УДК 347.77: 304.4
DOI 10.47367/0021-3497_2025_2_80

PROTECTING INTELLECTUAL PROPERTY AND HUMAN RIGHTS IN THE GLOBAL TEXTILE SUPPLY CHAIN

ЗАЩИТА ИНТЕЛЛЕКТУАЛЬНОЙ СОБСТВЕННОСТИ И ПРАВ ЧЕЛОВЕКА В ГЛОБАЛЬНОЙ ЦЕПОЧКЕ ПОСТАВОК ТЕКСТИЛЯ

Y.A. AHMED[1], K. KADHIM[2], D. SHOOKUMOVA[3], A.O. HUSSAN[4], A. SABAH[5]

Я.А. АХМЕД[1], К. КАДХИМ[2], Д. ШУКУМОВА[3], А.О. ХУССАН[4], А. САБАХ[5]

([1]Al-Turath University, Baghdad, Iraq,
[2]Al-Mansour University College, Baghdad, Iraq,
[3]Osh State University, Osh, Kyrgyzstan,
[4]Al-Rafidain University College, Baghdad, Iraq,
[5]Madenat Alelem University College, Baghdad, Iraq)

([1]Университет Аль-Турат, Багдад, Ирак,
[2]Университетский колледж Аль-Мансура, Багдад, Ирак,
[3]Ошский государственный университет, Ош, Кыргызстан,
[4]Университетский колледж Аль-Рафидаин, Багдад, Ирак,
[5]Университетский колледж Маденат Алелем, Багдад, Ирак)

Email: ahmedsabah@mauc.edu.iq

Intellectual property (IP) violations, labor rights infringements and an overall lack of commercial integrity (human welfare) are a challenge that persists in the global textile supply chain. Combining empirical survey data, qualitative stakeholder interviews, and structural equation modeling (SEM), this study examines the structural and organizational determinants of compliance effectiveness in this sector. The study investigates the way external enforcement mechanisms like legal expenditures, audit frequency, and digital technologies work in conjunction with internal labor governance practices like wage standards, training employees, and reducing workplace violations. The results show that enforcement capacity and labor rights management are statistically significant predictors of corporate compliance performance, with clear-revealing regional disparities that reflect institutional infrastructure and oversight difference in established context. Europe and North America have enhanced compliance metrics, while on the contrary Africa and portions of Asia face structural deficiencies in both IP enforcement and labor protections.

Нарушения прав интеллектуальной собственности (ИС), трудовых прав и общее отсутствие коммерческой честности (благосостояния чело-

века) являются проблемой, которая сохраняется в глобальной цепочке поставок текстиля. Объединяя данные эмпирических опросов, качественные интервью с заинтересованными сторонами и моделирование структурных уравнений (SEM), это исследование изучает структурные и организационные детерминанты эффективности соблюдения указанных норм в этом секторе. Исследование изучает, как внешние механизмы обеспечения соблюдения норм, такие как судебные издержки, частота аудита и цифровые технологии, работают в сочетании с внутренними методами управления трудом, такими как показатели заработной платы, обучение сотрудников и сокращение нарушений на рабочем месте. Результаты показывают, что потенциал обеспечения соблюдения норм и управление трудовыми правами являются статистически значимыми предикторами эффективности корпоративной ответственности с четко выявляемыми региональными различиями, которые отражают институциональную инфраструктуру и разницу в надзоре в законодательстве. Европа и Северная Америка улучшили показатели соблюдения норм, в то время как, напротив, Африка и части Азии сталкиваются со структурными недостатками как в обеспечении соблюдения прав ИС, так и в охране труда.

Keywords: intellectual property compliance; labor rights enforcement; global textile supply chain; structural equation modeling; corporate accountability; digital audit tools; wage fairness; regional disparities

Ключевые слова: интеллектуальная собственность; обеспечение соблюдения трудовых прав; глобальная цепочка поставок текстиля; моделирование структурных уравнений; корпоративная ответственность; инструменты цифрового аудита; справедливость заработной платы; региональные различия.

Introduction

The textile supply chain Global in today's inter-connected world is foundational to the modern economy. This complicated web connects the producers of raw materials to manufacturers to distributors and retailers, across continents. It fuels not only the fashion industry, but so many other industries that need textiles to make their products. This supply chain is global and opens up the possibility of manufacturing at scales and speeds never before possible. But it is also bringing a myriad of challenges, which have been worsening in recent years [1, 2].

