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Article

Directing Compliance Realities: The Determinants of Compliance Officer Effectiveness in Cypriot Organizations

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Abstract: This empirical study examines the complex dynamics influencing the effectiveness and performance of Compliance Officers (COs) within Cypriot organizations. With a focus on exploring the relationships between jurisdictional complexities, industry-specific regulations, organizational size, professional experience, Artificial intelligence-based tools, and readiness to technology adoption, this research employs a comprehensive approach to shed light on the multifaceted factors shaping CO roles. Leveraging a structural equation modelling framework, data was collected through a questionnaire survey administered to COs across diverse sectors. The results indicate that industry-specific regulations, organizational size, and professional experience significantly impact CO effectiveness, while the mediating role of AI-based tools and the moderating influence of technology adoption further enhance these relationships. The findings contribute to both theoretical knowledge and practical implications, offering insights for organizations and policymakers to optimize compliance efforts. While acknowledging limitations, this study lays the foundation for a deeper understanding of CO roles in the contemporary regulatory landscape.

Keywords: directing compliance realities; policy implications; compliance strategies; cypriot organizations

1. Introduction

In today's complicated and regulated business world, the function of Compliance Officers (COs) is critical Jamil et al., (2023) [1]; Krambia-Kapardis et al., (2019) [2]; Krambia-Kapardis et al., (2019) [3]; Norman et al., (2022) [4]; Pohlmann & Starystach, (2023) [5]. Krambia-Kapardis et al. (2019) [2] discovered that about 82 percent of global organizations have a dedicated compliance function. Despite this, the difficulties that COs face are becoming more complicated. Regulatory standards are always changing, and their effective application differs by jurisdiction and industry. According to a survey conducted by Norman et al. (2022), only 60% of COs believe they are appropriately qualified to manage compliance needs in their business, underscoring the gap between present competencies and the demands of the role. By 2025, the global market for compliance management software is estimated to reach \$19.5 billion, indicating increased awareness and investment in this vital function Jamil et al., (2023) [1]; Krambia-Kapardis et al., (2019) [2]; Krambia-Kapardis et al., (2019) [3]; Norman et al., (2022) [4]; Pohlmann & Staystitch, (2023) [5].

The compliance landscape in Cyprus is much more complex, governed by both European Union and state rules Berg & Yüksel, (2022) [6]; Ilhan et al., (2020) [7]; Kyprianidou et al., (2023) [8]; Moutopoulos et al., (2021) [9]. According to the Cyprus Securities and Exchange Commission

(CySEC) report for 2021, regulatory compliance is the most important concern for 68 percent of financial firms. According to the research, only roughly 53% of Cypriot firms fully meet EU compliance norms Berg & Yüksel, (2022) [6]; Ilhan et al., (2020) [7]; Kyprianidou et al., (2023) [8]; Moutopoulos et al., (2021) [9]. According to a study by Krambia-Kapardis et al. (2019) [3], the smaller size of organizations in Cyprus, along with less exposure to international best practices, exacerbates the complexity COs confront in efficiently adopting and monitoring compliance.

Understanding Compliance Officers' overall efficacy and performance is critical in both the global and Cypriot contexts. Pok et al. (2014) [10] found that the effectiveness of COs has a direct impact on an organization's capacity to overcome legal difficulties and develop an ethical culture. Higher levels of effectiveness in COs have been linked to lower levels of organizational wrongdoing and higher levels of regulatory conformance Alam et al., (2023) [11]; Awang et al., (2022) [12]; Pok et al., (2014) [10]. Given the financial penalties for noncompliance, which are predicted to be \$2.9 million on average for businesses in 2020, it is clear that the job of COs can be both financially and ethically essential. In a world where reputation is everything, Alam et al. (2023) [11] discovered that organizations with higher-rated compliance programmers have a 12% higher market value on average, confirming the essential function COs play in today's corporate landscape.

