

EVALUATING MANAGEMENT PERFORMANCE IN A SUBSIDISED STATE- OWNED METRO: A RESPONSIBILITY-CENTRE APPROACH

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Abstract:

When the losses of a state-owned transport operator are reimbursed by the budget, its net financial result says little about the work of its management. The paper proposes a method for evaluating management under such conditions and tests it on the data of JSC «Tashkent Metro». The change in the company's net result between 2024 and 2025 is decomposed by chain substitution into ten factors assigned to five responsibility centres (the state, traffic volume, the external environment, the owner and the executive body). Its robustness is checked with a symmetric decomposition and with alternative deflators. The net loss grew by only 2.6 billion soums, yet the component controlled by management deteriorated by 81.9 billion soums, while state decisions improved the result by 211.2 billion. Even under a 10 percent cost inflation assumption the controllable component remains negative at 50.7 billion soums. On this basis the paper derives a formula for ex-ante compensation of the social mandate with «inflation minus X» indexation of normative costs, and a remuneration formula in which a safety gate precedes all other indicators. The approach allows a supervisory board to hold management accountable for results it actually controls.

Keywords: Controllability principle; responsibility accounting; factor decomposition; public service compensation; incentive regulation; executive remuneration; urban metro; state-owned enterprises.

JEL classification: L51; L92; M41; M52.

Introduction

A supervisory board can evaluate management only if it knows which part of the financial result management has produced. In a commercial company this question is usually answered by profit and return on capital. In a state-owned metro these indicators are of little use. The fare is set by public authorities, a large share of passengers travel on concessionary terms, and the gap between revenue and cost is closed by budget transfers. A year in which management

lets costs grow may end with almost the same loss as a year of strict cost control, because the difference is absorbed by compensation.

This problem has become practical for JSC «Tashkent Metro». Resolution PQ-191 of 15 May 2026 provides for a supervisory board with independent members, a first deputy chairman for finance and transformation with international experience, IFRS reporting and a USD 84.3 million loan whose costs are to be reimbursed under the existing compensation procedure [1; 2]. Both the new board and the executives will need performance criteria. The criteria established for joint-stock companies with a state share link executive bonuses to key performance indicators selected from economic, production, energy and innovation indicators [3], but they do not separate the effects of state decisions from those of management. The IMF notes that fiscal risks from Uzbek SOEs remain sizable [4]. For this reason the purpose of compensation payments is also an issue of public finance.

The aim of the paper is to develop and test a method that makes the controllable part of a metro's financial result visible and to link it to the design of compensation and executive remuneration. The objectives are to decompose the change in the company's net result by responsibility centres and test the robustness of the decomposition; to derive a compensation formula that replaces reimbursement of actual losses with normative, ex-ante parameters; and to construct a system of key performance indicators with a remuneration formula consistent with both.

Literature Review

The theoretical basis of the paper lies in agency theory. Holmström showed that an agent's reward should be tied to measures that carry information about the agent's effort, and that adding measures dominated by factors outside the agent's control only increases risk without improving incentives [5]. In management accounting this result became known as the controllability principle, according to which managers should be held accountable only for outcomes over which they have significant influence [6]. Recent empirical work supports the principle and adds a behavioural explanation. Su, Baird and Nuhu found in a survey of 220 managers that controllable financial and non-financial measures are associated with better managerial performance, and that the effect operates through perceived fairness [7]. This literature, however, deals mainly with divisions of commercial firms and hardly addresses an organisation whose revenue is largely set by its owner. Papenfuß and Keppeler found that only 9 percent of the 232 studies on performance-related pay and public service motivation they reviewed concern state-owned enterprises [8], so the evidence base for SOE remuneration is thin.

