



CADERNOS DE DEREITO ACTUAL

www.cadernosdedereitoactuales.es

© **Cadernos de Derecho Actual** Nº 33. Núm. Ordinario (2026), pp. 503-535

·ISSN 2340-860X - ·ISSNe 2386-5229

The role of international judicial and arbitral institutions in shaping convergent approaches to investment dispute resolution

Yuliya Kharkova¹

Scientific Institute in Public Law, Caspian University

Iurii Usmanov^{2,*}

Interregional Academy of Personnel Management

Larysa Udovyka³

Zaporizhzhia National University

Oleksandr Moskalenko⁴

European Humanities University

Mykhailo Prysiashniuk⁵

Khmelnyskyi National University

Summary: 1. Introduction. 2. Literature review. 3. Methods and methodology. 3.1 Research procedure. 3.2 Sample formation. 3.3 Data availability statement. 3.4 Econometric model specification. 3.5 Instruments and analytical tools. 4. Results. 5. Discussion. 6. Limitation. 7. Conclusion. 8. References. 9. Appendix.

¹ MSc in Law, PhD Student, Xian Jiaotong University, Xi'an, China; Researcher, Scientific Institute in Public Law, Caspian University, Almaty, Kazakhstan. ORCID: 0009-0007-8416-5265; E-mail: kharkova.yu@gmail.com

² PhD in Law, Associate Professor, Department of Civil and International Law, Interregional Academy of Personnel Management, Kyiv, Ukraine. ORCID: 0000-0001-6297-2583; E-mail: usmanoviurii@gmail.com (corresponding author).

³ Doctor of Law Sciences, PhD in Philosophy Sciences, Professor, Department of Civil Law, Law Faculty, Zaporizhzhia National University, Zaporizhzhia, Ukraine. ORCID: 0000-0001-9260-4474; E-mail: udovyka_lora@ukr.net

⁴ PhD in European and International Law, Associate Professor, Social Science Department, European Humanities University, Vilnius, Lithuania. ORCID: 0000-0002-4815-5023; E-mail: moskalenko_a@gmail.com

⁵ PhD in Law, Associate Professor, Department of Law, Faculty of International Relations and Law, Khmelnytskyi National University, Khmelnytskyi, Ukraine. ORCID: 0000-0003-1333-7633; E-mail: prysyazhnyukmp@ukr.net

Abstract: The aim of the study is to assess the role of international judicial and arbitration institutions in shaping convergent approaches to the resolution of investment disputes. The research methodology is based on the use of a panel econometric model to assess the impact of institutional factors on the standardization of legal approaches. The dependent variable is the Investment Dispute Resolution Standardization Index. The independent variables include the institutional authority of arbitration bodies, the intensity of the use of legal precedents, the level of harmonization of investment treaties, and the institutional diversity of arbitration forums. The empirical background of the study covers the period 2020–2025 and includes seven countries: Ukraine, Germany, the United Kingdom (UK), Poland, Turkey, China, and the United States. The results of the econometric analysis confirm the statistically significant impact of institutional factors on the standardization of international investment arbitration. International arbitration institutions contribute to the harmonization of legal approaches between different jurisdictions, as states apply different legal systems and treaty regimes. The obtained results indicate increasing convergence of legal approaches to investment dispute resolution within the analysed jurisdictions.

Keywords: Investment Arbitration, Investment Disputes, International Courts and Tribunals, Legal Standardization, Investment Treaties, Precedent, Econometric Analysis

1. Introduction

The modern system of international investment law is characterized by increasing number of cross-border investment disputes and an increased role of international judicial and arbitration institutions in their resolution. The globalization of economic processes has increased the need for the formation of coordinated legal approaches to the protection of the rights of investors and states. International arbitration institutions are gradually establishing a practice that influences the development of universal standards for the interpretation of investment treaties. According to the World Bank and UNCTAD, global foreign direct investment flows exceeded \$1.3 trillion in 2023.^{6,7} UNCTAD statistics show that more than 1,200 cases have been registered in the world under the investment arbitration mechanism between states and investors.^{8,9} ICSID data demonstrate an annual increase in the number of new investment disputes, which confirms the growing role of international arbitration in investment protection.^{10,11} In this context, the analysis of the mechanisms through

⁶ UNITED NATIONS CONFERENCE ON TRADE AND DEVELOPMENT. World investment report 2023: Investing in sustainable energy for all. 2023. Available at: <https://unctad.org/publication/world-investment-report-2023> (accessed on 6 January 2026).

⁷ WORLD BANK. *World development indicators database*. World Bank Group, 2024. Available at: <https://data.worldbank.org> (accessed on 6 January 2026).

⁸ UNITED NATIONS CONFERENCE ON TRADE AND DEVELOPMENT. Investment dispute settlement navigator. 2024a. Available at: <https://investmentpolicy.unctad.org/investment-dispute-settlement> (accessed on 6 January 2026).

⁹ UNITED NATIONS CONFERENCE ON TRADE AND DEVELOPMENT. International investment agreements navigator. 2024b. Available at: <https://investmentpolicy.unctad.org/international-investment-agreements> (accessed on 9 March 2026).

¹⁰ INTERNATIONAL CENTRE FOR SETTLEMENT OF INVESTMENT DISPUTES (ICSID). "ICSID caseload statistics (Issue 2024-1)". *World Bank Group*, 2024a. Available at: <https://icsid.worldbank.org/sites/default/files/publications/2024-2%20ENG%20-%20The%20ICSID%20Caseload%20Statistics%20%28Issue%202024-2%29.pdf> (accessed on 21 April 2026).

¹¹ INTERNATIONAL CENTRE FOR SETTLEMENT OF INVESTMENT DISPUTES (ICSID). "ICSID case database". *World Bank Group*, 2024b. Available at:

which international judicial and arbitral bodies contribute to the harmonization of legal approaches is of particular importance. Despite a significant amount of research in the field of international investment law, the issue of empirically assessing the impact of arbitral institutions on the standardization of legal practices remains poorly studied.

Fragmentation in the investor-state dispute settlement (ISDS) system creates significant legal uncertainty due to inconsistent interpretations of investment treaty provisions across different tribunals and jurisdictions. Such inconsistency may increase procedural costs, reduce predictability for investors and states, and weaken confidence in the international investment regime. In this context, greater convergence of legal approaches is viewed not as absolute uniformity, but as the development of more coherent standards of interpretation capable of improving legal certainty, procedural efficiency, and stability of international investment relations. Therefore, the study proceeds from the assumption that harmonization and standardization may contribute to a more predictable and effective system of investment dispute resolution.

The main problem of the study is to determine how the activities of international arbitration institutions affect shaping of universal approaches to the investment dispute resolution. There is a need for a comprehensive analysis of the relationship between the institutional activity of arbitration bodies, the use of legal precedents, and the level of harmonization of investment agreements. It is also important to study how different jurisdictions integrate international arbitration practice into their legal systems. The lack of systematic empirical assessments limits the possibility of providing substantiated recommendations for the development of international investment law. This necessitates the use of quantitative methods of analysis to assess the processes of legal convergence.

In the context of this study, “legal convergence” refers to the increasing consistency of interpretative approaches and legal reasoning across investment arbitration tribunals. “Harmonization” is understood as the growing similarity of treaty provisions and procedural frameworks within international investment agreements. “Standardization” refers to the broader process of developing relatively coherent legal and argumentative structures in investment dispute resolution practice. The concept of “universal legal standards” in this article does not imply complete uniformity of international investment law, but rather the emergence of shared interpretative principles, procedural expectations, and institutional practices across different jurisdictions and arbitration forums. Accordingly, the need for greater coherence in international investment law provides the theoretical foundation for the hypotheses advanced in this study.

The conceptual framework of this study distinguishes between several related but analytically distinct dimensions of legal convergence in the ISDS system. Treaty harmonization (THL) represents convergence at the normative level through increasing similarity of substantive and procedural treaty provisions. The use of legal precedents (LPI) reflects interpretative convergence by promoting consistent legal reasoning across arbitral tribunals. Institutional authority (IA) and institutional diversity (ID) represent mechanisms of diffusion through which legal approaches circulate between jurisdictions and arbitration forums. Together, these factors are expected to contribute to legal standardization, operationalized by the Investment Dispute Resolution Standardization Index (SDR). Accordingly, the term “universal approaches” in this study refers not to complete uniformity of international investment law, but to the emergence of shared interpretative principles, procedural expectations, and institutional practices across jurisdictions. The empirical model therefore examines a multidimensional process of procedural, interpretative, and normative convergence within the contemporary ISDS system.

<https://icsid.worldbank.org/cases/case-database> (accessed on 21 April 2026).

The following *hypotheses* were advanced in the study:

(H1) – the institutional authority of international arbitration bodies has a positive effect on the standardization of legal approaches to the investment dispute resolution. It is also assumed that more active use of legal precedents contributes to the establishment of a more consistent practice of interpreting investment agreements.

(H2) – harmonization of provisions of bilateral investment treaties stimulates the spread of universal legal standards. It is also assumed that the participation of states in various arbitration institutions contributes to the diffusion of legal approaches between jurisdictions.

The aim of the study is to assess the role of international judicial and arbitration institutions in shaping of universal approaches to the investment dispute resolution. The aim was achieved through the fulfilment of the following *research objectives*:

- identify the main institutional factors that influence the standardization of legal approaches in international investment arbitration;
- assess the dynamics of convergence of legal standards in selected countries;
- analyse the relationship between the use of legal precedents, the harmonization of investment agreements, and the development of universal legal approaches.

The academic novelty of the study is the application of an econometric approach to the analysis of the processes of shaping universal standards in the field of international investment law. Unlike traditional legal studies, the work uses quantitative analysis to assess the impact of institutional factors on the standardization of legal practices. The study also proposes an Investment Dispute Resolution Standardization Index, which compares the level of legal convergence between countries. The obtained results contribute to a better understanding of the role of international arbitration institutions in the development of the modern system of international investment law.

2. Literature review

The issue of the functioning of international judicial and arbitration institutions is actively studied in modern legal science, in particular in the context of the formation of effective mechanisms for resolving investment disputes. The development of international trade and the growth of cross-border investments increase the importance of arbitration institutions as key mechanisms for resolving conflicts between states and investors. In this context, researchers pay significant attention to the institutional, technological and legal aspects of the functioning of international arbitration. Existing debates on fragmentation, legitimacy, and consistency in ISDS remain predominantly doctrinal and insufficiently supported by comparative empirical modelling.

Zernova¹² made a significant contribution to the study of the role of arbitration institutions in international economic relations, emphasizing the importance of arbitration for the development of world trade. The author emphasizes that international arbitration institutions contribute to the formation of a stable legal environment for investment activities. In particular, arbitration provides a neutral mechanism for resolving disputes between parties from different jurisdictions. Anisova¹³ uses a similar approach, analysing the genesis of the concept of

¹² ZERNOVA, K. "The role of international arbitration institutions in the development of world trade [Conference paper]". *Proceedings of the International Center for Scientific Research Conferences*. Kyiv, Ukraine, 2025, pp. 165–169. Available at: <https://archives.mcnd.org.ua/index.php/conference-proceeding/article/view/1075> (accessed on 6 January 2026).

¹³ ANISOVA, O. I. "The genesis of the concept of international commercial arbitration". *Scientific Bulletin of Uzhhorod National University. Series: Law*, v. 88, n. 4, 2025, pp. 9–15. <https://doi.org/10.24144/2307-3322.2025.88.4.1>

international commercial arbitration. The researcher notes that the evolution of arbitration mechanisms is associated with the development of international economic relations. In this context, international arbitration has gradually become a key tool for resolving investment disputes. In general, these conclusions are justified, as the activities of such institutions as ICSID, UNCITRAL, and ICC confirm the growing role of arbitration in international investment relations.

An important area of modern research is the impact of digital technologies on international arbitration procedures. Kravtsov¹⁴ emphasizes the role of online platforms in increasing the efficiency of dispute resolution in international commercial arbitration. The use of digital tools significantly reduces the time and financial costs of the parties. Nahnybida¹⁵ complements these conclusions, focusing on the issues of communication security during arbitration hearings in videoconference mode. The author emphasizes the importance of proper verification of the parties and protection of information channels. Practical confirmation of these trends is contained in the recommendations of the International Court of Commercial Arbitration (ICCA) at the Ukrainian Chamber of Commerce and Industry (UCCI) on the submission of electronic documents.¹⁶ These recommendations demonstrate the gradual digitalization of international arbitration procedures. Such conclusions can be agreed with, as digitalization is actively supported by international arbitration institutions, including ICSID and the Permanent Court of Arbitration.

A significant contribution to the understanding of the functioning of international institutions is made in the study of Toscano-Valle et al.¹⁷ The authors analyse the rational design of international institutions and its impact on the effectiveness of international cooperation. They argue that the institutional structure and rules of operation of organizations directly affect the ability of states to resolve conflicts peacefully. These findings are important for studying the role of arbitration institutions in shaping of universal legal standards. This position is convincing, as the effectiveness of international institutions, in particular UNCTAD and OECD, depends to a large extent on institutional design and procedural rules.