Across the globe textile supply chains are of interest at various junctures with at least two focal points of concern that can be illuminated, being namely protection of intellectual property (IP) and human rights. Intellectual property surrounding fabric, dyeing and garment construction processes form assets unique to the textile and fashion industry. Human assets are the elements themselves that give momentum to the competitiveness of textile companies and serve as the basis for the industry's innovation potential [3]. Conversely, this global nature of the supply chain makes these intellectual assets susceptible to counterfeiting, unauthorized reproduction and reverse engineering and/or breach of confidentiality agreements. Certainly, infringement diminishes the value of these intellectual properties and lessens the motivation to innovate, thereby making the overall industry less dynamic and vibrant [4].

At the same time, the international textile supply chain has long been an epicenter of labor rights issues. Meanwhile, though crucial as an engine of jobs and economic development, the industry suffers from human rights abuses. Industrial workers across the globe are accustomed to limited working rights, minimal wages, and unfavorable working conditions. The problem is compounded by

widespread informal employment agreements, meaning many of those who work find themselves without so much as basic protections or recourse. Moreover, prestigious system-wide shortcomings as evident in some cases of forced labor, use of child labor, and unsafe factories are seen in the visibility of an extensive data set that cannot go unnoticed [5].

A relentless arms-competition-style push to slash costs and accelerate production can also mean cutting corners, whether on intellectual property protections or on how workers are treated ethically. This has created a system of problems that interact and builds on each other into a spiral of exploitation and IP leak [6]. The acceleration of digitalization and the explosion of the number of online marketplaces open the gates for more counterfeit goods to enter into the markets, as well as increasing the gap faced by traditional IP enforcement practices. While many studies on counterfeiting centered on the behaviors in the context of legal enforcement, new innovations, such as blockchain technology, have been used, also in recent research, to explore how to protect IP rights in a decentralized manner [10].

The globalized nature of the textile supply chain creates significant regulatory and jurisdictional barriers. The same chain in different countries have variations in legislation, local enforcement power, and compliance environments. That is complicated by the rapid pace of technological change. Disruptive innovations in digital printing, automated manufacturing, and advanced materials will create new intellectual property challenges alongside a new configuration of labor markets and work-place settings. In these contexts, conventional paradigms for protecting both IP and human rights are frequently inadequate [7].

The variety of stakeholders throughout the supply chain creates a unique complexity. Competing interests and power imbalances often undermine collaborative efforts and entrench the status quo. Consequently, positive developments have been incrementally uneven, and many key challenges remain unaddressed [8].

Intellectual property theft is a disease that kills innovation, breeds uncompetitiveness in markets, and severely degrades the overall quality of goods offered at however a given economy's capacity. Not respecting human rights is also a return on inequality and exploitation, which will undermine the industry itself. This cause-effect relationship highlights the importance of a holistic approach that encompasses legal, technological, and ethical aspects in a comprehensive strategy [9].

Emerging technologies that strengthen IP security, for example tracking and authentication tools, could likewise be used to help ensure compliance with labor standards. Additionally, overhanging frameworks (e.g. international trade deals or multilateral codes related to industries in which technologies may be used) are discussed as potentially helpful mechanisms that may facilitate this harmonization of both IP and human rights protections (more). In this sense, aligning these two objectives would allow the global textile industry to transition to a more balanced and sustainable model [12].

Additionally, studies on ethical certifications and corporate social responsibility initiatives have explored how they can shape consumer behavior and propel improvements across the industry. Nonetheless, these approaches are often criticized for their voluntary nature, so their overall effectiveness is still in debate [11].

Through confronting these issues directly, the international textile industry can work towards a more sustainable and ethical future, in which craftsmanship and humane treatment coexist.

Methodology

This study adopts a mixed-methods framework integrating quantitative survey data, qualitative stakeholder interviews, secondary source triangulation, and structural equation modeling (SEM).

