Sciences is an effective tool for assessing financial sustainability. Testing its prognostic capabilities with data for enterprises in Bulgaria reveals its advantages over significantly more popular models. The reasons for this can be sought both in the universality of the Polish model and in the possibly greater similarities of the Bulgarian economy to the Polish one than to the American or Canadian ones. The findings of the research are grounds for assuming that other Polish analytical models could also be applied in assessing the financial sustainability of enterprises in Bulgaria. They could be used in their original form, combined with other similar models, and can also be further adjusted (adapted) to a specific business environment. The results of applying the analytical models for assessing the financial sustainability of enterprises can be particularly useful in their timely use for making informed decisions in the field of customs control, financial control, tax control, etc.

7.3. **Kulchev, K.** (2023). Analytical tools when preparing rating assessments of products. *Challenges for Finance and Economic Accounting in Conditions of Multiple Crises: Jubilee international scientific and practical conference. Conference Proceedings*, 480-485, Tsenov Academic Publishing House Svishtov. ISBN: 978-954-23-2426-3 (Print); ISBN: 978-954-23-2427-0 (Online). <https://dlib.uni-svishtov.bg/handle/10610/4869>

The sustainable upward development of enterprises, under the conditions of the modern business environment, characterized by over-informedness of customers and market instability, is unthinkable without maintaining a relatively high level of company competitiveness. To the highest degree this applies to the competitiveness of the products, the sales revenue of which is a major factor in the formation of the financial results of the production enterprises. To increase product competitiveness, it is necessary to know both the strengths and weaknesses of one's own products as well as those of the competing products. Achieving such a purpose is possible through the application of analytical tools designed for the preparation of rating assessments. Through the analyses made, the conclusion reached is that each of the products included in the research has the potential to be chosen by customers, and similar ratings can be used: as criteria in determining the levels of indicators in the business plan; when performing internal control; when making informed managerial decisions aimed at changes in the technical characteristics of the products; as a basis for undertaking specific marketing actions.

7.4. **Kulchev, K.** (2023). Comparative analysis of distributors. *Challenges for Finance and Economic Accounting in Conditions of Multiple Crises: Jubilee international scientific and practical conference. Conference Proceedings*, 486-491, Tsenov Academic Publishing House Svishtov. ISBN: 978-954-23-2426-3 (Print); ISBN: 978-954-23-2427-0 (Online).

<https://dlib.uni-svishtov.bg/handle/10610/4869>

In the optimization of business activities, issues related to the improvement of the company's policy on the selling of goods are extremely important. The main element of this policy is the distribution activity, which in turn includes two key components – building a distribution network (of distribution channels and the distributors participating in them) and physical

distribution of the products. Due to the long-term nature of the business relationship between an enterprise and its distributors, before the commercial agreements are concluded and the physical movement of the goods through the distribution network begins, the business partners should have carefully researched each other in order to know well the advantages and disadvantages of their counterparties. In the present paper, the emphasis is placed on the use of a comparative analysis of the distributors, in order to select the most suitable of them in the construction of a new network of distribution channels or in the optimization of an already existing distribution network. By preparing such complex assessments, the aim is to reveal the advantages and disadvantages of individual distributors. The results of the analysis can be used in implementing internal control and in taking specific actions aimed at: terminating relationships with distributors with lower complex ratings; searching for distributors with proven professional experience; providing greater trade discounts to distributors with higher complex ratings; organizing joint trainings with distributors; other actions aimed at increasing sales revenue.

7.5. **Kulchev, K.** (2023). Approaches for analyzing the financial sustainability of enterprises. *e-JOURNAL VFU*, 20, 434-444. ISSN 1313-7514 (Online). <https://ejournal.vfu.bg/bg/administrationandmanagment.html>

The possibilities to forecast financial sustainability of enterprises can be reduced to two approaches. The first one applies various combinations of individual indicators, which does not lead to calculating the integral indicators of financial sustainability. The second approach is aimed directly at calculating integral indicators by means of special analytical models for forecasting financial sustainability. The joint use of the two approaches should be perceived as a necessary prerequisite for the comprehensive analysis of financial sustainability in past reporting periods and for forecasting it in the future.

Summarizing the research, the following conclusions are highlighted: First, the early detection of deteriorated financial sustainability of the enterprise is an achievable goal, because before the occurrence of possible problems, it is very likely that warning indications will appear. Second, although a crisis is almost never purely financial, it affects key financial indicators early enough. Third, the right way to assess implies the combination of different analytical approaches, tools and indicators. The two approaches to assessing financial sustainability are based on the study of a combination of analytical indicators. The difference between them is that in the second approach only relative weighted individual indicators are used, the summation of which forms the level of a specific integral indicator. The resulting complex assessment gives a comprehensive picture of the degree of financial sustainability at a certain date and in dynamics.

7.6. **Kulchev, K.** (2023). Key elements of models for the analysis of the financial sustainability of enterprises. *e-JOURNAL VFU*, 20, 445-452. ISSN 1313-7514 (Online).