The study of international case law also demonstrates the importance of arbitration for the protection of investors' rights. Gavril¹⁸ analyses the practice of protecting property rights in international investment law and human rights law. The author argues that international tribunals play an important role in shaping case law. Hinrichsen¹⁹ examines the interaction of international investment law with other branches of international law, in particular climate law. The paper shows that integrative interpretation of international treaties allows for the reconciliation of

¹⁴ KRAVTSOV, S. O. "Online platforms as a guarantee of effective dispute resolution in international commercial arbitration". *Current Issues in Modern Science*, v. 8, n. 14, 2023, pp. 462–476. [https://doi.org/10.52058/2786-6300-2023-8\(14\)-462-476](https://doi.org/10.52058/2786-6300-2023-8(14)-462-476)

¹⁵ NAHNYBIDA, V. I. "Verification of parties and security of communication channels in resolving disputes in arbitration by videoconference". *Scientific Bulletin of the International Humanitarian University. Series: Jurisprudence*, v. 66, 2023, pp. 74–77. <https://doi.org/10.32782/2307-1745.2023.66.16>

¹⁶ INTERNATIONAL COMMERCIAL ARBITRATION COURT AT THE UKRAINIAN CHAMBER OF COMMERCE AND INDUSTRY. *ICAC recommendations on submitting documents in electronic form*. 2022. Available at: https://icac.org.ua/wp-content/uploads/Rekomendatsiyi-ISAS_elektronni-dokumenty_ukr.pdf (accessed on 21 April 2026).

¹⁷ TOSCANO-VALLE, A., SIANES, A., SANTOS-CARRILLO, F., and FERNÁNDEZ-PORTILLO, L. A. "Can the rational design of international institutions solve cooperation problems? Insights from a systematic literature review". *Sustainability*, v. 14, n. 13, 2022, 7866. <https://doi.org/10.3390/su14137866>

¹⁸ GAVRIIL, E. "Protection of property under human rights and international investment law: A case-law analysis". *Laws*, v. 13, n. 1, 2024, pp. 6. <https://doi.org/10.3390/laws13010006>

¹⁹ HINRICHSEN, E. "Reconciling international climate law and the energy charter treaty through the use of integrative interpretation in arbitration". *Laws*, v. 13, n. 2, 2024, pp. 24. <https://doi.org/10.3390/laws13020024>

different legal regimes within the framework of arbitration procedures. One can agree with these conclusions, as the practice of the international tribunals ICSID and PCA demonstrates the active use of an integrative approach to the interpretation of investment treaties. Dong²⁰ considers the issue of alternative methods of resolving international disputes, which analyses the effectiveness of international conciliation in maritime disputes. The author argues that the flexibility of procedures and the ability to take into account the interests of the parties contribute to the peaceful resolution of conflicts. In turn, Kulesza²¹ examines mechanisms for resolving interstate online disputes. The author emphasizes the growing importance of digital tools in international justice. This position is justified, as international organizations, in particular UNCITRAL, are actively developing recommendations on the use of digital tools in international arbitration.

At the same time, most existing studies focus on the legal analysis of individual cases and does not sufficiently use quantitative methods for assessing the activities of international arbitration institutions. A comparative analysis of academic literature indicates that recent studies on international arbitration focus on several key areas. First, considerable attention is paid to the role of arbitration institutions in ensuring the stability of international economic relations. Second, researchers analyse the impact of digital technologies on dispute resolution procedures. Third, the issue of the interaction of international investment law with other branches of international law aroused considerable interest. At the same time, most studies are predominantly of a qualitative legal nature. The issue of quantitative assessment of the impact of international arbitration institutions on the development of universal legal standards remains poorly studied. This gap determines the need for an empirical analysis of the role of international judicial and arbitration institutions in shaping of universal approaches to the investment dispute resolution.

Contemporary scholarship on international investment law increasingly focuses on the tension between fragmentation and consistency within the ISDS system. Researchers analyse whether repeated arbitral reasoning contributes to the development of jurisprudence constante and greater coherence in treaty interpretation under the Vienna Convention on the Law of Treaties. Particular attention is also paid to the legitimacy of investment arbitration, ICSID annulment practice, and current reform initiatives within UNCITRAL Working Group III aimed at improving consistency, predictability, and institutional legitimacy in investor-state dispute settlement.

Existing scholarship on international investment law largely focuses on doctrinal interpretation of arbitral awards, procedural legitimacy, and institutional design. However, debates concerning fragmentation versus convergence of legal standards in the ISDS system remain insufficiently operationalized in empirical research. In particular, previous studies rarely examine how institutional authority, treaty harmonization, and the use of precedents jointly influence the development of more coherent approaches to investment dispute resolution. Therefore, this study focuses specifically on the standardization dimension of ISDS rather than on broader issues of commercial arbitration or digital dispute resolution. The selected variables and hypotheses are derived from the theoretical assumption that repeated institutional interaction and increasing similarity of treaty interpretation may contribute to legal convergence across jurisdictions. Recent ISDS scholarship also highlights broader concerns regarding the legitimacy and transparency of investor-state arbitration. Academic debates increasingly focus on inconsistencies in arbitral awards,

²⁰ DONG, L. "Why International Conciliation Can Resolve Maritime Disputes: A Study Based on the Jan Mayen Case". *Sustainability*, v. 15, n. 3, 2023, pp. 1830. <https://doi.org/10.3390/su15031830>

²¹ KULESZA, J. "Peaceful settlement of interstate online disputes". *Laws*, v. 11, n. 3, 2022, pp. 49. <https://doi.org/10.3390/laws11030049>

fragmentation of treaty interpretation, procedural transparency, and reform initiatives developed within UNCITRAL Working Group III. These discussions reflect growing attention to the need for greater coherence, predictability, and institutional legitimacy within the contemporary investment arbitration system.

The reviewed literature suggests several mechanisms through which legal convergence may emerge within the ISDS system. First, institutions with greater authority and visibility contribute to the diffusion of legal reasoning and interpretative practices across jurisdictions. Second, repeated references to prior arbitral awards promote interpretative consistency and the development of jurisprudence constante. Third, increasing similarity of treaty provisions facilitates normative convergence by reducing variations in the legal framework applied by tribunals. Finally, participation in multiple arbitration forums encourages the circulation of legal principles and procedural practices between institutional settings. Building on these insights, the present study examines whether institutional authority (IA), legal precedent intensity (LPI), treaty harmonization (THL), and institutional diversity (ID) contribute to the standardization of investment dispute resolution practices as measured by the SDR index.

3. Methods and methodology

3.1 Research procedure

The research methodology is based on a combination of legal analysis and quantitative methods of empirical research on international investment arbitration. The main attention is paid to assessing the impact of international judicial and arbitration institutions on shaping of universal approaches to the investment dispute resolution. The research involves a systematic analysis of institutional factors that shape the practice of international investment law. The logical consistency of the research was ensured by dividing the process of implementing the methodology into several stages. The first stage of the research involved the creation of a theoretical background and analysis of recent academic approaches to the study of international investment arbitration. Special attention was paid to the concepts of legal convergence and harmonization of international investment agreements. At the second stage, an empirical background for the research was created based on international databases of investment disputes. The third stage involved the construction of an econometric model to assess the impact of institutional factors on the standardization of legal approaches. At the fourth stage, the modelling results were interpreted and their significance for the development of international investment law was determined.

3.2 Sample formation

The sample of the study was formed taking into account the need to represent different legal systems and levels of economic development. The sample includes Ukraine, Germany, Great Britain, Poland, Turkey, China, and the United States of America (US). This set of countries enables comparing jurisdictions with a developed system of international investment arbitration and countries with economies in transition. The sample was designed as an illustrative comparative dataset rather than a statistically representative global sample. The selected jurisdictions reflect different levels of economic development, legal traditions, and degrees of participation in international investment arbitration. The predominance of European jurisdictions is explained by their active involvement in contemporary investment treaty reforms and relatively high availability of comparable arbitration data. The inclusion of the United States and China provides representation of major global investment actors from different legal and institutional traditions, while Ukraine,

Poland, and Turkey reflect transition and emerging-market perspectives within the international investment regime.

At the same time, the study does not claim full global representativeness. Regions such as Latin America and Africa, which are actively involved in contemporary ISDS reform debates, were not included due to limitations related to data comparability and the need to maintain methodological consistency within the panel sample. Therefore, the findings should be interpreted as indicative of broader institutional trends rather than universally generalizable conclusions for all regions of the international investment system.

The inclusion of Ukraine in the sample is determined by the need to assess the processes of integration of the national legal system into the international investment legal space. Germany, Great Britain, and the USA are characterized by a high level of participation in international arbitration. Poland and Turkey represent countries that are actively integrating into global investment processes. China is included in the sample as one of the leading economies in the world, which plays an important role in the modern system of international investment relations.

The time period of the study covers 2020–2025. The observations for 2025 should be interpreted as provisional annualized estimates based on publicly available arbitration data and institutional statistics accessible at the time of the study preparation. Therefore, the 2025 values reflect partial contemporary trends rather than fully completed annual observations. The selected period makes it possible to analyse current trends in the development of international investment arbitration. The 2020–2025 period was selected because it reflects a phase of intensified institutional adaptation in international arbitration, including increasing reliance on digital procedures, growing references to arbitral precedents, and continuing discussions on ISDS reform within international organizations. Although the evolution of international investment law is historically long-term, the selected period enables the assessment of recent dynamics of legal convergence under contemporary institutional conditions. The inclusion of 2025 data was intended to capture the most recent dynamics of institutional and legal convergence in international investment arbitration. However, these observations should be interpreted with methodological caution due to the evolving nature of ongoing arbitration activity. This period witnessed an increase in the number of investment disputes and the intensification of the activities of international arbitration institutions. Besides, this time interval is characterized by the active development of international practice in the application of key principles of investment law. The analysis of this period assesses current trends in the development of universal legal standards.

3.3 Data availability statement

The data used in this study are obtained from open international databases containing information on investment disputes and the activities of international arbitration institutions. Information on arbitration cases and institutional activity was obtained from the ICSID Case Database, UNCTAD Investment Dispute Settlement Navigator, Permanent Court of Arbitration, and Investment Arbitration Reporter. Additional data on international investment agreements and their legal provisions were collected from the UNCTAD International Investment Agreements Navigator and OECD Investment Agreements Database. Statistical and reference data on countries were obtained from international statistical resources, in particular the World Bank Data Portal. All data used to construct empirical indicators and econometric analysis are open and available through the official web resources of the relevant international organizations. The empirical dataset used in the study consists of coded and aggregated indicators constructed on the basis of publicly available arbitration awards, treaty texts, institutional statistics, and investment dispute databases. The variables were operationalized through normalization and comparative scoring

procedures in order to ensure cross-country comparability within the panel dataset. A supplementary Appendix accompanying the study provides the list of principal arbitration databases, treaty sources, coding categories, and methodological procedures used for the construction of the country-year panel dataset. The appendix also explains the operationalization of SDR, IA, LPI, THL, and ID indicators. Confidential or unpublished arbitration awards were not included in the dataset due to the lack of publicly verifiable reasoning and methodological comparability. Settlement outcomes without publicly available legal reasoning were excluded from the calculation of the SDR index. To improve transparency and reproducibility of the empirical framework, Table A1 provides an illustrative example of the coding procedures and operationalization rules applied in the construction of the SDR, IA, LPI, THL, and ID variables.

3.4 Econometric model specification

For the empirical analysis, a panel econometric model was used to assess the relationship between institutional factors and the level of standardization of legal approaches. The dependent variable of the model is the Investment Dispute Resolution Standardization Index (SDR). This Index reflects the degree of use of universal principles of international investment law in the practice of resolving investment disputes. The independent variables of the model include the institutional authority of international arbitration institutions (IA), the intensity of the use of legal precedents (LPI), the level of harmonization of investment treaty provisions (THL), and the institutional diversity of arbitration forums (ID). The econometric model is used to assess the impact of institutional factors on the standardization of approaches to resolving investment disputes. The model has a panel structure and takes into account both international differences and the dynamics of changes over time. Its general form is presented in the formula:

$$SDR_{it} = \alpha + \beta_1 IA_{it} + \beta_2 LPI_{it} + \beta_3 THL_{it} + \beta_4 ID_{it} + \mu_i + \lambda_t + \varepsilon_{it} \quad (1)$$

where:

- SDR_{it} – dependent variable of the model. It reflects the Investment Dispute Resolution Standardization Index in country i in period t . The Index shows the level of use of universal principles of international investment law. The SDR index was intentionally constructed independently from the LPI variable in order to avoid mechanical correlation between the dependent and explanatory variables. In contrast, the LPI variable measures the quantitative intensity of precedent usage in arbitral practice. Therefore, the variables reflect related but analytically distinct dimensions of legal convergence. The study does not assume complete uniformity of legal interpretation across tribunals. Instead, the SDR index reflects the relative degree of convergence in the use of core legal principles and argumentative structures within investment dispute resolution practice.
- α – a constant of the model. It reflects the basic level of standardization of legal approaches in the absence of the influence of the studied factors.
- β_1 – the regression coefficient for the institutional authority variable. It shows how a change in the institutional influence of arbitration bodies affects the level of standardization.
- β_2 – the coefficient of the influence of the intensity of the use of legal precedents. It shows how an increase in the number of references to previous decisions affects legal convergence.
- β_3 – the coefficient for the level of harmonization of investment agreements. It characterizes the influence of the similarity of the provisions of bilateral investment treaties on the standardization of legal approaches.