Regulatory economics offers the second line of reasoning. Laffont and Tirole showed that a cost-plus contract leaves the regulated firm no incentive to reduce costs, whereas a fixed-price contract creates strong incentives but shifts excessive risk onto the firm, so that the optimal contract lies between the two [9]. Littlechild's «inflation minus X» rule made this idea operational for natural monopolies [10], and Shleifer's yardstick competition model showed that a monopolist's cost norm can be set from the costs of comparable firms, which creates

incentives even where there is no market competition [11]. In EU public transport law, the parameters used to calculate compensation must be fixed beforehand in an objective and transparent manner, and the payment may not exceed the net financial effect of the public service obligation [12], and the Commission's 2023 guidelines specify how this should be applied [13]. Avenali and co-authors showed for Italian bus services that standard costs must reflect operating conditions, commercial speed being the strongest cost driver [14]. This literature designs the contract between an authority and an operator. In our view its weakness, from the standpoint of corporate governance, is that it rarely follows the contract into the company, to the question of how the board then evaluates the managers who operate under it. Research on executive remuneration forms the third line. Bebchuk and Fried documented how pay can become decoupled from performance when it rewards managers for windfalls they did not produce [15]. Flammer, Hong and Minor found that firms integrating social and environmental criteria into executive pay become more long-term oriented [16], which supports the inclusion of non-financial indicators. In metro benchmarking groups such as CoMET and Nova, comparisons cover cost recovery, operating costs per car-kilometre, punctuality and asset productivity [17]. Studies of Uzbekistan link the weak performance of SOEs to limited transparency and an unsatisfactory organisation of corporate governance [18], but we found no study that proposes performance criteria for a state enterprise whose losses are compensated.

Accordingly, three questions remain open. No method has been proposed for separating the net result of a compensated operator into components attributable to the state, the owner and management. The design of compensation and the evaluation of management are studied separately. Finally, little attention has been paid to combining financial incentives with safety requirements in executive pay.

Research Methodology

The empirical basis consists of the company's statements of financial results (Form 2) for 2024 and 2025 [19], the number of passengers carried, 270.3 million in 2024 and 286.8 million in 2025 [20; 21], and the annual consumer price inflation of 7.3 percent in 2025 reported by the National Statistics Committee [22]. Legally, the analysis relies on PQ-191 and Cabinet of Ministers Resolutions No. 273 and No. 207.

The change in the net financial result, ΔNR , was decomposed by chain substitution into factors, each of which was assigned to the subject that controls it:

$$\Delta NR = \Delta NR_S + \Delta NR_V + \Delta NR_E + \Delta NR_O + \Delta NR_M \quad (1)$$

where ΔNR_S is the result of state decisions on fares, concessions and compensation; ΔNR_V the effect of traffic volume; ΔNR_E the effect of the external environment (inflation); ΔNR_O the result of the owner's investment and borrowing decisions; and ΔNR_M the result controlled by the executive body. The last component, which is central to the method, is calculated as

$$\Delta NR_M = -Q_1 \cdot [c_1 - c_0(1 + \pi)] - [P_1 - P_0(1 + \pi)] \quad (2)$$

where Q_1 is the number of passengers in the reporting year, c_0 and c_1 the cost of services sold per passenger in the base and reporting years, P_0 and P_1 period expenses, and π the inflation rate. Other operating income was assigned to the state centre, since under Resolution No. 273 it reflects the reimbursement of losses from regulated fares, and financial income and expenses to the owner centre.

Because the outcome of chain substitution depends on the order in which factors are replaced, the decomposition was repeated with a symmetric (Shapley) procedure that averages the contribution of each factor over all possible orders. Because CPI inflation may differ from the actual growth of input prices, the controllable component was also recalculated for inflation rates of 5.3, 9.3 and 10 percent. The compensation and remuneration formulas were derived analytically; their calibration requires data that will be available only after the technical audit provided for by PQ-191.

Results

The proposed approach rests on four management contours, linked by seven principles and served by three assessment tools (Figure 1). This paper concentrates on the contract contour, which separates the state's role as a purchaser of social services from its role as a shareholder, and on the execution contour, which measures and rewards management.

The decomposition of the change in the company's net result between 2024 and 2025 is presented in Table 1.

Formally, the results of 2025 differ little from those of 2024, as the net loss increased by only 2.6 billion soums, or 10.6 percent. The decomposition shows two large movements in opposite directions behind this stability. The state centre improved the result by 211.2 billion soums, since the growth of other operating income by 221.4 billion more than offset the loss of 10.3 billion caused by the decline in revenue per passenger from 1,273.5 to 1,237.7 soums. At the same time, costs under the control of the executive body grew faster than inflation and worsened the result by 81.9 billion soums, 31 times the change in the net loss.