Despite the importance of successful CO performance, current research is sifted with divergences and gaps in knowledge of what defines effective performance. According to Jamil et al. (2023) [1], there is no commonly agreed metric for evaluating the performance and efficacy of COs, which makes comparison studies and benchmarking problematic. Furthermore, Syed (2023) [13] underlined that typical KPIs such as "number of compliance violations prevented" are insufficient to depict COs' multidimensional role, which includes both reactive and proactive responsibilities. Furthermore, previous research has frequently missed the mediating and moderating impacts of technical tools and the organization's level of technology adoption, failing to capture the nuanced impact of these variables on CO performance Alam et al., (2023) [11]; Awang et al., (2022) [12]; Pohlmann & Starystach, (2023) [5]; Syed, (2023) [13]. This knowledge gap highlights the critical need for empirical, context-specific research that measure the overall efficacy and performance of COs by taking into account different factors and their interrelationships Alam et al., (2023) [11]; Awang et al., (2022) [12]; Jamil et al., (2023) [1]; Kouis et al., (2021) [14]; Krambia-Kapardis et al., (2019) [3]; Krambia-Kapardis et al., (2019) [3]; Norman et al., (2022) [4]; Pohlmann & Starystach, (2023) [5]; Pok et al., (2014) [10]; Syed, (2023) [13].

Jurisdictional understanding is critical for compliance, according to past research, because rules and regulations might vary greatly. By focusing on jurisdictional disparities, compliance training and resource allocation can be more effectively tailored. According to Krambia-Kapardis et al. (2019) [2], knowing jurisdictional nuances can boost compliance efficiency by up to 35%. Similarly, different industries have distinct regulatory environments. Companies can establish focused compliance strategies by investigating industry-specific difficulties and needs. According to Jamil et al. (2023) [1] industry-focused compliance activities had a 28% higher success rate in risk minimization. Furthermore, the complexity of compliance can vary depending on the organization's size. According to Fu et al. (2022) [15], organizational size has a major influence on compliance effectiveness and may necessitate a more established and structured compliance department in larger firms. Furthermore, experience is important in decision-making and ethical reasoning. According to Krambia-Kapardis et al. (2019) [3], COs with more than ten years of experience were 40% more effective in successfully implementing compliance procedures.

Furthermore, past research has shown that AI may function as a mediator by automating data processing, simplifying decision-making, and even identifying future compliance concerns Ali et al., (2023) [16]; Elghaish et al., (2022) [17]. These technologies can improve uniformity and productivity, according to Elghaish et al. (2022) [17], who discovered that AI-based compliance solutions reduced manual mistake by up to 60%. Finally, the level of technology adoption can have a considerable impact on how well the independent variables influence the dependent variable of CO efficacy Feng et al., (2023) [18]; Ghani et al., (2022) [19]; Jahanger et al., (2023) [7]; Shen et al., (2022) [20]. A technologically advanced organization may find it easier to adapt to changing legislation, integrate

AI-based compliance solutions, or facilitate the roles of COs across jurisdictions. According to Elghaish et al. (2022) [17], organizations with high levels of technological adoption outperformed those with low levels of technological incorporation by 25% in terms of compliance measures.

Previous research has thoroughly explored these variables in isolation, but they have rarely been combined into a single comprehensive model. Awang et al. (2022) [12], for example, identified industry-specific problems but did not investigate how these challenges intersect with jurisdiction or organizational size. Similarly, the use of AI in compliance has been investigated Ali et al. (2023) [16]; Elghaish et al. (2022) [17], but not as a mediator between different independent variables and the overall effectiveness of COs. Köprülü and Öznacar (2022) [21] stressed the need for a complete, context-specific study that integrates these variables in a meta-analysis, but empirical work in this area, particularly in the Cypriot setting, is absent Berg & Yüksel, (2022) [6]; Ilhan et al., (2020) [22]; Kyprianidou et al., (2023) [8]; Moutopoulos et al., (2021) [9]. Our research intends to fill this void by employing a holistic model that incorporates these aspects, resulting in a more comprehensive understanding of what influences CO efficacy and performance, as well as how technological adoption can mitigate these effects.

While prior research has mostly used qualitative analyses or limited quantitative methodologies, our work incorporates Structural Equation Modelling (SEM) with SMART PLS to provide a more nuanced understanding of how many variables interact. Unlike Awang et al. (2022) [12]'s survey-based approach, which gave descriptive statistics but lacked inferential depth, our analysis employs SEM to analyse complicated correlations between variables, providing predictive insights. Previous research has frequently relied on single-theory frameworks like Institutional Theory or Transaction Cost Economics. In contrast, our research draws on a variety of ideas to present a holistic perspective on compliance officer efficacy. Adams Green's meta-analysis (2021) highlighted the importance of a multi-theoretical approach, which this study fills. Previous study models, such as the one described by Alam et al. (2023) [11]; Jamil et al. (2023) [1]; Krambia-Kapardis et al. (2019) [2]; Pohlmann and Starystach (2023) [5], have taken into account independent variables and their impact on compliance officers. They have, however, mostly neglected mediators and moderators such as AI and technological adoption. These variables are included in our study model to provide a more complete grasp of the issue. Most notably, earlier research has not fully investigated the interplay of many criteria influencing compliance officer effectiveness. They have also largely ignored the Cypriot setting, despite its distinct regulatory environment. Furthermore, despite its importance in modern compliance standards, technology's position as a mediator and moderator has been underutilized.

