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Independent calculation of the financial performance of the Kyiv Metro, including the lease of advertising space

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Abstract. Accounting of financial results, especially in the context of leasing advertising space, is critical for the effective development and expansion of the financial activities of the Kyiv metro in the context of digitalisation and socio-economic changes. The purpose of the study was to examine the economic benefits of the financial activities of the Kyiv subway, including the lease of outdoor advertising. The study used the methods of economic analysis, inductive, modelling, and comparative. The results of the study showed that the lease of advertising space is accompanied by high profits of the outdoor advertising industry and investments, characterised by the growth of the industry as a whole, but does not cover all the costs of the Kyiv Metro utility. International advertising agencies and media companies may be interested in investing in advertising space, which is the only outdoor advertising medium in the Kyiv Metro. Competition is becoming intense in the areas of advertising and technology, which affects the metro's advertising revenues. The urban terminal of the metro includes advertising materials placed in stations and carriages, which provide visibility of advertising to passengers and are important for attracting attention to brands. The growth in the market value of these advertising spaces indicates their potential for investment, which may attract the interest of venture capitalists to new projects in this area. It has been found that optimising the use of advertising space can significantly increase the profitability of the Kyiv metro. It has been found that diversification of advertising formats and the introduction of digital advertising media can increase the profitability of the subway compared to traditional methods. Collaboration with local businesses for advertising can increase revenues and strengthen the connection between the metro and the local community. The results of the study can be useful for finance and economics specialists in the field of public transport to optimise the financial performance of the enterprise and improve the efficiency of resource management

Keywords: inflation; investment; profit; profitability; utility company

INTRODUCTION

The study of the independent calculation of the financial performance of Kyiv Metro, in particular in the context of leasing advertising space, is due to the growing importance of public transport as an advertising platform. Many advertising brands prefer the subway because it provides a large volume of potential consumers who use its services on a daily basis. In the context of interactive technologies and the development of media communication, the lease of advertising space opens up new financial opportunities for the metro. Modern advertising solutions, such as digital screens, interactive panels and integration with mobile applications, can significantly improve the effectiveness of advertising campaigns and increase consumer interest. These innovations can significantly increase advertising revenues,

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which in turn will affect the overall financial stability and development of the metro. That is why it is crucial to conduct an independent calculation to determine the efficiency of the existing use of advertising space and its impact on the overall financial results, which will optimise the financial performance of the Kyiv Metro. The issues of financial performance of underground transport systems and their profitability are important not only for Kyiv. This issue is becoming the subject of research in many countries, where public transport plays a key role in the life of cities.

J.H. Kwon (2024) explored the possibilities of increasing the profitability of the subway by leasing movable and immovable property for outdoor advertising, pointing to the significant potential of this approach to increase profitability and improve the financial performance of the utility. The large flow of passengers at the capital's metro stations encourages advertisers to invest in creative advertising, which not only helps to attract resources but also develops new forms of advertising in the metro. The spatial capabilities of the metro provide a great deal of scope for creativity in the production of advertising media, which, in turn, generates useful content and has a positive impact on the financial results of the company.

A. Buryachenko *et al.* (2024) concluded in their study that in order to increase the level of targeted use of advertising revenues by the Kyiv Metro utility, it is necessary to reform the mechanism of interaction between the city and intermediary companies, in particular, to establish direct accounting of revenues at the market value of the space, rather than a fixed price. In conformity with S. Boyko *et al.* (2024), the introduction of digital advertising in the subway could increase advertising revenues by 40% by 2027.

R. Mao *et al.* (2021), emphasise in their work the fact that looking at the business structure, it is easy to find that it is impossible for the metro to achieve profitability by relying only on ticket sales. J. Zhou *et al.* (2019) found in their study that the business strategy of a transport enterprise is not to rely on traditional business, but to expand integrated services and form its own development characteristics. That is why there are many types of advertising in the metro, including video advertising (LED digital media in the metro, mobile TV in cars, ads on platforms), print advertising (light boxes of channels, light boxes on platforms, light boxes in station halls, special extra-large light boxes), wall posters (light boxes of cars), and interior posters. However, there is little information in researchers' works about the specifics of financial activities with regard to the lease of advertising space.