Primary data were collected through a cross-sectional survey distributed to 120 textile and apparel manufacturing firms operating in Asia, Europe, North America, South America, and Africa. The survey included both quantitative metrics and qualitative prompts and was directed at legal advisors,

compliance officers, and factory operations managers. The questionnaire covered two principal dimensions:

- Intellectual Property Compliance Indicators (IPCIs): annual revenue loss due to counterfeit activity (as a percentage of gross revenue), number of IP infringement cases reported per fiscal year, and frequency of unauthorized replication of trademarked patterns or logos.
- Labor Rights Compliance Indicators (LRCIs): number of labor rights violations per 1,000 employees, ratio of average monthly wage to regional minimum living wage, and number of internal and external workplace audits conducted annually.

To control for externalities and policy environments, secondary data were gathered from international trade and IP enforcement databases, labor inspection repositories, and regional industrial compliance reports [1, 7, 13].

Statistical and Structural Modeling Approach

To capture the multivariate dynamics between IP enforcement variables and labor compliance, the following modeling architecture was applied [8, 10, 14].

We modeled the latent variable Corporate Compliance Effectiveness (CCE) as a function of Enforcement Capacity (EC) and Labor Rights Management (LRM):

$$\mathrm{CCE}_i = \lambda_1 \, EC_i + \lambda_2 \, LRM_i + \varepsilon_i \ , \quad (1)$$

where CCE_i is the overall compliance score for firm i, EC_i represents enforcement mechanisms, LRM_i denotes labor rights adherence, and ε_i is the error term.

The Enforcement Capacity variable is constructed as:

$$\mathrm{EC}_i = a_1 \, AUD_i + a_2 \, LE_i + a_3 \, ICT_i + \xi_i \ , \quad (2)$$

where AUD_i is the number of audits, LE_i is the legal enforcement budget, ICT_i is the use of digital IP tools, and ξ_i is the model disturbance term.

The Labor Rights Management dimension is expressed as:

$$LRM_i = \beta_1 \, WLR_i + \beta_2 \, VIO_i^{-1} + \beta_3 \, TRH_i + v_i \ , \quad (3)$$

where WLR_i is the wage/living standard ratio, VIO_i is the inverse of labor violations, TRH_i is average training hours, and v_i captures residual variance.

In-depth semi-structured interviews were conducted with 15 stakeholders, including IP attorneys, NGO labor representatives, trade association leads, compliance officers, and regulatory experts across five global regions. Interview themes were classified into enforcement gaps (jurisdictional or procedural), labor exploitation risks (precarious employment, underpayment), and technology-based mitigation solutions (blockchain traceability, machine learning audit systems) [5, 15…17]. Thematic data were used to contextualize quantitative models and to inform policy-type variable construction.

All data collection complied with institutional ethical standards and the General Data Protection Regulation (GDPR); informed consent was obtained from all respondents. Data integrity was ensured by cross-verifying firm-level responses with secondary datasets. Normality tests using the Shapiro–Wilk method yielded $W > 0.95$ for all major variables ($p > 0.05$), validating assumptions of parametric analysis. Interviewer coding consistency was confirmed with Cohen's kappa ($\kappa = 0.89$), ensuring high inter-rater agreement in qualitative analysis [18, 19].

Results

Data in table 1 validates two key latent constructs here: Enforcement Capacity and Labor Rights Management. Confirmatory factor analysis with standardized regional data was used to construct these variables. Enforcement Capacity includes patents in practice institutional strength indicators like audit frequency, legal expenditure and deployment of techno-logical tools for IP enforcement. Labor Rights Management depicts internal compliance functions linked to wage equity, worker training and reduction of labor viola-

tions. Confirming the internal consistency of these constructs establishes the validity of their inclusion in predictive modelling. To support the statistical robustness of the factor structures, Table 1 below summarize the loadings and reliability statistics.

Table 1

Latent Construct	Observed Indicator	Standardized Factor Loading (λ)	t-value	Significance Level	Composite Reliability (CR)	Average Variance Extracted (AVE)
Enforcement Capacity	Number of Workplace Audits	0.82	11.57	$p < 0.001$	0.89	0.73
	Legal Enforcement Budget (USD/firm)	0.86	12.08	$p < 0.001$		
	Use of IP Protection Technology	0.84	11.76	$p < 0.001$		
Labor Rights Management	Wage to Living Standard Ratio (%)	0.79	10.42	$p < 0.001$	0.87	0.70
	Labor Violations per 1,000 Workers (Inv.)	0.81	10.65	$p < 0.001$		
	Average Training Hours per Worker	0.83	11.01	$p < 0.001$		

