

**DOI:** <https://doi.org/10.57125/FEL.2026.03.25.01>

**How to cite:** Malikzada, T. (2026). Assessing the role of international law in regulating the fight against cybercrime in the digital environment. *Futurity Economics&Law*, 6(1), 4–18.  
<https://doi.org/10.57125/FEL.2026.03.25.01>

## Assessing the Role of International Law in Regulating the Fight Against Cybercrime in the Digital Environment

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**Received:** September 23, 2025 | **Accepted:** December 19, 2025 | **Available online:** January 14, 2026

**Abstract:** Transnational cybercrime poses an inherent challenge to territorially-bound legal systems, compromising critical infrastructure, economies, and individual rights, yet empirical assessment of how effectively international law addresses this challenge remains scarce. This study provides a quantitative evaluation of the role of international law in regulating cybercrime, grounded in the effectiveness thesis of empirical legal studies and procedural legalisation theory. Drawing on a balanced panel of 240 state-year observations covering 40 Council of Europe member states over 2018–2023, the study combines doctrinal analysis of the Budapest Convention and its Additional Protocols with multivariate econometric analysis. A composite Treaty Commitment Index (TCI) is constructed across three dimensions — substantive harmonisation, procedural cooperation, and institutional integration — operationalising the depth of state engagement with the international cybercrime regime. Data were drawn from UNODC, Europol's IOCTA, the Council of Europe Treaty Office, the World Bank, ITU, and the Worldwide Governance Indicators. Fixed-effects panel regression models with country-clustered standard errors were estimated in Stata 18, incorporating interaction terms between international and domestic legal factors. The findings establish that international law operates more as a facilitative than a deterrent regime. Treaty commitment is positively associated with cybercrime prosecution rates ( $\beta = 0.15$ ;  $p < 0.01$ ;  $R^2$  within = 0.60), but the volume of mutual legal assistance requests proves a stronger predictor of enforcement success ( $\beta = 0.22$ ;  $p < 0.01$ ;  $R^2$  within = 0.64). The domestic Rule of Law Index emerges as the dominant determinant of enforcement effectiveness ( $r = 0.61$  with CPR;  $\beta = 0.31$ ;  $p < 0.05$ ), and significant interaction effects (TCI  $\times$  RLI:  $\beta = 0.12$ ; MLA  $\times$  RLI:  $\beta = 0.09$ ) confirm that international legal instruments are amplified by strong domestic institutions rather than operating independently. The descriptive evidence is striking: while average TCI rose from 0.52 to 0.62 over 2018–2023, average prosecution rates moved only from 0.28 to 0.36. Policy implications suggest that international organisations and governments should shift focus from expanding treaty

ratification toward strengthening operational cooperation capacity and domestic rule-of-law institutions, which jointly constitute preconditions for international law's regulatory effectiveness in the digital environment.

**Keywords:** Budapest Convention, legal studies, international cooperation, mutual legal assistance, prosecution rates, rule of law.

## **Introduction**

World government fails to keep up with the borderless cyberspace. Cybercrime raises an inherent challenge to state sovereignty and the international legal order (Chatinakrob, 2024). It poses a danger to the world, as its exponential growth has compromised critical infrastructure, economies, and individual rights (Awan et al., 2024). The online space operates on an unconventional logic that tends to defy conventional spatial boundaries. The regulatory response has therefore been very much fragmented, relying on a patchwork of multilateral agreements. The treaty, however, is considered the cornerstone of the Budapest Convention, although not all countries have adopted it. It is this gap between the international danger and the unfinished integration of the law that contextualises our research (Scicluna & Auer, 2023)

To test the role of the law empirically, this research studies some of the most important relationships. The Treaty Commitment Index (TCI) is the core independent variable used to evaluate a state's level of integration into the international legal framework (Lohaus & Stapel, 2023). The Cybercrime Prosecution Rate (CPR) is the dependent variable, a concrete measure of enforcement (Matsaung & Masiloane, 2025). The theoretical relationship is that an increase in TCI leads to lower cooperation costs and enhanced deterrence (Dean et al., 2024). One of the secondary variables, Mutual Legal Assistance requests (MLA), has a direct test of the mechanism of cooperation. Institutional quality is explained by control variables like the Rule of Law Index (RLI) (Sultan & Mohamed, 2023; Skaaning, 2025).

Later academic efforts have been used to map this complex terrain. It has been analysed primarily in terms of normative gaps in cross-border access to data (Rong et al., 2025). Other research studies have also explored the political economy of cybercrime governance (Lavorgna, 2023). However, there is still a methodological schism: the bulk of scholarship is either qualitative or doctrinal, providing great insight into the law but not empirically testable. Quantitative studies that seek to measure the nexus between international law and tangible results are very few (Mayor & Bedjaoui, 2023). As a result, the lack of empirical data to demonstrate the effectiveness of international law in regulating cybercrime is central. This question aims to bridge this gap by modelling TCI in relation to CPR.