Researchers L. Sun *et al.* (2020) consider in their works the financial activities of the subway in terms of planning and construction, emphasising the development of rail transit networks in large cities and demonstrating trends in the development of a single network where the subway system should dominate. The researchers note that in large cities there is less and less space for a metro system, but the benefits of passenger traffic and generated time value are not as obvious as the benefits of a central city line, which affect the competitiveness of urban rail transport within the city. In large cities with relatively developed urban rail transit networks, their structure has many levels, including urban metro, suburban rail and new transit systems, which achieve better ridership effects. N. Gendron-Carrier *et al.* (2022) concluded that it is important for each city to consider how the multilevel rail network will be deployed in the future, as it is related to the economic benefits and sustainable development of the metro as a whole. However, these works do not outline specific indicators that affect the financial performance of the metro.

The purpose of this research article was to analyse the economic benefits of the financial activities of the Kyiv subway, considering revenues from the lease of outdoor advertising. The study was aimed at determining the impact of this phenomenon on the overall development of urban infrastructure and the economy of Kyiv.

MATERIALS AND METHODS

This study was based on the analysis of the financial performance of Kyiv Metro, taking into account the lease of advertising space for 2019-2023. In the course of its conduct, the methods of economic analysis, inductive, modelling, and comparative were used. The method of economic analysis at the stage of assessing the financial performance of Kyiv Metro allowed us to describe the general vision of the financial structure of the organisation, its profitability, solvency, and risks. The official financial statements of the municipal enterprise were analysed (Department of internal…, n.d.; Official website of Kyiv Metro, n.d.; Portal "Kyivaudit", n.d.; Audit report…, 2024). The key to diagnosing financial indicators was the quantification and assessment of the balance between profitability and risk.

To calculate the formation of the price of renting advertising space, a common unit of variable costs was determined by the formula:

$$CV_T = CV_F, \tag{1}$$

where *CV* is the variable cost and *F* is the fixed cost, considering that *T* is the contribution factor, or the percentage margin of the contribution, which will serve to add to *CV* and thus form the price sought to cover the fixed cost.

The use of the inductive method allowed us to identify the financial models used at the enterprise, as well as the specifics of its economic indicators, in particular in the context of advertising space rental indicators. This method helped to identify the features and characteristics of the enterprise's functioning in the current Ukrainian market. The modelling method in the formation of the mechanisms of financial activity of the municipal enterprise "Kyiv Metro" was represented by such forms of economic data as panel data, and binary logistic regression. This ensured an objective analysis of the observed economic phenomena to generate numerical data to describe the financial environment. Thus, these models emphasised the existing relationships between external variables represented by numerical forms. This allowed us to obtain descriptive elements that helped to generalise the behaviour of the analysed variables in the context of advertising space leasing.

The comparative method was used to compare the data provided in the financial statements of the utility company with the results of the study. This allowed us to identify the peculiarities and differences in the information, which pointed out the need for an independent analysis of the financial performance of the Kyiv Metro. As a working hypothesis, it was assumed that the minimum profit to be earned is a function of the value of total capital employed, consisting of interest earned on the liability and revenues expected from the subway. Thus, assuming that the weighted cost of total capital employed is defined as:

$$C_{p=R_{P/A}}+R^{C}/_{A}, \tag{2}$$

where C is the ticket yield, $R_{P/A}$ is the ratio of the ticket price P to the total assets A, R is the return on advertising capital C, and $R\ C/A$ is the proportion represented by capital relative to the total assets of the advertising space lease. This means that the profit structure, taking into account the lease of advertising space, can be planned on the basis that the minimum profit is not less than the cost of capital used.

This method helped to determine the norms of the potential product, which arose from the need to consider the activity index as a comparison process in order to assess the current levels of growth of indicators and determine the inflationary risks occurring in the monetary policy of the utility company. Drawing parallels made it possible to determine different degrees of economic expansion and contraction, while characterising the development of the metro economy.

RESULTS AND DISCUSSION

The main purpose of any enterprise is to make a profit. There is a need to know its minimum level in order to adopt it as a goal when planning operational activities, such as generating the necessary income and controlling costs and expenses (Sabau-Popa *et al.,* 2020). An important aspect of the financial activities of the municipal enterprise Kyiv Metro is the attraction of financial resources that can have different origins. In general, in addition to ticket sales, the company also receives income from government subsidies and lease of advertising space.

