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THE IMPACT OF TIME MANAGEMENT ON THE FINANCIAL AND MOTIVATIONAL INDICATORS OF AN ENTERPRISE IN CONDITIONS OF TURBULENCE IN THE EXTERNAL ENVIRONMENT

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ABSTRACT

The article examines the impact of time management on the financial and motivational performance of an enterprise in a turbulent external environment. The relevance of the topic is due to the fact that modern enterprises operate under the simultaneous pressure of the consequences of the COVID-19 pandemic, full-scale war, logistical disruptions, energy instability, and the mass spread of artificial intelligence-based technologies, which significantly increase the requirements for the quality of working time organization, process coordination, and adaptability of management decisions. The purpose of the study is to assess the impact of time management on the financial and motivational performance of enterprises in the logistics industry, as well as to determine the role of external turbulence, time loss, enterprise scale, and the intensity of the use of artificial intelligence-based technologies in shaping the performance of activities. The empirical basis is a sample of 5 actually operating logistics enterprises in our country for 2021–2025. Our study used the methods of theoretical generalization, descriptive statistics, correlation analysis, simple and multivariate regression, as well as graphical visualization of the results. The evaluation results showed that better organization of working time is associated with higher operational efficiency, reduced time loss, and stronger motivational characteristics of personnel. At the same time, external turbulence negatively affects the results of activity, but enterprises with a higher level of time management demonstrate greater resistance to crisis disturbances. It has been proven that time management should be considered not only as an individual skill, but as an important component of the organizational efficiency of the enterprise. The practical significance of the results obtained lies in the possibility of using them to improve internal management activities, increase labor productivity, strengthen labor motivation, and reduce operational losses in an unstable external environment.

Keywords: time management, financial performance, staff motivation, logistics companies, environmental turbulence, time loss, labor productivity

JEL Classification: M11, M12, C23, L91

INTRODUCTION

In modern conditions, the effectiveness of an enterprise is increasingly determined not only by the availability of financial, material, or human resources, but also by the ability to rationally organize working time, allocate priorities, synchronize management and executive processes, as well as respond in a timely manner to changes in the internal and external environment. Therefore, the problem of time management appears as one of the key components of ensuring the stability, productivity, and competitiveness of the enterprise.

Its importance has increased significantly in recent years under the influence of several powerful destabilizing factors. Initially, the COVID-19 pandemic caused a disruption in the usual models of work organization, the spread of remote and mixed employment, an increase in the burden on management personnel, and the need for new approaches to the coordination of work processes.

At the same time, the full-scale invasion has further complicated the activities of enterprises in our country, as security risks, personnel relocation, communication disruptions, energy instability, psychological exhaustion of employees, and the constant need to adapt operational schedules have been added to traditional management tasks. Under such conditions, time ceases to be just an organizational resource and begins to be a strategic factor in maintaining business continuity, financial stability, and labor motivation. At the same time, the mass introduction of technologies based on artificial intelligence forms new approaches to planning, control, communication, information processing and decision-making, which, on the one hand, provides enterprises with additional opportunities to increase the speed and accuracy of task performance, and on the other, sharpens the requirements for the quality of time organization, digital discipline, managerial flexibility and the ability of employees to effectively interact with updated work tools.

Under such conditions, time management can no longer be considered only as an individual skill of an individual employee, since it directly affects the financial performance of the enterprise through labor productivity, speed of operations, the level of working time losses, the efficiency of resource use and the quality of management decisions, as well as motivational indicators through job satisfaction, emotional stability, staff involvement, reduction of professional burnout and increased responsibility for work results.

Thus, the study of the impact of time management on the financial and motivational performance of the enterprise is relevant both from a scientific and applied perspective, since it provides an opportunity to form the basis for finding such approaches to the organization of working time that will contribute to the simultaneous strengthening of the economic performance of the enterprise and maintaining the appropriate level of labor motivation of the staff.

LITERATURE REVIEW

Scientific works devoted to time management generally confirm that it is not only an individual skill of organizing working time, but also a significant factor in the effectiveness of the organization. Of general significance for this topic is the meta-analysis of Aeon et al. (2021), which established a moderate relationship between time management and work performance, academic achievements, and well-being, as well as its negative relationship with distress.

In more applied studies, this conclusion is further confirmed at the level of specific organizational environments. Thus, Akintayo et al. (2020) prove using material from the Nigerian banking sector that time management practices are statistically significantly associated with business performance, while Odoh (2024) shows a positive relationship between effective time management and the productivity of employees of public organizations. A similar trajectory is also recorded by Abugre et al. (2023), who found that short-term and long-term planning, as well as employees' attitudes towards time management, significantly affect their performance in non-profit humanitarian organizations. Thus, a convincing view has already been formed in the scientific literature that time management is directly related to financially significant consequences for the enterprise through labor productivity, business performance, task performance efficiency, and, accordingly, through the overall improvement of organizational performance. At the same time, another substantive line of research reflects that the impact of time management is not limited to the financial plane, as it is closely related to the motivational state of employees, their attitude to work, job satisfaction, and emotional resilience.

