

Governance Structures and Financial Decision-Making in Higher Education Institutions: A Data-Driven Perspective

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Abstract

Governance structures play a fundamental role in shaping financial decision-making processes within higher education institutions. As universities confront increasing financial pressures, institutional complexity, and heightened demands for transparency and accountability, effective governance mechanisms have become essential for ensuring efficient financial management and sustainable institutional performance. Meanwhile, the rapid development of digital information systems has introduced new opportunities for integrating data-driven approaches into institutional governance. This study examines the relationship between governance structures and financial decision-making in higher education institutions from a data-driven perspective. Drawing upon theories of institutional governance and organizational decision-making, the research proposes a conceptual framework linking governance mechanisms with financial decision processes, resource allocation efficiency, and institutional performance outcomes. Using a conceptual analytical approach supported by recent literature and institutional practices, the study explores how governance arrangements influence financial transparency, accountability, and strategic resource allocation within universities. The analysis suggests that governance systems incorporating data-driven decision-making practices are more likely to achieve efficient financial management and improved institutional performance. This research contributes to the literature on higher education governance by integrating governance theory with data-driven financial management. The findings provide practical implications for policymakers and university leaders seeking to strengthen institutional governance and enhance financial sustainability in increasingly complex and data-intensive higher education environments.

Keywords: *Data-Driven Management, Financial Decision-Making, Higher Education Governance, Institutional Performance, Resource Allocation*

Introduction

Higher education institutions are financially limited, with different income sources, competition, digitalization and performance demands. Universities are evaluated not only on teaching and research skills but also on justifying public and private investments, allocate limited resources transparently, maintain quality and maintain long term financial stability. These expectations have made governance part of higher education management. Governance sets rules, roles and accountability relationships for institution priorities and

financial decisions. It ensures that financial decisions are credible and based on legitimate processes and are related to institution goals and not short-term administrative preferences. Financial decisions are not just budget decisions, they are governance between values such as autonomy over management, equity over efficiency, stability over innovation and responsibility over accountability. Budget decisions, faculty selection, investment in research, digital infrastructure, support and capital development directly impact teaching quality, research productivity, reputation and trust of stakeholders. Financial governance is also used to translate institutional strategy into tangible results. Recent work on performance governance and performance based funding suggests that financial tools are increasingly being used as steering tools to shape institutional behaviour, priorities and university understanding accountability (Huisman & Stensaker 2022; Matveeva 2025).

Data has changed informational foundations of university governance: Leaders now have tools such as learning analytics, finance dashboards, enrollment forecasts, staff workload, research performance indicators, procurement data, external benchmarking tools that can help plan and promote resources allocation, but having access to data does not guarantee better decisions. Data can be fragmented, selectively interpreted, poorly governed, or used to support narrow performance measures. A data driven approach requires not only attention to digital tools, but also to governance: who defines indicators, who validates data, who has access to financial information, how evidence is interpreted, and how decisions are communicated to academic and administrative stakeholders (Beerkens 2022; Gaftandzhieva et al. 2023).

This paper studies how governance structures affect financial decisions in higher education institutions using data driven approaches. It presents conceptual models where governance structures affect financial decisions, which affect resource allocation efficiency and ultimately the performance of institutions. It is shown that data-driven governance enhances these relationships when data systems are integrated into transparent, accountable and participatory decision-making processes. Data-driven tools can have limited or negative effects if they are not aligned with institutional values, academic judgment, and governance accountability. Hence, this paper contributes to literature on higher education governance linking structural governance mechanisms with financial decisions and institutional outcomes.