For a comprehensive analysis of the financial performance of the municipal enterprise Kyiv Metro, it is important to consider its expenses and revenues over the past few years. These indicators allow us to assess the financial position of the company, determine its profitability and identify trends that may affect its further development. Table 1 illustrates the expenses and revenues of the subway for 2019-2024.

Table 1. Expenses and income of the municipal enterprise Kyiv Metro for 2019-2024 (UAH million)

Year	Expenses	Income	Net profit/loss
2019	4,389	3,389	-1,000
2020	4,328	1,845	-2,483
2021	5,715	4,268	-1,447
2022	4,787	3,675	-1,112
2023	10,132	6,612	-3,520
2024*	4,531	2,581	-1,950

Note:* – data for 6 months of 2024
Source: developed by the authors on the basis of Official website of Kyiv Metro (n.d.), Community enterprise "Kyiv Metropolitan" (2020), Audit report… (2024)

The table shows that the costs of urban rail transport exceed its revenues, a widespread problem. The cost of maintaining the municipal enterprise Kyiv Metro is significant, while fares remain relatively low due to the specific nature of public transport. In addition, there is a clear dependence of the company's financial performance on the intensity of passenger traffic, which affects the company's assets (Table 2). According to the data, a significant decline in revenues correlates with a decline in passenger traffic in 2020 and 2022, the period of active restrictions related to the COVID-2019 pandemic and the year of the beginning of the full-scale Russian invasion of Ukraine, which caused a crisis in the entire economy.

Table 2. Passenger traffic intensity in the Kyiv metro in 2019-2024 (thousand people)

Year	Passenger traffic intensity (thousand people)
2019	350,000
2020	270,000
2021	319,000
2022	162,000
2023	232,000
2024	241,000

Source: State Tax Service of Ukraine (n.d.)

Similar fluctuations are observed in the MEs' income from the lease of advertising space, as evidenced by the data of the Department of Advertising of the executive body of the KCSA (n.d.) for 2021-2023. Figure 1 shows significant fluctuations in income, which indicate the impact of external factors, such as economic instability and war, on the financial performance of the enterprise. According to statistics from the Advertising Department of the executive body of the Kyiv City State Administration, in 2021, the subway's profit reached UAH 2,189,376. However, in 2022, there was a sharp drop to UAH 1,085,451, a 50.4% decrease due to the outbreak of a full-scale war in Ukraine and its impact on the economy and the advertising market. However, in 2023, there was a positive trend – the profit increased to UAH 1,589,880, which is 46.5% more than in 2022, but 27.4% less than in 2021 (Advertising Department…, n.d.). These dynamics indicate a gradual adaptation to the new conditions, but also highlight the need to revise the strategy for using advertising space, in particular by introducing new advertising formats, adapting pricing policies, and focusing on local businesses that continue to operate in wartime.

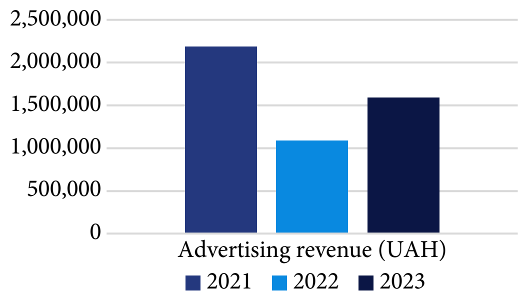

Figure 1. Kyiv Metro's profit from the lease of advertising space for 2021-2023

Note: Official data for 2024 were not available at the time of writing

Source: developed by the authors on the basis of Department of internal…(n.d.), Portal "Kyivaudit" (n.d.)

An important issue when planning profitability is the procedure for setting the rental price of advertising space. To a large extent, the rental price depends on the payback ratio of the tariff box (which is mostly set by law), i.e. the ratio of fare revenue to total operating costs (Onofrei *et al.*, 2020). They are, in turn, divided into variable and fixed costs, the latter being periodic and related to the costs of production or purchase of materials and services. The total unit of variable costs is determined using formula (1).

According to the calculations of H. Akono & E. Nwaeze (2018), a generally well-managed metro system can maintain a farebox payback ratio of more than 50%, generating higher profits by capturing the cost of renting advertising space. This success is due to its urban form due to the high density of the urban population and the functional zoning of the mixed-use metro. Consequently, the contribution factor that should be used to price the proposed lease of advertising space should be in line with the profitability of sales.