Korzynski and Protsiuk (2024) found that time management skills are negatively associated with cyberloafing, and job satisfaction mediates the relationship between workload, self-efficacy, time management, and unproductive online behavior of employees. In a study conducted among medical personnel during COVID-19, Alziyadat and Obidat (2022) showed that certain components of time management are associated with job satisfaction and emotional exhaustion, that is, they directly affect motivational indicators of work activity.

At the same time, Yimer et al. (2023) prove that a positive attitude towards time management depends on satisfaction with organizational policies, support from the manager and the appropriate attitude of management to the value of time, and Yimer et al. (2024) additionally show that the practice of time management itself varies significantly between organizations and is determined by institutional working conditions. Therefore, the available research convincingly demonstrates that time management should be considered as a factor not only of productivity, but also of work motivation, since it reflects job satisfaction, discipline in completing tasks, reduction of unproductive behavior, level of exhaustion, and the employee's general attitude towards the organization.

Separately, it is necessary to single out works in which time management is considered in conditions of increased time pressure, unpredictability, and the need for rapid replanning of work, which is especially important for the topic of turbulence in the external environment. Uhlig et al. (2023) in a field experiment proved that weekly planning behavior reduces the number of unfinished tasks and rumination, while increasing the cognitive flexibility of employees.

Mangi et al. (2025) showed that under conditions of time pressure, involvement in work is maintained through coping strategies, with problem-focused coping being associated with higher work engagement, and inclusive leadership strengthening the corresponding adaptation mechanisms. Taken together, these results provide grounds to argue that in conditions of external turbulence, time management no longer appears as a private technique of self-organization, but as a management mechanism for maintaining productivity, involvement, psychological stability, and continuity of work processes. At the same time, the analysis of available sources also shows a noticeable gap.

The problems of time management, staff motivation, and organizational efficiency have also been actively developed in Ukrainian scholarship. In particular, Ukrainian researchers emphasize that time management should be treated not only as an individual self-organization skill, but also as an enterprise-level management tool aimed at improving labor productivity, coordination, and the rational use of working time (Kulakova, 2016; Pysarevska, 2016).

This view is further developed in studies on corporate time management, where it is interpreted as a system of coordinated managerial practices intended to improve employee productivity and support the achievement of strategic goals of the enterprise (Lunova, 2024). In addition, Ukrainian research has shown that time organization can be directly linked to staff motivation, especially in relation to work discipline, productivity, and the balance between formal requirements and supportive working conditions (Vintoniak, 2023).

This position is also consistent with broader Ukrainian studies on personnel motivation, which argue that motivation is one of the key drivers of productivity growth and management effectiveness at the enterprise level (Ihnatiuk & Tunina, 2023). Therefore, the domestic literature confirms that time management should be considered as an integral organizational factor that influences both employee motivation and enterprise performance, which significantly reinforces the conceptual basis of this study.

Most studies focus either on the financial and performance consequences of time management or on its motivational and behavioral effects, while a comprehensive assessment of its impact on both the financial and motivational performance of an enterprise in a turbulent external environment remains underdeveloped. This circumstance forms the scientific feasibility of further research on the stated topic.

AIMS AND OBJECTIVES

The purpose of the study is to assess the impact of time management on the financial and motivational indicators of logistics enterprises in conditions of turbulence in the external environment, as well as to determine the role of external instability, time losses, the scale of the enterprise and the intensity of the use of technologies based on artificial intelligence in shaping the effectiveness of operational activities and labor motivation of personnel. To achieve the set goal, the following tasks are defined in the work:

1. To form a system of indicators for assessing time management, financial results, personnel motivational state, and external turbulence.
2. To justify the choice of real logistics enterprises as an empirical base for the study.
3. To build an integral time management index and a motivational index based on the generalization of organizational and behavioral indicators.
4. Conduct a correlation and regression analysis of the relationships between time management, financial, and motivational indicators of enterprise performance.

METHODS

The research methodology is based on a combination of general scientific, statistical, and econometric approaches, which corresponds to the logic of samples, in which methods are not limited to a list of tools, but explain why such methods are appropriate for a specific data structure and research problem. Within the framework of our article, an approach was used that combines theoretical generalization, systematization of indicators, construction of integral indices, descriptive statistics, correlation analysis, simple and multivariate regression, as well as visualization of results in the form of tables and graphs. This approach makes it possible to move from a conceptual understanding of the role of time management to its quantitative assessment and verification of statistically identified relationships between time management, financial results, and the motivational state of personnel.

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The empirical basis of the study is formed by a sample of 5 actually operating enterprises in the logistics industry of our country. Quarterly observations for 2021–2025 were generated for each enterprise, which makes it possible to cover the period of post-pandemic adaptation, the phase of full-scale war, energy failures, restructuring of logistics routes, and the intensification of the use of technologies based on artificial intelligence.

