

Article

Toward Sustainable Institutional Effectiveness: A Management Accounting-Based Performance Framework for Public Higher Education Institutions in the Western Balkans

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Abstract

This study contributes to the development of performance measurement frameworks for HEIs in resource-constrained settings. It offers valuable insights for policymakers and institutional leaders in the Balkans, emphasizing the need for a holistic approach that integrates both academic and administrative factors to improve institutional effectiveness and support strategic decision-making in public higher education. This study develops and validates a multidimensional performance framework for public higher education institutions (HEIs) in developing Balkan countries, integrating both academic and administrative dimensions of institutional performance. Using a cross-sectional design, data were collected from 162 respondents across public HEIs in Serbia, Bosnia and Herzegovina, Montenegro, North Macedonia, and Albania. A two-stage analytical approach was employed: an exploratory factor analysis (EFA) to identify the underlying structure of performance dimensions, followed by a confirmatory factor analysis (CFA) to validate the measurement model. The results confirm a robust five-factor structure, comprising three academic dimensions—teaching and learning, research, and knowledge transfer—and two administrative dimensions—resources and internationalization. Structural equation modeling (SEM) was used to assess the effects of academic and administrative performance on overall higher education performance (OHEP). Findings indicate that administrative performance exerts a stronger influence on institutional outcomes ($\beta = 0.649$, $p < 0.001$) compared to academic performance ($\beta = 0.314$, $p < 0.001$). Together, these dimensions explain 51.9% of the variance in overall institutional performance. The study contributes to the limited literature on integrated performance assessment in resource-constrained higher education systems. It offers empirically validated insights for policymakers and university leaders, emphasizing the importance of aligning academic and administrative capacities to enhance institutional effectiveness and inform strategic decision-making in public HEIs.



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Keywords: public higher education institutions; performance measurement; management accounting; academic performance; administrative performance; institutional effectiveness; sustainability; developing countries

1. Introduction

The performance of public higher education institutions (HEIs) has become a central theme in global debates on accountability, quality assurance, and institutional effectiveness. As higher education systems increasingly face demands for transparency, efficiency, and competitive positioning, the development of robust performance evaluation frameworks has gained prominence, particularly in developing and transitional regions [1,2]. For HEIs operating in resource-constrained environments, performance assessment is both essential and challenging due to structural limitations, governance instability, and persistent gaps in academic and administrative capacity.

This context is especially relevant in the Western Balkans, comprising Serbia, Bosnia and Herzegovina, Montenegro, North Macedonia, and Albania. These countries are characterized by post-socialist transition, ongoing reform efforts, and aspirations to align with European higher education standards [3,4]. Despite considerable progress, public HEIs in the region continue to struggle with underinvestment, limited research output, inefficient resource allocation, and weak international engagement [5]. Such structural constraints hinder the development of comprehensive performance assessment practices and highlight the need for models that capture the complexity of institutional functioning.

Globally, performance measurement in higher education has evolved from simple output indicators, such as graduation rates or student satisfaction, to multidimensional approaches that integrate academic and administrative components [6]. Academic performance remains centered on teaching, learning, research, and knowledge transfer, reflecting the core mission of universities. At the same time, administrative and governance performance, including financial management, resource optimization, and internationalization, has gained recognition as a vital determinant of institutional success [7,8]. Yet, despite their interdependence, academic and administrative dimensions are rarely examined within a unified empirical framework, particularly in developing countries [9,10]. This gap is pronounced in the Western Balkans, where academic outcomes are often constrained by limited institutional capacity and fragmented administrative structures [3]. The absence of integrated performance frameworks prevents universities from effectively diagnosing systemic weaknesses and implementing evidence-based reforms.

To address this gap, the present study develops and validates a comprehensive performance framework for public HEIs in the Western Balkans that incorporates both academic and administrative dimensions (Figure 1). The study has three objectives:

- (1) To empirically validate the structure of academic performance, encompassing teaching and learning, research, and knowledge transfer;
- (2) To validate key administrative performance dimensions, focusing on resources and internationalization;
- (3) To examine the impact of both academic and administrative performance on overall higher education performance.

This study contributes to the literature by offering one of the first empirically tested, multidimensional performance models tailored to the needs of public HEIs in developing Balkan countries. By highlighting the interdependence of academic and administrative domains, the research provides actionable insights for policymakers and university leaders seeking to enhance institutional effectiveness, strengthen governance, and support strategic decision-making in resource-limited higher education systems.

