USING HAMMING DISTANCE METRICS FOR ASSESSING INSTITUTIONAL SIMILARITY OF SUPREME AUDIT INSTITUTION MODELS: EVIDENCE FROM UZBEKISTAN

Shahzodbek Kh. Orziyev
Master's student, Department of Accounting and Audit, Bank-Finance Academy.
E-mail: *orziyev.sh@bfa.uz*
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Abstract. *This article proposes a novel methodological approach to the quantitative classification of Supreme Audit Institution (SAI) models, drawing on DiMaggio and Powell's (1983) institutional isomorphism theory — the application of Hamming distance metrics from coding theory. Five SAIs (U.S. GAO, U.K. NAO, German Bundesrechnungshof, South Korean BAI, and the Accounts Chamber of Uzbekistan) are compared across eight institutional characteristics. The principal finding: Uzbekistan's Accounts Chamber is institutionally much closer to the German Bundesrechnungshof model (distance = 4) than to the Anglo-Saxon NAO (distance = 6) or GAO (distance = 8) models. This result challenges the Anglo-centric assumptions prevailing in the post-Soviet audit reform literature.*

Keywords: *Supreme Audit Institutions, institutional isomorphism, Hamming distance, comparative public administration, INTOSAI, Uzbekistan.*

Introduction

International comparative analysis of Supreme Audit Institutions (SAIs) has traditionally relied on typological categories such as "Westminster", "Napoleonic", and "Collegial" [1, 2].

However, existing approaches do not permit quantitative measurement of institutional similarity. This limitation becomes particularly acute in transition economies, where policymakers seek appropriate reference models for institutional reform. This study applies Hamming (1950) distance metrics [3] from coding theory to SAI comparative analysis for the first time.

The empirical focus is the Accounts Chamber of the Republic of Uzbekistan, which acceded to INTOSAI and ASOSAI membership in 2022 and is undergoing intensive reforms through Presidential Decrees PF-100 (2024) and PF-252 (2025) [4, 5].

Methodology

Hamming distance counts the number of positions at which two equal-length vectors differ: $d\_H(x, y) = \Sigma|x\_i - y\_i|$. Five SAIs were coded across eight institutional characteristics: (1) basis of independence; (2) head appointment authority; (3) head tenure; (4) budget control; (5) audit types; (6) mandate breadth; (7) reporting audience; (8) decision-making structure. Data sources include primary legal documents, SAI annual reports, and academic literature.

Key Findings

Pairwise Hamming distances among the five SAIs are presented below:

SAI	GAO	NAO	Bundes.	BAI	Uzb. HP
GAO (USA)	0	4	6	5	8
NAO (UK)	4	0	3	8	6
Bundesrechnungshof	6	3	0	6	4
BAI (S. Korea)	5	8	6	0	5
Uzbekistan AC	8	6	4	5	0

The principal empirical finding: Uzbekistan's Accounts Chamber is closest to the German Bundesrechnungshof model (distance = 4), followed by the Korean BAI (5), the British NAO (6), and most distant — the American GAO (8). This result challenges the prevailing post-Soviet literature assumption that countries like Uzbekistan naturally emulate Anglo-Saxon SAIs. The four shared characteristics between Uzbekistan AC and Bundesrechnungshof are: a dual reporting line to both the head of state and parliament, a collegial decision-making structure, the dominance of financial and compliance audit within the portfolio, and reliance on internationally adapted (ISSAI-aligned) audit standards. These structural similarities, while not products of explicit modeling, reflect a deeper institutional logic tied to civil-law traditions and continental European administrative heritage.

Conclusion

The Hamming distance methodology offers a novel quantitative approach to comparative institutional analysis. For Uzbekistan's Accounts Chamber, this approach indicates that the Bundesrechnungshof model may be a more appropriate reform reference than commonly invoked Anglo-Saxon alternatives. Practical implication: twinning programs and technical assistance with Germany or other continental European SAIs may yield greater learning returns than partnerships with Anglo-Saxon counterparts. Future research directions: extending the analysis to encompass all Central Asian SAIs and applying weighted distance metrics.

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