Since time management and motivation are not directly reflected in standard financial reporting, an integrated approach was used to assess them. The time management index was built on the basis of such components as the quality of planning, adherence to deadlines, the level of prioritization, the share of urgent rework, the discipline of internal communications, and the ability of the enterprise to minimize unproductive time losses.

The motivation index was formed by generalizing the indicators of engagement, job satisfaction, willingness of employees to remain employed at the enterprise, and the inverse indicator of professional exhaustion. To assess the external environment, a turbulence index was used, which integrates security risks, energy disruptions, logistical disruptions, inflationary pressures, and the pace of technological change. In this way, the methodology is consistent with the samples, where a special emphasis is placed on data sources, the procedure for generating indicators, and an explanation of how complex phenomena are translated into measured variables. In this study, the time management index and the motivation index are treated as authorial integral indicators constructed on the basis of equal-weight aggregation. The choice of equal weights is justified by the fact that each component reflects an independent but conceptually equivalent aspect of the corresponding latent construct, while the available panel size does not provide a sufficiently stable basis for assigning differentiated empirical weights without introducing additional arbitrariness. Before aggregation, all partial indicators were transformed to a comparable 0–1 scale by min-max normalization.

Regression analysis was applied in two forms. First, a simple linear model to test the basic relationship between the time management index and operating profitability. Second, as a multifactor model, the turbulence index, the intensity of use of technologies based on artificial intelligence, the number of personnel, and time loss were added to the explanatory variables, which made it possible to separate the independent impact of time management from related factors. To verify the correctness of the econometric assessment, model quality indicators and multicollinearity diagnostics were used.

RESULTS

For our study, it is better to use data from real logistics companies that actually operate in our country. For further econometric analysis, we propose to take logistics, since in this industry the quality of time management is directly reflected in the speed of order processing, compliance with delivery deadlines, the level of downtime, staff workload, coordination costs, and general organizational discipline:

1. It is advisable to include Nova Poshta LLC in the sample as an enterprise that represents a high level of operational complexity, a significant scale of logistics processes, and active digitalization. The company's official materials reflect that NOVA is positioned as an international group of companies that provides private and business clients with a full range of logistics and related services, and Nova Poshta itself works not only with branches, but also with post offices, address delivery, business integration, fulfillment, and automation of logistics processes.
2. JSC "Ukrposhta" is the second important object of the sample, but already as an enterprise with a very wide territorial coverage, a large network, and a complex multi-level structure.
3. The group of companies "DELIVERY" is well-suited as a representative of B2B logistics, where time losses very quickly turn into direct financial losses for corporate clients. Officially, the company indicates that it has been operating since 2001 and specializes in transport and logistics services for the B2B sector both within Ukraine and abroad.
4. The transport company SAT is appropriate for the sample as an enterprise focused on cargo transportation throughout Ukraine and on the speed of service for business. The official pages of the company reflect that SAT provides cargo transportation services across Ukraine, offers assistance in organizing and managing logistics processes, and also positions itself as a logistics service for business with many years of experience.
5. Meest POST should be included as an enterprise that combines domestic and international logistics and, at the same time, actively works with business clients.

In 2021, all 5 enterprises are still operating in a mode of relative stabilization after the pandemic shock. Already at this stage, the highest values of the time management index, motivation index, and income per employee are demonstrated by Nova Poshta, while the lowest scores within the sample are mostly recorded in Ukrposhta. At the same time, a gradual improvement is observed in all enterprises throughout 2021. Further, as part of our study, we used the following indicators:

- (TMI), Time management index;
- (MI), Motivational index;
- (RevEmp), Income per 1 employee;
- (Margin), Operating profitability;
- (TimeLoss), Time loss;
- (ETI), Turbulence index;
- (AI), Intensity of use of technologies based on artificial intelligence.

The selected indicators form a single analytical system in which time management acts as a basic organizational factor, time losses reflect the operational channel of its influence, the motivational index captures the internal reaction of the staff, and financial indicators reflect the effective effect.

The time management index was used as a key integral indicator of the quality of working time organization. It was calculated by summarizing standardized assessments of task planning, meeting deadlines, the level of prioritization, the share of urgent rework, the discipline of internal communications, and the ability to minimize unproductive time costs. The motivation index was used to reflect the internal state of the staff; it was formed on the basis of standardized assessments of involvement, job satisfaction, willingness to stay at the enterprise, and the inverse indicator of professional exhaustion. Income per 1 employee was calculated as the ratio of net income to the average number of personnel, which makes it possible to assess the productivity of the use of labor resources. Operating profitability was defined as the ratio of operating profit to net income, since it is this indicator that most fully reflects the efficiency of the main activity of the enterprise. Time loss was calculated as the share of time lost due to delays, downtime, incoherence, and re-execution of tasks in the total working time pool or in operating costs, depending on the analytical section. The turbulence index was formed as an integral indicator of external pressure, combining standardized assessments of security risks, inflationary pressure, energy disruptions, logistical disruptions, and general environmental instability. The intensity of the use of technologies based on artificial intelligence was determined by the share of business processes in which appropriate tools are used for planning, forecasting, coordination, or control of operations.