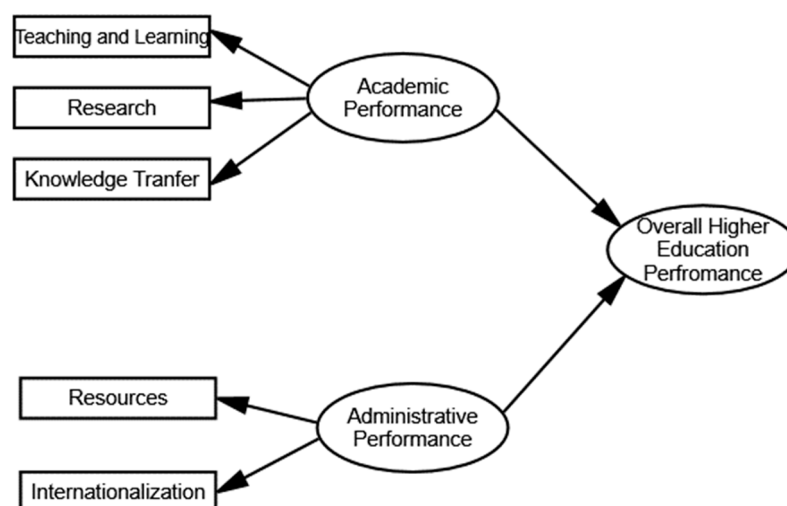


Figure 1. Conceptual model of academic and administrative performance effects on overall higher education performance.

2. Literature Review

2.1. Conceptual Evolution of Performance Assessment in Higher Education: Global Trends and Regional Shifts

The evaluation of performance in higher education has evolved significantly over the past few decades. In the early stages, frameworks for assessing university performance were predominantly shaped by classical managerial approaches, which viewed universities as autonomous entities with loosely defined goals and limited external accountability [11,12]. During the 1990s, however, the rise in New Public Management (NPM) significantly reshaped the landscape of public sector management, including higher education. NPM emphasized quantifiable indicators, accountability, and efficiency, leading to a greater focus on output-based measurements such as graduation rates, research funding, and academic performance [13,14].

This shift toward performance-driven governance in higher education was particularly visible in public institutions, where pressure from governments and international organizations to demonstrate societal value increased substantially [15]. As such, universities were increasingly required to align their activities with measurable outcomes, driven by the desire for institutional accountability, economic efficiency, and societal relevance. As a result, performance evaluation moved from simple output indicators, such as student numbers and teaching quality assessments, to more complex frameworks that account for multiple institutional dimensions.

The comprehensive evaluation of higher education performance today recognizes the multidimensional nature of university activities, which include teaching and learning, research productivity, knowledge transfer, governance, and financial sustainability [16–20], pointing out that simplistic indicators fail to capture the complexity of universities, which operate within globalized, competitive environments. They argue that the assessment of academic performance must also account for organizational factors such as governance structures, resource allocation, and administrative support.

Furthermore, the shift toward integrated performance evaluation models emphasizes that academic performance cannot be fully understood without examining the underlying administrative and organizational structures that support it [15]. Teaching and research, traditionally seen as the core functions of universities, are now recognized as interconnected with broader administrative dimensions, such as institutional governance, financial management, and strategic planning. The increasing focus on the third mission of universities,

knowledge transfer and societal engagement, demonstrates how universities are expected to contribute to local, national, and global innovation ecosystems [21,22].

In response to these challenges, integrated frameworks for performance measurement have emerged, combining academic indicators (such as teaching quality, research output, and knowledge transfer) with administrative dimensions like governance, resource management, and internationalization. These frameworks are intended to capture the full spectrum of university performance, enabling a more holistic understanding of institutional success [23–25].

2.2. Academic Performance: Teaching, Research, and Knowledge Transfer

Academic performance represents the core mission of higher education institutions, encompassing teaching and learning, research output, and knowledge transfer activities. Each dimension contributes uniquely to the overall performance of universities, shaping both their internal development and external impact.

Teaching and learning are central to academic performance and reflect the quality of educational delivery, curriculum design, and student engagement. Effective teaching practices have been linked to improved learning outcomes, higher student satisfaction, and enhanced institutional reputation [26,27]. In addition, the incorporation of innovative pedagogical approaches, such as problem-based learning and blended learning, has been shown to foster critical thinking and practical skills among students, which in turn strengthens the institution's overall academic profile [28,29].

Research productivity is another vital component, serving as a measure of scholarly output and knowledge creation. High-performing institutions often demonstrate strong research cultures, supported by structured funding mechanisms, collaborative networks, and institutional policies promoting publication and innovation [30,31]. Research performance is not only a marker of academic excellence but also a driver of reputation, attracting high-quality faculty and students, and facilitating partnerships at national and international levels [32].

Knowledge transfer, often referred to as the third mission of universities, involves the dissemination and application of research outcomes to benefit society, industry, and government. This includes technology transfer, consulting services, patenting, and public engagement initiatives [21,33]. The effectiveness of knowledge transfer depends on institutional support, such as dedicated offices for technology transfer, legal frameworks for intellectual property, and mechanisms for fostering collaboration with external stakeholders [34,35].