Review of Related Literature

Governance in Higher Education

Higher education governance comprises formal and informal systems universities use to make strategic decisions, coordinate academic and administrative units, allocate resources and share responsibility to internal and external stakeholders. It involves governing boards, executive leadership, senators, faculty committees, financial control systems, quality assurance units, external regulators, accreditation bodies, and stakeholder participation channels. Governance is not just an administrative layer, but a complex arrangement of authority, information, participation, and oversight that influences how universities deal with fiscal uncertainty, changes in policy, technological advances and public expectations. One of the issues in university governance is how to balance autonomy and accountability. Universities need autonomy for professional judgement, freedom and flexibility in academic work, but accountability because public funds, fees, donors and social trust control universities. Recent reforms combine autonomy with performance monitoring, strategic planning, external reporting but not always stable. Performance measures can increase transparency but can also limit

institutional priorities when used instead of thought. Financial accountability can prevent waste; excessive compliance can prevent innovation. Effective governance must balance managerial power and academic authority (Huisman & Stensaker 2022; Mizrahi 2021).

Board governance and executive leadership play important roles in financial decisions. Governing boards approve budgets, monitor risks, and ensure that institutional strategies are financially sound. Executive leadership translate broad strategies into detailed financial plans. Academic units give information about needs such as disciplinary needs, research priorities, teaching needs. Clear roles allow universities to combine strategy and expertise, but unclear roles can lead to politicized, opaque or overly central decisions. Research on higher education governance shows documenting, measuring and sharing performance data is more important, but legitimacy depends on it being integrated into governance routines (Beerens 2022; Huisman and Stensaker 2022).

Financial Decision-Making in Universities

Decision making is different budgeting of resources for different priorities (education, research, student services, digital platforms, physical infrastructure, quality assurance, internationalization, community engagement) of universities. Unlike a commercial organization focused on one surplus, universities have multiple missions and must decide on them. Budgeting to improve short term financial ratios can hurt long term quality of academic work if core programs or research capacities are underfunded. Investing in expensive facilities could improve reputation but limited flexibility because long term debts. Financial decision-making in universities is a governance function, not an accounting task.

Resource allocation is a key part of university governance, highlighting which priorities are highlighted, how risks are handled, and legitimacy of institutional strategies. Performance-based resource allocation models aim at linking funding to outcomes like graduation rate, research publications, external grants, employment, and retention. These models can help to improve transparency of resource distribution and motivate departments to align their activities to institutional goals. Performance-based funding can however benefit only if indicators are poorly designed, incentives are weak or too strong, or institutions have symbolic compliance rather than real improvement (Dougherty & Natow 2020; Matveeva 2025; Ortagus et al. 2020).

Financial decisions are highly dependent on information. Budget committees and senior leaders need accurate information on revenue trends, costs, enrollment patterns, staff burden, program viability, research income, space utilization and student outcomes. Without such information, universities might use historical budgeting, informal bargaining or general adjustments. These methods can be stable but often perpetuate existing inefficiencies and misrepresent the relationship between resources and performance. Data-driven financial management enables resource allocation to be diagnostic, forward-looking and strategically aligned, but data-driven financial management relies on common definitions, data governance, and interpretive competence.

Data-Driven Governance

Data-driven governance is a system of using institutional data, analytics, and digital information systems to improve decision making, oversight and accountability. In higher education data includes financial dashboards, student progression data, predictive enrollment models, research management systems, workload models, benchmarking data, quality assurance reports and more. These tools improve the availability of information to leaders and committees and reduce information asymmetry between central administration and academic units when data definitions and access is transparent.

Recent studies indicate the growing importance of data-driven decisions in higher education. Gaftandzhieva et al. (2023) emphasize the role of business intelligence, data analytics, data mining, learning analytics and decision support systems in improving institutional management. Kaspi and Venkatraman (2023) illustrate how data-driven decisions can help to transform assessment in education. Beerkens (2022) argues that data in higher education have evolved from simple input measures to more complex measures and governance. In this way data can describe institutional performance, but also shape how performance is defined, monitored and managed.

Objectives

Data-driven governance has several challenges. First, data systems may seem to mislead when indicators appear as neutral facts rather than socially constructed measures. Second, they tend to focus on measurable aspects rather than educationally relevant ones. Third, predictive analytics may raise accountability and privacy issues if data are used without clear ethical rules. Fourth, dashboards might centralize power if only executive leaders control access and interpretation of data. Thus, data-driven governance requires clear data governance policies, indicator validation, stakeholder consultation and transparent reporting.