The time management index (TMI) was used as the key integral indicator of the quality of working time organization and was calculated as

$$TMI_{it}=1/6(Plan_{it}+Deadline_{it}+Prior_{it}+(1-Rework_{it})+Comm_{it}+(1-Unprod_{it}))\cdot 100,$$

where $Plan_{it}$ is the standardized assessment of task planning quality, $Deadline_{it}$ is the standardized assessment of meeting deadlines, $Prior_{it}$ is the standardized assessment of prioritization quality, $Rework_{it}$ is the share of urgent rework, $Commit$ is the standardized assessment of internal communication discipline, and $Unprod_{it}$ is the share of unproductive time costs.

The motivation index was calculated as:

$$MI_{it}=14(Engage_{it}+Satisf_{it}+Stay_{it}+(1-Burnout_{it}))\cdot 100,$$

where $Engage_{it}$ is the level of staff engagement, $Satisf_{it}$ is the level of job satisfaction, $Stay_{it}$ is the willingness of employees to remain with the enterprise, and $Burnout_{it}$ is the standardized indicator of professional exhaustion.

Revenue per employee was calculated as:

$$RevEmp_{it}=Revenue_{it}/Staff_{it,}$$

where $Revenue_{it}$ is the net revenue of the enterprise, and $Staff_{it}$ is the average number of personnel.

Operating profitability was defined as:

$$Margin_{it}=OperProfit_{it}/\ Revenue_{it}\cdot 100,$$

where $OperProf_{it}$ is the operating profit of the enterprise.

The content of this table shows that enterprises with a higher culture of time organization have better positions in several areas at once, that is, in financial performance, motivational stability, and a lower level of time loss. At the same time,

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weaker enterprises lag behind not in one parameter, but usually in several at once, which indicates the systemic nature of the problem (Table 1).

Table 1. Average values of indicators for modeling for our selected enterprises.

Company	TMI	MI	RevEmp	Margin	TimeLoss	ETI	AI
Nova Poshta LLC	87.4	85.69	392.5	15.74	5.85	58.21	76.43
JSC "Ukrposhta"	67.15	61.49	185.02	4.79	8.66	71.43	44.81
The group of companies "DELIVERY"	74.54	70	271.12	9.19	7.89	64.92	56.72
The transport company SAT	71.47	65.77	247.96	7.91	8.29	66.31	52.63
Meest POST	77.81	74.48	290.21	10.62	7.39	61.85	63.94

Next, we should present the correlation matrix itself, which will reflect the density and direction of the main relationships between the variables and is the first step towards a deeper econometric assessment. Its main content is that the indicators of time management, motivation, and financial performance move in a coordinated manner, while time loss and turbulence of the external environment are mainly associated with a deterioration in results. It is especially important that time management has a positive relationship not only with financial variables, but also with the motivational component, which significantly strengthens the concept of the study. In other words, the matrix reflects that time management cannot be separated from the human factor, since it simultaneously affects both the operational rhythm and the internal state of the personnel (Table 2).

Table 2. Correlation matrix.

Index	TMI	MI	RevEmp	Margin	TimeLoss	ETI	AI
TMI	-	0.963	0.945	0.945	-0.77	-0.242	0.862
MI	0.963	-	0.985	0.99	-0.798	-0.347	0.736
RevEmp	0.945	0.985	-	0.997	-0.794	-0.366	0.69
Margin	0.945	0.99	0.997	-	-0.811	-0.392	0.69
TimeLoss	-0.77	-0.798	-0.794	-0.811	-	0.797	-0.686
ETI	-0.242	-0.347	-0.366	-0.392	0.797	-	-0.168
AI	0.862	0.736	0.69	0.69	-0.686	-0.168	-

The first regression has basic but very important content. The initial assessment of the impact of time management on financial performance was carried out using a simple linear regression of the following form:

$$Margin_{it}=\alpha+\beta 1 TMI_{it} + \varepsilon_{it,}$$

where $Margin_{it}$ is the operating profitability of the i-th enterprise in the period t, TMI_{it} is the time management index, α is the free term, $\beta 1$ is the coefficient of sensitivity of the financial result to changes in the quality of time organization, and ε_{it} is a random error.

It does not try to take into account all possible factors at once, but gives an initial assessment of whether there is a stable direct relationship between the time management index and operating profitability. The result obtained reflects that such a relationship not only exists, but is also statistically significant. An increase in the time management index by 1 point is associated with an increase in operating profitability by 0.4698 points on average. If the time management index increases by 10 points, then the expected profitability increases by approximately 4.7 points. The coefficient of determination of 0.8939 reflects that almost 89.4% of the variation in operating profitability in this first approximation is explained precisely by differences in the time management index (Table 3).

