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SOLVENCY CONTROL OF THE ENTERPRISE IN THE BANKRUPTCY PREVENTION SYSTEM

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Introduction. Recent trends in the economy, in particular the situation with COVID-19 epidemic, will contribute to the deterioration of the level of solvency, financial security of enterprises, and, as consequence, increasing the number of bankruptcies. Constant monitoring of the solvency level is a necessary element of anti-crisis financial management and a tool to prevent bankruptcy. That is why the development of methodological bases and methodological approaches to solvency control is an important area of research.

Aim and tasks. The aim of the article is to substantiate the solvency control system of the enterprise, which would cover the identification of the main control indicators, methods of control over individual control circuits, the formation of a clear structural and logical sequence of this process.

Results. The tendency of increasing the share of current liabilities in the total capital of the enterprise, decreasing the value of the financial autonomy ratio and total coverage ratio, which indicates a problematic state of solvency of Ukrainian enterprises was investigated. The solvency control system elements of the enterprise were determined: objects, subject, purpose, functions, functional directions, components of the control according to the management contours. The characteristic of solvency control according to the management contours (strategic, current, operational) was described more detailed. The gradation of the deviation scales in a solvency condition of the enterprise was improved and the matrix of decisions in which directions of the reaction on type and scale of deviations were defined was composed.

Conclusions. In order to avoid bankruptcy, the enterprise must adhere to the financial discipline, be aware of financial responsibility and constantly improve management mechanisms, especially preventive anti-crisis methods, which should include a solvency control. The proposed approach to controlling is expected to provide a comprehensive nature of solvency control as an important component of preventive anti-crisis management aimed at preventing bankruptcy. Complexity is achieved by the consistency of the control procedures on the control contours, differentiation of the control tools, identification of possible deviations and ways to respond to them.

Keywords: solvency of the enterprise; anti-crisis management; solvency control of the enterprise; control; bankruptcy prevention.

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КОНТРОЛЬ ПЛАТОСПРОМОЖНОСТІ ПІДПРИЄМСТВА В СИСТЕМІ ЗАПОБІГАННЯ БАНКРУТСТВА

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Вступ. Останні тенденції, які спостерігаються в економіці, зокрема ситуація з епідемією COVID-19, сприятимуть погіршенню рівня платоспроможності, фінансової безпеки підприємств, та, як наслідок, зростанню числа банкрутств. Постійний контроль рівня платоспроможності є необхідним елементом антикризового фінансового менеджменту та інструментом запобігання банкрутства. Саме тому, розвиток методологічних основ та методичних підходів контролю платоспроможності є актуальним напрямом дослідження

Мета і завдання. Обґрунтувати систему контролю платоспроможності підприємства, яка б охоплювала ідентифікацію основних контрольних показників, методів контролю за окремими контурами управління, формування чіткої структурно-логічної послідовності цього процесу.

Результати. Виявлено тенденцію зростання частки поточних зобов'язань у загальному обсязі капіталу підприємства, зниження значення коефіцієнтів фінансової автономії та загального покриття, що свідчить про проблемний стан платоспроможності підприємств України. Визначено елементи системи контролю платоспроможності підприємства: об'єкт, суб'єкт, мету, функції, функціональні напрями, складові контролю за контурами управління. Більш детально охарактеризовано контроль платоспроможності за контурами управління: стратегічним, поточним, оперативним. Удосконалено градацію масштабів відхилень у стані платоспроможності підприємства та сформовано матрицю рішень, у якій визначено напрями реагування за типом та масштабом відхилень.

Висновки. Задля уникнення банкрутства підприємство, має дотримуватись фінансової дисципліни, усвідомлювати фінансову відповідальність та постійно вдосконалювати механізми управління, насамперед превентивні антикризові методи, до числа яких варто включити контроль платоспроможності. Запропонований підхід контролінгу має забезпечити комплексний характер контролю платоспроможності підприємства, як важливої складової превентивного антикризового управління спрямованого на запобігання банкрутства. Комплексність досягається узгодженістю контрольних процедур за контурами управління, диференціацією інструментів контролю, ідентифікацією можливих відхилень та способів реагування на них.

Ключові слова: банкрутство; платоспроможність підприємства; антикризове управління; контроль методи контролю платоспроможності; запобігання банкрутству.