Collectively, these academic dimensions are interdependent and contribute to institutional performance not only by producing graduates and research outputs but also by enhancing societal relevance and global competitiveness. The literature emphasizes that strengthening these areas requires strategic leadership, adequate resources, and an integrated approach linking teaching, research, and knowledge transfer [36,37].

2.3. Administrative and Governance Performance: Financial Management, Internationalization, and Institutional Capacity

Alongside academic performance, administrative and governance capabilities significantly influence overall institutional outcomes. Strong administrative systems support academic activities by optimizing resources, ensuring compliance with regulations, and facilitating strategic planning and international collaboration.

Financial management is a cornerstone of administrative performance, as universities must efficiently allocate limited resources across academic and infrastructural needs. Research highlights that transparent budgeting processes, performance-based funding, and rigorous financial oversight enhance institutional stability and enable better investment in teaching and research [38,39]. In resource-constrained environments, efficient financial

management can directly affect the capacity of institutions to maintain quality standards and pursue innovation [2,40].

Internationalization is increasingly recognized as a strategic administrative objective. It encompasses student and staff mobility, joint degree programs, research collaborations, and global partnerships. Effective internationalization contributes to institutional prestige, cross-border knowledge exchange, and enhanced academic performance [41,42]. Empirical studies indicate that universities with well-structured internationalization strategies demonstrate higher research impact, improved teaching quality, and greater resilience to external pressures [37].

Institutional capacity, including governance structures, leadership quality, and administrative processes, underpins the effectiveness of both academic and managerial functions. Universities with transparent governance mechanisms, coordinated decision-making, and competent leadership tend to perform better across all dimensions, as highlighted in Clark's "triangle of coordination" [43] and subsequent studies [8]. In the Western Balkans, challenges such as political interference, fragmented governance, and underfunding underscore the importance of robust administrative frameworks for enhancing overall institutional performance [44].

Integrating academic and administrative performance is thus essential for achieving sustainable institutional outcomes. While academic excellence remains the primary mission, it is inseparable from strong administrative support, which ensures that resources, policies, and international linkages are aligned with strategic goals [15,24].

3. Materials and Methods

3.1. Design, Population, and Sample

The study was designed with the primary aim of verifying and empirically confirming the factorial dimensions of academic and administrative performance in higher education, followed by examining their impact on overall higher education performance in the public sector. Based on this research objective, the following research tasks were formulated:

1. To verify the dimensions of academic performance: teaching and learning, research, and knowledge transfer;
2. To verify the dimensions of administrative performance: resources and internationalization;
3. To determine the extent to which academic performance affects institutional outcomes (overall higher education performance);
4. To determine the extent to which administrative performance affects institutional outcomes (overall higher education performance);
5. To determine the extent to which the combined effect of academic and administrative performance contributes to higher levels of overall performance in public higher education.

The study employs a quantitative, cross-sectional empirical design, which is ideal for validating latent constructs and modeling relationships among the performance of higher education institutions [7,45]. In line with the best practices in measurement model development and structural inference, the methodological process was implemented in two phases [46]: (1) measurement model validation (CFA), confirming the latent structure of academic and administrative performance, and (2) structural model evaluation (SEM), assessing their impact on overall higher education performance in the public sector.

The target population consisted of public higher education institutions (HEIs) in five Western Balkan countries: Serbia, Bosnia and Herzegovina, Montenegro, North Macedonia, and Albania. Public HEIs are defined in accordance with international higher education governance standards [5,47,48] and include universities/faculties, academies, and vocational colleges established by the state, meaning publicly owned and financed through public expenditure [48].

The sample of 162 respondents was formed using a stratified purposive sampling approach, with the number of participants proportionally distributed according to the size of the public higher education sector in each country. A stratified purposive sampling strategy was applied, ensuring proportional representation of each country relative to system size. Stratified sampling is effective when cross-country comparisons are required and population strata differ in scale [49]. Only individuals employed in teaching, research, and/or administrative roles were included in the study, ensuring relevance and informed evaluation of system performance. This approach enables appropriate cross-country comparison of institutional performance and contributes to the reliability and validity of the findings.

Electronic questionnaires were administered through institutional email lists and university communication channels. A total of 213 invitations were sent, and 162 questionnaires were returned. After screening for completeness and statistical outliers, the final usable sample included 158 valid responses, representing an effective response rate of about 74%. The electronic administration of the questionnaires reduced the interviewer bias and enabled geographically dispersed respondents to be treated equally. Non-response bias was evaluated by comparing early and late respondents, and no statistically significant differences were found between the key constructs.

3.2. Measures and the Questionnaire

The instrument for measurement was designed after a thorough review of the existing literature on performance measurement in higher education, management accounting, and governance structures. Items were drawn from existing scales in research studies on academic performance, research output, knowledge transfer, resource management, and internationalization.