Table 3. Parameters of the first regression.

Parameter	Results
Free member	-25.9081
Time management index	0.4698
Number of observations	100
Coefficient of determination R^2	0.8939
Adjusted R^2	0.8928
F-statistic	825.39
Prob > F	1.57e-49
Standard error of regression	1.3283

Next, we present the direct relationship between the time management index and operating profitability. The upward trend of the observations and the regression line reflects that with the increase in the quality of time management, operational profitability tends to improve. The scatter diagram itself reflects a fairly tight upward relationship. The higher the time management index becomes, the higher the operational profitability becomes. The regression line goes up quite evenly, which is consistent with both the high correlation coefficient and the high R^2 value (Figure 1).

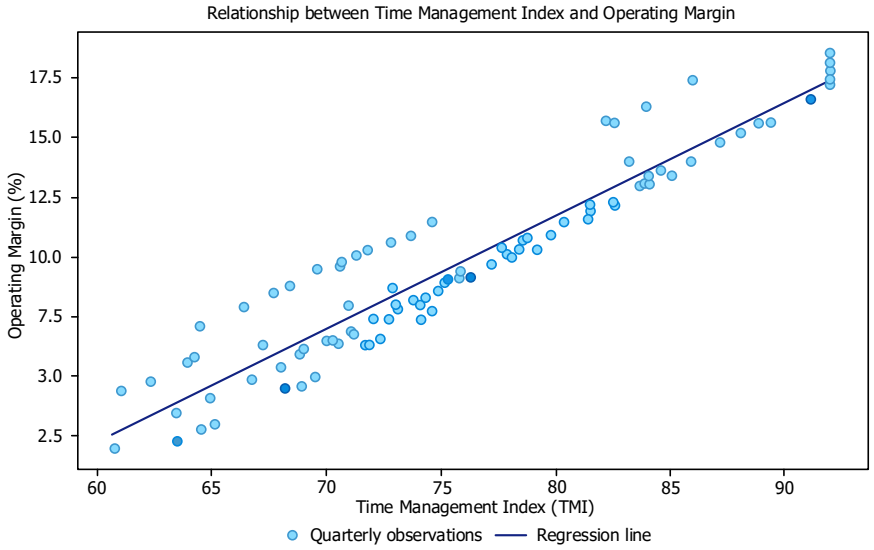

Figure 1. The connections between time management and operational profitability.

To further assess the impact of time management on the performance of enterprises, multi-factor regression models were constructed, which, in addition to the time management index, took into account the turbulence index of the external environment, the intensity of use of technologies based on artificial intelligence, the number of personnel, and time loss. Such a specification allowed us to separate the own effect of the organization of working time from the accompanying factors of an external and internal nature. The assessment showed that time management maintains a stable, positive, and statistically significant relationship with both operating profitability and the motivation index. Thus, even when simultaneously taking into account the instability of the environment, the scale of the enterprise, digitalization, and operational losses, better time organization is associated with higher financial and motivational results (Table 4).

Table 4. Multivariate regression for financial and motivational outcomes.

Variable	Model 1	p-value	Model 2	p-value
Constant	-36.6960	0.0006	-38.8327	0.0133
Time Management Index	0.7221	0.0000	1.6438	0.0000
Turbulence Index	-0.0498	0.3650	-0.1062	0.1779
Intensity of Use of Artificial Intelligence Technologies	-0.1703	0.0000	-0.3387	0.0000
Number of Personnel	0.0000367	0.0000	0.0001155	0.0000
Time Loss	0.2506	0.7465	0.7855	0.3826

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At the same time, the multi-factor specification revealed strong multicollinearity between some of the control variables, primarily between the turbulence index, time loss, and the intensity of use of technologies based on artificial intelligence. This indicates that in the studied period, they reflect processes that are close in economic content, related to crisis shocks, adaptive changes, and digital transformation of logistics enterprises. Under such conditions, individual control coefficients should be interpreted with caution. However, the main result of the model remains unchanged; time management is the most stable explanatory factor, which confirms its significant role in the formation of both financial efficiency and labor motivation of the enterprise in a turbulent external environment (Table 5).

Table 5. Multicollinearity assessment.

Variable	VIF
Time Management Index	159.7794
Turbulence Index	336.1114
Intensity of use of technologies based on artificial intelligence	33.4522
Number of personnel	1.3798
Time loss	776.2111

Table 5 demonstrates that time management remains the most stable explanatory factor in both multivariate specifications. In substantive terms, this means that better organization of working time is associated not only with higher operating profitability, but also with stronger staff motivation, even after controlling for turbulence, enterprise scale, the intensity of the use of technologies based on artificial intelligence, and time loss. The negative sign of the turbulence index is theoretically expected, although its statistical weakness may be explained by the fact that all enterprises in the sample were exposed to the same macro-level shocks. The negative sign of the artificial-intelligence variable should not be interpreted as evidence of a harmful effect of digitalization as such. More plausibly, it reflects that the active introduction of such technologies was intensified precisely in enterprises operating under stronger pressure, restructuring needs, and higher coordination complexity.