Introduction. The operation of an enterprise in a market environment is always associated with the risk and likelihood of bankruptcy, especially at a time when environmental fluctuations have reached unprecedented proportions. In particular, the situation with COVID-19 has significantly brought the prospects of bankruptcy closer to many Ukrainian enterprises. Thus, according to the European Business Association, 33% of entrepreneurs report 50-75% of income losses, a significant increase in receivables. Another 44% suffered up to 50% of revenue losses, and 7% of businesses are considering closing [1]. Such trends, unfortunately, will contribute to the deterioration of the enterprises solvency level, increase the number of bankruptcies. Despite the fact that bankruptcy is a normal phenomenon for a market economy, it entails complex socio-economic consequences: the loss of potential tax payments to the state, rising unemployment due to job losses.

Taking into account that bankruptcy is an essentially loss of solvency, constant monitoring of its level is a necessary element of crisis financial management and a tool to prevent bankruptcy. Therefore, the development of methodological bases and methodological approaches to solvency control is an important area of research.

Analysis of recent research and publications. A significant amount of research by domestic and foreign authors is devoted to the issues of anti-crisis financial management and bankruptcy prevention. In particular, in the works of L.O. Ligonenko [2] the theoretical foundations of crisis management of the enterprise is revealed, methodology of financial crisis diagnosis, methods of preventive crisis management, methodology of rehabilitation procedures, debt restructuring, liquidation mechanism, strategies of enterprise behavior against the background of crisis phenomena are investigated. In the studies of O.Tereshchenko [3] an emphasis is placed on non-crisis financial management: the author's model of assessing the probability of bankruptcy on the basis of discriminant analysis is proposed, methodological aspects of financial rehabilitation and financial mechanisms of crisis management are considered. I.O. Blank deeply explores the methodology of bankruptcy diagnosis and mechanisms of financial stabilization in the individual management circuits [4]. In the works of E.M. Mnykh the methodology of analyzing the state of the enterprise and assessing the probability of bankruptcy are described [5]. A number of works are devoted to the study of the main causes of bankruptcy, the mechanism of implementation of recovery procedures and liquidation of enterprises [6-17].

At the same time, currently there are no comprehensive approaches to the organization and methods of solvency control as an important safeguard against the development of crises and bankruptcy in a turbulent economic environment, which requires further research in this area.

Aim and tasks. Substantiation of the enterprise solvency control system, which would include the identification of the main control indicators, methods of control over individual control circuits, the formation of a clear structural and logical sequence of this process.

Methods and materials. The study is based on the principles of a systematic approach, which allows to establish the impact of solvency control on the development of the financial crisis, the compliance of control methods with the main tasks of financial management at the strategic, current and operational levels. The article uses methods of scientific abstraction, generalization, analysis and synthesis to identify and systematize control indicators, methods of responding to identified deviations, the formation of a structural and logical scheme of the process of solvency control.

Results. The last 12 years were really challenging for the Ukrainian economy, as its chronic problems were compounded by the negative effects of the global crisis of 2007-2008, the war in Donbass, annexation of part of the territory, political instability, and the dynamics of business development and financial condition (table 1).

Since 2009, there has been a tendency of reducing the number of enterprises in Ukraine, only in 2013 and 2018 there was a slight improvement. This trend, based on the background of a reduction in unprofitable enterprises, may indicate that a significant part of business entities have ceased to function in one way or another due to losses and related financial problems. This indicates the adverse impact of external factors on the business environment. Despite the constant decrease in the share of unprofitable enterprises since 2010, the main financial indicators show a deterioration in the financial condition of enterprises.

Thus, the value of the coefficient of financial autonomy which shows what part of its assets the company is able to finance from its own financial resources, over 10 years was gradually decreasing and was much lower than the norm (0.4-0.6). It signals about a high level of risk and a high dependence on creditors. The total coverage ratio was also decreasing and at the end of 2018 it was 0.98, which is even less than the satisfactory meaning and indicates a problematic state of solvency of enterprises. This is due to the lack of the current assets to cover current liabilities.

Problems with solvency and deterioration of the financial condition of Ukrainian enterprises are proved by the trend of increasing the share of current liabilities in the total capital of enterprises - from 44.7% in 2012 to 58.9% in 2018.