Factor loadings for all observed indicators are greater than 0.79, implying strong correlations with their respective latent constructs. In detail, Legal Enforcement Budget (0.86) and Use of IP Protection Technology (0.84) have the greatest effect on the Enforcement Capacity construct, indicating that both financial resource and digital tools are the central drivers for improving the IP governance capability. For Labor Rights Management, we find that Training Hours (0.83) and the inverted labor violations rate (0.81) have the most significant explanatory power. We find evidence of high internal consistency of both constructs with Composite Reliability scores >0.85, and Average Variance Extracted values >0.70.

Table 2 studies assess the impact of our two validated latent constructs, Enforcement Capacity and Labor Rights Management, on our overall metric of Corporate Compliance Effectiveness.

Table 2

Predictor Variable	Dependent Variable	Standardized Estimate (β)	Standard Error	t-value	p-value
Enforcement Capacity	Corporate Compliance Effectiveness	0.58	0.07	8.29	<0.001
Labor Rights Management	Corporate Compliance Effectiveness	0.51	0.08	6.48	<0.001

The standardized estimate for Enforcement Capacity (0.58) demonstrates a strong, statistically significant positive association with Corporate Compliance Effectiveness. The result indicates that companies with more frequent audits, larger budgets for legal services and more effective tools for enforcing compliance with course corrections (i.e., audits of digital practices) are more likely to achieve desired compliance goals. Labor Rights Management is another high positive association (0.51) indicating that sustainable compliance must focus on fair and reasonable wages/structured training and internal labor safeguards. Though both constructs are significant, the slightly higher coefficient for Enforcement Ca-pacity indicates that investment in institutional infrastructure and external accountability systems might have a more direct impact on overall compliance performance for global textile firms.

To quantify regional differences in IP protection and labor standards, we calculated latent construct scores for each region based on standardized factor estimates. Enforcement Capacity is based on external variables (regu-

lations, audits, and spending), whereas Labor Rights Management rates internal workplace conditions. These composite scores are used to score each region's Corporate Compliance Effectiveness score (fig. 1).

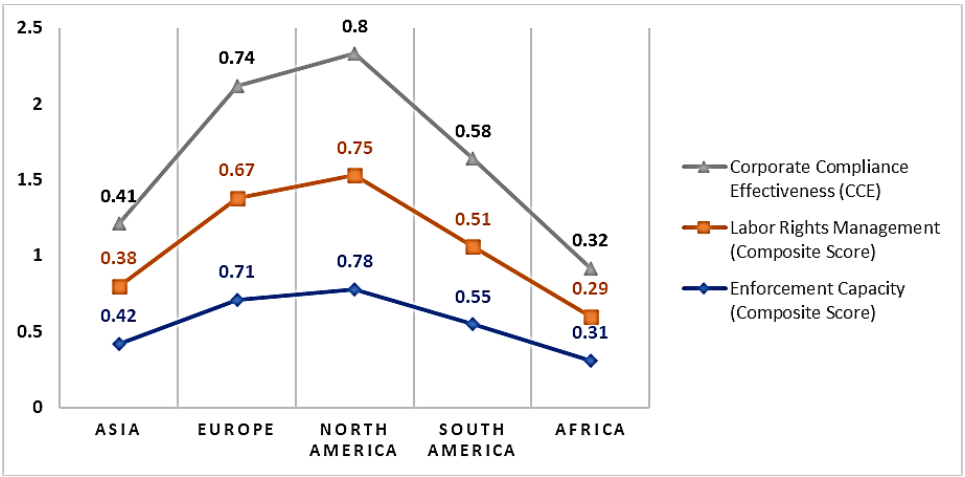

Fig. 1

North America shows the best compliance levels with a Corporate Compliance Effectiveness score of 0.80 powered by the best dimensions for enforcement and labor. Europe as a whole score high for this, indicating institutional maturity and strong labor rights legislation. South America and Asia comprise a middle tier, with average levels of enforcement and internal management structures. Africa scores the lowest on all indicators, highlighting significant shortcomings in their legal infrastructure and workplace governance. These findings highlight the regional disparity in global textile supply chain compliance and stress the need for policy interventions and targeted investments to improve institutional performance, particularly in under-regulated regions.