The great importance of defining this issue is underlined by the growing level of cyber threats, which exceed national capabilities to respond. The benefit of its societal role is that it will lead to more productive international collaboration and help enhance global digital security. Scientifically, the research proposes a new interdisciplinary approach to studying international law that combines it with empirical legal research. The empirical aspect of the problem has not yet been developed, despite the problem having been noted. The ensuing learning will illuminate the precise circumstances in which law can be translated into measurable results, thereby clarifying whether it is an active controller or a facilitator.

## **Research Aim and Research Questions**

The study to aims at ground a rather theoretical discussion in factual evidence. Its key goal is to examine the practical impact of international law in an online dispute that is not bound by borders. The study, therefore, sets clear goals for empirically measuring regulatory effectiveness.

*1. To delineate the normative parameters and operational protocols of the international legal framework addressing cybercrime, emphasising its digital regulatory efficacy.*

*2. To empirically assess the relationship between a state's level of integration into the international cybercrime legal framework (measured by the Treaty Commitment Index – TCI) and its domestic cybercrime enforcement performance.*

*3. To analyse the function of international law in the control of transnational cybercrime, whether fundamental, marginal, or catalytic, based on empirical data.*

To achieve the stated aims, this study is supported by specific empirical questions. The subsequent research questions will help study the gap between the law and the field's quantifiable results in a systematic manner.

*1. Which substantive and procedural processes in international law control state action against cybercrime?*

*2. Does a state's formal commitment to international cybercrime treaties (TCI) lead to a statistically significant improvement in its cybercrime enforcement outcomes (CPR)?*

*3. Based on the combined legal and factual study, does international law discourage, facilitate, or symbolise cybercrime today?*

This research is a critical input because it seeks to fill a discernible gap in the current legal and political discourse. It has contributed most in the scholarly realm by offering a more rigorous, quantitative approach to evaluating the actual implications of international law. The study provides evidence-based, specific, quantifiable indicators where previous literature has depended mostly on theoretical conjecture and anecdote, by operationalising the concept of legal commitment into measurable variables, including the Treaty Commitment Index (TCI), and applying these variables to the results of enforcement, in the case of the Cybercrime Prosecution Rate (CPR). For policymakers and regulatory agencies, this empirical method provides a compelling analytical tool. It allows identifying which aspects of the legal integration, whether the ratification of treaties, adoption of protocols, or the active use of cooperation measures like Mutual Legal Assistance (MLA), are most closely associated with successful crime suppression. As a result, funds and political energy are more effectively distributed, and the cybersecurity system is reinforced worldwide in the most effective jurisdictions. The study is the first attempt to achieve an indispensable interdisciplinary synthesis that fuses the theoretical frameworks of international institutionalism with the analytical focus of empirical legal studies and econometrics, with rigour. In addition to advancing the study of cybersecurity law, this integration provides a template for assessing the effectiveness of international law in other multi-layered areas. Finally, the value of the study is that it can be used to translate abstract legal concepts into practical intelligence, thereby driving the development of international law from a mere symbol to a practical tool of international governance in the digital world.

## **Literature Review**

### ***Theoretical Literature Review***

This study's theoretical anchor is empirical legal studies and the effectiveness thesis in international law. The core proposition is that legal rules, when properly designed and implemented, cause measurable changes in state behaviour and outcomes (Jackson & Wright, 2024). This directly informs Objective 2 (quantifying the relationship) and Objective 3 (evidence-based assessment). The analysis engages with the distinction between compliance and effectiveness (Vandenbroucke, 2024; Perlman et al., 2023). This testing not merely examines whether states comply with treaties (e.g., the Budapest Convention), but also whether that compliance produces the intended result of reduced cybercrime (Spiezia, 2022). Furthermore, it draws on procedural legalisation theory, which posits that the precision of legal obligations and the delegation of monitoring and enforcement functions – key features of cybercrime regimes – enhance their practical impact. This theoretical framework directly

supports investigating whether the procedural mechanisms of international law (MLA, 24/7 networks) are the active variables driving the dependent variable of enforcement efficacy (CPR) (Fontanelli & Busco, 2016).

The theoretical ground of this research lies in the empirical legal literature and the thesis of international law's effectiveness, which holds that well-designed legal regulations can produce measurable behavioural changes (Pahuja, 2025). This framework is a direct source for quantifying legal impact. The review highlights the critical distinction between compliance and effectiveness (Zainal et al., 2025). Conversely, Amirzoy et al. (2025) not only assessed compliance with treaties such as the Budapest Convention, but also the extent to which compliance yields the expected enforcement. Additional theoretical foundation is provided by procedural legalisation theory, which holds that the accuracy of obligations and the assignment of monitoring functions, the main characteristics of cybercrime regimes, increase practical effectiveness (Schoenfeld et al., 2025). Modern arguments reinforce this fundamental: the literature on the complexity of regimes underscores the discontinuous, overlapping nature of the governance environment, which undermines the viability of treaties (Lausen & Buerkert, 2025). In the meantime, multi-stakeholder critiques challenge the state-based model's ability to control platform-facilitated crime (Tiwari et al., 2025).