Table 1. Performance indicators of Ukrainian enterprises for 2008-2018

Year	Number of enterprises, units	The share of unprofitable enterprises, %	The financial autonomy ratio	The total coverage ratio	Share of current liabilities, % of capital
2008	392222	37,2	0,35	1,15	44,7
2009	404473	39,9	0,35	1,11	46,4
2010	378810	41	0,35	1,18	46,2
2011	375695	34,9	0,34	1,18	46,7
2012	364935	35,5	0,35	1,18	46,2
2013	393327	34,1	0,34	1,15	47,1
2014	341001	33,7	0,25	1,04	52,6
2015	343440	26,3	0,28	1,00	51,0
2016	306369	26,6	0,25	0,99	58,5
2017	338256	27,2	0,25	0,98	57,9
2018	355877	25,7	0,25	0,98	58,9

Source: compiled by the authors according to the State Statistics Service of Ukraine [18].

To the above decribed problems are the negative consequences of the 2020 pandemic were added. They have yet to be assessed and analyzed, but the closure of some small and medium-sized enterprises, a significant loss of income, an increase in the number of unprofitable businesses are obvious. According to experts, such situations will occur more often, which will lead to changes in the formats and business models of entrepreneurship, employment structure, and so on. However, the need to improve management models in enterprises, the introduction of risk-oriented approaches, the focus on ensuring survival and safety in a turbulent environment is absolutely obvious.

Control is an integral and final stage of the management process in the enterprise, within which the verification of the achieved results, the degree and quality of implementation of decisions and justification of measures for further development have place [20-24]. Systematic and quality of control significantly affects the state of financial discipline, the quality of staff of all functional units, which determines the dynamics and opportunities for enterprise development. Taking into consideration that solvency is a defining characteristic of the financial condition, which determines the potential threat of bankruptcy, control of its level directly affects not only the pace of development of the enterprise, but it is a necessary condition for its survival and existence. Based on the fact that solvency is defined as the ability to fulfill obligations on time and in full to counterparties without disrupting operating activities, the main focus of such control are solvency indicators and factors of its formation.

From the standpoint of a systems approach, solvency control as a component of enterprise management can be described as follows (table 2).

Solvency control is cross-cutting in accordance with the concept of total cash management, which was once proposed by A. King [19]. This means that the process of such control involves not only the owner (as the main stakeholder, who is interested in business development, increasing its value and avoiding bankruptcy) and the financial department, whose functions include ensuring solvency, but also the heads of major centers of financial responsibility and "owners" of processes, the activity of which directly or indirectly affects its level.

Thus, the head of the commercial department must control the volume of sales, the terms of its repayment, to be responsible for the selection of potential debtors. The procurement department has to monitor and control the level of retained stocks, the speed of their turnover, ensure an acceptable choice of suppliers that meet the target criteria for the value of the trade credit, and so on.

Complexity of control is provided by a combination of the control procedures on the separate control loops.

Thus, strategic solvency control is aimed at implementing the strategic objectives of the enterprise, a necessary condition for which is a stable solvency of the enterprise. Such stability is the key to avoiding bankruptcy.

An important indicator of the probability of bankruptcy and crisis development is the indicator "Net asset value", which is calculated as the difference between assets and liabilities of the enterprise. Thus, this indicator is an important indicator of strategic solvency control. It, in its turn, is significantly determined by the amount of net cash flow from operating activities and the ratio of its reinvestment, which should also be included in the indicators of the strategic solvency control.

Table 2. Elements of the enterprise solvency control system

Elements	Storage
Objects	Solvency indicators and factors of its formation
Subjects	Owners; Director; Financial Director; Financial Managers; Heads of centers of financial responsibility; "Owners" of business processes
Purpose	Identification of deviations in the planned level of solvency and justification of response measures to ensure sustainable solvency as a condition of financial security of the enterprise
Functions	-monitoring the process of implementation of financial decisions in the field of solvency; -measurement of deviations of actual solvency indicators from target; -identification of problems in ensuring solvency on the scale of detected deviations; -development of solutions to stabilize the level of solvency; -adjustment of target solvency parameters
Functional directions	-control of the state and structure of assets, the level of their liquidity; -control of the state of obligations of the enterprise; -control of cash flows; -control of personnel whose activities affect the level of solvency; -control of business processes that affect the formation of the solvency of the enterprise.
Components of control according the management contours.	Strategic control; Current control; Operational control