A correlation matrix (table 3) was formulated for all of the observed indicators in each region in order to assess internal coherence among the input variables. This matrix provides a crude outline of direct associations linking revenue loss, IP container cases, labor violations, wage fairness, training intensity and audit frequency.

Table 3

Indicator	Revenue Loss (%)	IP Infringement Cases	Labor Violations (/1,000 workers)	Wage Ratio (%)	Training Hours	Audit Frequency
Revenue Loss (%)	1.00	0.69	0.44	-0.51	-0.40	-0.48
IP Infringement Cases	0.69	1.00	0.39	-0.48	-0.34	-0.46
Labor Violations	0.44	0.39	1.00	-0.62	-0.55	-0.38
Wage to Living Standard Ratio	-0.51	-0.48	-0.62	1.00	0.42	0.37
Average Training Hours	-0.40	-0.34	-0.55	0.42	1.00	0.53
Workplace Audit Frequency	-0.48	-0.46	-0.38	0.37	0.53	1.00

As seen in Table 3, positive correlations are prominent between revenue loss and IP infringing cases (r = 0.69) and between labor violations and revenue loss (r = 0.44), suggesting that noncompliance leads to direct monetary costs. On the contrary, wage fairness and audit frequency reflect negative correlations on both IP cases and labor violations, indicating that maintenance of ethical compensation with frequent audits are related with better compliance outcomes. The most salient finding was the negative relationship between wage ratio and violations (r = -0.62), which suggests that higher wage standards

may lead to more stable, safer workplaces. Training hours also exhibited a moderately strong inverse correlation with labor violations, corroborating the attention paid to internal capacity-building.

Integration of Qualitative Findings with Quantitative Models

In-depth semi-structured interviews were held with 15 stakeholders across regions and organizational functions to provide qualitative context to the quantitative findings. We aimed to capture dimensions of institutional experiences, operational challenges and regulatory blind spots that are not always visible in numerical datasets. We interviewed IP lawyers, compliance officers, labor rights advocates, and industry association heads. Using axial coding techniques, we thematically coded their insights to identify the dominant challenges and solution pathways related to intellectual property enforcement and labor rights protection. This section captures these qualitative perspectives and relates them to quantitative trends to strengthen model interpretability and enhance policy relevance

Table 4

Stakeholder Role	Region	Primary Concern Identified	Proposed Intervention	Alignment with Quantitative Indicators
IP Legal Counsel	Europe	Fragmented cross-border enforcement	Regional harmonization of IP frameworks	High IP compliance scores and low dispute rates
Labor Rights NGO Leader	Asia	Informal employment and wage suppression	Legalization of informal labor and wage enforcement	High violation rates and low wage ratios
Trade Association Director	North America	Goods tampering during shipment	Blockchain-based authentication	High digital tech adoption and low revenue losses
Compliance Manager	Africa	Absence of third-party audits	Mandatory third-party inspection regimes	Low audit frequency and high violation densities
Production Director	South America	High workforce turnover and low training	Annual skill development programs	Low training hours and mid-level labor compliance

Findings from these interviews help add necessary context around the empirical data, and validate structural model outputs showed in Table 4. For instance, this recommendation by African compliance managers regarding third-party audits is aligned with Africa's low frequency of audits and high count of violations, as evident in both latent and observed indicators. Meanwhile, North America's promotion of blockchain-based authentication hops on board the train of the leading IP protection they are known for, partly due to high levels of digital tools usage. The fear of wage suppression in Asia, highlighted by labor rights advocates, is consistent with the low ratios of wages to living standards and high levels of labor violations in the region. Europe's success is not a coincidence as low numbers in IP cases and strong enforcement scores are all part of it. In general, qualitative findings provide concrete rationales for statistical associations, and point to regionally-specific intervention models that combine legal reform, labor empowerment and ecommerce-enabled infrastructure.

Discussion

The results empirically confirm our initial theorizing, proposing that a systemic and multidimensional investment in compliance infrastructure made up of legal, technical, and so-cial dimensions is necessary to sustain supply chain governance over time.