Profitability has the same property for different combinations of profit and sales, where as the contribution margin increases, the price also increases and the number of units to be leased decreases. The higher the value of sales, the higher the value of the resulting utility, and the latter decreases as the value of sales decreases. Therefore, it all comes down to finding a relationship that guarantees the right price and volume to achieve the target profitability. To achieve this goal, the financial elements must have an effective capital budgeting process that selects sustainable and profitable investment projects that are accompanied by an appropriate financial structure (Berest & Sablina, 2022). Otherwise, business continuity and progress in value creation may be at risk. Once the investment decision has been made, the financing decision is made. In some cases, financing can come from own resources in a high proportion, but in many others, due to the size of the investment, other financing options need to be evaluated, including the lease of advertising space in the Kyiv Metro.

The Kyiv Metro receives revenue only from ticket sales and the lease of advertising space, as the municipal enterprise Kyivreklama is responsible for advertising placement (Municipal enterprise Kievreklama, n.d.). On average, the sector has favourable liquidity indicators. However, it should be emphasised that debt-to-asset ratios are primarily intended to measure the level of total enterprise profits provided by creditors in the short and long term (Fig. 2).

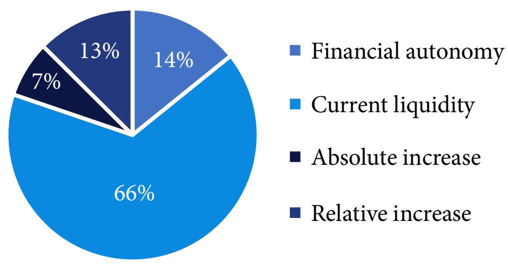

Figure 2. Indicators of solvency and sustainability of the municipal enterprise 'Kyiv Metro' for 2023 in % ratio

Note: Official data for 2024 were not available at the time of writing

Source: State Statistics Service of Ukraine (n.d.)

The emergence of the golden mean as a point of stability confirms the existence of a mechanism that prevents the interest margin from being arbitrary and even chaotic, and hence the prices and other items in which it is involved. To reinforce the above, it is important to consider the most complete cases where unit variable costs are split into those that depend on production or direct purchases and those that depend on price or volume. There are numerous models with different characteristics that allow for the interpretation of a data set at different points in time. If this dataset belongs to different units, then a panel data analysis may be an appropriate methodology to measure the effects of renting advertising space in the studied utility, Kyiv Metro. Thus, transformations were made to the ratios of financial assets to approximate arithmetic operations. In this case, the panel data model is written as follows:

$$Y = X\beta + \varepsilon, \quad (3)$$

where Y is the matrix of dependent variables, X is the matrix of independent variables, β is the matrix of estimated coefficients, and ε is the error term.

Given this evidence, it was decided to perform a binary logistic regression, preceded by a principal components factor analysis, which would reduce the information redundancy represented by the set of ratios. This model takes into account the heterogeneity of the cross-sections, which allows each unit to have its own cross-section of the enterprise's assets from transport activities and advertising space lease. The limitation of the model is that the value of ε is not directly observable. Given daily earnings data, the capital asset valuation is the most convenient scheme for hedging risk in the market, as it formally describes the relationship between risk and return, and serves as a general framework for understanding systematic diversification. Accordingly, an asset is considered risk-free if its return is equal to the expected return, because the return is directly proportional to the risk exposure, as the higher the risk, the higher the return.

Hypothesis (2) was confirmed by economic indicators that depend on causal relationships. Similarly, the assumption is based on the fact that the available amounts of different risky financial assets are set as an exogenous variable of the model. On the other hand, the usefulness of the model lies in the ability to estimate the cost of capital when conducting a discounted cash flow valuation of the capital metro or when evaluating new investment projects. Total asset turnover indicates the ability of a company to use its property to generate income, which is related to management efficiency (Amirhossein *et al*., 2020). The higher the turnover of total assets, the higher the level of efficiency of the company's use of funds and rights it owns. Fixed assets turnover expresses the company's productivity in generating income through the investments it makes in fixed assets – buildings, structures, machinery, and equipment. A particularly important aspect is that inventory in any organisation is the minimum amount of available products or items needed to meet customer demand. It is an indicator that expresses the number of inventory turns during the year, where a higher inventory turnover means that the company is effectively managing and constantly supporting new products and ways of making money.