To ensure content validity and appropriateness for Western Balkan higher education structures, the instrument was reviewed by experts before full implementation. Three experts in higher education management and public sector performance measurement reviewed the items for clarity, appropriateness, and construct validity. Some minor wording changes were incorporated based on their suggestions.

The structured questionnaire consisted of two parts: the first part included general questions about the characteristics of public HEIs (institution name, country, and institutional age), while the second part focused on examining respondents' perceptions regarding the academic and administrative subsystems of public HEIs, as well as institutional outcomes (overall higher educational performance). All indicators were measured using a 5-point Likert scale (1 = strongly disagree → 5 = strongly agree), following psychometric recommendations [50]. To measure academic performance (a reflective second-order construct), 20 items were used (adapted from [6], comprising three first-order measurement dimensions: teaching and learning (TL), research (RSCH), and knowledge transfer to the community (KT). To measure administrative performance (also a reflective second-order construct), 12 items were used (adapted from [6], 2021), consisting of two first-order dimensions: resources (RESRC) and internationalization (INT). To measure overall higher education performance (a reflective first-order construct), 5 items were used (authors' contribution).

Data collection was conducted electronically during November and December 2024, ensuring geographical reach and minimizing administrative bias. Participation was voluntary and anonymous, in accordance with ethical research principles [51].

3.3. Methods and Techniques of Model Evaluation

IBM statistical software packages, IBM SPSS Version 30 and Amos graphics Version 30, were used for data processing. The research sample was analyzed using descriptive statistics. To evaluate the dimensionality of the scales used to measure the constructs of academic perfor-

mance (teaching and learning, research, knowledge transfer) and administrative performance (resources, internationalization), exploratory factor analysis (EFA) was first conducted [52,53]. As a preliminary analytical step, EFA is widely applied to identify underlying factor structures, reduce item complexity, and determine the adequacy of indicators for representing latent constructs [54]. Factor extraction was performed using the principal component method, followed by Promax rotation, which is appropriate for factors expected to be correlated [55].

In the subsequent phase, to empirically confirm the factorial dimensions identified through EFA and ensure the validity of the proposed measurement structure for academic and administrative performance, confirmatory factor analysis (CFA) was applied [7,45]. This step was essential for verifying the adequacy of the measurement model prior to assessing the impact of academic and administrative performance on overall higher education performance in the public sector. Reliability and validity were assessed using internal consistency (Cronbach's Alpha, $\alpha \geq 0.70$; composite reliability, $CR \geq 0.70$), convergent validity ($AVE \geq 0.50$), discriminant validity (Fornell–Larcker criterion), and model fit indices ($\chi^2/df < 3$, $NFI \geq 0.90$, $TLI \geq 0.90$, $CFI \geq 0.90$, $RMSEA \leq 0.08$, $SRMR \leq 0.08$), following recommendations by [7,45,46,56,57]. Structural Equation Modeling (SEM) was applied to test path coefficients representing the influence of academic and administrative performance on institutional outcomes. Model significance was evaluated through standardized β -coefficients, t-values, and p-statistics [45].

3.4. Limitations of Cross-Sectional Design

The cross-sectional design is a limitation to strong causal inference. While structural equation modeling enables the exploration of directional associations, longitudinal data would offer stronger evidence on the dynamics of the academic and administrative aspects. Future studies should take into account the longitudinal validation of the proposed framework.

4. Results

4.1. Demographic Profile of the Sample

The sample consisted of 162 respondents from public HEIs. Of these, 81 (50%) were from Serbia, 39 (24.07%) from Bosnia and Herzegovina, 23 (14.20%) from North Macedonia, 11 (6.79%) from Montenegro, and 8 (4.94%) from Albania. Regarding institutional age, 58 institutions (35.8%) had been established within the past 40 years, 96 (59.3%) between 41 and 80 years ago, and 8 (4.9%) more than 80 years ago. A more detailed overview of the sample structure is presented in Table 1, which summarizes the distribution of respondents by country and institutional age. This breakdown provides additional context regarding the geographical coverage and institutional maturity of the participating public higher education institutions.

Table 1. Demographic profile of the sample (n = 162).

Variable		Number of Respondents (n)	Structure (%)
Country	Serbia	81	50.00
	Bosnia and Herzegovina	39	24.07
	North Macedonia	23	14.20
	Montenegro	11	6.79
	Albania	8	4.94
Years of Establishment	Up to 40 years	58	35.80
	41–80 years	96	59.30
	Over 80 years	8	4.90

Source: Author's calculation.

4.2. Confirmatory Phase and SEM

Possible univariate and multivariate deviations were examined to verify compliance with model assumptions. Based on the analysis of standardized z-scores, no univariate

outliers were detected. Multivariate outliers were identified using Mahalanobis distance at $p < 0.001$. Five cases exceeding the critical threshold were removed to ensure multivariate normality and model stability [58]. Descriptive statistics prior to outlier removal did not indicate substantial distortions in central tendency or dispersion. The removal procedure improved overall model fit without altering substantive relationships among constructs.