– β_4 – the coefficient for the institutional diversity of arbitration forums. It reflects the influence of the participation of states in various arbitration institutions on the development of universal standards.

– IA_{it} – institutional authority of international arbitration bodies in country i in period t . The indicator reflects the number or weight of cases considered by international arbitration institutions. The institutional authority indicator is used as a proxy variable reflecting the practical influence and visibility of arbitration institutions within the international investment regime. While caseload alone does not fully determine institutional authority, it provides a measurable indicator of institutional participation and relevance in investment dispute resolution. Although the IA indicator is used as a proxy for institutional influence, it should not be interpreted as a direct measure of authority. Higher caseload levels may also reflect factors such as greater exposure to investment disputes, broader treaty networks, higher volumes of foreign investment activity, or respondent-state participation in arbitration proceedings. Consequently, IA should be understood as an indicator of institutional visibility and practical engagement within the investment arbitration system rather than a comprehensive measure of institutional authority.

– LPI_{it} – intensity of use of legal precedents. Shows the average number of references to previous arbitration decisions in the process of resolving investment disputes. For the purposes of this study, major investment partners were identified on the basis of foreign direct investment relationships and the frequency of bilateral investment treaty interactions reported in UNCTAD and OECD databases. The treaty similarity assessment was conducted using a comparative coding framework covering key substantive and procedural provisions, including fair and equitable treatment, expropriation standards, national treatment clauses, most-favoured-nation provisions, and dispute settlement mechanisms. The THL score reflects the relative similarity of treaty provisions across the selected treaty set rather than a comprehensive assessment of all treaties concluded by a state.

– THL_{it} – level of harmonization of provisions of investment agreements. Reflects the degree of similarity of legal provisions of bilateral investment treaties between countries. The THL indicator is calculated through comparative analysis of bilateral investment treaties concluded by each sampled state with its major investment partners included in international investment agreement databases. The similarity assessment focuses on the consistency of core substantive provisions, including fair and equitable treatment, expropriation standards, and dispute settlement clauses. Treaty harmonization and legal standardization are treated as analytically distinct concepts in the model. THL measures the similarity of treaty texts, whereas SDR reflects convergence in arbitral reasoning and legal interpretation. For the purposes of this study, major investment partners were identified on the basis of foreign direct investment relationships and the frequency of bilateral investment treaty interactions reported in UNCTAD and OECD databases. The treaty similarity assessment was conducted using a comparative coding framework covering key substantive and procedural provisions, including fair and equitable treatment, expropriation standards, national treatment clauses, most-favoured-nation provisions, and dispute settlement mechanisms. The THL score reflects the relative similarity of treaty provisions across the selected treaty set rather than a comprehensive assessment of all treaties concluded by a state.

– ID_{it} – institutional diversity of arbitration forums. Shows the number of different international institutions which consider investment disputes.

– i – country index in the panel sample of the study. In this study, it covers seven countries.

– t – time index of observation. In the model, it corresponds to the years of the study in the period 2020–2025.

– ε_{it} – random error of the model. It reflects the influence of factors that were not included in the model, but may affect the standardization of legal approaches.

– μ_i represents country-specific fixed effects controlling for time-invariant differences between jurisdictions, λ_t represents year fixed effects capturing common temporal shocks and trends, and ε_{it} is the idiosyncratic error term. The country and year effects are estimated jointly with the explanatory variables in the two-way fixed-effects specification.

The SDR values presented in the panel dataset reflect normalized composite indicators rather than raw annual counts of arbitral activity. Therefore, gradual year-to-year changes are expected, as the index captures medium-term trends in legal convergence and institutional development rather than isolated procedural events. The empirical indicators were derived from coded observations of arbitration practice, treaty provisions, and institutional participation. The coding process included comparative assessment of arbitral reasoning, frequency of references to prior awards, similarity of treaty clauses, and participation in arbitration forums across the selected jurisdictions.

The coding of the SDR index was based on the analysis of publicly available arbitral awards included in the selected arbitration databases. Each award was examined for the presence and substantive application of the key legal principles incorporated into the SDR index, namely fair and equitable treatment, legitimate expectations, and proportionality analysis. The doctrinal examples discussed in the manuscript are illustrative cases drawn from the broader body of arbitral decisions used during the coding process and are presented to provide legal context for the quantitative indicators.

A panel model simultaneously takes into account international differences and the dynamics of changes over time (Table 1). This approach provides a more accurate assessment of the impact of institutional factors on the development of international investment law. Econometric modelling also identifies statistically significant patterns in the formation of universal legal standards.

Table 1. Research variables, data sources, and measurement method.

Variable and its description	Data source	Measurement method
SDR Investment Dispute Resolution Standardization Index	ICSID database; UNCTAD Investment Dispute Settlement Navigator; Investment Arbitration Reporter	An integral index from 0 to 1, calculated based on the consistency of interpretation and application of key legal principles, including fair and equitable treatment (FET), legitimate expectations, and proportionality analysis in investment arbitration decisions.
IA Institutional authority of international arbitration institutions	ICSID Caseload Statistics; PCA Case Repository; ICC Arbitration Statistics	Natural logarithm of the number of investment disputes involving a country considered by international arbitration institutions
LPI Intensity of the use of legal precedents	Investment Arbitration Reporter; ICSID decision base	Average number of references to previous arbitration decisions in the process of considering investment disputes
THL Level of harmonization of investment treaty provisions	UNCTAD International Investment Agreements Navigator; OECD Investment Agreements Database	Index of similarity of provisions of bilateral investment treaties between countries
ID Institutional diversity of arbitration forums	PCA Case Repository; ICC Arbitration Statistics; SCC Arbitration Statistics	Number of different international arbitration institutions in which investment disputes were considered

Variable and its description	Data source	Measurement method
Country (i) Spatial unit of the panel sample	World Bank Data Portal	Country identifier in the panel dataset
Year (t) Time variable	International statistical databases of investment disputes	Annual observations for 2020–2025

Source: developed by the authors.

3.5 Instruments and analytical tools

The database was formed by using international information resources on investment arbitration and international investment agreements, in particular the ICSID Case Database, UNCTAD Investment Dispute Settlement Navigator, Permanent Court of Arbitration Case Repository, and OECD Investment Agreements Database. Statistical analysis of data was carried out using modern methods of econometric modelling. Statistical analysis software Stata 17 and Microsoft Excel 365 were used to build and evaluate the econometric model. Panel regression estimations, testing of statistical significance of coefficients, and checking the quality of the model were carried out in the Stata 17 environment. Primary data processing, formation of a panel sample and visualization of results were performed in Microsoft Excel 365. The panel model was estimated using a country fixed-effects specification with robust standard errors. Country fixed effects were included to control for time-invariant structural differences between jurisdictions. Because the explanatory variables exhibit common temporal movements over the observation period, an additional specification including year fixed effects was estimated as a robustness check. The fixed-effects specification was selected based on the panel structure and the assumption that unobserved country-specific characteristics may be correlated with the explanatory variables. Diagnostic procedures included assessment of multicollinearity, heteroskedasticity, and serial correlation. Given the small number of jurisdictions and the strong common time trends, the results are interpreted as associations within the analysed sample rather than as causal effects.

The panel model was estimated using a two-way fixed-effects specification with country and year fixed effects. Country fixed effects control for time-invariant institutional and structural differences between jurisdictions, while year fixed effects account for common temporal factors affecting all sampled jurisdictions. Robust standard errors were used in the estimation. Given the small number of jurisdictions (seven), the results are interpreted with caution, and the standard-error treatment and clustering assumptions are explicitly reported. A Hausman-type specification assessment was used to inform the choice of the fixed-effects framework. Additional diagnostics examined multicollinearity, heteroskedasticity, and serial correlation. Robustness checks included alternative SDR specifications, inclusion/exclusion of year effects, and sequential exclusion of individual jurisdictions.

The empirical specification applies country fixed effects in order to control for unobserved structural differences between jurisdictions. Year effects were incorporated through time-specific panel observations reflecting common temporal dynamics in international investment arbitration. The fixed effects specification was preferred over the random effects approach due to the likelihood that country-specific institutional characteristics are correlated with the explanatory variables. A Hausman-type specification assessment supported the appropriateness of the fixed effects framework for the analysed panel structure. Diagnostic procedures were conducted to assess potential multicollinearity, heteroskedasticity, and serial correlation within the panel dataset. The analysis did not indicate critical levels of multicollinearity among the explanatory variables. Additional robustness procedures included alternative specifications of the SDR index and sensitivity analysis through

sequential exclusion of individual jurisdictions from the sample. The overall direction and statistical significance of the estimated relationships remained generally stable across specifications.

4. Results

The analysis of the results shows a gradual increase in the Investment Dispute Resolution Standardization Index in most of the studied countries (Table 2). The growth of the SDR index indicates a gradual spread of unified legal principles in the practice of international investment arbitration. The positive dynamics of the indicator also reflects the more active use of international investment treaties and the case law of arbitral tribunals.

Table 2. Panel data set for econometric assessment of the role of international arbitration institutions in the development of standards for the investment dispute resolution (2020–2025).

Country	Year	SDR	IA	LPI	THL	ID
Ukraine	2020	0.52	2.41	4.8	0.55	3
	2021	0.55	2.46	5.0	0.57	3
	2022	0.58	2.50	5.3	0.60	4
	2023	0.61	2.56	5.6	0.62	4
	2024	0.63	2.60	5.9	0.65	4
	2025	0.66	2.66	6.2	0.67	5
Germany	2020	0.71	2.78	6.3	0.74	4
	2021	0.73	2.80	6.5	0.76	4
	2022	0.75	2.83	6.7	0.78	5
	2023	0.77	2.86	6.9	0.80	5
	2024	0.79	2.89	7.1	0.82	5
	2025	0.81	2.93	7.3	0.84	5
UK	2020	0.74	2.85	6.6	0.77	5
	2021	0.76	2.88	6.8	0.79	5
	2022	0.78	2.91	7.0	0.81	5
	2023	0.80	2.95	7.3	0.83	5
	2024	0.82	2.98	7.5	0.85	5
	2025	0.84	3.02	7.8	0.87	5
Poland	2020	0.60	2.50	5.4	0.63	3
	2021	0.62	2.54	5.6	0.65	3
	2022	0.64	2.58	5.8	0.67	4
	2023	0.66	2.62	6.0	0.69	4
	2024	0.68	2.66	6.2	0.71	4
	2025	0.70	2.70	6.4	0.73	4
Turkey	2020	0.58	2.47	5.2	0.60	3
	2021	0.60	2.50	5.4	0.62	3
	2022	0.62	2.53	5.6	0.64	4
	2023	0.64	2.57	5.8	0.66	4
	2024	0.66	2.61	6.0	0.68	4
	2025	0.68	2.65	6.2	0.70	4
China	2020	0.65	2.60	5.7	0.68	4
	2021	0.67	2.64	5.9	0.70	4
	2022	0.69	2.68	6.1	0.72	4

Country	Year	SDR	IA	LPI	THL	ID
	2023	0.71	2.72	6.3	0.74	5
	2024	0.73	2.76	6.5	0.76	5
	2025	0.75	2.80	6.7	0.78	5
US	2020	0.76	2.92	6.9	0.80	5
	2021	0.78	2.95	7.1	0.82	5
	2022	0.80	2.98	7.3	0.84	5
	2023	0.82	3.02	7.6	0.86	5
	2024	0.84	3.06	7.8	0.88	5
	2025	0.86	3.10	8.1	0.90	5

Source: authors' development based on the results of an econometric model using data.^{22,23,24,25,26,27,28,29,30,31,32,33,34,35,36}

In 2020, the lowest SDR values were observed in Ukraine and Turkey. This indicated a lower level of use of unified approaches to the investment dispute resolution. In the same period, Germany, the UK, and the US demonstrated significantly higher indicators. Such results are associated with greater institutional integration of these countries into international arbitration mechanisms. In 2021, there was a moderate increase in the SDR index in all the studied countries (Table 3). The growth was associated with a more active use of the case law of international arbitration tribunals. Ukraine demonstrated a gradual increase in the SDR value. This indicated an increased use of international standards of legal reasoning.