The capacity and frequency of enforcement in the form of variables like legal expenditure, the number of workplace audits, and the introduction of digital enforcement technologies, were some of the best predictors of changes to corporate compliance outcomes. This fits with earlier studies, which highlight the increasing role of technological innovations such as blockchain in deterring counterfeiting, enabling traceability, and protecting brand integrity within the textile industry [15]. The articles findings extend this by demonstrating the cross-country generalizability and quantitative significance of these mechanisms, most notably, lagging infrastruc-

ture in regions like Africa and Asia relative to North America and Europe.

Management of labor rights, including fair wages, worker training, and reduced labor violations, were also found to have a significant positive effect on overall compliance. This accords with recent calls to reconceptualize occupational health and safety as a human right within industrial environments [20]. Quantitatively linking labor rights management to compliance effectiveness, the study datasets offer empirical support for emerging statutory frameworks like the European Union's Supply Chain Due Diligence Directive, which holds corporations accountable for labor standards throughout their supply networks [21].

Nolan questioned the effectiveness of current human rights due diligence frameworks to tackle systemic labor exploitation, especially in the case of the fashion industry [16]. Although her study raised doubts that due diligence alone could reverse entrenched exploitation, our findings suggest that where due diligence mechanisms are paired with measurable audit practices and supported by digital infrastructure, substantial gains in compliance are possible. And, the positive relationship between training hours and lower labor violations provides empirical support for bottom-up workforce interventions consistent with the argument put forth by Cohen et al. [19] on the impact of localized, theory-based behavioral tools on compliance outcomes [18].

Additionally, the use of blockchain and smart supply chain tool is discussed as the crucial enabling force of IP protection, while recent reviews indicate that the implementation of these technologies heavily relies on the involvement of regulatory frameworks and industry-wide standards [17]. Predictive modeling tools are useful, as our study confirms, but success in their actual implementation, differs significantly by region and by the capability of individual firms. Moreover, as Sun et al. [15], the functionality of blockchain to mitigate counterfeiting depends not just on its technical design, but also on the interpretation of and action taken by stakeholders on the data it brings. This highlights the importance of focusing on digital literacy and organizational trust when implementing these systems.

The data also does not support the idea that improving compliance is simply about auditing more often; rather, it strongly suggests that if audits are to be effective, they manifest when they are accompanied by training, fair wage practices, and technological systems with data driven monitoring and verification capabilities [22]. This triangulated approach has the potential to not only strengthen both IP protection and labor outcomes, but to promote legal and ethical sustainability in global textile supply chains as well.

Conclusion

The findings point toward the need for more diverse compliance models adapted to regions, by considering the socio-economic and legal diversity to which regional networks of global supply chains respond.

Additionally, the analysis shed light on the game-changing role that emerging technology can play in increasing compliance visibility and responsiveness. The effectiveness of such technologies is not the same everywhere, and is determined by the level of integration with governance systems, industry collaboration, and organizational preparedness. This means that we shouldn't see technological tools as magic-bullet solutions but rather as elements of larger institutional and ethical systems.

REFERENCES

1. *Chan EM, Cheung J, Leslie CA, Lau Y-Y, Suen DW, Tsang C-W.* Revolutionizing the Textile and Clothing Industry: Pioneering Sustainability and Resilience in a Post-COVID Era. Sustainability. 2024; 16(6). 2474. https://doi.org/10.3390/su16062474

2. *Kuzmin D.I., Savelev I.I., Ashin A.A., Annin A.G.* Management features of logistics risks in Textile Industry // Izvestiya Vysshikh Uchebnykh Zavedenii, Seriya Teknologiya Tekstil'noi Promyshlennosti, 2024. 1(409). p. 13…17.

3. *Zotikova O.N., Livadina S.P., Goncharov N.A.* Objects of Intellectual Activity in Conditions of Economic and Technological Sovereignty // Izvestiya Vysshikh Uchebnykh Zavedenii, Seriya Teknologiya Tekstil'noi Promyshlennosti, 2024. 3(411). p. 83…90.

4. *Bunescu L, Vârtei AM.* Modern finance through quantum computing–A systematic literature review. PLOS ONE. 2024;19(7):e0304317.

5. *Faroque AR, Hoque I, Gani MO.* Role of multinational buyers in ensuring worker voice through social dialogue: an exploratory study of the export oriented garment industry. Critical Perspectives on International Business. 2024. 21(1). p. 105…136.