Given the complexity of the structural model, sample adequacy for SEM estimation was carefully assessed. Although larger samples (200+) are often recommended for complex structural models, methodological guidelines emphasize that adequacy depends not solely on sample size but also on model specification, factor loadings, communalities, and overall measurement quality [45]. In this study, the strong standardized loadings and satisfactory reliability indicators supported stable parameter estimation. Therefore, the final sample of 158 observations was considered adequate for structural equation modeling.

To address the first two research questions, the Kaiser–Meyer–Olkin (KMO) measure of sampling adequacy and Bartlett’s Test of Sphericity were conducted. The test results showed a KMO value of 0.855, exceeding the recommended threshold of 0.60 [59], while Bartlett’s test was statistically significant [$\chi^2(171) = 4102.830, p < 0.001$], indicating that the data met the necessary criteria for factor analysis.

Following these preliminary checks, Principal Component Analysis (PCA) with the Promax rotation was performed. It was decided that the factor loading for each item be at least 0.6, while the characteristic roots are set to “1”, as the default acceptable level for determining the factor [58]. After removing multiple items (TL: 1, 2; RSCH: 1, 2, 3; KT: 1, 2, 5, 6; RESRC: 5, 6, 7, 8), the exploratory factor analysis (EFA) identified five factors (dimensions). Academic performance consisted of three dimensions (teaching and learning, research, and knowledge transfer), with a total of 11 items, while administrative performance consisted of two dimensions (resources and internationalization), with 8 items. The quality criteria (factor loadings, Cronbach’s α , CR, AVE) for the five dimensions of academic and administrative performance are presented in Table 2.

Table 2. Factor loadings, CA, CR, and AVE of dimensions of academic and administrative performance.

Dimensions	Items	Factor Loading	CA	CR	AVE
Teaching and learning (TL)	TL5	0.870	0.890	0.919	0.695
	TL4	0.840			
	TL7	0.836			
	TL6	0.835			
	TL3	0.786			
Resources (RESRC)	RESRC1	0.895	0.891	0.928	0.763
	RESRC2	0.878			
	RESRC4	0.874			
	RESRC3	0.846			
Research (RSCH)	RSCH6	0.948	0.921	0.943	0.806
	RSCH5	0.940			
	RSCH4	0.887			
	RSCH7	0.810			
Internationalization (INT)	INT2	0.866	0.861	0.903	0.700
	INT3	0.860			
	INT1	0.836			
	INT4	0.782			
Knowledge transfer (KT)	KT3	0.903	0.712	0.858	0.751
	KT4	0.829			

Note: CA = Cronbach’s Alpha; CR = Composite Reliability; AVE = Average Variance Extracted. Source: Author’s calculation.

According to the results presented in Table 2, the factor loadings demonstrated a well-defined structure, ranging from: 0.786 to 0.870 for the first factor (TL), 0.846 to 0.895 for the second factor (RESRC), 0.810 to 0.948 for the third factor (RSCH), 0.782 to 0.866 for the fourth factor (INT), and 0.829 to 0.903 for the fifth factor (KT). Reliability was assessed using Cronbach's α (CA) and composite reliability (CR). The obtained CA and CR values ranged from 0.712 to 0.943, which is well above the recommended threshold of 0.7 [60].

The convergent validity was assessed using AVE (average variance extracted). The values of AVE were between 0.695 and 0.806, higher than 0.5 [60]. Satisfactory levels were obtained in the case of internal consistency reliability, convergent validity, and discriminatory validity as well. For assessing discriminant validity, the Fornell–Larcker criterion was applied [57]. Based on the results in Table 3, each construct's square root of AVE is higher than its correlations with other constructs [60–62], which confirms discriminant validity.

Table 3. Fornell–Larcker discriminant validity assessment for the dimensions of academic and administrative performance.

Dimensions of Academic and Administrative Performance (Factors)	TL	RESRC	RSCH	INT	KT
TL	0.834				
RESRC	0.078	0.873			
RSCH	0.467	0.462	0.898		
INT	0.366	0.433	0.537	0.837	
KT	0.088	0.494	0.312	0.359	0.867

Bold values indicate the square roots of AVE (Fornell–Larcker criterion). Source: Author's calculation.