Source: compiled by the authors

Ongoing solvency control has to ensure current solvency in the process of implementing current financial plans. The main focus of such control is the structure and liquidity of the current assets, the structure of current liabilities, the balance of cash flows of the enterprise. Therefore, the main indicators of such control, in our opinion, should be the ratio of specific types of current assets, the structure of current liabilities, total, intermediate coverage and absolute liquidity ratios, cash flow liquidity ratio, cash flow quality ratio, interest rate ratio, current value obligations.

Also, within the current control, it is advisable to monitor the state of business processes that affect the level of solvency: the process of concluding credit agreements, credit standards, timeliness and accuracy of reporting, etc.

Operational control of solvency is focused on ensuring operational solvency and avoiding cash gaps during the implementation of developed budgets. Therefore, within this contour it is advisable to monitor the amount of cash inflows and outflows in terms of individual payments, the coverage degree of certain categories (ranked by priority) of payments, the amount and frequency of cash shortages. Therefore, the main focus of control is the level of synchronicity of cash flows.

A brief description of the solvency control within the individual control circuits is given in the table 3.

Table 3. Characteristics of the enterprise solvency control on the contours of management

Contour of management	Focus of control	Control period	First-order control indicators
Strategic	Long-term solvency within the implementation of strategic plans	1 year	Net asset value; Net cash flow from operating activities; Net cash flow reinvestment ratio
Current	Current solvency within the implementation of the current financial plan	1 quarter	Structure of current assets; The level of liquidity of current assets; Structure of current liabilities; Cost of current liabilities; Coefficients of coverage; Cash flow liquidity ratio; Net cash flow quality ratio from operating activities; Percent multiplicity factor
Operational	Operational solvency (synchronicity of cash flows) within the budgets	1 month; decade; week; day	Volumes of cash inflows by counterparties and terms; Volumes of spending money by counterparties and terms; Ratios of execution of separate payments according to their priority; Volumes, frequency of cash shortages

Source: compiled by the authors

Each type of solvency control has its own system of methods, the choice of which is made in accordance with the purpose and focus of control procedures (table 4).

Table 4. Methods of controlling the enterprise solvency

Type of control	Time gorizon	Інструменти контролю
Strategic	year	"Hosin canri", balanced scorecard, strategic maps, "target funnel", KPI, GAP - analysis, SWOT-analysis, constraint theory, risk map
Current	quarter	Compliance, Isikawa method, ABC analysis, XYZ analysis, control chart method, red line method
Operational	Within a month with arbitrary detail	Payment calendar, ranking

Source: compiled by the authors

Thus, at the strategic level of control it is necessary to apply methods of comparison that allow to identify deviations of the actual level of solvency with strategic targets, best market practices, competitors, update opportunities and threats to the solvency of the enterprise, define the main factors of its formation. The results of such control are the basis for adjusting the development strategy, in particular the financial strategy, or individual ways and means of its implementation.

At the tactical level, in our opinion, it is advisable to use such tools as ABC analysis, XYZ analysis, the red line method, which allows you to rank stocks, current receivables according to various criteria of significance. Compliance can be considered as an important tool of tactical control. In European countries, the compliance system is a part of almost all sectors of the state: medicine, trade, financial and insurance organizations, manufacturing enterprises, banking institutions and others. There is no compliance control and management in Ukraine. However, it is actively used in the banking sector and is introduced individually in the real sector.

According to the definition of the National Bank of Ukraine, compliance risk is the probability of losses / sanctions, additional losses or loss of planned income or loss of reputation due to non-compliance with the law, regulations, market

standards, rules of fair competition, corporate ethics, conflict, as well as internal bank documents of the bank [25]. That is, compliance is aimed at controlling the processes and personnel that carry them out for correctness, correctness, integrity. Such a tool, in our opinion, is appropriate for enterprises in the real sector of the economy. It is not only an effective tool for controlling and preventing the risk of insolvency, but it is also an important tool for resolving agency conflicts. Therefore, this tool is especially relevant for public companies.