The natural dynamics and processes of change in the country's economy, which affect the current financial structure of the company, make it increasingly necessary to analyse the company's financial situation, taking into account its internal development and its position relative to other companies operating in the same market (Monasterolo, 2020). The investment elements continue to have the same decision-making pattern subject to alternatives, in line with new market investment trends, where space leasing is understood more globally and is linked to the system of economic organisation and the complex structure of modern markets. This vision implies the adoption of an analytical perspective that allows us to link its effects to the global scale of the economic system, which faces great difficulties, mainly stemming from the near impossibility of quantifying the impact of leasing advertising space on the overall economic activity of the enterprise. The conceptual framework of financial performance is important for decision-making in the economic sphere of the municipal enterprise Kyiv Metro, as the modern globalised market requires individuals and legal entities to develop to be innovative, capable and develop their financial skills in order to achieve their goals, mission, and vision.

According to researchers J.D. Farmer *et al.* (2019), an independent financial analysis of a utility serves as a basis for assessing the situation and real economic performance to identify difficulties and apply appropriate corrective measures to address them. Financial analysis is based on the calculation of key indicators that express liquidity, solvency, performance, debt, efficiency, and profitability. As a key management and analytical tool in all business activities, it determines the conditions and helps to predict the future. The transformation process brought about by technological progress, automation, and economic development makes it difficult to calculate the results of a company's financial performance, especially when considering the lease of advertising space. The importance of financial analysis in this case lies in the fact that it allows identifying economic and monetary aspects that show the conditions in which the utility company operates, in terms of liquidity, solvency, debt, efficiency, effectiveness and profitability, facilitating management and economic decisions. Therefore, the behaviour and activity of exogenous variables, such as inflation, which affects the current market value of assets and liabilities, should be taken into account and the importance of the balance between current and non-current assets should be considered (Table 3).

Table 3. Assets of the municipal enterprise Kyiv Metro for 2019-2023 (UAH, thousand)

Year	Non-current assets	Current assets	Assets
2019	50,191,774	1,150,744	51,342,518
2020	49,462,456	1,564,738	51,027,194
2021	48,594,136	1,834,189	50,428,325
2022	46,951,959	2,044,748	48,996,707

Table 3. Continued

Year	Non-current assets	Current assets	Assets
2023	170,981,222	2,754,566	173,735,788
2024	171,437,662	3,140,029	174,577,691

Source: State Tax Service of Ukraine (n.d.)

Researchers Q. Zhang & A. Posso (2019) believe that independent financial analysis should be applied by all types of companies, small or large, and regardless of their production activities, as it is a measure of operational efficiency that allows assessing the results of the enterprise. This tool facilitates decision-making on investments, financing, and action plans, and helps to identify the strengths and weaknesses of an organisation. However, it is important to note that financial analysis with respect to the lease of advertising space should be conducted systematically to determine the company's liquidity and solvency, assess its operating activities, asset utilisation, ability to pay off and cancel contractual obligations, its profits, required investments, productivity, and profitability. As for the interpretation of the indicators, it may be difficult to establish criteria for their evaluation, as the result may be ambiguous with respect to the production activities of the utility. To this end, it is important to describe financial analysis as a management stage, identifying the relevant methods on which it is based, the impact of the inflationary phenomenon on its application, and briefly analyse the importance of international financial standards in the use of this useful management tool, especially when calculating the profit from the lease of advertising space. The authors acknowledge that the technique of assessing the operational behaviour of a company, including the lease of advertising space, facilitates the diagnosis of the current situation and anticipates any future events that are most focused on achieving pre-set goals, while confirming the results of the study.