The analysis showed that the most stable positive relationship in the sample is formed around the quality of time management, reducing time losses, maintaining motivational stability of personnel, and the ability of the enterprise to maintain operational efficiency under such conditions of external instability. That is why for LLC "Nova Poshta" it was advisable to highlight areas related not to the basic adjustment of time management, but to its more flexible balancing and prevention of personnel overload, since for a strong enterprise, the main challenge is not the formation of time discipline as such, but maintaining its effectiveness without accumulating exhaustion. For JSC "Ukrposhta", on the contrary, attention is logically focused on internal coordination and acceleration of digital integration, because it is these components that are most closely related to overcoming time losses, increasing the coherence of actions in a large network, and reducing organizational inertia (Figure 2).

The modeling showed that in a turbulent external environment, weaknesses in planning, prioritization, coordination, and workload distribution almost immediately transform into time loss, reduced motivation, and worsening financial performance. Therefore, the selected areas of improvement are logical precisely because they simultaneously cover organizational, technological, and behavioral areas. Some of them are aimed at increasing the accuracy and predictability of work processes, others at reducing chaos and better synchronization of actions, and still others at maintaining employee engagement under high time pressure. Taken together, this gives grounds to assert that the proposed areas are not a random set of recommendations, but reflect a practical interpretation of the obtained econometric results, adapted to the specifics of each enterprise and to the general logic of the functioning of the logistics industry in our country.

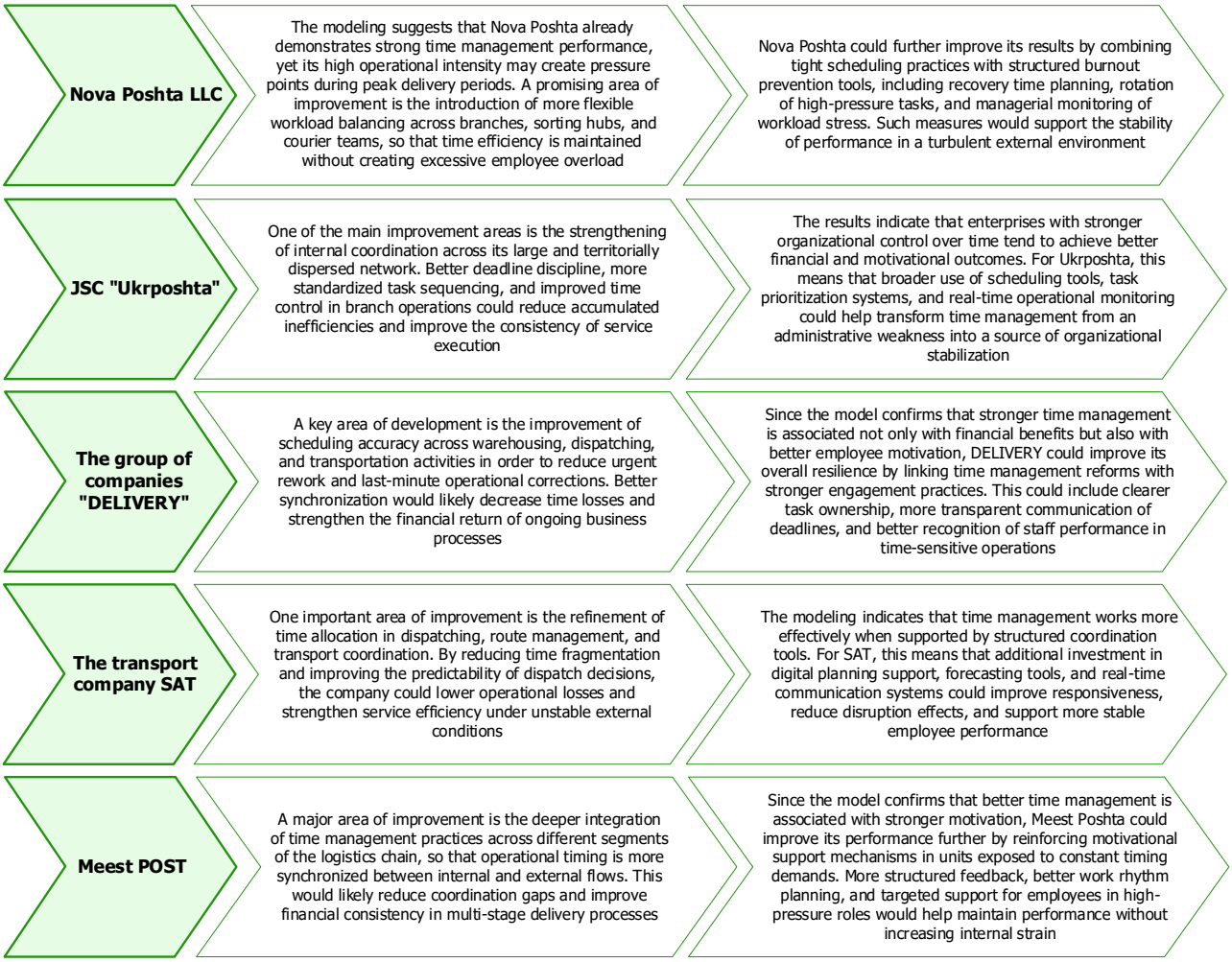

Figure 2. Possible areas of improvement based on the modeling conducted.