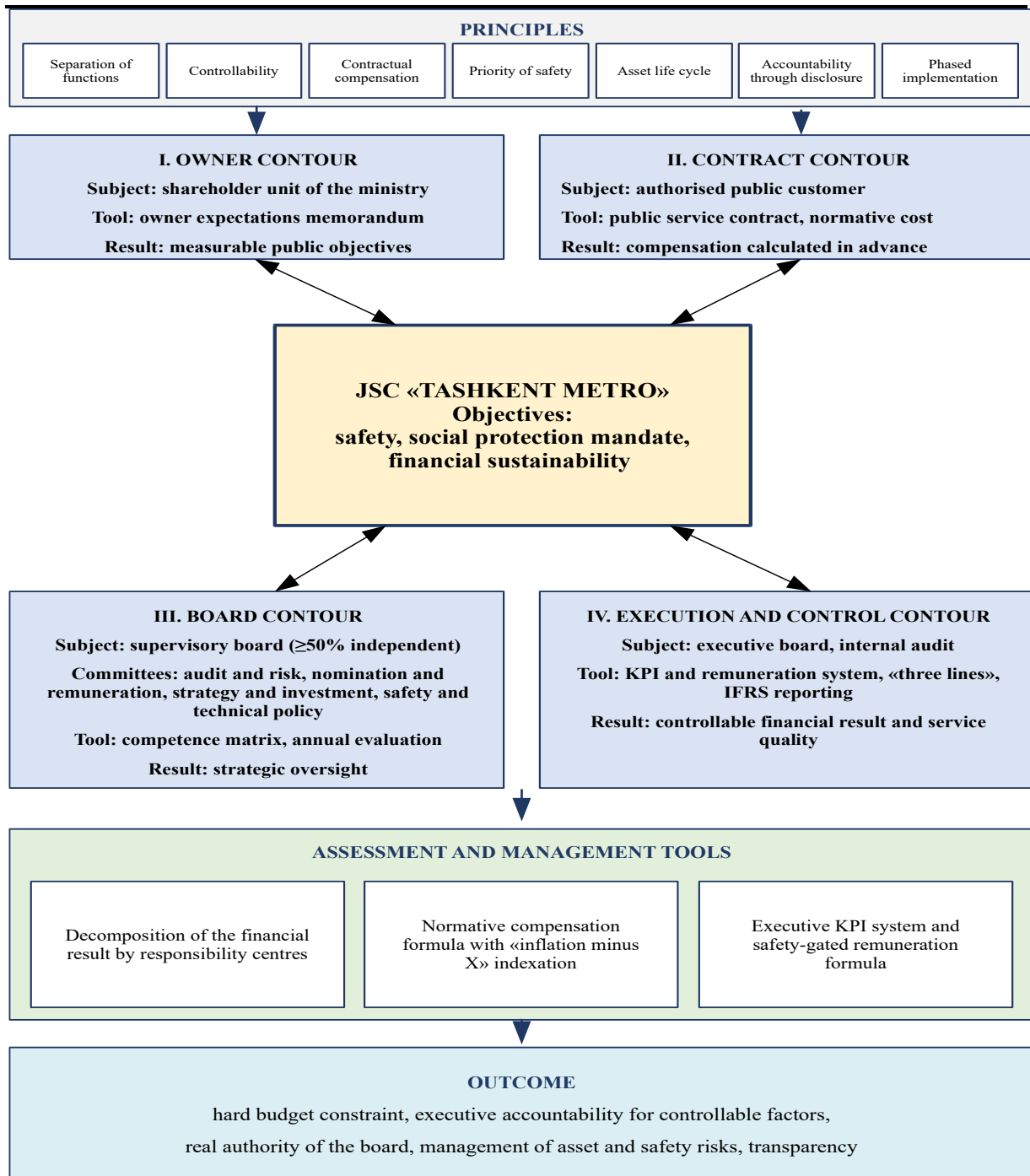


Figure 1. Model of corporate governance methodology for JSC «Tashkent Metro»