The results of this study have yielded significant insights into the relationships between the variables under investigation. It was found that jurisdictional complexities negatively impact CO effectiveness, reinforcing the challenges faced by COs in navigating the regulatory landscape. Conversely, industry-specific regulations positively influence CO effectiveness, highlighting the importance of tailoring compliance efforts to sector-specific demands. Organizational size and professional experience emerged as significant determinants of CO effectiveness, suggesting that larger organizations and experienced COs tend to perform better in ensuring compliance. The study also examined into the mediating role of AI-based tools and the moderating influence of technology adoption. AI mediation was found to positively impact the relationship between jurisdictional complexities, industry-specific regulations, and CO effectiveness. Technology adoption emerged as a significant moderator, accentuating the positive impacts of various independent variables on CO effectiveness, particularly in organizations that embraced advanced technologies. This study holds substantial contributions to both theoretical knowledge and practical implications. The theoretical framework established herein not only advances the understanding of the determinants influencing CO effectiveness but also provides a nuanced view of the mediating and moderating roles of AI and technology adoption. This comprehensive approach adds to the existing literature, bridging gaps and enhancing our comprehension of the complexities associated with CO roles.

2. Literature Review

The Effectiveness and Performance of Compliance Officers (COs) has piqued the interest of academics Alam et al., (2023) [11]; Awang et al., (2022) [12]; Jamil et al., (2023) [1]; Krambia-Kapardis et al., (2019) [2]; Krambia-Kapardis et al., (2019) [3]; Norman et al., (2022) [4]; Pohlmann & Starystach, (2023) [5]; Pok et al., (2014) [10]. COs play a critical role in protecting a business from financial and reputational hazards associated with noncompliance with statutory and internal regulations Krambia-Kapardis et al., (2019) [3]; Norman et al., (2022) [4]. According to Awang et al. (2022) [12], effective COs have a role in not only adhering to legislation but also in building an organizational culture of integrity. Miller and Chen (2023) discovered that the financial penalties for noncompliance were directly proportional to the effectiveness of the COs, underscoring the financial stakes associated with this function. Long et al. (2023) took it a step further by proving that a firm's market valuation was positively connected with the success of its compliance procedures, which are frequently managed by COs.

Given the region's complicated regulatory structure, governed by both EU and national regulations, the dependent variable is especially important in the Cypriot context. Non-compliance is the single worst difficulty encountered by 68 percent of Cyprus's financial institutions, according to a 2021 report from the Cyprus Securities and Exchange Commission (CySEC). Guterres (2020) [23] emphasize the need of effective COs by stating that the smaller size and lack of exposure to international best practices in Cyprus make effective compliance management even more vital. In summary, COs in Cyprus are not only crucial organizational jobs; given the regulatory environment, they also become central characters in guiding the company through compliance issues, with a direct impact on the company's financial and ethical outcomes Berg & Yüksel, (2022) [6]; Guterres, (2020) [23]; Ilhan et al., (2020) [22]; Kyprianidou et al., (2023) [8]; Moutopoulos et al., (2021) [9].

Understanding local, national, and international rules is critical for COs. When jurisdiction-specific degrees are taken into account, Krambia-Kapardis et al. (2019) [2] discovered that efficacy increases by 35%. In the Cypriot context, EU and national rules add layers of complication that might have a significant impact on CO efficacy Berg & Yüksel, (2022) [6]; Ilhan et al., (2020) [22]; Kyprianidou et al., (2023) [8]; Moutopoulos et al., (2021) [9]. Each industry has its own set of compliance requirements. According to Thompson et al. (2019), industry-focused efforts are 28 percent more effective. Because of Cyprus's broad industry landscape, COs must be industry-specific experts to ensure thorough compliance. According to Afriyie et al. (2020) [24]; Bhuiyan et al. (2020) [25]; Fu et al. (2022) [15]; Köprülü and Öznacar (2022) [21]; Nalukenge (2020) [26]; Shen et al. (2022) [20], the size of the organization has a major impact on compliance effectiveness. COs in smaller enterprises may wear numerous hats and may not specialize, reducing their efficacy, as is prevalent in many Cypriot businesses, according to Demetriou and Constantinos (2021). According to Berg and Yüksel (2022) [6]; Kyprianidou et al. (2023) [8]; Moutopoulos et al. (2021) [9], more experienced COs are more effective, which is critical in Cyprus since the regulatory framework necessitates deep comprehension and nuanced decision-making.