Confirmatory factor analysis (CFA) was conducted to assess the structure of the five-factor solution. Each observed variable (TL: 6, 5, 7, 4, 3; RSCH: 5, 6, 7, 4; KT: 3, 4; RESRC: 4, 3, 1, 2; INT: 2, 3, 1, 4) was specified with its respective error term (e1–e19). Incorporation of the covariance between the error terms of INT2 and INT3 (e18 and e19) resulted in a slight improvement in model fit. The CFA results were as follows: χ^2/df (Normed χ^2) = 1.650 (recommended values ≤ 3), NFI (Normed Fit Index) = 0.894 (marginally below the cut-off value of 0.90), TLI (Tucker–Lewis Index) = 0.945 (recommended values ≥ 0.90), CFI (Comparative Fit Index) = 0.955 (recommended values ≥ 0.95), SRMR (Standardized Root Mean Square Residual) = 0.064 (recommended values ≤ 0.08), RMSEA (Root Mean Square Error of Approximation) = 0.065 (recommended values ≤ 0.08). Even though NFI = 0.894 is slightly below 0.90, earlier methodological guidelines suggest that values above 0.89 can still indicate adequate model fit when other indices meet recommended standards (e.g., [45]). Overall, the CFA results indicate that the five-factor structure of academic-administrative performance demonstrated acceptable model fit [45,63,64]. CFA thus confirmed the five-factor dimensions of academic and administrative performance, addressing the first two research tasks. Figure 2 visually presents the measurement of the five latent constructs and their associated observed indicators.

Following confirmation of the factorial validity of academic and administrative performance through CFA, the next step was to estimate the structural model to address research tasks 3, 4, and 5. The structural model examined the direct effects of academic performance (AP) and administrative performance (ADP) on overall higher academic performance (OHEP), as well as their combined contribution to explaining institutional outcomes. The results of the structural model are presented in Table 4. The structural model demonstrated satisfactory fit indices consistent with recommended thresholds, supporting the adequacy of the proposed structural relationships.

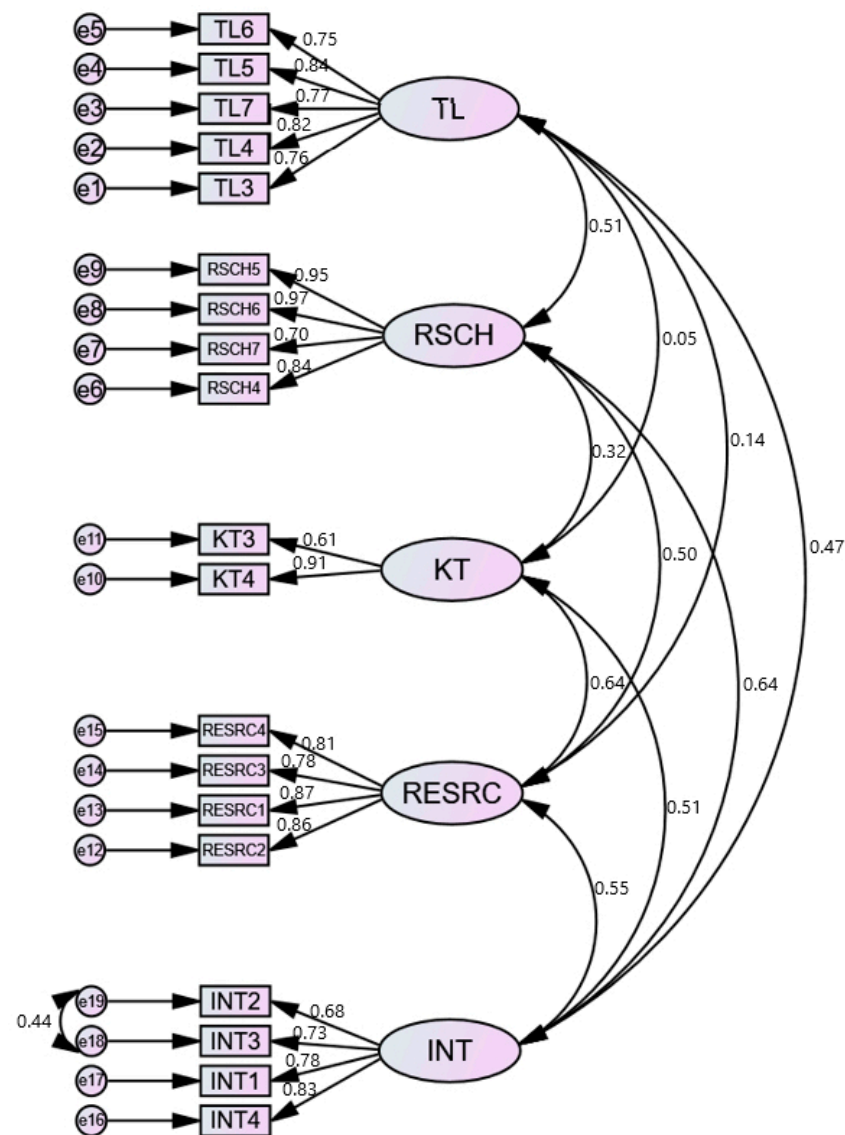


Figure 2. Confirmatory factor analysis (CFA) model showing standardized factor loadings and error terms (e1–e19) for the five-factor structure of academic and administrative performance. The covariance between INT2 and INT3 error terms is included.