DISCUSSION

The results obtained confirm that time management should be considered not only as an individual skill of an employee, but as a significant organizational component that is directly related to the performance of the enterprise. Our study revealed a stable positive relationship between the time management index, the motivational index, and the financial performance of logistics enterprises.

This conclusion is generally consistent with the work of Januszewski and Krupcala (2021), in which the combination of CRM tools and time management is interpreted as a factor in increasing organizational efficiency and effectiveness, as well as with temporal leadership studies, where better management of time parameters is associated with higher innovative performance of employees and teams. In particular, Zhang, van Eerde, Gevers, and Zhu (2021) showed a positive relationship between temporal leadership and innovative job performance through vigor and pro-social rule breaking for efficiency, and Liu, Liu, and Zhang (2021) proved that team temporal leadership is associated with team learning behavior and team innovation performance under time pressure. Therefore, our results do not contradict the existing body of research but expand it, as they shift the emphasis from the innovative or micro-organizational plane to the financial and motivational results of real logistics enterprises in our country.

The motivational component of our results also has clear parallels with previous empirical work. In our model, better time management is accompanied not only by financial improvement, but also by higher motivational stability of personnel, which is reflected in better engagement, lower burnout, and generally more favorable working conditions. This trend is consistent with the results of Peykar, Vahedparast, Gharibi, and Bagherzadeh (2023), who, in a randomized study among Iranian female medical workers, showed that time management training reduces work-family conflict, as well as with the conclusions of Salam, Fakhry, and Elsayed (2025), where time management training was recognized as an effective tool for increasing professional performance and reducing work-family conflict in managerial medical personnel.

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However, the work of Li and Ye (2021) deepens this vision, showing that temporal leadership can positively influence employees' behavioral outcomes through self-efficacy. In our case, this well explains why time management was found to be related to motivational indicators not indirectly, but rather directly. When an employee sees predictability of deadlines, less chaotic tasks, and clear time priorities, a more favorable internal work environment emerges, which supports confidence, engagement, and willingness to work productively even under high external pressure. At the same time, our study also revealed an important nuance.

Although the overall effect of time management was positive, the strength of this effect should not be interpreted as automatically linear and necessarily the same in any organizational environment. This correlates particularly well with the results of Zhang, Zhang, Liu, and Chen (2022), who showed a U-shaped association between temporal leadership and employee extended work availability, and also emphasized the role of organizational time norms. This logic is important for interpreting our data. We have recorded a positive net effect of time management, but this does not deny that under excessive time intensity or under too strict time norms, time management can shift from a productive form to a form of additional pressure. That is why our result should be read as follows. For logistics companies in conditions of external turbulence, better time organization has a positive effect on average, but time management should remain balanced and not shift into a mode of constant acceleration or continuous employee availability. This conclusion is also consistent with the broader vision of Forouzan, Teimouri, and Safari (2020), who considered time management in the work environment as a systemic model related to the quality of work life, and not only as a technical tool for task allocation.

The role of artificial intelligence-based technologies deserves special attention. In our multivariate model, their intensity did not give a clearly positive isolated effect after including other explanatory variables. At first glance, this may seem contradictory, but in a substantive sense, such a result is quite logical. Unlike the study by Januszewski and Krupcala (2021), where the synergy of digital tools and time management was manifested within one micro-enterprise of e-commerce, in our case, we are talking about logistics enterprises operating in a much more complex environment, where digitalization occurs in parallel with security risks, route restructuring, personnel losses, energy outages, and high uncertainty.

However, the results of the study have certain limitations that should be taken into account when interpreting them. First, the empirical base covers only 5 logistics enterprises in our country, so it is more correct to extend the obtained patterns primarily to enterprises with a similar industry structure, scale, and operating environment. Second, some of the integral indicators, in particular the time management index, the motivation index, and the external turbulence index, are formed on the basis of standardized assessments, which partly depend on the quality of the initial assessment.

CONCLUSIONS

The conducted research allowed us to confirm that time management is a significant component of increasing the financial and motivational effectiveness of the enterprise in conditions of turbulence in the external environment. The generalization of theoretical approaches and the results of econometric analysis showed that high-quality organization of working time, effective prioritization of tasks, reduction of the share of urgent rework, and better coordination of operational processes are associated with higher labor productivity, better indicators of operating profitability, and a more stable motivational state of personnel. At the same time, it was established that the negative impact of external turbulence is manifested through a deterioration in the rhythm of work, increased time losses, and weakening of the labor stability of employees. However, enterprises in which the corresponding time management systems are better formed demonstrate a higher ability to adapt to crisis changes, restore process control more quickly, and incur less financial and motivational costs. Thus, this gives grounds to consider time management not as a local tool of self-organization, but as a systemic factor in maintaining the effectiveness of the enterprise.