Synthesis and Research Gap

We fill an existing gap by proposing an integrated governance-finance-performance model. The model assumes that governance structures impact financial decisions by means of accountability, participation, transparency and strategic control. Financial decisions then impact resource allocation efficiency by ensuring funds, staff, infrastructure and digital resources align with goals. Improved resource allocation efficiency leads to improved performance. Data-driven governance supports such pathways by improving quality, accessibility and interpretability of information. Importantly, data does not automatically lead to better results. Instead, data is a proxy for the quality of governance.

Methodology

We present the Governance-Finance-Performance Model based on the assumption that university financial results are not dependent on revenue or accounting, but by governance structures that dictate authority, accountability, participation and information use. Governance structures are the independent variable, financial decision is the main mediator, resource allocation efficiency is the operation mechanism and institution performance is the dependent outcome. Data-driven governance improves information quality and transparency.

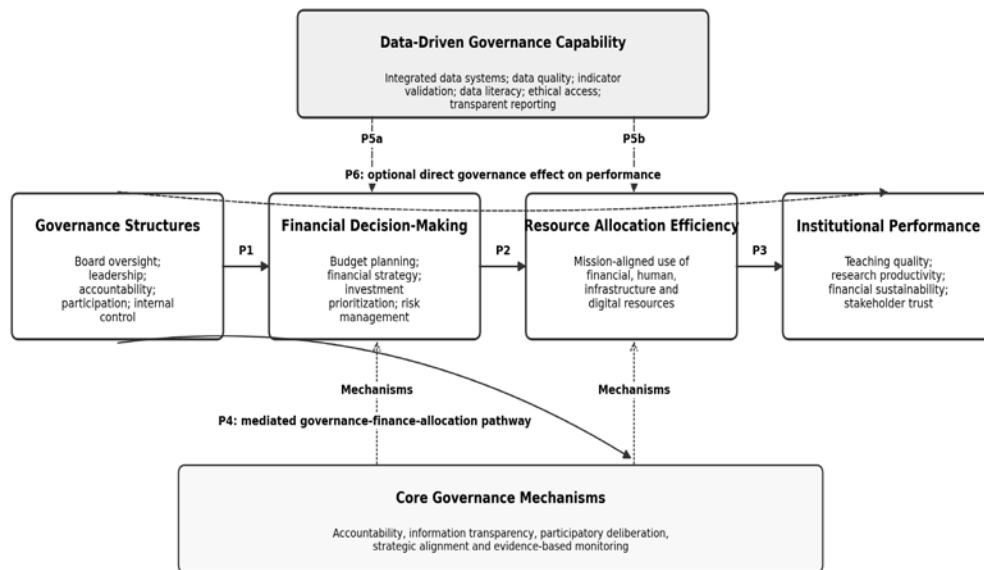


Figure 1. Governance-Finance-Performance Conceptual Framework

Note. Solid arrows indicate the core sequential effects among governance structures, financial decision-making, resource allocation efficiency, and institutional performance. Dashed arrows indicate the enabling or moderating role of data-driven governance capability. Dotted arrows indicate governance mechanisms through which accountability, transparency, participation, strategic alignment, and evidence-based monitoring support decision quality. Source: Author's reconstruction based on the submitted conference paper and related literature.

The first element of governance structures is board oversight, executive leadership, committees, internal control, academic participation, external accountability. They provide formal channels to propose, review, approve and evaluate financial decisions. They clarify roles, provide reliable information flows, question assumptions, link financial decisions to mission and strategic planning.

The second component, financial decision making, consists in budgeting, strategic financial planning, revenue diversification, investment appraisal, program funding, risk management and internal resource distribution. Governance is the link between governance and performance, since governance determines outcomes through financial decisions. A good governance system is useless if it fails to improve financial decisions; data platforms are useless if their outputs are not used in budget discussions, risk assessment, strategic priorities.