The Isikawa (herringbone) method aims to control the factors of solvency / insolvency formation, as it allows to identify causal links between the level of solvency, processes, changes in the external environment, etc.

The main tools for operational control of solvency are the payment calendar and ranking of payments. Ranking allows us to focus on the highest priority payments, which, on the one hand, ensure the normal rhythm of operating activities (receipts from major debtors; payments to major suppliers), and on the other - avoid sanctions and fines (payment of taxes, wages, interest on the loan) and the principal amount of the bank loan debt). The payment calendar allows to do daily reconciliation of planned payments with the actual cash flow, to identify "gaps" in liquidity, their causes.

Deviations identified in the control process need to be assessed and response measures need to be developed. According to available research, such deviations are classified into "positive", "acceptable negative", "critical negative" [4]. In our opinion, such a gradation of the scale of deviations should be supplemented by their identification along the contour of control procedures (Fig. 1).

Contour of management	***Scale of deviations***			Deviation change vector by the contours
Strategic	Positive	Negative permissible	Negative critical	⇑
Current	Positive	Negative permissible	Negative critical	
Operational	Positive	Negative permissible	Negative critical	
Scale deviation vector	⇒			

Fig. 1. Typology of deviations in the enterprise solvency state

Source: compiled by the authors

If the results of the control reveal positive deviations, or no deviations in all contours of control procedures, the company should maintain the achieved standards and act ahead (prevent the violation of solvency at the planning stage). Usually, the deployment of crisis phenomena begins with the deterioration of solvency at the operational level. Tolerances, in our opinion, can be "technical" or "substantial".

Technical deviations are related to imperfect budgeting of payments and fixing of terms of payments in contracts. This shortcoming is corrected by improving these aspects and does not require significant changes in the practice of operating, financial, investment activities.

If the deviations are related to the occurrence of risky events (unforeseen and unappreciated in advance), imperfect credit policy, they can be interpreted as "substantial", and there is a need to introduce at least a system of "Accelerate income - slow down spending" and parallel work on improving certain policies for managing current assets and current liabilities. Lack of the reaction from the company and such deviations can lead to their transformation into a "critical" nature and "transition" to a higher circuit. As the scale of deviations increases and they move along the contours of management, the crisis phenomena deepen and the probability of bankruptcy increases and the arsenal of measures to respond to them becomes more complicated (Table 5).

Table 5. Matrix of decisions based on the results of solvency control

Type and scale of deviations	Response directions
Positive deviations in all contours, or their absence	Support for achieved standards
Permissible operational deviations, no deviations in other circuits	"Acceleration of income - slowing down the consumption of GC"; Coordination of accounts; Credit policy monitoring
Permissible operational deviations, permissible tactical deviations, absence of strategic deviations	Credit policy review; Revision of the policy of borrowing capital; Finding ways to increase revenue and optimize costs at available capacity (without additional investment)
Critical operational deviations, permissible tactical deviations	
Critical operational deviations, critical tactical deviations, allowable strategic deviations	The previous measures are accompanied by a revision of the mechanism of operating activities (pricing policy, product quality, range of goods in trade, etc.)
Critical deviations for all control loops	Implementation of anti-crisis measures to restore solvency

Source: compiled by the authors

Of course, the choice of response measures is determined by the causes of deviations and the possibility of eliminating them.

Conclusion. The institution of bankruptcy is an important attribute of a market economy, which on the one hand "cleanses" the market from inefficient enterprises, and on the other hand has complex, sometimes devastating consequences. Effective regulation of the functioning of this institution is an important task that can be solved only by counter-efforts of the state and enterprises. The state must create effective legislative and institutional support that allows to protect the interests of creditors as much as possible and to enable an insolvent enterprise to recover and survive. The company, in its turn, must adhere to financial discipline, be aware of financial responsibility and constantly improve management mechanisms, especially preventive anti-crisis methods, which should include solvency control. The proposed approach is expected to provide a comprehensive nature of solvency control as an important component of preventive anti-crisis management aimed at preventing bankruptcy. Complexity is achieved by the consistency of control procedures along the control contours, differentiation of control tools, identification of possible deviations and ways of responding to them.

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