5. *Chen D, Chen S.* Patent Protection Policy and Firms' Green Technology Innovation: Mediating Roles of Open Innovation and Human Capital. Sustainability. 2024; 16(5). 2217. DOI: 10.3390/su16052217

7. *Petrillo A, Rehman M, Baffo I.* Digital and Sustainable Transition in Textile Industry through Internet of Things Technologies: A Pakistani Case Study. Applied Sciences. 2024; 14(13). 5380; https://doi.org/10.3390/app14135380

8. *Kumar D. & Kumar P.* Protecting Intellectual Property Rights in the Digital Age. International Journal For Multidisciplinary Research 2024. 6(3). https://doi.org/10.36948/ijfmr.2024.v06i03.20153

9. *Uddin S, Ahmed MS, Shahadat K.* Supply chain accountability, COVID-19, and violations of workers' rights in the global clothing supply chain. Supply Chain Management: An International Journal. 2023. 28(5). p. 859…873.

10. *Yang L., Kumarasinghe P.* Analysis of the impact of RCEP on the industrial and innovation chains of China's textile and clothing industry. PLOS ONE. 2024.19(8): e0309708.

11. *Velluti S.* Labour standards in global garment supply chains and the proposed EU corporate sustainability due diligence directive. European Labour Law Journal. 2024. 15(4). p.822…850.

12. *Cao Y, Elahi E, Khalid Z, Li P, Sun P.* How Do Intellectual Property Rights Affect Green Technological Innovation? Empirical Evidence from China. Sustainability. 2023; 15(10).

13. *Wang W, Liao Y, Shen W.* The Impact of Online Anti-Counterfeiting on Channel Structure and Pricing Decisions. Sustainability [Internet]. 2023; 15(10). p. 7762. DOI: 10.3390/su15107762

14. *Al-kfairy M, Mustafa D, Kshetri N, Insiew M, Alfandi O.* Ethical Challenges and Solutions of Generative AI: An Interdisciplinary Perspective. Informatics. 2024. 11(3). p. 58. DOI: 10.3390/informatics11030058

15. *Sun Z, Xu Q, Liu J.* Dynamic supervision of counterfeit products based on blockchain technology: A differential game on goodwill accumulation. PLOS ONE. 2023.18(10): e0293346.

16. *Nolan J.* Chasing the Next Shiny Thing: Can Human Rights Due Diligence Effectively Address Labour Exploitation in Global Fashion Supply Chains? International Journal for Crime, Justice and Social Democracy. 2022. 11(2). p.1…14.

17. *Roumeliotis C, Dasygenis M, Lazaridis V, Dossis M.* Blockchain and Digital Twins in Smart Industry 4.0: The Use Case of Supply Chain-A Review of Integration Techniques and Applications. Designs. 2024. 8(6). 105. DOI: 10.3390/designs8060105

18. *Hazaea SA, Zhu J, Khatib SFA, Elamer AA.* Mapping the literature of internal auditing in Europe: a systematic review and agenda for future research. Meditari Accountancy Research. 2023. 31(6)/ p. 1675…1706.

19. *Cohen R, Gesser-Edelsburg A, Singhal A, Benenson S, Moses AE.* Translating a theory-based positive deviance approach into an applied tool: Mitigating barriers among health professionals (HPs) regarding infection prevention and control (IPC) guidelines. PLOS ONE. 2022.17(6). e0269124.

20. *Orikpete O, Ewim D.* Adoption of occupational health and safety as a fundamental human right and its implications for Nigerian workers. International Journal of Occupational Safety and Health. 2023.13. p. 396…408.

21. *Jin Woo LEE.* New Efforts to Promote Labor Rights: focusing on the Supply Chain Due Diligence Laws of European Member States & the EU Parliament's Supply Chain Due Diligence Directive. The Korean Journal of Area Studies. 2023. 41(2). p. 1…25.

22. *Mishra A, & Siby A.* The Impact of Replicas and First-Copy Products on Authentic Products: An Exploration in the Apparel Industry. International Research Journal on Advanced Engineering and Management. 2024. 2(04). p. 1076…1083. DOI: 10.47392/IRJAEM.2024.0142

Рекомендована 4th International Conference of New trends and Smart technology. Baghdad, Iraq. Поступила 07.04.2025.