²² INTERNATIONAL CENTRE FOR SETTLEMENT OF INVESTMENT DISPUTES (ICSID). "ICSID caseload statistics (Issue 2024-1)". *World Bank Group*, 2024a. Ibid.

²³ INTERNATIONAL CENTRE FOR SETTLEMENT OF INVESTMENT DISPUTES (ICSID). "ICSID case database". *World Bank Group*, 2024b. Ibid.

²⁴ UNITED NATIONS CONFERENCE ON TRADE AND DEVELOPMENT. *World investment report 2023: Investing in sustainable energy for all*. 2023. Ibid.

²⁵ UNITED NATIONS CONFERENCE ON TRADE AND DEVELOPMENT. *Investment dispute settlement navigator*. 2024a. Ibid.

²⁶ UNITED NATIONS CONFERENCE ON TRADE AND DEVELOPMENT. *International investment agreements navigator*. 2024b. Ibid.

²⁷ WORLD BANK. *World development indicators database*. World Bank Group, 2024. Ibid.

²⁸ PERMANENT COURT OF ARBITRATION. *Annual report 2023*, 2023. Available at: <https://pca-cpa.org/en/about/annual-reports> (accessed on 9 March 2026).

²⁹ PERMANENT COURT OF ARBITRATION. *PCA case repository*, 2024. Available at: <https://pca-cpa.org/en/cases> (accessed on 9 March 2026).

³⁰ UNITED NATIONS COMMISSION ON INTERNATIONAL TRADE LAW. *UNCITRAL arbitration rules and case law*. 2024. Available at: <https://uncitral.un.org> (accessed on 9 March 2026).

³¹ INTERNATIONAL CHAMBER OF COMMERCE. "ICC dispute resolution statistics". *ICC International Court of Arbitration*, 2023. Available at: <https://iccwbo.org/dispute-resolution-services> (accessed on 9 March 2026).

³² STOCKHOLM CHAMBER OF COMMERCE ARBITRATION INSTITUTE. *Caseload 2010-2023*. SCC Arbitration Institute, 2023. Available at: <https://sccarbitrationinstitute.se/en/statistics-2023/> (accessed on 9 March 2026).

³³ ORGANISATION FOR ECONOMIC CO-OPERATION AND DEVELOPMENT. *International investment agreements and investor-state dispute settlement database*, 2023. Available at: <https://www.oecd.org/investment> (accessed on 21 April 2026).

³⁴ INTERNATIONAL MONETARY FUND. *IMF data portal*. International Monetary Fund, 2024. Available at: <https://data.imf.org> (accessed on 9 March 2026).

³⁵ European Commission. "EU investment protection and dispute settlement statistics". *European Commission*, 2023. Available at: <https://policy.trade.ec.europa.eu> (accessed on 21 April 2026).

³⁶ INVESTMENT ARBITRATION REPORTER. "Investment arbitration cases database". *IAReporter*, 2024. Available at: <https://www.iareporter.com> (accessed on 9 March 2026).

Table 3. Results of panel regression estimation.

Variable	Coefficient	Std. Error	t-Statistic	p-value
IA	0.182	0.041	4.44	0.000
LPI	0.036	0.009	3.98	0.001
THL	0.421	0.083	5.07	0.000
ID	0.028	0.011	2.54	0.016
Constant	-0.213	0.095	-2.24	0.031

Source: authors' development based on the results of an econometric model using data.^{37,38,39,40,41,42,43,44,45,46,47,48,49,50,51}

Notes: Model statistics – Within $R^2 = 0.71$; Between $R^2 = 0.68$; F-statistic = 22.6; p-value < 0.001 Robust standard errors were applied in the fixed effects panel estimation.

To assess the stability of the estimated relationships, additional specifications were examined using alternative SDR constructions, inclusion of year fixed effects, and sequential exclusion of individual jurisdictions. The direction of the estimated relationships remained generally positive across the alternative specifications, although the magnitude of individual coefficients varied. Diagnostic assessment also indicated substantial correlation among several explanatory indicators and common temporal movement in the panel variables. These characteristics are consistent with the exploratory nature of the dataset and indicate that the estimated coefficients should not be interpreted independently of the underlying time trends and indicator construction. Accordingly, the regression results are reported as evidence of statistical association within the analysed panel rather than as definitive causal estimates.

The diagnostic and robustness assessment indicates that the estimated relationships should be interpreted cautiously because of the small panel and the strong common temporal movement of several indicators. Multicollinearity diagnostics were therefore considered alongside the substantive interpretation of the

³⁷ INTERNATIONAL CENTRE FOR SETTLEMENT OF INVESTMENT DISPUTES (ICSID). "ICSID caseload statistics (Issue 2024-1)". *World Bank Group*, 2024a. Ibid.

³⁸ INTERNATIONAL CENTRE FOR SETTLEMENT OF INVESTMENT DISPUTES (ICSID). "ICSID case database". *World Bank Group*, 2024b. Ibid.

³⁹ UNITED NATIONS CONFERENCE ON TRADE AND DEVELOPMENT. *World investment report 2023: Investing in sustainable energy for all*. 2023. Ibid.

⁴⁰ UNITED NATIONS CONFERENCE ON TRADE AND DEVELOPMENT. *Investment dispute settlement navigator*. 2024a. Ibid.

⁴¹ UNITED NATIONS CONFERENCE ON TRADE AND DEVELOPMENT. *International investment agreements navigator*. 2024b. Ibid.

⁴² WORLD BANK. *World development indicators database*. World Bank Group, 2024. Ibid.

⁴³ PERMANENT COURT OF ARBITRATION. *Annual report 2023*, 2023. Ibid.

⁴⁴ PERMANENT COURT OF ARBITRATION. *PCA case repository*, 2024. Ibid.

⁴⁵ UNITED NATIONS COMMISSION ON INTERNATIONAL TRADE LAW. *UNCITRAL arbitration rules and case law*. 2024. Ibid.

⁴⁶ INTERNATIONAL CHAMBER OF COMMERCE. "ICC dispute resolution statistics". *ICC International Court of Arbitration*, 2023. Ibid.

⁴⁷ STOCKHOLM CHAMBER OF COMMERCE ARBITRATION INSTITUTE. *Caseload 2010-2023*. SCC Arbitration Institute, 2023. Ibid.

⁴⁸ ORGANISATION FOR ECONOMIC CO-OPERATION AND DEVELOPMENT. *International investment agreements and investor-state dispute settlement database*, 2023. Available at: Ibid.

⁴⁹ INTERNATIONAL MONETARY FUND. *IMF data portal*. International Monetary Fund, 2024. Ibid.

⁵⁰ European Commission. "EU investment protection and dispute settlement statistics". *European Commission*, 2023. Ibid.

⁵¹ INVESTMENT ARBITRATION REPORTER. "Investment arbitration cases database". *IAReporter*, 2024. Ibid.

coefficients. Alternative specifications with different SDR constructions, year effects, and sequential exclusion of individual jurisdictions were examined to assess the stability of the estimated relationships. The results are interpreted as associations within the analysed sample rather than as definitive causal effects.

The estimated coefficients suggest that there are several institutional mechanisms, which can be linked to the higher the level of legal convergence in the jurisdictions studied. The positive coefficient of institutional authority (IA) indicates that the more institutions are engaged in international arbitration, the more consistent the use of legal reasoning and standards of interpretation. The positive impact of legal precedent intensity (LPI) presents evidence that further reinforces the idea that frequent references to previous cases before arbitral tribunals help create closer convergence in interpretation. The best estimated one is treaty harmonization (THL), suggesting that uniformity of treaty provisions may result in a more uniform normative framework for dispute resolution. The institutional diversity (ID) also shows a positive correlation with SDR, so that the more the forum of arbitration, the more legal principles and legal procedures will diffuse. The results confirm much of the existing academic research on legal convergence and institutional coordination in the ISDS system. Within the same time frame, other explanations are not ruled out. For instance, a higher level of precedent use could be linked to more complex or mature cases, and increased institutional involvement could be linked with increased investment activity as well as convergence itself. Therefore, it is important to view the estimated coefficients as statistically significant associations rather than as causal relationships.

The estimated coefficients remained within acceptable confidence intervals under robust estimation procedures, supporting the relative stability of the observed institutional relationships. In 2022, the trend towards convergence of legal approaches became more pronounced. Ukraine, Poland, and Turkey demonstrated a significant increase in the SDR index values. The growth is partly explained by the more active use of the norms of international investment agreements. At the same time, developed jurisdictions maintained consistently high values of the indicator. The UK and the US remained leaders in the level of standardization of legal approaches. In 2023, the process of harmonization of legal standards continued. The SDR index values increased in all countries in the sample. Ukraine demonstrated particularly dynamic growth. This may indicate the gradual inclusion of national legal practice in the international investment legal space.

In 2024, a further increase in the level of standardization of legal approaches was observed. The SDR values in Germany, the UK and the US exceeded 0.80. This indicates a high level of coherence of legal arguments in international investment disputes. Ukraine also demonstrated positive dynamics. The SDR indicator reached a value of 0.63. This trend indicates the gradual adaptation of legal practices to international standards. In 2025, the general trend towards legal convergence was preserved. The highest values of the SDR index were recorded in the US and the UK. Ukraine demonstrated a value of 0.66, which indicates further convergence of legal approaches to international standards.

The results of the econometric evaluation of the model confirm a statistically significant impact of institutional factors on the standardization of investment arbitration. The most significant factor was the level of harmonization of the provisions of investment agreements. The institutional authority of international arbitration bodies also demonstrated a significant positive impact. The intensity of the use of legal precedents contributes to the spread of the same legal approaches across jurisdictions. The institutional diversity of arbitration forums also has a positive impact on the convergence of legal standards.

The results of the regression analysis demonstrate a statistically significant relationship between institutional factors and the standardization of investment dispute resolution practices. Institutional authority ($\beta = 0.182$, $p < 0.001$) exhibits a

strong positive effect, indicating that jurisdictions that are more likely to engage in arbitration proceedings tend to apply more consistent legal reasoning that is consistent with international standards. The intensity of legal precedents also has a significant positive effect ($\beta = 0.036$, $p = 0.001$), indicating that extensive citation of previous arbitration awards contributes to the convergence of legal interpretations across jurisdictions. Treaty harmonization is the most influential factor ($\beta = 0.421$, $p < 0.001$), confirming that similarity in the provisions of bilateral investment treaties significantly contributes to the development of universal approaches to investment dispute resolution. Institutional diversity further enhances this process ($\beta = 0.028$, $p = 0.016$), demonstrating that participation in multiple arbitration frameworks promotes the spread of consistent legal standards.

A comparative analysis of countries reveals some structural differences. Developed economies are characterized by more stable and high SDR values. This is explained by a larger number of arbitration cases and a more active use of international legal standards. Countries with transition economies demonstrate a gradual increase in the indicators. Ukraine and Poland show the most noticeable dynamics of convergence of legal approaches. China occupies an intermediate position between developed and transition economies. Turkey demonstrates a stable but slower increase in the standardization indicator.

In general, the results of the study confirm the important role of international judicial and arbitration institutions in the development of universal approaches to the investment dispute resolution. The expansion of the practice of using precedents contributes to the harmonization of legal standards. Harmonization of the provisions of investment agreements also plays a key role in the development of agreed legal approaches. The obtained results indicate the gradual formation of a global system of standards for the investment dispute resolution. This trend contributes to the increase in the predictability of international investment law and the stability of the investment environment.

Figure 1 shows the dynamics of the Investment Dispute Resolution Standardization Index in the studied countries for 2020–2025. The SDR index is used to assess the degree of coherence of legal approaches in international investment arbitration. The increase in the index value indicates a more active use of universal principles of international investment law. Such principles include fair and equal treatment of the investor, the doctrine of legitimate expectations, and the proportionality test. The table data demonstrate a general trend towards a gradual increase in the level of standardization of legal approaches in all studied countries.