Within the controllable component, the cost of services sold per passenger rose from 3,286.0 to 3,566.3 soums, by 8.5 percent in nominal terms but by only 1.1 percent in real terms, which reduced the result by 11.6 billion soums. The main pressure came from period expenses, which increased by 40.1 percent in nominal and 30.6 percent in real terms and reduced the result by 70.3 billion; within them, other operating expenses grew by 43.0 percent. Part of this increase may reflect the depreciation of newly commissioned lines, which belongs to the owner's

investment decisions. Form 2 does not allow such costs to be separated, and this is an argument for keeping accounts by responsibility centres and by line in the ERP system that PQ-191 requires.

Table 1 Decomposition of the change in the net financial result of JSC «Tashkent Metro» by responsibility centres, 2025 compared with 2024

Factor	Formula	Value, mln soums	Responsibility centre
Revenue: volume effect	$(Q_1 - Q_0) \cdot r_0$	+21,140.0	Volume
Revenue: revenue per passenger	$Q_1 \cdot (r_1 - r_0)$	-10,266.5	State
Change in other operating income	$OI_1 - OI_0$	+221,435.1	State
Cost of sales: volume effect	$-(Q_1 - Q_0) \cdot c_0$	-54,546.8	Volume
Cost of sales: inflation	$-Q_1 \cdot c_0 \cdot \pi$	-68,820.0	External
Cost of sales: real unit cost	$-Q_1 \cdot [c_1 - c_0(1 + \pi)]$	-11,626.0	Executive
Period expenses: inflation	$-P_0 \cdot \pi$	-15,635.8	External
Period expenses: real change	$-[P_1 - P_0(1 + \pi)]$	-70,311.4	Executive
Change in financial income	$FI_1 - FI_0$	+17.4	Owner
Change in financial expenses	$-(FE_1 - FE_0)$	-14,028.8	Owner
Total, state centre (ΔNR_s)		+211,168.5	
Total, volume (ΔNR_v)		-33,406.8	
Total, external environment (ΔNR_E)		-84,455.8	
Total, owner (ΔNR_o)		-14,011.4	
Total, executive body (ΔNR_M)		-81,937.4	
Net change in the result (ΔNR)	$-27,692.9 - (-25,050.0)$	-2,642.9	

The volume effect is negative because of the ratio between revenue and cost per passenger. In 2024 revenue per passenger amounted to 1,273.5 soums and the cost of sales per passenger to 3,286.0 soums, so each additional passenger increased the loss by about 2,000 soums even before period expenses. PQ-191 aims to raise daily ridership to 1.8 million by 2030, about 2.3 times the 2025 average of 786 thousand. Under the current financial model this growth will increase the need for compensation. Rewarding management for ridership growth is meaningful only if compensation is tied to the volume of service, which is the logic of the formula proposed below. Finally, the owner centre reflects the growth of interest expenses; once the USD 84.3 million loan is drawn, its share will rise, and the decomposition will attribute these costs to the subject that decided to borrow.

Table 2 Sensitivity of the decomposition to the order of substitution and to the deflator, billion soums

Responsibility centre	Chain (baseline)	Shapley	$\pi = 5.3\%$	$\pi = 9.3\%$	$\pi = 10\%$
State	+211.2	+211.5	+211.2	+211.2	+211.2
Volume	-33.4	-36.0	-33.4	-33.4	-33.4
External environment	-84.5	-85.2	-61.3	-107.6	-115.7
Owner	-14.0	-14.0	-14.0	-14.0	-14.0
Executive body	-81.9	-78.8	-105.1	-58.8	-50.7

Under the symmetric procedure the controllable component changes by less than 4 percent. The choice of deflator has a stronger influence, but even if input prices had grown by 10 percent instead of 7.3, management would still be responsible for a deterioration of 50.7 billion soums, nineteen times the change in the net loss. Consequently, the conclusion that the stable bottom line concealed a substantial deterioration in controllable costs holds.