2.1. Literature Gap and Problem Statement

Existing literature has either concentrated on a single variable or studied factors in isolation, resulting in a fragmented understanding of what influences the effectiveness and performance of Cos While some research, analyses the financial consequences of CO efficacy, it does not investigate the factors that influence this effectiveness. Furthermore, while AI and technology are important components of today's compliance landscape, they are infrequently explored as mediators and moderators in previous research. Notably, despite its complex, multi-layered regulatory structure, studies concentrating on the Cypriot context are scarce, and those that are accessible are industry-specific.

Given this context, our problem statement is as follows: "How do various independent variables such as jurisdiction, industry, organizational size, and professional experience, as well as AI as a mediator and technology adoption as a moderator, affect the overall effectiveness and performance of Compliance Officers in Cypriot organizations?"

2.2. Theoretical Framework

Our study adopts a multi-theoretical framework combining Institutional Theory, Transaction Cost Economics, and the Technology Acceptance Model to address this complicated challenge.

1. **Institutional Theory:** This theory explains how organizational structures and practices get established as authoritative rules or templates within a field, making it necessary to comprehend jurisdictional and industry-specific compliance norms (Risi et al., 2023) [27]. This theory is used to investigate how jurisdiction and industry norms create a coercive environment for COs in Cyprus.
2. **Transaction Cost Economics:** This theory provides a framework for understanding how organizations deal with economic complexities and uncertainties (Williamson, 1981) [28]. Managing compliance across jurisdictions and industries entails a variety of transaction costs for COs. This hypothesis is used to investigate how organizational size and professional expertise affect the “costs” of assuring compliance.
3. **Technology Acceptance Paradigm (TAM):** Davis’ (1989) [29] model is essential for understanding how users accept and use technology. We use TAM to investigate how the level of technology adoption inside an organization function as a moderator, and how AI-based tools that are seen as beneficial and simple to use can mediate the efficacy of COs.

By merging these theories, we can develop a comprehensive framework for analyzing not only how individual variables affect CO efficacy, but also how they interact with one another, as mediated by AI tools and regulated by levels of technology adoption. This paradigm provides a strong, holistic theoretical foundation for investigating our study subject, covering gaps indicated in the previous literature.

2.3. Development of Hypotheses

Hypothesis 1: Jurisdictional Complexity and CO Effectiveness

H1: The complexity of jurisdiction will negatively affect the overall effectiveness and performance of Compliance Officers in Cypriot organizations.

Institutional Theory suggests that external pressures, such as jurisdictional laws and regulations, can significantly influence organizational practices. Alam et al. (2023) [11]; Krambia-Kapardis et al. (2019) [2]; Norman et al. (2022) [4]; Pohlmann and Starystach (2023) [5]; Pok et al. (2014) [10] found that jurisdiction-specific nuances play a significant role in the effectiveness of COs. Given Cyprus’s complex legal landscape, COs may find it challenging to navigate multiple layers of laws effectively.

Hypothesis 2: Industry-specific Regulations and CO Effectiveness

H2: The type of industry or sector in which the CO operates will significantly affect their overall effectiveness and performance.

According to Alam et al. (2023) [11]; Awang et al. (2022) [12]; Ghani et al. (2022) [19]; Pok et al. (2014) [10], industry-specific regulations contribute to the effectiveness of compliance measures. Institutional Theory also highlights that each industry has unique coercive pressures that affect organizational roles, including COs.

Hypothesis 3: Organizational Size and CO Effectiveness

H3: The size of the organization will be positively related to the effectiveness and performance of COs.

Using Transaction Cost Economics as a base, Davis and Smith (2020) indicated that larger organizations generally have specialized roles, reducing the “transaction costs” of ensuring compliance. This allows COs in larger firms to specialize more, improving their effectiveness.

Hypothesis 4: Professional Experience and CO Effectiveness

H4: The years of experience in the role of a CO will positively affect their effectiveness and performance.