Within the framework of our study, a system of indicators has been formed for assessing time management, financial results, personnel motivation, and external turbulence. It is substantiated that the time management index, motivation index, revenue per employee, operating profitability, time loss, external turbulence index, and intensity of use of technologies based on artificial intelligence form an interconnected analytical system that allows us to trace the organizational, behavioral, and financial effects of the quality of working time organization. The choice of 5 actually operating logistics enterprises in our country as the empirical basis of the study is justified, and a quarterly data panel for 2021–2025 has been formed. This approach made it possible to cover the period of post-pandemic adaptation, military pressure, energy instability, restructuring of logistics routes, and strengthening the role of technologies based on artificial intelligence. An integral time management index and a motivational index were constructed based on the generalization of organizational and behavioral indicators. It was established that a higher level of time management is accompanied by lower time losses,

higher staff involvement, better job satisfaction indicators, and greater stability of employees' work behavior. A correlation and regression analysis of the relationships between time management, financial, and motivational results of enterprises was conducted. It was proven that better organization of working time is statistically associated with higher operating profitability, higher revenue per 1 employee, and stronger motivational characteristics of personnel. At the same time, it was found that external turbulence worsens performance; however, enterprises with a more developed time management system demonstrate higher resistance to crisis disturbances.

Thus, time management should be considered as a significant component of organizational efficiency, which simultaneously affects financial performance, the motivational state of personnel, and the adaptability of the enterprise in an unstable external environment. The scientific significance of the study lies in forming the basis for a careful consideration of time management as a factor that simultaneously affects the economic efficiency and behavioral stability of personnel. The practical significance of the results obtained lies in the possibility of their use for improving internal management systems, optimizing the organization of working time, reducing operational losses, and strengthening motivational policies at enterprises in the logistics industry.

Further research should be directed at expanding the sample by industry, as well as at assessing how different time management tools and solutions based on applied digital technologies change the sustainability of an enterprise under such conditions.

ADDITIONAL INFORMATION

AUTHOR CONTRIBUTIONS

All authors have contributed equally.

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CONFLICT OF INTEREST

The Authors declare that there is no conflict of interest.

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ВПЛИВ ТАЙМ-МЕНЕДЖМЕНТУ НА ФІНАНСОВІ Й МОТИВАЦІЙНІ ПОКАЗНИКИ ДІЯЛЬНОСТІ ПІДПРИЄМСТВА В УМОВАХ ТУРБУЛЕНТНОСТІ ЗОВНІШНЬОГО СЕРЕДОВИЩА

У роботі досліджено вплив тайм-менеджменту на фінансові й мотиваційні показники діяльності підприємства в умовах турбулентності зовнішнього середовища. Актуальність теми зумовлена тим, що сучасні підприємства функціонують під одночасним тиском наслідків пандемії COVID-19, повномасштабної війни, логістичних збоїв, енергетичної нестабільності й масового поширення технологій на базі штучного інтелекту, що істотно посилює вимоги до якості організації робочого часу, координації процесів і адаптивності управлінських рішень. Метою дослідження є оцінювання впливу тайм-менеджменту на фінансові й мотиваційні результати діяльності підприємств логістичної галузі, а також визначення ролі зовнішньої турбулентності, втрат часу, масштабу підприємства та інтенсивності використання технологій на базі штучного інтелекту у формуванні результативності діяльності. Емпіричну основу становить вибірка з 5 реально діючих логістичних підприємств нашої країни за 2021–2025 роки. У нашому дослідженні використано методи теоретичного узагальнення, описової статистики, кореляційного аналізу, простої та багатофакторної регресії, а також графічної візуалізації результатів. За результатами оцінювання встановлено, що краща організація робочого часу пов'язана з вищою операційною результативністю, зниженням втрат часу та сильнішими мотиваційними характеристиками персоналу. Водночас зовнішня турбулентність негативно впливає на результати діяльності, однак підприємства з вищим рівнем тайм-менеджменту демонструють більшу стійкість до кризових збурень. Доведено, що тайм-менеджмент слід розглядати не лише як індивідуальну навичку, а й як важливу складову орга-

нізаційної ефективності підприємства. Практичне значення одержаних результатів полягає в можливості використання їх для вдосконалення внутрішніх управлінської діяльності, підвищення продуктивності праці, посилення трудової мотивації та зниження операційних втрат у нестабільному зовнішньому середовищі.

Ключові слова: тайм-менеджмент, фінансова результативність, мотивація персоналу, логістичні підприємства, турбулентність зовнішнього середовища, втрати часу, продуктивність праці

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