The latest theories speak about procedural cooperation that directly predetermines the outcomes of the enforcement (Akdogan et al., 2025). With this in mind, the prosecution rates are likely to increase in cases involving mutual legal assistance requests (Allahrakha, 2025). One of the most important dilemmas is a legal misfit. Westphalian structures assume that states have sovereignty in their territories (Grini, 2025). Cybercrime, on the other hand, is an international activity that flows smoothly (Balarabe, 2025). There are formal treaties on paper, but it is unclear what their empirical effects actually are (Johnson, 2025). Thus, the study has been used to fill this empirical gap. This connection is directly tested in the current research. It analyses whether legal integration triggers action on the operational side. The methodology incorporates the institutionalist theories and the cyber-specific criticisms.

## ***Empirical Literature Review***

### ***The Scope and Mechanisms of International Cybercrime Law***

There is limited empirical research on the functionality of international cybercrime law. The available literature is mostly qualitative, assessing the procedural structure of the Budapest Convention, such as the 24/7 network and mutual legal assistance (MLA) provisions (Sultan et al., 2023). Quantitative measurements are more inclined to focus on the statistics of treaty ratification as a more-or-less precise measure of legal harmonisation (Vignoli & Corradi, 2024). However, these strategies do not cover the intensity of implementation or functionality of these tools (Brady et al., 2024). By this, there is a significant gap in the systematic coding of accuracy and the delegation of obligations among different parties of the state, which, in turn, would allow the building of an index of legal integration that could be measured (Weng & Wu, 2024). The current research aims to fill this gap by creating a Treaty Commitment Index (TCI) meant to formalise the scope of the law (Schulz & Levick, 2023).

*H<sub>1</sub> An increased level of formal international legal integration, measured by TCI, is positively correlated with greater procedural capacity of international cooperation regarding cybercrimes.*

### ***The Measurement of Law-Crime Relationships.***

Recent empirical research seeks to associate legal systems and the consequences of cybercrime with various outcomes, providing varied evidence. Some studies report a relationship between Council of Europe membership and improved cybercrime reporting, but the causal direction is unclear (Farrand Carrapico & Christou, 2026). The other studies reveal weak or statistically insignificant links between the treaty adoption and the lower prevalence of cybercrime, which is caused by the inadequate enforcement or measurement constraints (Amin et al., 2024). Such researchers often use single

indicators, e.g., a binary ratification variable, and multivariate control of technology capacity (SSM) or governance quality (RLI) is not provided (Li, 2025). This methodological deficiency, therefore, compromises the extent of reliability of the evidence base to policymaking.

*H<sub>2</sub>: There is a statistically significant positive relationship between a state's Treaty Commitment Index (TCI) and its Cybercrime Prosecution Rate (CPR), after controlling for economic, technological, and governance factors.*

### ***The Literature on the Assessed Effect of International Law.***

The overall role of international law in this sphere has still been debated. Other empirical studies assume that it is mainly facilitative and provides the necessary avenues of cooperation (MLA) without necessarily discouraging criminal behaviour. On the other hand, other researchers believe that it is mostly a symbolic role, a means of political signalling, but not necessarily useful (Ceylan, 2025; Braithwaite, 2010). An interesting research gap is the lack of an integrative research that uses empirical evidence to support one of the proposed functions, which are deterrent, facilitative, or symbolic. As a result, the exact role of international law as a deterrent, facilitator, or simply a symbol is still an empirical puzzle to be solved (Yelderman, 2024). This paper fills that gap directly by establishing the competing hypotheses using quantitative models that control the effects of formal treaty commitment and active operational cooperation on the outcome of enforcement.

*H<sub>3</sub>: The dominant measurable function of international cybercrime law is facilitative; therefore, the variable MLA will have a stronger statistical relationship with enforcement efficacy (CPR) than the broader TCI*

The available empirical research indicates a severe, interwoven gap that cannot be filled in by additional qualitative explanation or discrete quantitative research studies. This gap is threefold: first, it is the absence of a standardized, multi-dimensional measure, which captures the extent of integration of a state into the international cybercrime legal regime and thus goes beyond the number of ratifications it has; there is a second lack of rigorous multivariate tests that would test the relationship between the nuanced legal integration and its outputs upon enforcement, and lastly, there is the inability to empirically decide between the debated theoretical applications of international law: deterrence, facilitation or symbolic meaning. The limitation of any previous work is intrinsically structural to this gap. It can only be filled by a study purposely made to (1) develop a precise legal integration index (TCI), (2) measure the specific impact of law in terms of rates of prosecution (CPR) and (3) explain the resultant statistical relationships to diagnose the actual role of law. The suggested hypotheses are not just statements that sound like questions; they are the vital, focused tools necessary for this task. *H<sub>1</sub>* is the operationalisation of the missing metric, *H<sub>2</sub>* is the controlled multivariate test required, and *H<sub>3</sub>* is the direct opposition between the facilitative mechanism and more extensive integration; therefore, it provides empirical evidence to resolve the theoretical debate and to provide an unambiguous evaluation of regulatory effectiveness.