The third component, resource allocation efficiency, concerns how well universities use financial and non-financial resources to achieve institutional goals while avoiding waste, duplicates and misalignments. Efficiency is more than just cost reduction. It includes allocative efficiency, which measures whether resources are allocated for appropriate

priorities, operational efficiency, which measures productive use of resources and strategic efficiency, which measures whether resources are used for long term sustainability.

The fourth component is teaching outcomes, student success, research productivity, financial sustainability, stakeholder trust, and organizational learning. As mission-driven institutions, higher education institutions view performance as a composite outcome, including both quantitative and qualitative measures. Such measures include student retention, research output, budget balance, graduate employability, accreditation results, and stakeholder trust. While performance depends on many external factors, governance-finance is a key component of the model.

The model proposes five key propositions. Proposition 1 states transparency and accountability governance improves quality financial decision-making. Proposition 2 states quality financial decision-making improves resource allocation efficiency. Proposition 3 states efficient resource allocation improves institutional performance. Proposition 4 states financial decision-making mediates link between governance structures and resource allocation efficiency. Proposition 5 states data governance improves link between governance structures and financial decision-making by improving information quality, reducing asymmetry and supporting evidence-based decision making.

Analysis

We have used a conceptual analytical approach to study the way governance structures influence financial decision making and performance in higher education institutions. Unlike statistical estimation of causal effects, this approach can be used to tackle the problem of multiple related constructs such as governance, finance, data use, allocation of resources, performance, although these constructs have been explored in separate papers, but they need integration to explain mechanism and propositions.

The approach consists of three parts. The first part is a systematic review of recent and relevant literature on higher education governance, performance governance, resource allocation, performance-based funding, data-driven decision making and financial accountability. We searched for peer reviewed journal articles and sources related to governance, performance data, decision making and resource allocation in higher education directly. We did not aim at systematic review but to find the most relevant conceptual relationships and patterns for developing the framework. The second part of the analysis is synthesis. Concepts from the literature were classified into four categories: governance, financial decision-making, resource allocation efficiency and institutional performance. The definition of each concept, its connection to other concepts and most important mechanisms were clarified; accountability, information transparency, strategic alignment, data systems were discussed. It enabled us to move from general discussion of governance to a particular model of financial decision-making.

Third part is conceptual model. Based on the literature synthesis, we developed a direction model and conceptual propositions, which were assessed theoretically, practically and experimentally. Theoretically coherently, practically relevant and experimentally testable. Theoretically coherently, we ensure that the relations between constructs are logically based on governance and organizational decision-making theory. Practically relevance consists in the assumption that the model accurately represents real

decision-making problems universities face. Empirical testability requires the constructs to be implemented for future research.

The model is institutional rather than system-level. National funding formulas, accreditation rules and public accountability rules shape the external environment, but how universities internalize these pressures into financial decisions are examined. The latter can differ from a similar external rule when they rely on board oversight, leadership, budget transparency, data governance maturity, etc. This model will help researchers and practitioners explore internal governance capacities for data-informed financial management.

Findings and Discussion

Accountability as a Governance Mechanism

The primary link between governance and financial decisions is accountability. Accountability is responsible for explaining, justifying and taking responsibility for financial decisions. In universities, accountability is either vertically or horizontally connected. Vertical accountability connects the institution to governments, funders, boards, regulators, accreditation bodies, public and executive leaders, units, offices, faculty committees and students. Successful financial governance needs both forms as universities must meet external expectations while maintaining internal legitimacy. Governance structures increase financial accountability by clearly defining decision power, review process, required evidence and evaluation method. For instance, a budget committee consisting of finance professionals, academic leaders, and strategic planning representatives can evaluate proposed allocations from different perspectives, and a board can monitor by mandating multi-year financial forecasts and risk assessments. Academic committees can provide insight into educational impact of financial plans, without which decisions may only be justified retrospectively, and stakeholders may view it as opaque or arbitrarily.