<https://ejournal.vfu.bg/bg/administrationandmanagment.html>

One of the possible approaches to assessing the financial sustainability of enterprises is to apply integral indicators, which are calculated using analytical models developed specifically for forecasting it in future reporting periods. Key elements of these models are financial ratios (coefficients), the selection of which was carried out empirically. The objective assessment of financial sustainability depends on the compatibility of the selected ratios within a specific analytical model. Based on the conducted research, the following conclusions are reached: First, the main elements of the models for analyzing the financial sustainability of enterprises are ratios selected according to certain considerations: they should be components of empirical equations with proven high prognostic capabilities; they should participate in a significant number of

financial sustainability forecasting models; they should be considered useful in assessing financial sustainability without necessarily being included in empirical equations. Second, in the analysis and assessment of financial sustainability, ratios with the same content and different names are used. Within the framework of this article, financial ratios are selected, which are subjected to additional tests for compatibility, in which the ratios with the highest levels of their weighted coefficients participate in the final versions of the analytical models. Third, after the completion of the compatibility tests, it can be argued that some financial ratios, which are building blocks of already existing analytical models for predicting financial sustainability, have the necessary qualities for their inclusion in the new models of a similar type. To the highest degree this applies to the indicators of profitability and indebtedness.

7.7. **Kulchev, K.** (2023). Digitalization of analytical models for assessing the financial sustainability of enterprises. *e-JOURNAL VFU*, 20, 547-557. ISSN 1313-7514 (Online).

<https://ejournal.vfu.bg/bg/administrationandmanagment.html>

Digitalization is a process that has contributed significantly to the automation of recurrent analytical activities. Such routine activities are also performed when assessing the financial sustainability of enterprises. This paper presents a methodology for assessing financial sustainability, applying an approach focused entirely on the use of a system of relative indicators. The relative indicators are the main building blocks when constructing models for assessing the financial sustainability of enterprises. The aim of this article is to outline the role of some modern software products in the pre-analytical and analytical processing of information related to the financial condition of enterprises, as well as their financial sustainability. As a result of using the specialized software, analysts can focus on the most important stage of their work – the final one, when forming conclusions, recommendations and

assessments regarding the financial sustainability of the enterprise in the past, current and future periods. An important advantage of some of the modern software products is the ability to create graphs and charts, which highlight trends and illustrate significant changes in the financial sustainability of enterprises.

7.8. **Kulchev, K.** (2023). Profitability analysis of non-manufacturing enterprises. *e-JOURNAL VFU*, 20, 558-570. ISSN 1313-7514 (Online). <https://ejournal.vfu.bg/bg/administrationandmanagment.html>

Carrying out a financial analysis most often aims to determine the financial condition (financial health) of one or more enterprises. Performance indicators and, in particular, business profitability indicators occupy a prominent place in the system of financial analysis indicators. This paper studies profitability indicators that contribute to diagnosing the financial health of enterprises. Emphasis is placed on deriving average levels of key profitability indicators of non-manufacturing enterprises. Based on the research done, it can be concluded that for individual enterprises, large deviations (even in increasing) of profitability indicators from their average industry levels can be signals of worsening financial health and increased risk of insolvency. These deviations also lead to significant differences between the average and adjusted average levels of the indicators of the bankrupt enterprises. Such differences are not observed in financially stable enterprises.

7.9. **Kulchev, K.** (2024). Cash flow analysis of non-manufacturing enterprises. *e-JOURNAL VFU*, 21, 1-12. ISSN 1313-7514 (Online). <https://ejournal.vfu.bg/bg/administrationandmanagment.html>

When evaluating the financial condition of enterprises, the ratios involving cash flows are of paramount importance. These indicators are applied

in financial analysis, including in discriminating financially stable business organizations from enterprises at an increased risk of insolvency. The present paper aims to calculate the average values of some ratios involving cash flows, and the research has been done based on information from the financial statements of non-manufacturing enterprises. On the basis of the conducted research, it is summarized that the ratio between the net cash flow from the main activity to the current liabilities can give a comparatively earliest warning signal for the deterioration of the financial condition of the enterprise (compared to the other two indicators for the cash flows analysis discussed in the present paper). However, in order to correctly interpret such an indication, the levels of a number of important indicators for analyzing the financial condition of enterprises should also be taken into account. This number includes indicators of profitability, indebtedness, liquidity, etc.

9. Studies published in non-refereed peer-reviewed journals or published in edited collective volumes

Kostova, S., **Kulchev, K.**, Ivanova, D. (2022). Analytical models applicable in assessing the financial sustainability of enterprises. *Scientific research almanac*, Volume 30, 214-244, Tsenov Academic Publishing House Svishtov. ISSN: 1312-3815. <https://almanahni.uni-svishtov.bg/title.asp?title=2736>

In a dynamic and unpredictable environment, attention should be paid to sustainable development procedures, which will help clarify the obligations of investors and increase transparency on the part of financial institutions and companies regarding how they consider sustainable development in the decision-making process. In this regard, analytical procedures are established as a particularly important component of the audit, due to the interest of clients not only in their current state, but also in the growth prospects. Such predictions could be made if the assumption that the company will remain operational for

the foreseeable future is substantiated in advance. In the field of statutory audit, one of the main objectives of the EC is: improving the information value of audits for investors and assessment of enterprises. The results of the application of analytical models for assessing the financial sustainability of enterprises can be particularly useful in their timely use to make informed decisions in the field of internal and external control.

15 March 2024,
Svishtov

Signature:
(Head Assist. Prof. K. Kulchev)