The decomposition is a diagnostic tool, and incentives will change only if the compensation mechanism itself is revised. Following the logic of the EU rules [12; 13], we propose to compensate the social mandate according to a formula set in advance in a five-year public service contract:

$$K_t = N_t \cdot V_t - T_t + L_t - \beta \cdot D_t \pm S_t, \quad K_t \leq K_t^{\max} \quad (3)$$

where K_t is compensation in year t ; N_t the normative cost per train-kilometre; V_t the contracted volume of service in train-kilometres; T_t fare revenue; L_t compensation for carrying concessionary passengers; D_t non-fare revenue; β the share of non-fare revenue used to reduce compensation ($0 \leq \beta \leq 0.5$); S_t a bonus or penalty for quality indicators; and $K_t^{\max}$ an upper limit that prevents overcompensation. The normative cost of the first contract period is based on the company's own costs as cleaned by the technical audit and on the costs of comparable metros; in subsequent years it is indexed according to Littlechild's rule [10]:

$$N_t = N_{t-1} \cdot (1 + \pi_t - X) \quad (4)$$

where X is an efficiency coefficient fixed for the contract period and reviewed on the basis of benchmarking.

The main difference from the existing procedure is that compensation is determined by the normative cost and does not depend on the actual one. If the company keeps its actual costs below the norm, the saving remains with it, and costs above the norm are not reimbursed. In Laffont and Tirole's terms the contract lies between cost-plus and fixed price [9]: the X coefficient and the quality term share risk and gain between the state and the company. The upper limit on β guarantees that at least half of non-fare revenue stays with the company, creating an incentive to develop advertising, retail and leasing income. In addition, the contract changes the meaning of the decomposition. Fare decisions remain with the city council, but

their financial consequence passes to the purchaser through T_t and L_t , so that the state centre becomes predictable and the executive component becomes the result for which management is accountable.

The third tool translates the controllable component into executive remuneration. The indicators in Table 3 were selected so that management can influence them, they are linked to the PQ-191 targets and they can be disclosed publicly.

The variable remuneration of executives is linked to the indicators of Table 3 as follows:

$$M = M_0 \cdot G \cdot \sum v_k \cdot a_k, \quad a_k = \min(F_k / R_k; 1.2), \quad k = 1, \dots, 10 \quad (5)$$

where M is variable remuneration; M_0 its base amount set by the board's nomination and remuneration committee; G the safety gate coefficient, equal to 1 if no serious safety incident occurred in the reporting period and 0 otherwise; v_k the weight of indicator k ; a_k its achievement ratio; and F_k and R_k the actual and planned values, the ratio being inverted for indicators whose decrease is the goal. Capping the ratio at 1.2 prevents an exceptional result on one indicator from compensating for failures on others. Net profit and profitability are deliberately excluded from the formula and replaced by ΔNR_M . The safety gate removes the incentive to improve financial indicators by postponing maintenance and asset renewal, a risk that is real for a network whose oldest lines have been in service since 1977.

Table 3 Key performance indicators for the executive body of JSC «Tashkent Metro»

Area	Indicator	Unit	2025	2030 target	Weight
Safety	Serious traffic safety incidents (accidents, fatalities)	cases	not disclosed	0	gate G
Safety	In-service failures of rolling stock	per mln train-km	not disclosed	annual decline	0.10
Passengers and quality	Average daily ridership	thousand	786	1,800	0.10
Passengers and quality	Peak headway	minutes	1.5–9	2–3	0.10
Passengers and quality	Timetable adherence	%	not disclosed	benchmark	0.10
Passengers and quality	Passenger satisfaction index	points	not measured	annual growth	0.10
Financial	Executive responsibility centre result (ΔNR_M)	mln soums	–81,937.4	≥ 0	0.15
Financial	Real operating cost per train-km	% change	not determined	–X, formula (4)	0.10
Financial	Share of non-fare revenue in total income	%	not disclosed	annual growth	0.10
Assets and governance	Completion of the asset renewal plan based on the technical audit	%	–	100	0.10
Assets and governance	Timely publication of IFRS and KPI reports	yes / no	no	yes	0.05