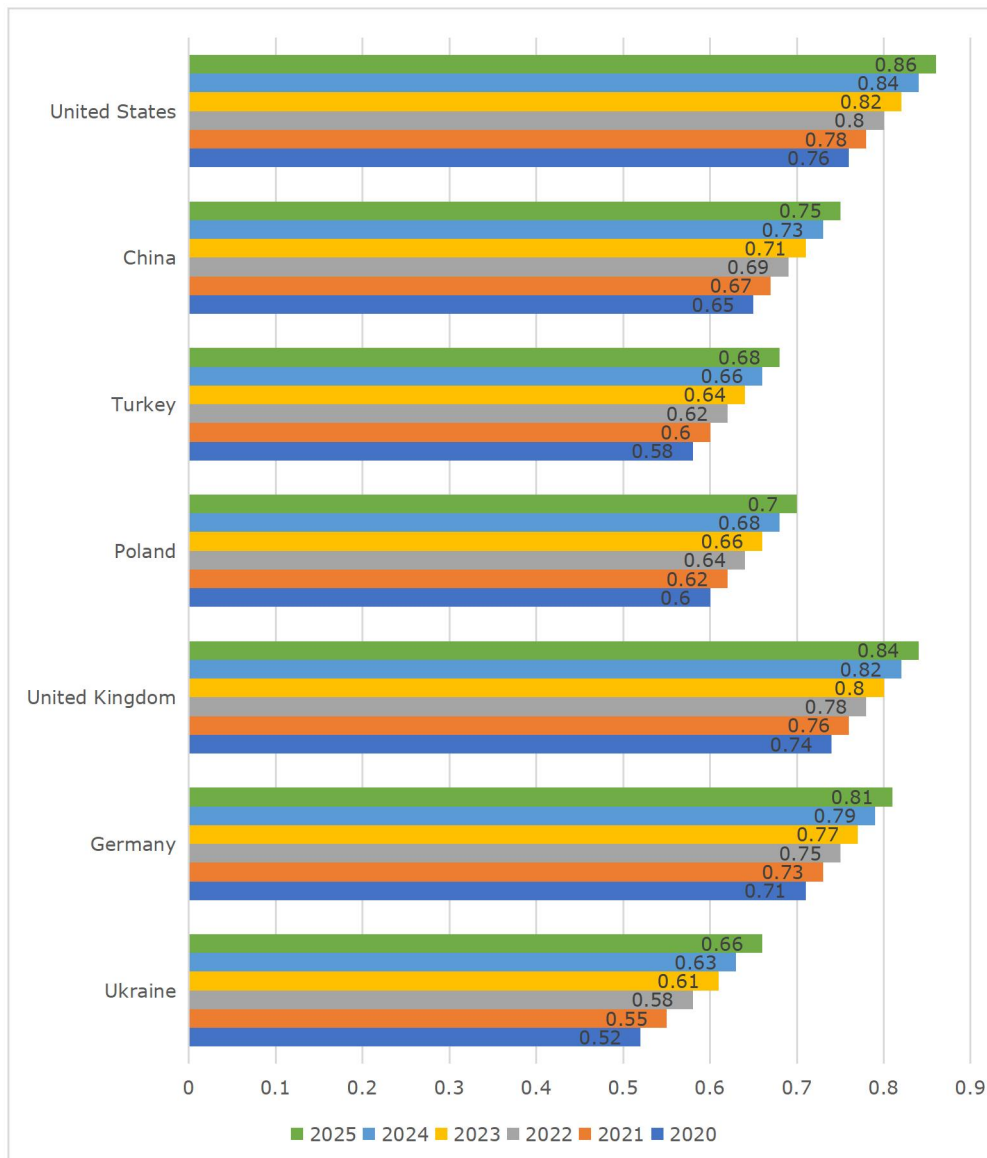


Figure 1. Dynamics of the Investment Dispute Resolution Standardization Index (SDR) by Country, 2020–2025.

Source: authors' development based on the results of an econometric model using data.^{52,53,54,55,56,57,58,59,60,61,62,63,64,65,66}

⁵² INTERNATIONAL CENTRE FOR SETTLEMENT OF INVESTMENT DISPUTES (ICSID). "ICSID caseload statistics (Issue 2024–1)". *World Bank Group*, 2024a. Ibid.

⁵³ INTERNATIONAL CENTRE FOR SETTLEMENT OF INVESTMENT DISPUTES (ICSID). "ICSID case database". *World Bank Group*, 2024b. Ibid.

⁵⁴ UNITED NATIONS CONFERENCE ON TRADE AND DEVELOPMENT. *World investment report 2023: Investing in sustainable energy for all*. 2023. Ibid.

⁵⁵ UNITED NATIONS CONFERENCE ON TRADE AND DEVELOPMENT. *Investment dispute settlement navigator*. 2024a. Ibid.

⁵⁶ UNITED NATIONS CONFERENCE ON TRADE AND DEVELOPMENT. *International investment agreements navigator*. 2024b. Ibid.

⁵⁷ WORLD BANK. *World development indicators database*. World Bank Group, 2024. Ibid.

⁵⁸ PERMANENT COURT OF ARBITRATION. *Annual report 2023*, 2023. Ibid.

⁵⁹ PERMANENT COURT OF ARBITRATION. *PCA case repository*, 2024. Ibid.

⁶⁰ UNITED NATIONS COMMISSION ON INTERNATIONAL TRADE LAW. *UNCITRAL arbitration rules and case law*. 2024. Ibid.

In 2020, there were significant differences between countries in the level of standardization of legal approaches. The highest values of the SDR index were recorded in the USA and the UK. These countries traditionally have a high level of participation in international investment arbitration. Germany also demonstrated a high level of standardization of legal practices. Ukraine and Turkey had the lowest index values among the studied countries. This indicated a less active use of universal legal standards.

In 2021, there was a moderate increase in the SDR index in all countries. This trend may be associated with a more active use of the case law of international arbitration tribunals. The most noticeable growth was observed in countries with transition economies. Ukraine and Poland demonstrated a gradual approach to the average values of the sample. At the same time, developed jurisdictions maintained consistently high positions.

In 2022, the trend towards harmonization of legal approaches became more pronounced. The values of the SDR index increased in all countries in the sample. Ukraine reached a value of 0.58, indicating increased integration into the international investment arbitration system. Poland and Turkey also showed positive dynamics. The USA and the UK remained leaders in the level of standardization of legal practices.

In 2023, further convergence of legal approaches between countries was observed. In most states, the SDR index values exceeded 0.60. Ukraine demonstrated a significant increase in the indicator to 0.61. This may indicate the gradual use of more unified legal arguments in the practice of resolving investment disputes. China also demonstrated a stable increase in the standardization indicator. In 2024, the process of convergence of legal standards continued. Germany, the UK and the US achieved SDR index values exceeding 0.79. They indicate a high level of consistency of legal approaches in these jurisdictions. Ukraine and Poland demonstrated stable positive dynamics. Turkey also gradually increased the level of standardization of legal practices.

In 2025, the general trend towards harmonization of legal standards persisted. The highest SDR index values were observed in the US and the UK. Ukraine reached a value of 0.66, which indicates further convergence of legal approaches with international standards. China and Poland also demonstrated stable growth of indicators. Overall, the results of the table confirm the gradual development of universal approaches to the investment dispute resolution. International judicial and arbitration institutions play a key role in this process through the dissemination of unified legal principles and practices.

The obtained results indicate the need for further harmonization of the provisions of international investment agreements in order to shape more consistent approaches to the investment dispute resolution. It is appropriate to strengthen the role of international arbitration institutions in the dissemination of uniform standards of legal interpretation and the application of key principles of investment law. The states are recommended to more actively integrate the practice of international

⁶¹ INTERNATIONAL CHAMBER OF COMMERCE. "ICC dispute resolution statistics". *ICC International Court of Arbitration*, 2023. Ibid.

⁶² STOCKHOLM CHAMBER OF COMMERCE ARBITRATION INSTITUTE. *Caseload 2010-2023*. SCC Arbitration Institute, 2023. Ibid.

⁶³ ORGANISATION FOR ECONOMIC CO-OPERATION AND DEVELOPMENT. *International investment agreements and investor-state dispute settlement database*, 2023. Ibid.

⁶⁴ INTERNATIONAL MONETARY FUND. *IMF data portal*. International Monetary Fund, 2024. Ibid.

⁶⁵ European Commission. "EU investment protection and dispute settlement statistics". *European Commission*, 2023. Ibid.

⁶⁶ INVESTMENT ARBITRATION REPORTER. "Investment arbitration cases database". *IAReporter*, 2024. Ibid.

arbitration tribunals into national legal systems and investment policies. An important direction is to increase the transparency of arbitration procedures and expand access to decisions on international investment disputes. Further research should be aimed at developing more comprehensive methods for quantitative analysis of international case law and its impact on the development of global investment law.

5. Discussion

The results of the study confirm the significant role of international judicial and arbitration institutions in shaping of universal approaches to the investment dispute resolution. The obtained empirical results are consistent with the theoretical provisions of modern studies of international investment law. In particular, it was found that the institutional authority of arbitration bodies and the harmonization of investment agreements significantly affect the standardization of legal approaches. These conclusions confirm the thesis about the key role of international arbitration mechanisms in ensuring the predictability of investment legal relations. These conclusions confirm the thesis about the key role of international arbitration mechanisms in ensuring the predictability of investment legal relations. The discussion interprets the econometric findings primarily through the lens of legal convergence and institutional coordination in international investment law. Therefore, the cited studies are used selectively to explain the mechanisms underlying the statistically significant relationships identified in the regression model.

The doctrinal examples discussed below should be understood as illustrative manifestations of the broader convergence patterns captured by the SDR index. These cases demonstrate how key legal principles were applied and interpreted in arbitral practice and therefore provide qualitative context for the empirical relationships identified in the econometric analysis.

In the academic literature, considerable attention is paid to the role of the principle of investor's legitimate expectations in the development of legal standards. Henckels⁶⁷ emphasizes that the principle of "legitimate expectations" is an important element of the rule of law in international investment law. The author notes that the application of this principle contributes to the formation of stable legal standards in the practice of arbitral tribunals. The results obtained in the study are consistent with this approach, as the standardization index includes the use of such legal principles in the practice of dispute resolution. So, the increase in the value of the SDR index in the studied countries may indicate the spread of uniform standards of legal interpretation.

An important aspect of the functioning of international arbitration are procedural rules and standards of evidence. Karkason⁶⁸ emphasizes the importance of the rules of evidence of the International Bar Association in the establishment of transparent arbitration procedures. The use of these rules contributes to the unification of procedural approaches in international disputes. Our study confirms this trend, as the institutional diversity of arbitration forums has a positive impact on the standardization of legal practices. This indicates the gradual development of uniform procedural standards in international arbitration.

Recent studies also draw attention to the role of digitalization of arbitration procedures. Ongenae⁶⁹ analyses the use of electronic arbitral awards and their impact

⁶⁷ HENCKELS, C. "Legitimate expectations and the rule of law in international investment law". *Investment protection standards and the rule of law*, Oxford University Press, 2023, pp. 43–68. <https://doi.org/10.1093/oso/9780192864581.003.0003>

⁶⁸ KARKASON, D. IBA rules of evidence in international arbitration. *Transnational Matters*, 2024. Available at: <https://www.transnationalmatters.com/iba-rules-of-evidence-in-international-arbitration/> (accessed on 21 April 2026).

⁶⁹ ONGENAE, K. "Electronic arbitral awards: Yea or nay? A glimpse inside the minds of arbitral institutions". *Journal of International Arbitration*, v. 40, n. 3, 2023, pp. 263–300.

on the efficiency of international arbitration. The author notes that digital technologies contribute to increasing the accessibility and speed of arbitration procedures. The study by Nahnybida⁷⁰ provides similar conclusions on the impact of the COVID-19 pandemic on the digitalization of arbitration processes. The author argues that the use of remote procedures has become an important element of modern arbitration. These trends indirectly support the broader process of procedural and institutional convergence identified in this study. In this context, digitalization is considered relevant not as an independent determinant of SDR growth, but as a procedural factor facilitating greater consistency, accessibility, and institutional interaction within arbitration practice.

Special attention in academic research has been paid to the problems of combating corruption in the field of international investment. Olmos Giupponi and Yu⁷¹ emphasize the complexity of considering cases related to illegal investments. The authors note that international tribunals play an important role in shaping standards for combating corruption. The results of the study partially confirm this approach, as the strengthening of the role of arbitration institutions contributes to the spread of uniform legal standards. In this context, international arbitration mechanisms can act as a tool for ensuring transparency in investment relations. The relevance of anti-corruption standards in this discussion derives from their contribution to the broader process of harmonization of arbitral reasoning and institutional legitimacy within the ISDS system.

Comparative analysis shows that the results of the study are also consistent with studies of alternative mechanisms for resolving international disputes. Greggi and Miotto⁷² analyse the tax dispute resolution system within the Organization for Economic Cooperation and Development. The authors emphasize the importance of institutional mechanisms for the effective resolution of international conflicts. A similar approach is observed in our study, where the institutional authority of arbitration bodies demonstrated a significant impact on the standardization of legal approaches. Ukrainian scholars are also actively researching the theoretical foundations of international commercial arbitration. Makeieva and Mudryk⁷³ emphasize the importance of arbitration as an alternative mechanism for resolving international commercial disputes. Similar conclusions are drawn in the studies of Petryna⁷⁴ and Nesterenko,⁷⁵ which analyse conceptual approaches to defining the concept of international commercial arbitration. The authors emphasize the importance of clearly defining the legal nature of arbitration in national legislation. In this context, the results of the study confirm the need for further development of institutional mechanisms for international arbitration.