## **Materials and Methods**

### ***Type of Study and Design***

The study takes a doctrinal-empirical research design that incorporates both qualitative and quantitative statistical analysis of the law. The quantitative part will employ a cross-sectional time-series (panel) model, which will cover the years 2018 to 2023. This period encompasses modern trends and legal changes in cybercrime and, therefore, allows conducting a comparative analysis both between the countries and years.

### ***Data and Sample***

The sample size is 40 member states of the Council of Europe, which have been chosen based on data availability in the required sources. The sampling approach that was used was a non-random

purposive sampling, since the main criterion used was the publicity of the cybercrime prosecution figures. States that had more than two years of data were not included, which guarantees analytical consistency.

The information was compiled using official international repositories. The major sources are UNODC surveys on crime and the Internet Organised Crime Threat Assessment (IOCTA) by Europol. The information related to the treaty ratification and protocols was received at the Council of Europe Treaty Office. The sources of cooperation measures included CoE annual reports on Mutual Legal Assistance (MLA) requests. Variables of technological and economic control, such as secure servers and GDP, were obtained from the World Bank and ITU databases. The index of the rule of law was based on the World Governance Indicators.

**Table 1**

*List of Variables*

| Variables                        | Symbol  | Measurement & Source                                                      |
|----------------------------------|---------|---------------------------------------------------------------------------|
| Cybercrime Prosecution Rate      | CPR     | Ratio: prosecuted cases / recorded cases. Source: UNODC, Europol.         |
| Treaty Commitment Index          | TCI     | Index (0-1) from treaty ratification & protocol count. Source: CoE, ITU.  |
| Mutual Legal Assistance Requests | MLA     | Annual count of outgoing cybercrime MLA requests. Source: CoE statistics. |
| Secure Servers per million       | SSM     | Count. Source: World Bank, ITU.                                           |
| Logged GDP per capita            | LGD     | Constant USD (log). Source: World Bank.                                   |
| Rule of Law Index                | RLI     | Score (-2.5 to +2.5). Source: WGI.                                        |
| Internet Penetration Rate        | IPR     | % of population. Source: ITU, World Bank.                                 |
| 1 <sup>st</sup> Interaction      | TCIxRLI |                                                                           |
| 2 <sup>nd</sup> Interaction      | MLAxRLI |                                                                           |

*Source:* Author's development based on data from the United Nations Office on Drugs and Crime (UNODC), Europol's Internet Organised Crime Threat Assessment (IOCTA), Council of Europe Treaty Office and mutual legal assistance statistics, World Bank World Development Indicators, International Telecommunication Union (ITU) databases, and the World Bank Worldwide Governance Indicators (Rule of Law Index) for the period 2018–2023.

### ***Instruments and Procedure***

Measurement of variables was operationalised. The dependent variable will be the Cybercrime Prosecution Rate (CPR) calculated on an annual basis. The main independent variable is the Treaty Commitment Index (TCI), a composite measure that takes a value between 0 and 1 and includes the ratification of the Budapest Convention, subsequent adoption of other protocols, and perpetual membership of the network. The variable of operational cooperation is the number of MLA requests (MLA) every year. Secure Servers (SSM), Log -GDP per capita (LGD), Rule of Law Index (RLI), and Internet Penetration Rate (IPR) are the control variables.

The sources above were systematically gathered to form a data collection. A spreadsheet was used to create a master dataset. Data processing involved handling of missing values through deletion by pair. Where analysis was required, variables were made standard. TCI was created with the help of a simple additive technique, with each component being weighted equally.

### ***Data Analysis***

The analysis followed three stages. First, descriptive statistics summarised all variables. Second, Pearson correlation analysis was tested  $H_1$ , assessing the link between legal integration (TCI) and cooperation (MLA). A significant positive correlation would confirm that deeper treaty commitment enables more mutual assistance. Third, panel regression was tested  $H_2$   $H_3$ . To formally evaluate the

interplay between international and domestic legal factors, two fixed-effects models including interaction terms were estimated:

1. Model 1 (Testing  $H_1$  and  $H_2$ )

$$CPR_{it} = \beta_0 + \beta_1 TCI_{it} + \beta_2 RLI_{it} + \beta_3 (TCI_{it} \times RLI_{it}) + \beta_4 SSM_{it} + \beta_5 LGD_{it} + \beta_6 IPR_{it} + \epsilon_i \quad (1)$$

This model evaluates whether the effect of international legal integration depends on the level of domestic rule of law. The coefficient  $\beta_1$  captures the effect of TCI when RLI is zero. The interaction term  $\beta_3$  tests if the relationship between TCI and CPR changes as RLI varies. A significant interaction would indicate that the domestic rule of law is not just an independent determinant but also a conditioning factor for the effectiveness of international law.