Discussion

The results confirm, on the data of a real company, Holmström's argument that an uninformative measure adds risk without adding incentives [5]. In 2025 the net loss of the metro carried almost no information about management, since it barely moved while the controllable result deteriorated by 81.9 billion soums. Had management been evaluated on the bottom line, it would have been judged on the size of budget transfers. This is the situation Bebchuk and Fried describe as pay without performance [15], except that here the windfall comes from the budget and not from the stock market. For this reason we cannot agree with the practice of evaluating the managers of compensated operators by net profit or profitability, however familiar these measures are; in their place the board needs ΔNR_M or an equivalent controllable measure. The fairness mechanism identified by Su, Baird and Nuhu [7] suggests that such a measure would also be better accepted by managers, an important point for a company that intends to recruit executives on the international market.

The compensation formula follows the middle path recommended by Laffont and Tirole [9] and is consistent with the EU requirement of ex-ante parameters and no overcompensation [12; 13]. The evidence of Avenali and co-authors [14] warns, however, that a normative cost which ignores operating conditions will be either unattainable or too generous. For a metro the relevant conditions include the age of the fleet, the length and design of lines and the share of underground sections. This is why we propose to set the first norm only after the technical audit and to review X against comparable metros. With about 287 million journeys a year, the Tashkent Metro falls within the size range of the Nova group of small and medium-sized metros [17], which makes yardstick comparison in Shleifer's sense practically achievable [11].

The safety gate develops the finding of Flammer, Hong and Minor that non-financial criteria in executive pay strengthen long-term orientation [16]. In our opinion, for a safety-critical operator safety should serve as a precondition for any variable pay and not as one of the weighted indicators, because no improvement in costs can compensate for a serious accident. This position differs from the balanced scorecard [24], in which all perspectives are traded against each other through weights.

Several limitations should be noted. The decomposition covers two years, and Form 2 does not allow costs to be separated by line or by the decision that caused them. CPI is an imperfect deflator for the metro's inputs, although Table 2 shows that the conclusion holds over a wide range. The compensation and remuneration formulas are presented analytically; their parameters can be calibrated only once audited cost data and benchmark values are available.

Conclusions and Recommendations

The net result of a metro whose losses are compensated does not measure the performance of its management. A decomposition by responsibility centres makes the controllable part visible. At JSC «Tashkent Metro» a nearly unchanged net loss in 2025 concealed a 211.2 billion soum improvement produced by state decisions and an 81.9 billion soum deterioration in costs controlled by the executive body, and this conclusion holds under a symmetric decomposition and under alternative deflators. The contribution of the paper lies in linking three tools that are

usually treated separately. The decomposition defines what management is accountable for, the normative compensation formula makes cost savings worthwhile, and the safety-gated remuneration formula rewards results without encouraging cuts in maintenance.

On this basis we propose the following measures. First, from the 2027 reporting year the supervisory board should receive an annual decomposition of the financial result by responsibility centres together with the financial statements, and the ERP system to be introduced by June 2027 should record costs by line, cost type and responsibility centre. Second, after the technical audit is completed in February 2027, the Ministry of Transport and the company should prepare a five-year public service contract based on formulas (3) and (4), with the first normative cost derived from audited costs and peer benchmarks, β not exceeding 0.5 and an explicit compensation ceiling, so that the contract can apply from 2028. Third, variable remuneration of the executive board, including the first deputy chairman for finance and transformation, should follow formula (5) from 2027, with a target of $\Delta NR_M \geq 0$ by 2030. Fourth, the company should join an international benchmarking group of comparable metros to obtain the data needed for setting and reviewing the X coefficient. Fifth, the KPI results and the decomposition should be published annually together with the IFRS statements, so that the owner, the budget authorities and passengers can see what the compensation pays for.