<https://doi.org/10.54648/JOIA2023013>

⁷⁰ NAHNYBIDA, V. I. "The influence of quarantine COVID-restrictions related and policy of digitalization on dispute resolution via international commercial arbitration". *University Scientific Notes*, v. 6, n. 84, 2021, pp. 8–16. <https://doi.org/10.37491/UNZ.84.1>

⁷¹ OLMOS GIUPPONI, B., and YU, H. L. "Analysing Obstacles and Challenges in Fighting Corruption in Cases of Illegal Investments". *Laws*, v. 11, n. 4, 2022, pp. 59. <https://doi.org/10.3390/laws11040059>

⁷² GREGGI, M., and MIOTTO, A. "The OECD dispute resolution system in tax controversies". *Laws*, v. 13, n. 4, 2024, 45. <https://doi.org/10.3390/laws13040045>

⁷³ MAKEIEVA, O. M., and MUDRYK, R. R. "International commercial arbitration: Theoretical and legal aspects". *Scientific Works of Kyiv Aviation Institute. Series Law Journal "Air and Space Law"*, v. 3, n. 56, 2020, pp. 61–66. <https://doi.org/10.18372/2307-9061.56.14892>

⁷⁴ PETRYNA, V. N. "International commercial arbitration: Conceptual problems in Ukrainian law". *Scientific Perspectives*, v. 6, n. 24, 2022, pp. 427–435. [https://doi.org/10.52058/2708-7530-2022-6\(24\)-427-435](https://doi.org/10.52058/2708-7530-2022-6(24)-427-435)

⁷⁵ NESTERENKO, M. D. "Theoretical approaches to defining the concept and features of international commercial arbitration". *Theory and Practice of Jurisprudence*, v. 1, n. 23, 2023, pp. 84–99. <https://doi.org/10.21564/2225-6555.2023.23.274457>

The results of the study confirm the growing role of international institutions in shaping more coherent approaches to the investment dispute resolution. Similar trends are observed in other areas of international law. In particular, Lysenko et al.⁷⁶ emphasize the importance of harmonization of international standards and institutional cooperation for effective global regulation. The obtained results are consistent with this approach, as the harmonization of investment treaties has proven to be a key factor in legal convergence.

The comparative analysis also demonstrates the relationship between the effectiveness of international institutions and the level of coordination between states. Voloshanivska et al.⁷⁷ note that reforms of the global justice system are aimed at strengthening institutional interaction and combating corruption. This confirms the conclusions of the study on the importance of institutional interaction between arbitration forums. In turn, Antoshkina et al.⁷⁸ emphasize the role of the development of legal education for the effective functioning of international legal mechanisms. This indicates that the development of universal standards in international arbitration depends not only on institutions, but also on the development of the legal profession.

There is growing literature on international investment law that now reflects the challenges of fragmentation, legitimacy and consistency of the ISDS system. The argument of Schill⁷⁹ is that international investment law shows a gradual and incremental shift towards international multilateralism, as the arbitral reasoning increasingly aligns with the treaty interpretation. Van Harten,⁸⁰ however, highlights the spread of arbitration's roles as a public law alternative, thus calling into question the legitimacy and accountability of international arbitration. The same kind of criticism is advanced by Franck⁸¹ who emphasizes the dangers of conflicting rulings by arbitrators and the legitimacy crisis in investment treaty arbitration.

Roberts⁸² and Roberts⁸³ looks at the simultaneous presence of divergent interpretative paradigms in international investment law and shows that convergence is not achieved because of differences in legal culture, institutional practice and approaches to treaty interpretation. Sornarajah⁸⁴ considers the development of investment arbitration and warns of the conflict between investor protection and state sovereignty in the modern investment regime. The institutionalization of

⁷⁶ LYSENKO, S., LIUBCHENKO, A., KOZAKOV, V., DEMIANCHUK, Y., and KRUTIK, Y. "Global cybersecurity: Harmonising international standards and cooperation". *Multidisciplinary Reviews*, v. 7, 2024, pp. e2024spe021. <https://doi.org/10.31893/multirev.2024spe021>

⁷⁷ VOLOSHANIVSKA, T., SHCHOKIN, R., PAVLOVA, O., FRANTSUZ, A. Y., and DEI, M. O. "Reforming global criminal justice: Addressing corruption's impact on armed crime". *Journal of Law and Legal Reform*, v. 5, n. 3, 2024, pp. 1369–1404. <https://doi.org/10.15294/jllr.v5i3.4082>

⁷⁸ ANTOSHKINA, V. K., SHEVCHENKO, A. Y., SKRYL, S. A., SADOVYI, S. M., and KUZNICHENKO, O. V. "Problems of legal education development in Ukraine". *International Journal of the Legal Profession*, v. 31, n. 2, 2024, pp. 175–185. <https://doi.org/10.1080/09695958.2023.2279758>

⁷⁹ SCHILL, S. W. *The multilateralization of international investment law*. Cambridge University Press, 2009. <https://doi.org/10.1017/CBO9780511605451>

⁸⁰ VAN HARTEN, G. *Investment treaty arbitration and public law*. Oxford University Press, 2007. <https://doi.org/10.1093/acprof:oso/9780199552146.001.0001>

⁸¹ FRANCK, S. D. "The legitimacy crisis in investment treaty arbitration: Privatizing public international law through inconsistent decisions". *Fordham Law Review*, v. 73, n. 4, 2005, pp. 1521–1625. Available at: <https://ssrn.com/abstract=812964> (accessed on 9 March 2026).

⁸² ROBERTS, A. "Clash of paradigms: Actors and analogies shaping the investment treaty system". *American Journal of International Law*, v. 107, n. 1, 2013, pp. 45–94. <https://doi.org/10.5305/amerjintelaw.107.1.0045>

⁸³ ROBERTS, A. *Is international law international?* Oxford University Press, 2017. <https://doi.org/10.1093/oso/9780190696412.001.0001>

⁸⁴ SORNARAJAH, M. *The international law on foreign investment*. 4th ed. Cambridge University Press, 2017. <https://doi.org/10.1017/9781316459959>

investment arbitration brings some uniformity to legal standards, according to Alvarez⁸⁵, although there is still a lot of doctrinal variation among tribunals.

Other research focuses on the process of the emergence of consistency in arbitral law. Hence, a reliance on repeated cases before arbitrators helps build a framework of international investment law and facilitates progressive development of jurisprudence constante, argues Schill⁸⁶. Van Harten and Loughlin⁸⁷ reach the same results after analysing investment arbitration as a new type of global administrative law that is becoming more and more procedural coordinated and standardized. Furthermore, Franck⁸⁸ shows that, the issue of inconsistency in investment arbitration must be analysed systematically on an empirical basis and not just on a doctrinal level.

The practical aspect of the functioning of international arbitration is also reflected in judicial practice. The decision of the Supreme Court of Ukraine in case No. 925/200/22 demonstrates the growing role of international arbitration in resolving corporate and investment disputes.⁸⁹ Judicial practice confirms the importance of arbitration mechanisms for ensuring effective protection of the rights of participants in international economic relations. So, the results of the study are consistent with modern scientific and practical approaches to the development of international investment arbitration. In general, the analysis confirms that international judicial and arbitration institutions play a key role in shaping of universal approaches to the investment dispute resolution.

Overall, the empirical findings are most directly explained by the interaction between treaty harmonization, institutional authority, and repeated reliance on arbitral precedent, all of which contribute to greater coherence of legal interpretation across jurisdictions. The broader literature discussed in this section provides contextual support for these institutional mechanisms rather than independent explanatory variables within the econometric model.

The obtained results confirm the hypotheses advanced in the study on the positive impact of the institutional authority of arbitration bodies and the harmonization of investment agreements on the standardization of legal approaches. In particular, the empirical analysis confirmed that the more intensive use of precedents and the participation of states in international arbitration institutions contribute to the development of universal legal standards. The practical significance of the results is the possibility of using the obtained conclusions to improve international investment policy and harmonise the provisions of investment agreements. The obtained results can also be used by international arbitration institutions and state bodies to increase the efficiency of investment dispute resolution mechanisms.

The quantitative results of the study are also supported by selected doctrinal developments in international investment arbitration practice. In particular, arbitral tribunals increasingly rely on similar interpretative approaches regarding fair and equitable treatment (FET), legitimate expectations, and proportionality analysis.

⁸⁵ ALVAREZ, J. E. *The public international law regime governing international investment*. Hague Academy of International Law, 2011. <https://doi.org/10.1163/9789004249936>

⁸⁶ SCHILL, S. W. "System-building in investment treaty arbitration and lawmaking". *German Law Journal*, v. 12, n. 5, 2011, pp. 1083–1110. <https://doi.org/10.1017/S2071832200017235>

⁸⁷ VAN HARTEN, G., and LOUGHLIN, M. "Investment treaty arbitration as a species of global administrative law". *European Journal of International Law*, v. 17, n. 1, 2006, pp. 121–150. <https://doi.org/10.1093/ejil/chi159>

⁸⁸ FRANCK, S. D. "Empirically evaluating claims about investment treaty arbitration". *North Carolina Law Review*, v. 86, n. 1, 2007, pp. 1–88. Available at: <https://scholarship.law.unc.edu/nclr/vol86/iss1/2> (accessed on 21 April 2026).

⁸⁹ SUPREME COURT OF UKRAINE. *Ruling in case No. 925/200/22*. Unified State Register of Court Decisions, 2024. Available at: <https://reyestr.court.gov.ua/Review/116984639> (accessed on 6 January 2026).

For example, in *Tecmed v. Mexico*, the tribunal emphasized the importance of protecting the investor's legitimate expectations as part of the FET standard. Similar reasoning was later developed in *LG&E v. Argentina* and *CMS v. Argentina*, where tribunals linked state conduct with requirements of transparency, consistency, and predictability in regulatory action. Although tribunals apply these principles differently depending on factual circumstances, the repeated reliance on comparable legal reasoning demonstrates a tendency toward interpretative convergence in investment arbitration.

Convergence can also be observed in proportionality analysis and necessity-related reasoning. In *Continental Casualty v. Argentina*, the tribunal applied a balancing approach between investor protection and public policy objectives. Similar analytical structures appear in later investment disputes concerning emergency economic measures and regulatory interventions.

At the same time, the study does not assume complete uniformity of interpretation across tribunals. Divergences remain visible in the application of umbrella clauses, MFN clauses, and the scope of legitimate expectations. Therefore, the concept of standardization used in this article refers to the gradual convergence of argumentative frameworks and legal reasoning rather than absolute doctrinal uniformity.

Although the results demonstrate statistically significant relationships between institutional factors and legal standardization, these findings should be interpreted within the boundaries of the selected sample. The analysed jurisdictions represent illustrative examples of different legal and institutional environments rather than a globally representative cross-section of the ISDS system. Therefore, the observed patterns should be understood as evidence of legal convergence within the examined jurisdictions during the 2020–2025 period rather than as confirmation of universally applicable trends across all regions and investment regimes.

6. Limitation

The study has certain limitations related to the availability and comparability of data on international investment disputes across jurisdictions. The intensity of precedent use may also vary depending on the legal complexity and substantive characteristics of particular categories of investment disputes, which may affect the comparability of arbitral reasoning across cases. The 2025 observations are based on partial data availability and therefore may be subject to future revision as additional arbitration decisions and institutional statistics become publicly available. Further research could extend the time horizon of the analysis and include a larger number of jurisdictions for a deeper understanding of the processes of legal convergence in the field of investment disputes. Future studies may expand the regional coverage by including jurisdictions from Latin America, Africa, and Southeast Asia in order to assess possible differences in regional patterns of ISDS convergence. Part of the arbitration awards remain confidential, which limits the possibility of fully covering the entire practice of international investment arbitration. Limitations are also associated with the use of index indicators, which generalize complex legal phenomena and may simplify certain aspects of the legal analysis. Furthermore, the study covers a limited number of countries, which may affect the representativeness of the results in a global context. Due to the use of normalized composite indicators, the dataset reflects aggregated institutional trends rather than the full procedural complexity of individual arbitration proceedings. Due to the relatively small panel sample and observational nature of the dataset, the study does not establish definitive causal relationships between institutional factors and legal convergence. The results should therefore be interpreted as evidence of statistically significant associations within the analysed comparative framework.

Several limitations should be considered when interpreting the results. The panel dataset includes a relatively small number of jurisdictions and covers a limited time horizon. In addition, the SDR indicator is a composite measure that captures multiple dimensions of legal convergence. Consequently, although the regression results identify statistically significant relationships between institutional factors and legal standardization, they do not establish causality. The findings should therefore be interpreted as evidence of association within the analysed sample rather than definitive proof of causal effects operating throughout the broader ISDS system.

The relatively small sample size and short observation period limit the ability to capture the full diversity and long-term evolution of investment arbitration practice. Furthermore, the quantitative indicators employed in the study are intended to complement doctrinal legal analysis rather than substitute for detailed examination of arbitral reasoning and legal interpretation.