Accountability plays an important role in performance-based funding and management systems that link resources to outcomes, but can also encourage gaming, narrow compliance or short-term thinking. Matveeva (2025) suggests that performance-based funding should be evaluated whether it succeeds or fails rather than as universally effective, as is true for financial governance at universities. Performance indicators should be evaluated in accountable processes checking validity, compliance with mission, consequences.

Data driven governance can improve accountability by making evidence visible and auditable. Financial dashboards, program reviews and performance reports can help stakeholders understand decisions, but accountability can be undermined if data is used selectively or not transparent methodically. For example, a dashboard might show low enrollment of programs and not include contributions to equity, regional workforce development or interdisciplinary research. Therefore, accountability requires not only data disclosure but interpretive responsibility. Decision makers must clarify how data was chosen, assumptions made, and how competing values were balanced.

Information Transparency and Decision Quality

The second mechanism is information transparency. Financial decisions depend on information quality, availability and credibility. Financial data are distributed at many universities across accounting, enrollment, human resources, research management,

procurement and learning management systems. It can lead to inconsistent figures, delayed reports and conflicting interpretations. Data-driven governance solves this problem by integrating data sources and giving decision information to leaders and committees.

Information transparency improves decision quality in four ways: First, information transparency reduces information differences between central administration and academic units: if they understand financial reasons for allocation decisions, they accept difficult trade-offs. Second, diagnostic ability improves by identifying costs, revenue risks and performance patterns. Third, it aids scenario planning by allowing leaders to model alternative enrollment, staffing, or investment assumptions. Fourth, it improves institutional learning by enabling post-decision evaluation. Decisions can be reassessed based on evidence rather than defended by institutional habit.

Performance data shows that higher education governance increasingly relies on data availability, purpose and audience (Beerens, 2022). The same data can serve different functions (for instance, a research output indicator could be used to report externally, internally, strategically or individually, depending on the particularity of the task). Financial decision making needs to distinguish between learning data and control data. Treating all data as control data may lead academic stakeholders to resist reporting or manipulate reporting. Conversely, when data is used for learning together it can help share understanding and strategy.

Strategic Resource Allocation

The third mechanism is strategic resource allocation. Governance structures play a role in how universities prioritize investments and allocate resources. Incremental budgeting often relies on historical patterns and may not change the strategy. Data-driven budgeting allows universities to identify areas where resources yield significant academic, financial or social benefits. However, strategic allocation involves more than just performance measurement, it requires governance processes that align data with the mission and long-term goals of the institution. Strategic allocation consists in choosing among competing priorities. Universities have to choose whether to invest in digital learning platforms, expand student support, recruit research-active faculty, renovate facilities, support low-enrolled but mission-critical programs or establish new international partnerships. Each choice has financial and academic consequences. Good governance systems evaluate choices according to clear criteria such as mission alignment, financial viability, quality, student demand, research potential, equity impact, risk exposure.

Performance-based resource allocation models distribute resources by establishing a direct linkage between resource provision and substantive performance outcomes. Wang (2019) elucidates the practical application of such mechanisms within the Chinese institutional context, arguing that resource allocation ought to be tied to measurable output performance rather than granting preferential treatment to privileged entities, newly launched initiatives, or public welfare-oriented missions. Ortagus et al. (2020) further demonstrate that performance-based funding yields equivocal and heterogeneous effects, with its efficacy contingent upon incentive structure design, institutional arrangement, and the governance framework.

Data-Driven Governance as an Enabling Condition

Data-driven governance should be seen as supporting, not replacing traditional governance. Data-driven governance can help improve connection between governance frameworks and financial decision making by clarifying assumptions, simplifying scenario analysis and monitoring performance. Data-driven governance requires data quality, data literacy, trust and ethics. A weak university may use data to justify already made decisions, whereas a strong university might use data for decision making. Kaspi and Venkatraman (2023) show how data driven decision making can change assessment. Gaftandzhieva and al (2023) show that analytics and decision support systems can improve decision quality if they align with goals. Financial governance means dashboards and analytics should focus on decision problems rather than on data availability. Effective systems address questions such as: Which programs are at risk, which investments align with goals, which student outcomes need additional support, which units have under-resourced relative to mission?