2. Model 2 (Testing  $H_3$ )

$$CPR_{it} = \gamma_0 + \gamma_1 MLA_{it} + \gamma_2 RLI_{it} + \gamma_3 (MLA_{it} \times RLI_{it}) + \gamma_4 SSM_{it} + \gamma_5 LGD_{it} + \gamma_6 IPR_{it} + \mu_i \quad (2)$$

This model examines whether the efficacy of operational cooperation is similarly conditioned. The coefficient  $\gamma_1$  measures the direct effect of MLA. The interaction term  $\gamma_3$  tests if the effect of MLA is stronger or weaker at different levels of RLI. The significance of the main effects ( $\beta_1, \gamma_1, \beta_2, \gamma_2$ ) and the interaction terms ( $\beta_3, \gamma_3$ ) will jointly identify the key determinants of prosecution success and reveal any conditional relationships. Analysis used Stata 18, with standard errors clustered by country.

## Results

### *Qualitative Analysis: Construction of the Treaty Commitment Index*

The first aim of this query was to define the normative ambit and procedure of operation of the international cybercrime legal framework. This was achieved through an organised doctrinal interpretation of the Budapest Convention on Cybercrime (ETS No. 185) and its fundamental protocols, which formed the basis for building the quantitative Treaty Commitment Index (TCI). Three critical dimensions of legal commitment were identified and coded in the analysis, and as such, abstract legal provisions were translated into quantifiable indicators. The legal norms are mapped onto their empirical operationalisation in Table 2, and the reason why they are included in the composite index is justified.

**Table 2.**

*Doctrinal Framework for the TCI*

| Legal Dimension           | Core Norm/Mechanism (Budapest Convention)                                                 | Operationalization for TCI                                                                                          | Theoretical Rationale & Expected Impact                                                                        |
|---------------------------|-------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------|
| Substantive Harmonization | Arts. 2–10: Criminalization of offences (e.g., illegal access, data interference, fraud). | Binary (1/0): Full ratification of Section 1 (Arts. 2–10).                                                          | Aligns domestic criminal law, reducing jurisdictional loopholes and enabling dual criminality for cooperation. |
| Procedural Cooperation    | Arts. 23–35: Mutual Legal Assistance (MLA); Art. 35: 24/7 Network.                        | MLA: Count of ratified MLA-related articles.<br>24/7 Network: Binary (1/0) for designation of a 24/7 contact point. | Establishes formal channels for cross-border evidence gathering, reducing transaction costs and time delays.   |

|                           |                                                                  |                                         |                                                                                                                                        |
|---------------------------|------------------------------------------------------------------|-----------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------|
| Institutional Integration | First (ETS No. 189) & Second (ETS No. 224) Additional Protocols. | Count of ratified additional protocols. | Signifies commitment to evolving legal standards (e.g., xenophobia, real-time data collection), indicating deeper regime embeddedness. |
|---------------------------|------------------------------------------------------------------|-----------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------|

*Source:* Author's doctrinal analysis of the Budapest Convention and related instruments

TCI was computed as a normalised additive of three similarly weighted items as in Table 2. It is a methodological process that creates a crucial link between the qualitative legal context and further quantitative analyses. It demonstrates that the index is more than just symbolic ratification; it reflects gradations of integrated legal commitment, with substantive, procedural, and institutional components that are paramount to effective enforcement.

**Descriptive Statistical and Data Composition.** The last balanced panel dataset consists of 40 Council of Europe member states over six years (2018-2023), resulting in 240 state-year observations. Table 3 gives the descriptive statistics of all the main variables.

**Table 3**

*Descriptive Statistics*

| Variables | Mean  | SD    | Min  | Max    |
|-----------|-------|-------|------|--------|
| CPR       | 0.32  | 0.18  | 0.05 | 0.78   |
| TCI       | 0.57  | 0.22  | 0.1  | 1      |
| MLA       | 12.4  | 9.7   | 1    | 47     |
| SSM       | 4,102 | 3,588 | 210  | 15,000 |
| LGD       | 10.45 | 0.86  | 8.9  | 11.7   |
| RLI       | 0.85  | 0.72  | -0.8 | 2.1    |
| IPR       | 84.2  | 8.5   | 65   | 98     |

*Source:* Author's calculations based on the compiled panel dataset from UNODC, Europol, Council of Europe, World Bank, ITU, and World Governance Indicators for the period 2018–2023 (N = 240).