The empirical analysis is based on a relatively small panel consisting of seven jurisdictions observed over the period 2020–2025. Consequently, although the applied econometric procedures provide useful insights into institutional patterns associated with legal convergence, the statistical estimates should be interpreted with caution. The limited number of observations restricts the scope for extensive robustness testing and reduces the ability to draw strong causal inferences. Therefore, the findings should be viewed primarily as exploratory evidence requiring further validation in larger and more diverse samples.

7. Conclusions

The relevance of the study is determined by the growing number of international investment disputes and the need to form agreed legal approaches to their effective resolution. The analysis of the role of international judicial and arbitration institutions in ensuring the predictability of the legal environment for foreign investments is of particular importance.

The results of econometric modelling confirmed the statistically significant impact of the studied institutional factors on the Investment Dispute Resolution Standardization Index. The greatest impact was demonstrated by the level of harmonization of investment agreement provisions with a coefficient of 0.421. The institutional authority of international arbitration bodies also showed a significant positive impact on the standardization of legal practices with a coefficient of 0.182. The intensity of the use of legal precedents contributes to the spread of the same legal approaches in different jurisdictions with a coefficient of 0.036. The institutional diversity of arbitration forums also has a positive impact on the process of legal convergence. The obtained results are confirmed by the high statistical characteristics of the model, in particular the coefficient of determination at the level of 0.71. Analysis of the dynamics of the Investment Dispute Resolution Standardization Index for 2020–2025 showed a gradual increase in the level of legal convergence in all the countries studied. The highest values of the SDR index were recorded in the USA and the UK, where in 2025 the indicator reached 0.86 and 0.84, respectively. Germany also demonstrates a consistently high level of standardization of legal approaches with an indicator of 0.81 in 2025. Countries with economies in transition showed a more dynamic growth of the indicator. Ukraine increased the value of the SDR index from 0.52 in 2020 to 0.66 in 2025. A similar trend is observed in Poland and Turkey, which indicates the gradual integration of these countries into the international investment arbitration system.

In general, the results of the study confirm that international judicial and arbitration institutions play an important role in shaping of universal approaches to the investment dispute resolution. At the same time, the findings should be interpreted with caution, as the study is based on a limited comparative sample and does not aim to establish universally applicable conclusions for the entire global

investment arbitration system. Rather, the identified trends reflect indicative patterns of legal convergence observed within the selected jurisdictions during the analysed period. The spread of the practice of using precedents contributes to the harmonization of legal standards between different jurisdictions. Harmonization of the provisions of international investment agreements is also a key factor in the development of agreed legal approaches. The obtained results indicate patterns of increasing legal convergence and standardization within the selected jurisdictions, suggesting the potential development of more coherent approaches to investment dispute resolution. The prospects for further research are associated with expanding the geography of analysis and including a larger number of jurisdictions. It is also appropriate to increase the time limits of the study to analyse long-term trends in the development of investment arbitration. Further research can combine econometric methods with a more in-depth legal analysis of specific arbitration cases. This will allow for a more complete assessment of the mechanisms contributing to the convergence of legal standards in international investment law.

The study should be viewed as an exploratory empirical assessment of selected dimensions of legal convergence in international investment arbitration. The proposed indicators provide a quantitative framework for analysing institutional patterns associated with standardization; however, they do not fully capture the doctrinal complexity of arbitral reasoning. Future research may benefit from focusing on narrower dimensions of convergence, including the interpretation of fair and equitable treatment, legitimate expectations, proportionality analysis, or the use of precedent within specific categories of investment disputes. Combining quantitative methods with detailed doctrinal and case-based analysis may provide a more comprehensive understanding of convergence processes within the ISDS system.

8. References

- ALVAREZ, J. E. *The public international law regime governing international investment*. Hague Academy of International Law, 2011. <https://doi.org/10.1163/9789004249936>
- ANISOVA, O. I. "The genesis of the concept of international commercial arbitration". *Scientific Bulletin of Uzhhorod National University. Series: Law*, v. 88, n. 4, 2025, pp. 9–15. <https://doi.org/10.24144/2307-3322.2025.88.4.1>
- ANTOSHKINA, V. K., SHEVCHENKO, A. Y., SKRYL, S. A., SADOVYI, S. M., and KUZNICHENKO, O. V. "Problems of legal education development in Ukraine". *International Journal of the Legal Profession*, v. 31, n. 2, 2024, pp. 175–185. <https://doi.org/10.1080/09695958.2023.2279758>
- DONG, L. "Why International Conciliation Can Resolve Maritime Disputes: A Study Based on the Jan Mayen Case". *Sustainability*, v. 15, n. 3, 2023, pp. 1830. <https://doi.org/10.3390/su15031830>
- European Commission. "EU investment protection and dispute settlement statistics". *European Commission*, 2023. Available at: <https://policy.trade.ec.europa.eu> (accessed on 21 April 2026).
- FRANCK, S. D. "Empirically evaluating claims about investment treaty arbitration". *North Carolina Law Review*, v. 86, n. 1, 2007, pp. 1–88. Available at: <https://scholarship.law.unc.edu/nclr/vol86/iss1/2> (accessed on 21 April 2026).
- FRANCK, S. D. "The legitimacy crisis in investment treaty arbitration: Privatizing public international law through inconsistent decisions". *Fordham Law Review*, v. 73, n. 4, 2005, pp. 1521–1625. Available at: <https://ssrn.com/abstract=812964> (accessed on 9 March 2026).
- GAVRIIL, E. "Protection of property under human rights and international investment law: A case-law analysis". *Laws*, v. 13, n. 1, 2024, pp. 6. <https://doi.org/10.3390/laws13010006>
- GREGGI, M., and MIOTTO, A. "The OECD dispute resolution system in tax controversies". *Laws*, v. 13, n. 4, 2024, 45. <https://doi.org/10.3390/laws13040045>
- HENCKELS, C. "Legitimate expectations and the rule of law in international investment law". *Investment protection standards and the rule of law*, Oxford University Press, 2023, pp. 43–68. <https://doi.org/10.1093/oso/9780192864581.003.0003>

- HINRICHSEN, E. "Reconciling international climate law and the energy charter treaty through the use of integrative interpretation in arbitration". *Laws*, v. 13, n. 2, 2024, pp. 24. <https://doi.org/10.3390/laws13020024>
- INTERNATIONAL CENTRE FOR SETTLEMENT OF INVESTMENT DISPUTES (ICSID). "ICSID caseload statistics (Issue 2024-1)". *World Bank Group*, 2024a. Available at: <https://icsid.worldbank.org/sites/default/files/publications/2024-2%20ENG%20-%20The%20ICSID%20Caseload%20Statistics%20%28Issue%202024-2%29.pdf> (accessed on 21 April 2026).
- INTERNATIONAL CENTRE FOR SETTLEMENT OF INVESTMENT DISPUTES (ICSID). "ICSID case database". *World Bank Group*, 2024b. Available at: <https://icsid.worldbank.org/cases/case-database> (accessed on 21 April 2026).
- INTERNATIONAL CHAMBER OF COMMERCE. "ICC dispute resolution statistics". *ICC International Court of Arbitration*, 2023. Available at: <https://iccwbo.org/dispute-resolution-services> (accessed on 9 March 2026).
- INTERNATIONAL COMMERCIAL ARBITRATION COURT AT THE UKRAINIAN CHAMBER OF COMMERCE AND INDUSTRY. *ICAC recommendations on submitting documents in electronic form*. 2022. Available at: https://icac.org.ua/wp-content/uploads/Rekomendatsiyi-ISAS_elektronni-dokumenty_ukr.pdf (accessed on 21 April 2026).
- INTERNATIONAL MONETARY FUND. *IMF data portal*. International Monetary Fund, 2024. Available at: <https://data.imf.org> (accessed on 9 March 2026).
- INVESTMENT ARBITRATION REPORTER. "Investment arbitration cases database". *IAReporter*, 2024. Available at: <https://www.iareporter.com> (accessed on 9 March 2026).
- KARKASON, D. IBA rules of evidence in international arbitration. *Transnational Matters*, 2024. Available at: <https://www.transnationalmatters.com/iba-rules-of-evidence-in-international-arbitration/> (accessed on 21 April 2026).
- KRAVTSOV, S. O. "Online platforms as a guarantee of effective dispute resolution in international commercial arbitration". *Current Issues in Modern Science*, v. 8, n. 14, 2023, pp. 462–476. [https://doi.org/10.52058/2786-6300-2023-8\(14\)-462-476](https://doi.org/10.52058/2786-6300-2023-8(14)-462-476)
- KULESZA, J. "Peaceful settlement of interstate online disputes". *Laws*, v. 11, n. 3, 2022, pp. 49. <https://doi.org/10.3390/laws11030049>
- LYSENKO, S., LIUBCHENKO, A., KOZAKOV, V., DEMIANCHUK, Y., and KRUTIK, Y. "Global cybersecurity: Harmonising international standards and cooperation". *Multidisciplinary Reviews*, v. 7, 2024, pp. e2024spe021. <https://doi.org/10.31893/multirev.2024spe021>
- MAKEIEVA, O. M., and MUDRYK, R. R. "International commercial arbitration: Theoretical and legal aspects". *Scientific Works of Kyiv Aviation Institute. Series Law Journal "Air and Space Law"*, v. 3, n. 56, 2020, pp. 61–66. <https://doi.org/10.18372/2307-9061.56.14892>
- NAHNYBIDA, V. I. "The influence of quarantine COVID-restrictions related and policy of digitalization on dispute resolution via international commercial arbitration". *University Scientific Notes*, v. 6, n. 84, 2021, pp. 8–16. <https://doi.org/10.37491/UNZ.84.1>
- NAHNYBIDA, V. I. "Verification of parties and security of communication channels in resolving disputes in arbitration by videoconference". *Scientific Bulletin of the International Humanitarian University. Series: Jurisprudence*, v. 66, 2023, pp. 74–77. <https://doi.org/10.32782/2307-1745.2023.66.16>
- NESTERENKO, M. D. "Theoretical approaches to defining the concept and features of international commercial arbitration". *Theory and Practice of Jurisprudence*, v. 1, n. 23, 2023, pp. 84–99. <https://doi.org/10.21564/2225-6555.2023.23.274457>
- OLMOS GIUPPONI, B., and YU, H. L. "Analysing Obstacles and Challenges in Fighting Corruption in Cases of Illegal Investments". *Laws*, v. 11, n. 4, 2022, pp. 59. <https://doi.org/10.3390/laws11040059>
- ONGENAE, K. "Electronic arbitral awards: Yea or nay? A glimpse inside the minds of arbitral institutions". *Journal of International Arbitration*, v. 40, n. 3, 2023, pp. 263–300. <https://doi.org/10.54648/JOIA2023013>
- ORGANISATION FOR ECONOMIC CO-OPERATION AND DEVELOPMENT. *International investment agreements and investor-state dispute settlement database*, 2023. Available at: <https://www.oecd.org/investment> (accessed on 21 April 2026).
- PERMANENT COURT OF ARBITRATION. *Annual report 2023*, 2023. Available at: <https://pca-cpa.org/en/about/annual-reports> (accessed on 9 March 2026).
- PERMANENT COURT OF ARBITRATION. *PCA case repository*, 2024. Available at: <https://pca-cpa.org/en/cases> (accessed on 9 March 2026).