Data literacy. Board members, senior leaders, deans, department heads and committee members need to understand indicators, recognize limitations and ask questions. Without data literacy dashboards may be technical specialists or superficial interpretation. Data literacy also improves shared governance. Academics can engage more meaningfully if they understand financial decisions. Training, documentation and transparent data dictionary should also be part of governance capability.

Institutional Performance Outcomes

Finally, the final component of the model establishes a linkage between resource allocation efficiency and institutional performance. Effective and strategic resource allocation by universities can improve teaching quality, research productivity, student support, financial sustainability, and trust in the institution. Unfortunately, this is not always automatic since performance also depends on external funding, policy environment, student demographics, labor markets, and disciplines. But governance-informed financial decisions can lead to improved performance by aligning resources with mission and evidence. Resources are needed in teaching, staff development, learning technologies, student advising, assessment quality improvement, research grant development, research infrastructure, doctoral supervision, collaboration, administration, procurement, workload planning, digital systems, risk management, student services, retention, employability, mental health and inclusion. All these areas require linking evidence, financial decisions and outcomes.

The model suggests that universities should assess both decisions themselves and decisions. A financially challenging decision might be accepted if it is transparent, evidenced, involves participation, and aligned with the mission of the institution. A similar decision might not be accepted if the decision was perceived as a lack of transparency or political. Governance quality influences not only technical efficiency but also organizational trust. In higher education trust is important because universities depend on collaboration from staff, students, administrators, partners, and funders. Practically, data platforms should be evaluated for their impact on governance decisions and not only technical capabilities. A visually appealing dashboard is useless if it does not improve budget discussions, trade-offs or reasons why some investments are prioritized. On the other hand, simple indicators can be useful if they are reliable, defined and debated in responsible decisions.

Policy Implications

This analysis has several implications for policymakers, university leaders, boards and academic managers. First, governance reform should not be limited to simple structural changes; new committees, dashboards or reporting requirements will not improve financial decisions unless they are integrated into real decisions. Policymakers and institutions should focus on financial evidence production, interpretation, discussion and application. Decision quality should also be considered.

Second, universities should make budget assumptions, allocation formulas, performance indicators, investment criteria clear to students and staff. Transparency can't mean every decision has to be distributed, but it can mean everyone knows why important decisions are made. Transparency reduces rumors, builds trust and allows difficult changes to take place. Third, boards should be more able to control institutions using data. Boards should not control university activities but should know financial information, risks and trends. Board members should ask whether financial decisions align mission, reliability of data, alternative scenarios and sustainability of allocation patterns. Board oversight should also be used as learning tools not approval.

Fourth, university leaders should invest in integrated data systems and data governance. Fragmented data systems weaken link between finance, enrollment, staffing, research and student outcomes. Integrated systems allow decision making to be more coherent, but require data quality standards, data dictionary, access, privacy, and data literacy development. Data platforms should prioritize governance over technology procurement.

Fifth, performance-based allocation needs careful implementation. Performance indicators can be helpful in resource allocation planning but should be balanced with qualitative judgment and mission-sensitive criteria. Institutions should not be too cautious with narrow metrics that may affect disciplines with different cost structures, different publishing practices, different student profiles. Allocation models should provide safeguards for equity, diversity and long term capacity building.

Sixth, academic involvement needs to be formalized in financial governance. Faculty and academic leaders have valuable insights on program quality, discipline growth, student needs and research directions. They can improve quality and legitimacy of financial decisions but should be organized and supported. Committees need reliable data, clear mandates and timeframes, which avoids merely symbolic consultation while still keeping the academic voice.