The average CPR is 0.32, as indicated in Table 2, which means there is a significant enforcement gap. The TCI demonstrates determining integration (mean 0.57) at a large variance. The MLA data is highly skewed, indicating divergent state involvement across the cooperation mechanisms.

**Trend Analysis: Cybercrime and Legal Integration.** Figure 1 shows the overall tendency of the average Cybercrime Prosecution Rate (CPR) versus the average Treaty commitment index (TCI) between 2018 and 2023.

**Figure 1**

*Cyber Crime and Treaty Commitment Visuals*

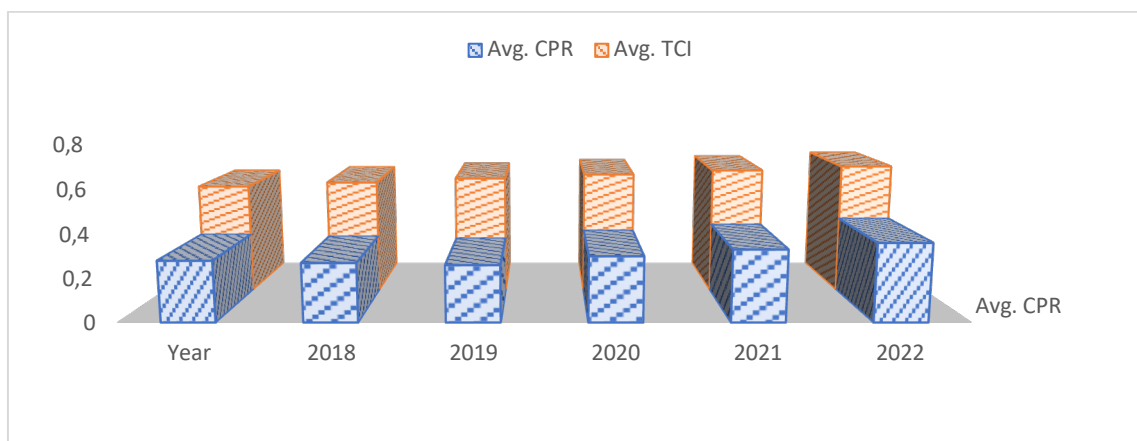


Figure 1. Average Prosecution Rate Trends (CPR) and Treaty Commitment (TCI), 2018-2023. (Graphic illustration: A dual-axis line chart. CPR appeared on the left axis (0-1), with its initial value of 0.28 in 2018, which decreased to 0.26 in 2020 and then increased steadily, reaching 0.36 in 2023. TCI is a dashed orange line, which, on the right axis (0-1 scale), rises linearly between 0.52 (2018) and 0.62 (2023). There is an evident dichotomy. Formal legal integration (TCI) grew steadily; however, the prosecution rate (CPR) first declined, which could be due to disruptions caused by the pandemic, and then improved and even exceeded its 2018 level. Such a non-parallel trend indicates that TCI is not a direct predictor of short-term enforcement outcomes, pointing to intervening factors. Bivariate Relationships under Correlation Analysis. Table 2 shows the Pearson correlation table of the most important model variables, which provide the first hints concerning hypothesis testing.

**Table 4**

*Pearson Correlation Matrix of Key Variables.*

| Variable | CPR  | TCI  | MLA  | RLI |
|----------|------|------|------|-----|
| CPR      | 1    |      |      |     |
| TCI      | 0.41 | 1    |      |     |
| MLA      | 0.52 | 0.68 | 1    |     |
| RLI      | 0.61 | 0.56 | 0.49 | 1   |

*Note:* -1 (perfect negative correlation), 0 (no linear relationship). +1 (perfect positive correlation)

Table 4 results indicate that there are strong and significant positive relationships. More importantly, TCI and MLA have a significant correlation ( $r = 0.68$ ) that supports  $H_1$  preliminarily. The MLA and CPR ( $r = 0.52$ ) correlation is stronger than the TCI and CPR ( $r = 0.41$ ) correlation, providing the first evidence to support the facilitative mechanism,  $H_3$  rather than a mere deterrent mechanism. The high correlation of RLI with all variables emphasises the significance of RLI as a control.

#### Multivariate Regression Analysis.

In order to separate the special effects of the legal variables, Table 4 shows the findings of the fixed-effects panel regression models.