- PETRYNA, V. N. "International commercial arbitration: Conceptual problems in Ukrainian law". *Scientific Perspectives*, v. 6, n. 24, 2022, pp. 427–435. [https://doi.org/10.52058/2708-7530-2022-6\(24\)-427-435](https://doi.org/10.52058/2708-7530-2022-6(24)-427-435)
- ROBERTS, A. "Clash of paradigms: Actors and analogies shaping the investment treaty system". *American Journal of International Law*, v. 107, n. 1, 2013, pp. 45–94. <https://doi.org/10.5305/amerjintelaw.107.1.0045>
- ROBERTS, A. *Is international law international?* Oxford University Press, 2017. <https://doi.org/10.1093/oso/9780190696412.001.0001>
- SCHILL, S. W. "System-building in investment treaty arbitration and lawmaking". *German Law Journal*, v. 12, n. 5, 2011, pp. 1083–1110. <https://doi.org/10.1017/S2071832200017235>
- SCHILL, S. W. *The multilateralization of international investment law*. Cambridge University Press, 2009. <https://doi.org/10.1017/CBO9780511605451>
- SORNARAJAH, M. *The international law on foreign investment*. 4th ed. Cambridge University Press, 2017. <https://doi.org/10.1017/9781316459959>
- STOCKHOLM CHAMBER OF COMMERCE ARBITRATION INSTITUTE. *Caseload 2010-2023*. SCC Arbitration Institute, 2023. Available at: <https://sccarbitrationinstitute.se/en/statistics-2023/> (accessed on 9 March 2026).
- SUPREME COURT OF UKRAINE. *Ruling in case No. 925/200/22*. Unified State Register of Court Decisions, 2024. Available at: <https://reyestr.court.gov.ua/Review/116984639> (accessed on 6 January 2026).
- TOSCANO-VALLE, A., SIANES, A., SANTOS-CARRILLO, F., and FERNÁNDEZ-PORTILLO, L. A. "Can the rational design of international institutions solve cooperation problems? Insights from a systematic literature review". *Sustainability*, v. 14, n. 13, 2022, 7866. <https://doi.org/10.3390/su14137866>
- UNITED NATIONS COMMISSION ON INTERNATIONAL TRADE LAW. UNCITRAL arbitration rules and case law. 2024. Available at: <https://uncitral.un.org> (accessed on 9 March 2026).
- UNITED NATIONS CONFERENCE ON TRADE AND DEVELOPMENT. International investment agreements navigator. 2024b. Available at: <https://investmentpolicy.unctad.org/international-investment-agreements> (accessed on 9 March 2026).
- UNITED NATIONS CONFERENCE ON TRADE AND DEVELOPMENT. Investment dispute settlement navigator. 2024a. Available at: <https://investmentpolicy.unctad.org/investment-dispute-settlement> (accessed on 6 January 2026).
- UNITED NATIONS CONFERENCE ON TRADE AND DEVELOPMENT. World investment report 2023: Investing in sustainable energy for all. 2023. Available at: <https://unctad.org/publication/world-investment-report-2023> (accessed on 6 January 2026).
- VAN HARTEN, G. *Investment treaty arbitration and public law*. Oxford University Press, 2007. <https://doi.org/10.1093/acprof:oso/9780199552146.001.0001>
- VAN HARTEN, G., and LOUGHLIN, M. "Investment treaty arbitration as a species of global administrative law". *European Journal of International Law*, v. 17, n. 1, 2006, pp. 121–150. <https://doi.org/10.1093/ejil/chi159>
- VOLOSHANIVSKA, T., SHCHOKIN, R., PAVLOVA, O., FRANTSUZ, A. Y., and DEI, M. O. "Reforming global criminal justice: Addressing corruption's impact on armed crime". *Journal of Law and Legal Reform*, v. 5, n. 3, 2024, pp. 1369–1404. <https://doi.org/10.15294/jllr.v5i3.4082>
- WORLD BANK. *World development indicators database*. World Bank Group, 2024. Available at: <https://data.worldbank.org> (accessed on 6 January 2026).
- ZERNOVA, K. "The role of international arbitration institutions in the development of world trade [Conference paper]". *Proceedings of the International Center for Scientific Research Conferences*. Kyiv, Ukraine, 2025, pp. 165–169. Available at: <https://archives.mcnd.org.ua/index.php/conference-proceeding/article/view/1075> (accessed on 6 January 2026).

9. Appendix

Appendix A. Construction of the empirical dataset and SDR index

A1. General structure of the dataset

The empirical dataset used in this study was constructed as a country-year panel covering seven jurisdictions (Ukraine, Germany, the United Kingdom, Poland, Turkey, China, and the United States) for the period 2020–2025. The dataset combines information obtained from publicly available arbitration awards, international investment agreement databases, institutional arbitration statistics, and legal analytical sources.

The primary unit of observation is the country-year level. The indicators were constructed through aggregation and normalization of coded observations derived from arbitration practice and treaty provisions associated with each jurisdiction during the analysed period.

The empirical material was collected from the following databases and institutional sources:

- ICSID Case Database;
- UNCTAD Investment Dispute Settlement Navigator;
- UNCTAD International Investment Agreements Navigator;
- Permanent Court of Arbitration (PCA) Case Repository;
- OECD Investment Agreements Database;
- Investment Arbitration Reporter;
- ICC Arbitration Statistics;
- SCC Arbitration Statistics.

Only publicly accessible arbitration materials and treaty texts were included in the dataset.

A2. Construction of the investment dispute resolution standardization index (SDR)

The Investment Dispute Resolution Standardization Index (SDR) was developed as a normalized composite indicator ranging from 0 to 1.

The purpose of the index is to provide a quantitative proxy for selected dimensions of legal convergence, specifically the consistent substantive use of core legal principles and related argumentative structures in international investment dispute resolution. The index does not purport to measure the complete content, direction, or doctrinal correctness of tribunal interpretations.

The SDR index was calculated using the following structure:

$$SDR_{it} = \frac{FET_{it} + LE_{it} + PROP_{it}}{3} \quad (2)$$

where:

- FET – use of the fair and equitable treatment principle;
- LE – use of the legitimate expectations doctrine;
- PROP – application of proportionality analysis;

Each component received equal weighting (0.33) within the composite structure of the SDR index. The resulting values were normalized to a scale from 0 to 1 in order to ensure comparability across jurisdictions and years.

The SDR index reflects the degree of consistency in the use of core legal principles and argumentative structures. The index does not assume complete uniformity of legal interpretation across tribunals.

Illustratively, if a country-year observation demonstrated substantive use of fair and equitable treatment, legitimate expectations, and proportionality analysis in the majority of coded arbitral decisions, the normalized SDR value approached the upper segment of the 0–1 scale. Lower values reflected less consistent reliance on these interpretative approaches across the analysed awards.

A3. Coding methodology

The coding process was based on qualitative legal analysis combined with quantitative aggregation procedures.

A legal principle was considered “used” when:

- the arbitral tribunal engaged in substantive legal reasoning concerning the principle;
- the principle formed part of the tribunal’s interpretative analysis;
- the principle influenced the reasoning or legal justification of the award.

Mere incidental references without analytical discussion were not treated as sufficient for coding purposes.

The following types of arbitral materials were included:

- jurisdictional decisions;
- merits awards;
- annulment decisions.

Settlement agreements and confidential awards without publicly available legal reasoning were excluded from the dataset due to the absence of verifiable legal analysis.

To improve methodological consistency, the coding procedure was based on standardized analytical criteria applied across all sampled jurisdictions and years. Comparative cross-checking of coded observations was conducted using multiple arbitration databases and treaty sources. The normalization and aggregation procedures were additionally reviewed to ensure internal consistency of the constructed indicators within the panel dataset.

For illustrative purposes, the coding procedure included publicly available investment arbitration awards in which the analysed jurisdiction participated either as respondent state or as a relevant treaty party. Examples of arbitral materials considered during the coding process include cases administered under the ICSID and PCA frameworks involving interpretation of fair and equitable treatment, legitimate expectations, proportionality, and related investment protection standards.

During coding, each award was assessed according to the presence of substantive legal reasoning concerning the selected principles. The coded observations were subsequently aggregated at the country-year level and normalized for comparative analysis.

To improve the reproducibility of the empirical analysis, the construction of each country-year observation followed a standardized sequence. First, publicly available arbitral materials were identified for each sampled jurisdiction and year using the specified arbitration databases. Second, each eligible award was coded according to the predefined SDR components (FET, legitimate expectations, and proportionality analysis), while precedent references were coded separately for the LPI indicator. Third, the coded award-level observations were aggregated at the country-year level using the arithmetic mean of the available coded observations for each indicator. Fourth, the resulting country-year measures were normalized to the relevant indicator scale used in the panel dataset. The same coding and aggregation procedure were applied consistently across all seven jurisdictions and all years in the 2020–2025 observation period. Awards without publicly available substantive legal

reasoning were excluded. These procedures were applied to ensure consistency of measurement and comparability across country-year observations.

To clarify the construct measured by the SDR index, the coding captures substantive rather than merely incidental reliance on the selected principles. However, the index is not intended to capture every dimension of interpretative convergence, such as the precise legal test, evidentiary threshold, factual application, or authorities followed or distinguished by a tribunal. Accordingly, the SDR should be interpreted as a quantitative proxy for selected dimensions of convergence in legal reasoning rather than as a comprehensive measure of doctrinal uniformity. The qualitative case examples in the Discussion provide additional context regarding how the identified principles are interpreted and applied in arbitral practice.

For each country-year observation, all eligible publicly available arbitral materials identified for the respective jurisdiction and year were coded using the same criteria. The year of an observation was determined by the year of the relevant publicly available decision. Where an arbitral proceeding involved more than one sampled jurisdiction, the observation was associated with each relevant jurisdiction according to its participation in the proceeding. Jurisdictional decisions, merits awards, and annulment decisions were treated as separate publicly available arbitral materials and were coded using the same substantive-principle criteria. Materials without sufficient publicly available legal reasoning were excluded.

For each country-year observation, the component score was calculated as the arithmetic mean of the coded award-level observations available for that country and year. Thus, the denominator for each component was the number of eligible coded arbitral materials contributing to the respective country-year observation. The resulting component scores were combined using equal weights for FET, legitimate expectations, and proportionality analysis and subsequently normalized to the 0–1 scale. No unpublished or confidential materials were used in the calculation.

A4. Construction of explanatory variables

Institutional Authority (IA)

The institutional authority variable was operationalized as the natural logarithm of the number of investment disputes involving each jurisdiction that were administered by major international arbitration institutions. The measure is therefore used as a proxy for institutional visibility, practical engagement, and exposure to international arbitration rather than as a direct or comprehensive measure of the normative authority of arbitral institutions. Accordingly, the empirical results should be interpreted as capturing the association between institutional participation and legal standardization, rather than establishing that formal institutional authority itself causes convergence.

Intensity of Legal Precedent Use (LPI)

The LPI indicator measures the average number of substantive references to prior arbitral awards identified within publicly available investment arbitration decisions associated with each jurisdiction.

The variable reflects the quantitative intensity of precedent-based reasoning rather than the overall coherence of legal interpretation.

The LPI indicator measures the average number of substantive references to previous arbitral awards identified in the publicly available investment arbitration materials included in the dataset. Because the indicator is based on the available body of arbitral materials, differences in the number and characteristics of disputes may affect the observed level of precedent use. Accordingly, LPI is interpreted as a measure of the intensity of precedent-based reasoning within the analysed materials rather than as a direct measure of interpretative convergence. This qualification is

particularly relevant given the exploratory nature and limited size of the empirical sample.

Treaty Harmonization Level (THL)

The THL variable was calculated through comparative analysis of bilateral investment treaties concluded by each sampled state with its principal investment partners represented in international investment agreement databases.

The assessment focused on the similarity of:

- fair and equitable treatment clauses;
- expropriation standards;
- dispute settlement provisions;
- investor protection guarantees.

The indicator was normalized on a scale from 0 to 1.

The THL indicator was constructed by comparing the investment treaties concluded by each sampled state with its principal investment partners represented in the UNCTAD and OECD investment agreement databases. The comparison focused on the substantive and procedural provisions identified in the methodology, including fair and equitable treatment, expropriation standards, investor protection guarantees, and dispute settlement provisions. Each provision was assessed comparatively for the degree of textual similarity across the selected treaty set. The resulting similarity assessments were aggregated into a country-level THL score and normalized to the 0–1 scale. The indicator therefore reflects relative treaty similarity within the selected treaty set and should not be interpreted as a measure of harmonization across all treaties concluded by a state.

Institutional Diversity (ID)

The ID variable measures the number of different international arbitration institutions in which disputes involving the sampled jurisdiction were considered during the analysed period.

The indicator reflects the level of institutional participation and procedural exposure within the international arbitration framework.

A5. Nature of the dataset and interpretation of trends

The empirical indicators presented in the panel dataset are normalized and aggregated measures derived from coded observations rather than raw annual counts of arbitral activity.

Accordingly, gradual year-to-year variation in the indicators reflects medium-term institutional and legal convergence trends rather than isolated procedural events or fluctuations in individual disputes.

The dataset was constructed for comparative analytical purposes and should not be interpreted as a complete representation of all global ISDS activity.

A6. Limitations of the dataset

Several limitations affect the empirical dataset.

First, part of international investment arbitration practice remains confidential, limiting access to the full universe of arbitral awards.

Second, the coding process necessarily involves interpretative legal assessment, particularly regarding the identification of substantive reliance on legal principles.

Third, the dataset focuses on a limited comparative sample of jurisdictions and therefore does not establish universally applicable conclusions regarding all regions of the international investment regime.

Future studies may expand the regional scope of analysis and refine the coding methodology through broader inclusion of arbitral practice and treaty networks.

References to arbitral precedent were excluded from the SDR index in order to preserve conceptual independence between the dependent variable and the explanatory variable measuring the intensity of precedent use (LPI).

Appendix B

Table A1. Illustrative coding framework and construction of empirical variables.

Variable	Example Source	Coding Rule
SDR	ICSID Award X	FET=1; LE=1; PA=0
LPI	Award X	12 precedent citations
THL	Germany–Poland BIT	Similarity score 0.78
IA	ICSID Statistics	ln(number of cases)
ID	ICSID+PCA+ICC	3 forums