From the point of view of M. Amidu *et al.* (2021), the analysis of independent financial statements is characterised by the fact that it is an operation based on the reclassification, compilation, receipt, and comparison of accounting, operational and economic data of a utility company, which, through the use of appropriate methods and tools, seeks to assess the financial condition, development, and results of economic activity in the present and past to obtain the best performance in the near future, taking into account indicators for the rental of advertising space. From these statements, it follows that this process is a management phase consisting of several stages. Initially, it focuses on the use and transformation of accounting information recorded in the financial statements, and is subsequently used as a mechanism to select the most relevant information to prevent counterproductive situations and forecast assets by calculating indicators and applying a specific methodology. In this context, the objectives of independent financial analysis are aimed at considering trends in the financial variables involved in the company's operations. They are based on measuring the level of solvency, liquidity, profitability and, in general, the current state of the utility company, and therefore, full compliance with these objectives depends on the quality of the accounting information used for their application, especially with regard to the lease of advertising space. Therefore, the importance of calculating the indicators lies in the interpretation of the value given by each indicator or their ratio, since this value itself provides very little information, its calculation should not be limited to the use of formulas.

H. Sugiarto *et al.* (2023) recognised that profitability is determined by the way in which a company is able to generate a surplus for distribution to shareholders, comparing it with the total resources invested in operations as an indicator of the efficiency achieved. According to the authors, the most profitable companies are those that succeed due to their ability to generate income, in particular through the rental of advertising space. Thus, profitability is the main indicator for assessing business performance, since, setting aside the issue of financing, it is possible to understand how productive and viable the enterprise was in the context of the development of its economic activities and management practices. Similarly, if entities are able to analyse risks in the dynamics associated with economic conditions, they can predict changes in profitability over time. Therefore, making strategic investment decisions is a crucial activity for the development of a utility organisation. Accordingly, comparing the authors' analysis and the results of the study, it is possible to highlight the fact that financial indicators provide information about the company's performance and economic condition when they are calculated for a series of periods, which allows determining average indicators and trends in one industry. As noted by A. Lusardi (2019) in his work, the economic context is characterised by a sequence of situations in which facts and phenomena affecting the current company at all levels occur with unprecedented speed and depth in history. These facts make it necessary, if not essential, to create a reserve or bank of ideas designed to maintain a stock of assets.

The authors B. Bui *et al.* (2020) pointed out that one of the most important challenges in financial analysis is to determine the impact of changes in the financial structure on the cost of capital and firm value. Using an analytical formulation and numerical examples, they conclude that the cost of capital decreases with an increase in the debt ratio. By modifying the input hypotheses, the conclusions can be adjusted, expanding the range of specific situations that lead to the development of new financial models.

In summary, despite high maintenance costs, Kyiv Metro faces uneven development of profitability caused by external economic factors, such as changes in market conditions, economic instability and fluctuations in demand for public transport services. Significant fluctuations in revenues from the lease of advertising space, which demonstrate both a decrease and an increase in profits in different years, confirm the need to adapt the strategy for using these assets, including a review of pricing policy and the introduction of new advertising formats. The importance of independent financial analysis for assessing the situation and performance of the metro was identified, as it provides a clear understanding of the financial position of the enterprise and allows for further development and optimisation of financial flows.

CONCLUSIONS

The study analysed the state and economic benefits of the financial activities of the municipal enterprise Kyiv Metro, and identified the main factors affecting its profitability, including tariffs, passenger traffic and income from the lease of advertising space. The analysis showed that income from the lease of advertising space accounts for a significant share, but its fluctuations from year to year require adaptation of the strategy for using these assets to ensure stable income.

The study paid special attention to the panel data model, which allowed for an in-depth study of the relationship between the main economic indicators of Kyiv Metro, taking into account the impact of external factors such as inflation, market volatility and passenger traffic dynamics. This model provided a comprehensive analysis of the company's financial position, allowing for comparison of indicators for different periods and identification of key trends, including risks and opportunities for increasing profitability. The results of the panel analysis showed that with an increase in passenger traffic and advertising space rental, there is an increase in profitability, but profitability is significantly affected by fluctuations in external factors. Additionally, the current assets of the enterprise were considered, which allowed assessing the efficiency of using the resources of the subway. The results show that higher asset turnover contributes to the financial stability of the enterprise, providing flexibility in the use of working capital to cover operating expenses and investments in development. At the same time, optimisation of the asset structure allows the company to use its financial resources more efficiently, which has a positive impact on its overall profitability. An essential aspect of the study was also an independent financial analysis that provided an objective assessment of the financial performance of the metro. This analysis helped to identify weaknesses that require corrective measures, in particular in the strategy for managing revenues from the lease of advertising space.