Table 4. Structural model results.

Structural Relationship	β (Standardized)	SE	t	p	Interpretation
AP $\rightarrow$ OHEP	0.314	0.215	3.464	***	Moderate positive and significant effect
ADP $\rightarrow$ OHEP	0.649	0.214	4.784	***	Strong positive and significant effect
AP and ADP $\rightarrow$ OHEP	-	-	-	-	$R^2 = 0.519$ (Together, AP and ADP explain 51.9% of OHEP)

Note: *** $p < 0.001$; β = standardized path coefficient; SE = standard error; R^2 = coefficient of determination. Source: Author's calculation.

Academic performance demonstrated a moderate and statistically significant effect on overall higher education performance ($\beta = 0.314$; $t = 3.464$; $p < 0.001$), indicating that improvements in teaching and learning, research activities, and knowledge transfer contribute meaningfully to institutional outcomes. Administrative performance showed a strong and statistically significant effect on overall higher education performance ($\beta = 0.649$; $t = 4.784$; $p < 0.001$), suggesting that resources and internationalization exert substantial

influence on overall higher education performance. Together, academic and administrative performance explained 51.9% of the variance in overall higher education performance ($R^2 = 0.519$), confirming a considerable combined contribution of these two performance subsystems to institutional outcomes.

Based on the presented structural model results, all three research tasks: examining the effect of academic performance, the effect of administrative performance, and their combined influence on overall higher education performance, were fully achieved. Figure 3 presents the structural model with standardized items, illustrating the magnitude and direction of the effects among the latent constructs included in the analysis.

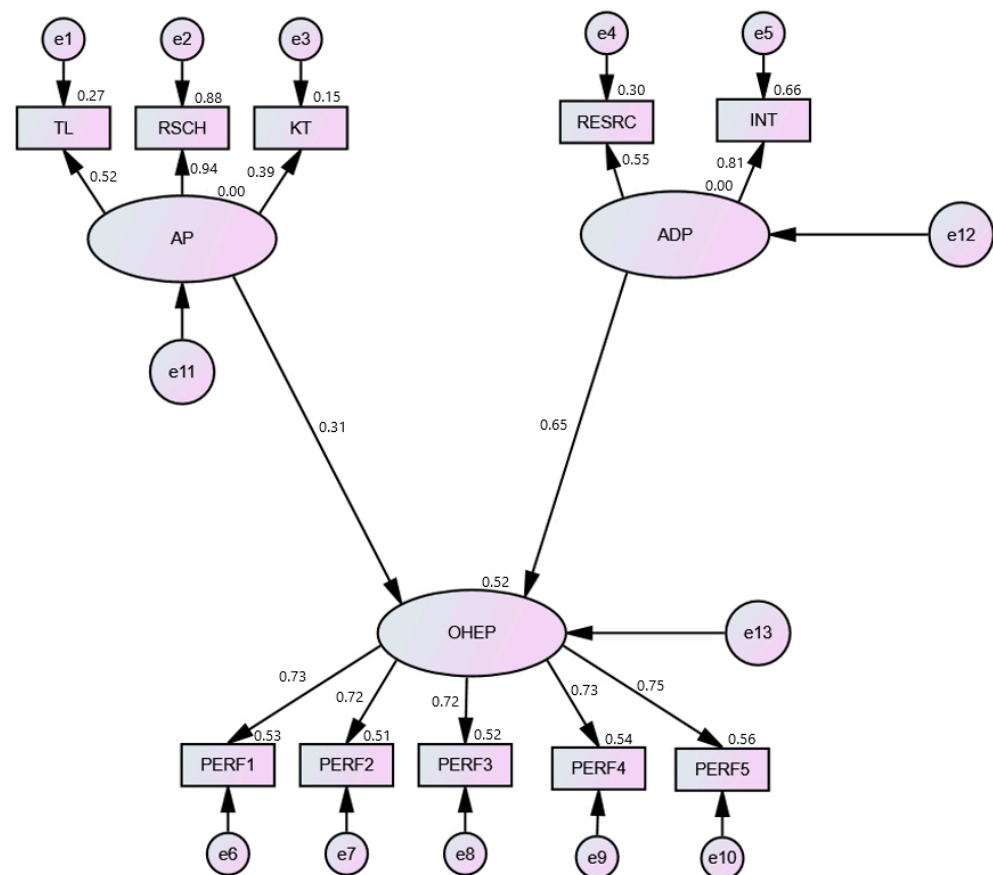


Figure 3. Structural equation model (SEM) illustrating the standardized path coefficients between academic performance (AP) and administrative performance (ADP), and overall higher education performance (OHEP). The model explains 51.9% of the variance in OHEP ($R^2 = 0.519$).