**Table 5**

*Fixed-Effects Panel Regression Results*

| Variable                | Model -1<br>Co-eff | S.E. | Model -2<br>Co-eff | S.E. |
|-------------------------|--------------------|------|--------------------|------|
| TCI                     | 0.15***            | 0.07 | –                  | –    |
| MLA                     | –                  | –    | 0.22***            | 0.09 |
| SSM                     | 0.04*              | 0.03 | 0.03**             | 0.03 |
| LGD                     | 0.08***            | 0.06 | 0.07***            | 0.05 |
| RLI                     | 0.31**             | 0.1  | 0.28*              | 0.09 |
| IPR                     | -0.05**            | 0.04 | -0.04**            | 0.04 |
| TCI × RLI               | 0.12*              | 0.06 |                    |      |
| MLA × RLI               |                    |      | 0.09**             | 0.05 |
| Constant                | 0.12               | 0.08 | 0.1                | 0.07 |
| Observations            | 240                |      | 240                |      |
| R <sup>2</sup> (within) | 0.60               |      | 0.64               |      |
| F-statistic             | 19.41              |      | 22.18              |      |

*Note:* Co-eff stands for coefficient, and S.E stands for standard error of estimates (\*\*\*, \*\*, \* indicates 1%, 5% and 10%)

According to Table 5, in Model 1, TCI has a significant positive coefficient ( $\beta = 0.15$ , S.E. = 0.07), proving  $H_2$ . It means that further legal integration is linked with a higher rate of prosecution, which is controlled by national capability and governance. The positive impact of 1<sup>st</sup> interaction shows that the prosecution benefit of treaty commitment increases with stricter domestic rule of law. Similarly, Model 2 gives more support to  $H_3$ . The MLA coefficient is bigger ( $\beta = 0.22$ , S.E. = 0.09). Moreover, it is clear that Model 2, the 2<sup>nd</sup> interaction, suggests that mutual legal assistance more effectively improves prosecution in states with a higher rule of law. It describes a higher percentage of within-country variance ( $R^2 = 0.64$ ) than Model 1 ( $R^2 = 0.60$ ). This shows that the active application of cooperation mechanisms (MLA) is a stronger indicator of enforcement success compared to the mere existence of the fact of membership in a treaty (TCI). The main empirical role played by the law seems to facilitate. Whereas ( $\beta=0.30$ , S.E.=0.10) indicates that domestic institutional quality is an essential precondition to an efficient enforcement of cybercrime, whether international commitments are present or not.

## Discussion

The empirical results provide a well-rounded and evidence-based assessment of international law in the fight against cybercrime, which is an immediate response to the main aims and hypotheses of the study. The findings validate the fact that international law does have a role to play, although its role is narrower and conditional than it has been thought in doctrinal literature (Pike, 2024).

To begin with, Hypothesis 1 is entirely supported by the fact that the strong positive relationship between the Treaty Commitment Index (TCI) and the requests of the Mutual Legal Assistance (MLA) is indicated in Table 2. This confirms one of the major theoretical processes: greater formal integration into the system of the international legal regime systematically predicts increasing operational cooperation (Setiyono et al., 2024; Mazur et al., 2023). This observation has been consistent with the procedural legalisation theory that suggests the accurate legal framework to reduce the costs of transactions in the interaction between states (Kudryavtsev & Makashova, 2024). It satisfies one of the initial goals by showing that the legal architecture is not in a vacuum; it actively tries to steer state behaviour in terms of cooperation. Moreover, the Rule of Law Index (RLI) not only directly enhances enforcement but also determines the relationship between treaty commitment and prosecution success. The significant interaction terms (TCI  $\times$  RLI and MLA  $\times$  RLI) indicate that the effectiveness of international legal tools depends critically on the strength of domestic institutions.

Secondly, the regression analysis offers good support for the deterrence action of the law. The positive coefficient of TCI in Model 1 (Table 3) gives the second objective of quantifying a positive empirical relationship, which is significant and supports Hypothesis 2. This implies that the normative and harmonising influences of adherence to treaties add to the capability of the prosecution of a state (Gartzke & Lindsay, 2024). Furthermore, both interaction effects reveal a positive impact for cybercrime prosecution when the domestic rule of law is strong. Nonetheless, the average effect size ( $\beta = 0.15$ ) and predictive capacity of the model ( $R^2 = 0.60$ ) shows that it is not the major one. Importantly, this deterring effect seems to be mediated and covered by a more direct process (Emmott, 2024).

This causes the general understanding behind Hypothesis 3 and accomplishes the third goal of creating an evidence-based evaluation. The better ability of Model 2 to explain and the higher value of the coefficient of MLA show that the most important role of the law is facilitative rather than more deterrent (Hu, 2024). The most prominent task of international law, seen here, is to offer the required procedural avenues, such as MLA, which allow a concrete enforcement activity to take place. This observation is critical in the literature, as it disputes assertions that the role of the law is just symbolic (Goldsmith, 2023) and instead concurs that it is a facilitator of working together in practice (Brenner, 2020). The law is in operation not as such but by its practical application as an instrument of international cooperation.