Further research could focus on developing new financial models to forecast the company's profitability and assess the risks associated with changing economic conditions. Another important area is to improve the strategy of using advertising space and search for additional sources of income, which will increase the sustainability and efficiency of the subway's financial activities.

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REFERENCES

[1] Akono, H., & Nwaeze, E.T. (2018). Why and how firms use operating cash flow in compensation. *Accounting and Business Research*, 48(4), 400-426. doi: 10.1080/00014788.2017.1404441.

[2] Amidu, M., Abor, J.Y., Coffie, W., & Akakpo, A.A. (2021). Financial inclusion, livelihood activities, and stock market participation. *Emerging Economy Studies*, 7(1), 53-61. doi: 10.1177/23949015211057924.

[3] Amirhossein, F., Javadi, S., & Kim, I. (2020). Environmental regulation and the cost of bank loans: International evidence. *Journal of Financial Stability*, 51, 956-966. doi: 10.1016/j.jfs.2020.100797.

[4] Audit report on the results of the state financial audit of the activities of the municipal enterprise Kyiv Metro for the period from 1 January 2021 to 31 December 2023. (2024). Retrieved from https://surl.li/bdlusn.

[5] Berest, M., & Sablina, N. (2022). Diagnosis of capital structure as a tool for administering the financial activities of enterprises. *Economics of Development*, 21(2), 8-18. doi: 10.57111/econ.21(2).2022.8-18.

[6] Boyko, S., Zahozhai, K., & Logvinov, P. (2024). Financial security of the functioning of the metropolitan (According to the materials of CE "Kyiv Metropolitan"). *Economy and Society*, 62. doi: 10.32782/2524-0072/2024-62-120.

[7] Bui, B., Moses, O., & Houqe, M.N. (2020). Carbon disclosure, emission intensity and cost of equity capital: Multi country evidence. *Accounting and Finance*, 60(1), 56-71. doi: 10.1111/acfi.12492.

[8] Buryachenko, A., Zahozhaj, K., & Logvinov, P. (2024). Development of self-financing in providing public transport activities. *Modeling the Development of the Economic Systems*, 2, 102-106. doi: 10.31891/mdes/2024-12-13.

[9] Community enterprise "Kyiv Metropolitan": Financial statements and financial analysis for 2020. (2020). Retrieved from https://zvitnist.com/03328913_KOMUNALNE_PDPRYYEMSTVO_KYYIVSKYY_METROPOLITEN.

[10] Department of Internal Financial Control and Audit of the City State Administration. (n.d). Retrived from https://data.gov.ua/organization/9afcacb1-6224-46d8-ad51-bae9cb6e6f54.

[11] Farmer, J.D., Hepburn, C., Ives, M.C., Hale, T., Wetzer, T., Mealy, P., Rafaty, R., Srivastav, S., & Way, R. (2019). Sensitive intervention points in the post-carbon transition. *Science*, 364, 132-140. doi: 10.1126/science.aaw7287.