Conclusion

We explored how governance structures impact financial decisions in higher education institutions using data-driven approaches. We argue that governance structures influence financial decisions through accountability, transparency, participation and strategic control and affect the efficiency of resource allocation. Data-driven governance further improves this relationship when data systems are integrated into transparent, ethical and participatory decisions. The proposed Governance-Finance-Performance Model combines three traditionally different areas: higher education governance, financial decision-making and data-driven management. Data are not neutral tools that guarantee better decisions, but their effectiveness depends on quality governance. Universities need frameworks that establish decision rights, validate indicators, allow deliberation and align financial decisions with the

mission of the institution. Without these structures, data-driven tools might increase administrative control without improving performance.

his paper has practical implications: Universities should improve budget transparency, board oversight, data governance, institutionalize academic participation, use performance indicators, policy makers should build capacity rather than report compliance. Future work should test statements on surveys, case studies, panel data, mixed methods design. Comparisons between countries and types of institutions would be useful given different governance structures and funding structures. Financial sustainability is closely related to governance quality in today's complex and data rich higher education environment. Universities that combine accountable governance, evidenced financial decisions and mission-oriented resource allocation tend to maintain academic quality, improve performance and maintain trust. Data driven governance should not be seen as a technical upgrade but rather as a governance capability.

References

- Beerens, M. (2022). An evolution of performance data in higher education governance: A path towards a 'big data' era? *Quality in Higher Education*, 28(1), 29–49. <https://doi.org/10.1080/13538322.2021.1951451>
- Dougherty, K. J., & Natow, R. S. (2020). Performance-based funding for higher education: How well does neoliberal theory capture neoliberal practice? *Higher Education*, 80(3), 457–478. <https://doi.org/10.1007/s10734-019-00491-4>
- Gaftandzhieva, S., Hussain, S., Hilcenko, S., Doneva, R., & Boykova, K. (2023). Data-driven decision making in higher education institutions: State-of-play. *International Journal of Advanced Computer Science and Applications*, 14(6). <https://doi.org/10.14569/IJACSA.2023.0140642>
- Huisman, J., & Stensaker, B. (2022). Performance governance and management in higher education revisited: International developments and perspectives. *Quality in Higher Education*, 28(1), 106–119. <https://doi.org/10.1080/13538322.2021.1951457>
- Jongbloed, B., & Vossensteyn, H. (2016). University funding and student funding: International comparisons. *Oxford Review of Economic Policy*, 32(4), 576–595. <https://doi.org/10.1093/oxrep/grw029>
- Kaspi, S., & Venkatraman, S. (2023). Data-driven decision-making (DDDM) for higher education assessments: A case study. *Systems*, 11(6), Article 306. <https://doi.org/10.3390/systems11060306>
- Matveeva, A. (2025). Performance-based funding in higher education: A meta-narrative review and renewed research agenda proposal. *Tertiary Education and Management*, 31, 21–44. <https://doi.org/10.1007/s11233-025-09151-y>

- Mizrahi, S. (2021). Performance funding and management in higher education: The autonomy paradox and failures in accountability. *Public Performance & Management Review*, 44(2), 294–320. <https://doi.org/10.1080/15309576.2020.1806087>
- Mouritzen, P. E., & Opstrup, N. (2020). *Performance management at universities*. Springer. <https://doi.org/10.1007/978-3-030-21325-1>
- Ortagus, J. C., Kelchen, R., Rosinger, K. O., & Voorhees, N. (2020). Performance-based funding in American higher education: A systematic synthesis of the intended and unintended consequences. *Educational Evaluation and Policy Analysis*, 42(4), 520–550. <https://doi.org/10.3102/0162373720953128>
- Wang, D. D. (2019). Performance-based resource allocation for higher education institutions in China. *Socio-Economic Planning Sciences*, 65, 66–75. <https://doi.org/10.1016/j.seps.2018.01.004>
- Ward, J., & Ost, B. (2021). The effect of large-scale performance-based funding in higher education. *Education Finance and Policy*, 16(1), 92–124. https://doi.org/10.1162/edfp_a_00300