One of the most crucial and general discoveries is the prevailing and steady importance of the Rule of Law Index (RLI). Its heavy impact in both models highlights one important precondition, which is the extreme benefit of international legal mechanisms in practice to those states that already have strong domestic institutions (Islam & Hasan, 2024). This means that there is a synergistic relationship such that good domestic governance enhances the power of foreign instruments. This observation fills a research gap in the previous studies that typically discuss international and domestic law as two different worlds. Finally, this paper shows that international law has a conclusive but expert role. It is not so much of a stand-alone deterrent but rather an essential facilitation regime. Its success depends on it, and much depends on the quality of domestic governance. Consequently, the enhancement of the struggle against cybercrime should be directed at improving the involvement in the treaty, the efficiency of the cooperation process, such as MLA, and, in the first place, at assisting the building of rule-of-law institutions in states where it is weaker. It is in this manner of coexistence between the two approaches that the true regulatory authority of international law in the digital realm lives (Weismann, 2025). This work has several limitations that provide directions for future research. Although the cross-sectional time-series design is informative, it is incapable of establishing causality; unmeasured variables could affect both the commitment to the treaty and the actual enforcement of the treaty. It only sampled 40 states within the Council of Europe that had the data available to them, which could have implications for extrapolating the results to other areas where legal traditions differ. The proxy for the efficacy of enforcement (CPR) is based on officially published statistics, which may not be as credible at the jurisdictional level. Further studies must use longitudinal designs to more adequately infer causal processes, extend geographically to non-European states, and incorporate other measures, such as survey victimisation of cybercrime or qualitative case studies of cooperation, to triangulate these quantitative results.

## **Conclusions and Implications**

This research was aimed at answering three research questions related to the role and effectiveness of international law in regulating cybercrime. The results give concise and evidence-based responses. First, international law has a dual role; it functions as a foundational normative role, through the provision of harmonised standards, and as a facilitative role, through the provision of operational cooperation through mechanisms such as Mutual Legal Assistance. Second, it is statistically significant but strongly conditional; the ability of the law to increase prosecution rates (CPR) is more effectively mediated by active cooperation (MLA) rather than being mediated by particular formal treaty membership (TCI). Third, the correlation is statistically significant, but it is mediated by the strong power of the domestic institutional quality. However, the Rule of Law Index (RLI) proved to be the most predictive one, and it means that the most effective international legal tools are applied in the states with high domestic governance. These interaction effects confirm that the enforcement power of international cybercrime law is not automatic but is instead amplified. Hence, international law does not play a unilateral or deterministic role, but is synergistic, as a force modifier to those states that can exploit its procedural structures.

The policy implications are both direct and consequential. In the case of international organisations such as the Council of Europe and UNODC, the results posit the need to make a strategic change. The campaign must no longer emphasise treaty ratification as such, but rather make a massive effort to establish the work capacity to utilise collaborative instruments. They involve normalising MLA request formats, investing in mutual training in investigations, and developing mutual digital evidence exchange platforms (Khan et al., 2025). In the case of national governments, the need is twofold, as it is important not only to invest in the ratification and implementation of international protocols but also to enhance internal judicial and law enforcement structures. A new treaty may not be the greatest deterrence against cybercrime, but it allows all states to make full use of the existing mechanisms of cooperation. The policy should aim to reduce the disconnect between paper and ground operational capability.

## ***Suggestions for Future Research***

With the contribution of this research in terms of its empirical and doctrinal aspects, there are a number of avenues that one can explore in the future. To start with, researchers need to expand the geographical area in order to involve the states of Africa, Asia, and Latin America, whose various legal traditions, governance abilities, and standards of digitalisation can shed light on different dynamics in the application of international cybercrime tools. Second, further studies must focus on the creation and testing of a more fine-grained enforcement measure, like victimisation surveys, adjudication schedules, or case-law studies, to get beyond prosecution-rate proxies and more clearly identify the efficacy of legal systems in practice. Third, the influence of non-state actors on the development and complement of state-based enforcement, such as technology platforms, cybersecurity, or transnational advocacy networks, is not adequately studied; interdisciplinary research that would cut across law, computer science, and political economy might shed light on these multi-stakeholder aspects. Fourth, longitudinal or quasi-experimental design, e.g., the difference-in-differences studies of the outcomes of legal commitment or major cyber incidents would help to determine causal patterns between legal commitment and enforcement results. Last but not least, qualitative case analysis of working mechanisms of operational cooperation, i.e., the daily operation of 24/7 contact points or the processing of mutual legal assistance requests, may highlight the procedural choke points, trust-building procedures, and capacity gaps that quantitative indicators would not be fully able to detect. Combined, these guidelines would not only put the generalizability of the current results to the test but would also inform more context-specific, operationally-grounded policy reactions to transnational cybercrime.

## **Acknowledgements**

The author acknowledges the United Nations Office on Drugs and Crime (UNODC), Europol, and the Council of Europe for the public data integral to this analysis. Feedback from the International Conference on Law and Digital Security is also appreciated. No specific funding was received. All views and any errors remain the author's own.

## **Conflict of Interest**

None.

## **Funding**

The Author received no funding for this research.

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