[12] Gendron-Carrier, N., Gonzalez-Navarro, M., Polloni, S., & Turner, M.A. (2022). Subways and urban air pollution. *American Economic Journal: Applied Economics*, 14(1), 164-196. doi: 10.1257/app.20180168.
[13] Kwon, J.H. (2024). Development and utilization of smart projected beam advertising system for public transportation. *Tehnički Glasnik*, 18(1), 108-114. doi: 10.31803/tg-20230224094437.
[14] Lusardi, A. (2019). Financial literacy and the need for financial education: Evidence and implications. *Swiss Journal of Economics and Statistics*, 155(1), 166-172. doi: 10.1186/s41937-019-0027-5.
[15] Mao, R., Bao, Y., & Duan, H. (2021). Global urban subway development, construction material stocks, and embodied carbon emissions. *Humanities and Social Sciences Communications*, 8, 83-89. doi: 10.1057/s41599-021-00757-2.
[16] Monasterolo, I. (2020). Climate change and the financial system. *Annual Review of Resource Economics*, 12, 312-320. doi: 10.1146/annurev-resource-110119-031134.
[17] Municipal enterprise Kievreklama. (n.d.). Retrived from https://www.kyivreclama.kyiv.ua/.
[18] Official website of Kyiv Metro. (n.d.). *Financial statements*. Retrieved from http://metro.kyiv.ua/node/4495.
[19] Onofrei, M., Gavriluta, A., Bostan, I., Oprea, F., Paraschiv, G., & Lazar, C.M. (2020). The implication of fiscal principles and rules on promoting sustainable public finances in the EU countries. *Sustainability*, 12, 2772-2781. doi: 10.3390/su12072772.
[20] Portal "Kyivaudit". (n.d.). *Municipal enterprise "Kyiv Metro"*. Retrived from https://kyivaudit.gov.ua/vr/ka/company.nsf/(pdpredr)/03328913.
[21] Sabau-Popa, C.D., Simut, R., Droj, L., & Bente, C.C. (2020). Analyzing financial health of the SMES Listed in the AERO Market of Bucharest stock exchange using principal component analysis. *Sustainability*, 12, 3726-3733. doi: 10.3390/su12093726.
[22] State Statistics Service of Ukraine. (n.d). Retrived from https://www.ukrstat.gov.ua.
[23] State Tax Service of Ukraine. (n.d). Retrived from https://tax.gov.ua/elektronna-zvitnist/.
[24] Sugiarto, H., Yanti, J., Cahyani, D., Junaidi, A., & Oktoriza, L.A. (2023). Exploration financial performance optimization strategies on business success: A literature review. *SEIKO: Journal of Management & Business*, 6(2), 402-411. doi: 10.37531/sejaman.v6i2.4958.
[25] Sun, L., Yang, Y., Fu, X., Xu, H., & Liu, W. (2020). Optimization of subway advertising based on neural networks. *Mathematical Problems in Engineering*, 2020, article number 1871423. doi: 10.1155/2020/1871423.
[26] Zhang, Q., & Posso, A. (2019). Thinking inside the box: A closer look at financial inclusion and household income. *The Journal of Development Studies*, 55(7), 1616-1631. doi: 10.1080/00220388.2017.1380798.
[27] Zhou, J., Murphy, E., & Long, Y. (2019). Commuting efficiency gains: Assessing different transport policies with new indicators. *International Journal of Sustainable Transportation*, 13, 710-716. doi: 10.1080/15568318.2018.1510562.

Незалежний розрахунок результатів фінансової діяльності Київського метрополітену з урахуванням оренди рекламних площ

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Анотація. Облік фінансових результатів, особливо в контексті оренди рекламних площ, є критично важливим для ефективного розвитку та розширення фінансової діяльності Київського метрополітену в умовах цифровізації та соціально-економічних змін. Мета дослідження – розглянути економічні переваги фінансової діяльності метрополітену міста Києва, враховуючи винайм зовнішньої реклами. У дослідженні використовувались методи економічного аналізу, індуктивний, моделювання, порівняльний. Результати роботи визначили, що оренда рекламних площ супроводжується високим прибутком індустрії зовнішньої реклами та інвестицій, що характеризуються зростанням галузі в цілому, однак не покриває всіх витрат комунального підприємства «Київський метрополітен». Міжнародні рекламні агенції та медіа-компанії можуть бути зацікавлені в інвестиціях у рекламні площі, які є єдиним зовнішнім носієм реклами в Київському метрополітені. Конкуренція стає інтенсивною в сферах реклами та технологій, що впливає на доходи метрополітену від реклами. Міський термінал метрополітену охоплює рекламні матеріали, розміщені в станціях та вагонах, що забезпечують видимість реклами для пасажирів і є важливими для залучення уваги до брендів. Зростання ринкової вартості цих рекламних площ свідчить про їхній потенціал для інвестицій, що може привернути інтерес венчурних капіталістів до нових проектів у цій сфері. Виявлено, що оптимізація використання рекламних площ може суттєво підвищити рентабельність Київського метрополітену. Встановлено, що диверсифікація рекламних форматів та впровадження цифрових рекламних носіїв може збільшити прибутковість метрополітену порівняно з традиційними методами. Співпраця з локальними бізнесами для розміщення реклами може збільшити доходи, та посилити зв'язок метрополітену з місцевою громадою. Результати дослідження можуть бути корисними для спеціалістів з фінансів та економіки у сфері громадського транспорту для оптимізації фінансової діяльності підприємства та підвищення ефективності управління ресурсами

Ключові слова: інфляція; інвестиції; прибуток; рентабельність; комунальне підприємство