5. Discussion

This study aimed to develop and validate a performance framework for public higher education institutions (HEIs) in the Balkans, focusing on both academic and administrative dimensions. The findings demonstrate that both dimensions are crucial in shaping institutional performance, but their influence varies significantly.

Academic performance, which includes teaching, research, and knowledge transfer, had a moderate impact on institutional outcomes. This finding suggests that, while academic quality remains important, its full potential is often constrained by systemic inefficiencies and a lack of adequate administrative support. The challenges faced by universities in the region, such as underfunding, outdated infrastructure, and limited access to international networks, serve as significant barriers that hinder academic excellence. In the context of the Balkans, the administrative framework plays a pivotal role in overcoming these

barriers. Without robust administrative support, including strategic resource management and international engagement, the academic mission of universities is often underachieved.

In contrast, administrative performance, particularly in areas such as resource management and internationalization, had a stronger and more statistically significant effect on overall institutional performance. This finding highlights the critical role of efficient governance, strategic planning, and resource optimization in ensuring that higher education institutions can thrive in a competitive global environment. The role of internationalization is especially important, as universities with stronger international ties are better positioned to enhance their academic performance and overall institutional reputation.

The study also revealed an integrative synergy between the academic and administrative dimensions. Together, these dimensions accounted for more than half (51.9%) of the variance in overall institutional performance. This underscores that the optimal functioning of universities depends on a balanced integration of strong academic capabilities and effective administrative practices. Successful universities in the Balkans, as elsewhere, demonstrate this balance, leveraging strong governance and resource management to support and enhance academic outcomes.

Finally, the research offers significant implications for policymakers in the region. Given the ongoing challenges such as chronic underfunding and outdated institutional frameworks, it is crucial that reforms address both academic and administrative inefficiencies in tandem. Policymakers must adopt a holistic approach, ensuring that investments in academic infrastructure, research capacity, and international collaboration are accompanied by efforts to modernize administrative structures and improve resource allocation.

Although the results provide strong evidence for the structural relationships within the proposed framework, there are a number of considerations that deserve attention. Although the responses were aggregated across five countries to provide adequate statistical power, the institutional contexts might vary across national systems. Future studies could employ multi-group SEM to investigate the possibility of cross-country differences in structural relationships and test the measurement invariance across institutional contexts. These analyses would provide more nuanced insights into the performance dynamics in different higher education contexts.

6. Conclusions

This study proposes a comprehensive framework for assessing the performance of public higher education institutions (HEIs) in the Balkans, integrating both academic and administrative dimensions. Through empirical validation, this research emphasizes the significant roles these dimensions play in determining institutional outcomes, especially within resource-constrained and developing contexts. The findings confirm that while both academic and administrative performance are crucial for institutional success, their relative influence can vary, particularly in regions with unique challenges such as the Balkans.

Academic performance, which includes teaching quality, research productivity, and knowledge transfer, plays a fundamental role in any university's mission. However, the results suggest that its influence on overall institutional performance in the Balkans is moderate. Universities in this region face numerous systemic barriers that undermine academic outcomes, from underfunding to outdated administrative practices. Thus, while academic excellence is vital, it cannot be fully realized without efficient and effective administrative support, including governance and international collaboration.

In contrast, administrative performance, especially in resource management, governance, and internationalization, plays a more dominant role in shaping institutional performance. The study highlights how internationalization, in particular, has become a global benchmark for assessing the success of higher education institutions. Universities

that prioritize international connections, resource management, and governance are better able to foster an environment that supports both academic and administrative success.

The research emphasizes the importance of an integrated approach to performance evaluation. Academic and administrative dimensions are inherently interconnected, and their synergy is crucial for sustained institutional success. This study highlights that universities which excel in both areas are better positioned to achieve long-term sustainability and compete on the global stage. Focusing on just one dimension, whether academic or administrative, will not suffice to improve overall institutional performance.

For policymakers in the Balkans, this study provides actionable insights. To address the region's challenges, policies must foster both academic excellence and administrative efficiency. Investments should not focus solely on improving academic infrastructure or research output but also on strengthening governance, resource management, and international collaboration. Such a holistic approach will enable institutions to maximize their potential and ensure their long-term success in an increasingly competitive higher education environment.

Finally, future research should explore specific interventions that can further strengthen the connection between academic and administrative performance. Further studies could investigate how improvements in administrative practices might directly lead to better academic outcomes or examine the impact of academic reforms on administrative efficiency. Comparative research with other regions facing similar challenges could also offer valuable insights into how the dynamics of performance in public HEIs play out on a global scale.

In conclusion, this study underscores the importance of adopting a comprehensive approach to performance evaluation in public higher education institutions. By recognizing the interdependence between academic and administrative factors, universities in the Balkans, and other similar regions, can better navigate their unique challenges, enhance institutional outcomes, and position themselves for success in the global higher education landscape.

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