References

1. Resolution of the President of the Republic of Uzbekistan No. PQ-191 of 15.05.2026 «On Additional Measures to Improve the Efficiency of the Tashkent Metro». Available at: <https://lex.uz/docs/-8209276> (in Uzbek).
2. Resolution of the Cabinet of Ministers of the Republic of Uzbekistan No. 273 of 17.09.2012 «On Improving the Activity of Passenger Carriers in Public Transport and the Procedure for Their Financing». Available at: <https://lex.uz/mact/2054370> (in Uzbek).
3. Resolution of the Cabinet of Ministers of the Republic of Uzbekistan No. 207 of 28.07.2015 «On the Introduction of Criteria for Assessing the Efficiency of Joint-Stock Companies with a State Share and Other Economic Entities». Available at: <https://lex.uz/ru/docs/2712352>
4. Simone, A., Ahmedov, S., Wang, S., Ould-Brahim, A. (2026). State Owned Enterprises in Uzbekistan: Issues and Reform Options. IMF Selected Issues Paper No. SIP/2026/058. Washington, DC: International Monetary Fund.
5. Holmström, B. (1979). Moral Hazard and Observability. The Bell Journal of Economics, Vol. 10, No. 1, pp. 74–91.
6. Merchant, K.A., Van der Stede, W.A. (2017). Management Control Systems: Performance Measurement, Evaluation and Incentives. 4th ed. Harlow: Pearson.
7. Su, S.X., Baird, K., Nuhu, N. (2022). Controllability of Performance Measures and Managerial Performance: The Mediating Role of Fairness. Meditari Accountancy Research, Vol. 30, No. 2, pp. 313–341. DOI: 10.1108/MEDAR-07-2020-0957.
8. Papenfuß, U., Keppeler, F. (2020). Does Performance-Related Pay and Public Service Motivation Research Treat State-Owned Enterprises Like a Neglected Cinderella? A

-
- Systematic Literature Review and Agenda for Future Research on Performance Effects. *Public Management Review*, Vol. 22, No. 7, pp. 1119–1145. DOI: 10.1080/14719037.2020.1740300.
9. Laffont, J.-J., Tirole, J. (1993). *A Theory of Incentives in Procurement and Regulation*. Cambridge, MA: MIT Press.
10. Littlechild, S.C. (1983). *Regulation of British Telecommunications' Profitability*. London: Department of Industry.
11. Shleifer, A. (1985). A Theory of Yardstick Competition. *The RAND Journal of Economics*, Vol. 16, No. 3, pp. 319–327.
12. Regulation (EC) No 1370/2007 of the European Parliament and of the Council of 23 October 2007 on Public Passenger Transport Services by Rail and by Road. *Official Journal of the European Union*, L 315, pp. 1–13.
13. European Commission (2023). Communication from the Commission: Interpretative Guidelines Concerning Regulation (EC) No 1370/2007 on Public Passenger Transport Services by Rail and by Road (2023/C 222/01). *Official Journal of the European Union*, C 222, 26 June 2023.
14. Avenali, A., Boitani, A., Catalano, G., D'Alfonso, T., Matteucci, G. (2016). Assessing Standard Costs in Local Public Bus Transport: Evidence from Italy. *Transport Policy*, Vol. 52, pp. 164–174. DOI: 10.1016/j.tranpol.2016.06.007.
15. Bebchuk, L., Fried, J. (2004). *Pay without Performance: The Unfulfilled Promise of Executive Compensation*. Cambridge, MA: Harvard University Press.
16. Flammer, C., Hong, B., Minor, D. (2019). Corporate Governance and the Rise of Integrating Corporate Social Responsibility Criteria in Executive Compensation: Effectiveness and Implications for Firm Outcomes. *Strategic Management Journal*, Vol. 40, pp. 1097–1122. DOI: 10.1002/smj.3018.
17. Transport Strategy Centre, Imperial College London (2022). Sydney Trains Update (CY2020): Comparison with International Benchmarking Groups. Sydney: Transport for NSW. Available at: <https://www.transport.nsw.gov.au/system/files/media/documents/2022/Sydney-Trains-Performance-Comparison-to-International-Benchmarking-Groups-2020.pdf>
18. Akhmedov, Kh.R. (2024). Regulation of the Activities of State-Owned Enterprises. *Iqtisodiyot va ta'lim*, Vol. 25, No. 2, pp. 447–451. DOI: 10.55439/ECED/vol25_iss2/a64 (in Uzbek).