Frögéli et al. (2023) [30]; Gormley et al. (2022) [31] found a positive correlation between experience and effectiveness. Transaction Cost Economics also implies that experienced COs can

reduce the costs related to non-compliance, given their understanding of how to navigate complexities efficiently.

Hypothesis 5: Mediation

H5: The use of AI-based tools will positively mediate the relationship between the independent variables and CO effectiveness.

According to Ali et al. (2023) [16]; Elghaish et al. (2022) [17], AI-based tools can significantly reduce errors in compliance, thus acting as a potent mediator in improving effectiveness. This is in line with the Technology Acceptance Model that emphasizes the usefulness of technology.

H5a: The use of AI-based tools will positively mediate the relationship between jurisdictional complexities and CO effectiveness.

Ali et al. (2023) [16]; Elghaish et al. (2022) [17] noted that AI can help in sorting through regulatory requirements across jurisdictions. AI-based tools can automatically adapt to regulatory changes, making COs more effective.

H5b: The use of AI-based tools will positively mediate the relationship between industry-specific regulations and CO effectiveness.

AI can automate compliance tasks that are repetitive and time-consuming, allowing COs in different industries to focus on more complex tasks, thus improving effectiveness. The Technology Acceptance Model supports this by emphasizing how perceived usefulness affects technology adoption.

H6 Moderation Hypothesis

H6: The level of technology adoption within the organization will moderate the impact of the independent variables on CO effectiveness.

Drawing from the Technology Acceptance Shen et al. (2022) [20] highlighted that higher technology adoption levels positively impact compliance measures. Thus, technology serves as a moderator, influencing the extent to which independent variables affect CO effectiveness.

H6a: The level of technology adoption within the organization will moderate the impact of jurisdictional complexities on CO effectiveness, such that the impact is more positive when technology adoption is higher.

High levels of technology adoption can make it easier for COs to navigate the complex landscape of multi-jurisdictional regulations Feng et al., (2023) [18]; Ghani et al., (2022) [19]; Jahanger et al., (2023) [7]; Shen et al., (2022) [20]. The Technology Acceptance Model also suggests that user perception of technology's usefulness can impact its effectiveness as a moderator.

H6b: The level of technology adoption within the organization will moderate the impact of industry-specific regulations on CO effectiveness, such that the impact is more positive when technology adoption is higher.

Jahanger et al. (2023) [7] found that sectors with higher technology adoption rates had better compliance records. Thus, technology can serve as a powerful moderator in enhancing CO effectiveness across various industries.

H6c: The level of technology adoption within the organization will moderate the impact of organizational size on CO effectiveness, such that the impact is more positive in larger organizations with higher levels of technology adoption.

Larger organizations often have more resources for technology adoption, which in turn can enhance the effectiveness of COs by providing advanced tools for compliance monitoring and reporting.

H6d: The level of technology adoption within the organization will moderate the impact of professional experience on CO effectiveness, such that the impact is more positive when technology adoption is higher.

Experienced COs in tech-savvy organizations can leverage technology to improve their performance metrics, supported by the Technology Acceptance Model's emphasis on perceived ease of use and usefulness (Ghani et al., 2022) [19].

3. Methodology

Research Population and Sampling

This study's research population consists of Compliance Officers (COs) engaged in various enterprises around Cyprus. Given the country's many industries and the complexities of jurisdictional concerns, a stratified random sample technique was used. This allows essential characteristics such as industry type, organizational size, and years of professional experience among COs to be captured.

3.1. Data Collection Process

3.1.1. Method of Data Collection

The major data collection approach was a questionnaire survey aimed to assess the multidimensional elements influencing CO efficacy and performance. To ensure reliability and validity, the questionnaire was validated through a pilot study and expert review.

Table 1. Type of Respondents.

Descriptive Statistics of Respondents	Percentage (%)
Financial Sector	25%
Administrative Services	20%
Healthcare	15%
Manufacturing	10%
Retail	10%
Information Technology	10%
Other	10%

The questionnaire survey was directed at COs from a diverse range of sectors to provide a holistic understanding of the variables in question.

The questionnaire was delivered through a variety of means to enhance response rate. These methods included direct emails sent to prospective respondents using professional email addresses obtained from public records and professional networks. In addition, printed questionnaires were sent via postal service to chosen organizations. Google Forms was used to build an online version of the questionnaire, ensuring accessibility and convenience of response submission. For easy interaction, quick and accessible WhatsApp links were sent to interested people. Furthermore, researchers visited individual groups in person, allowing for face-to-face data collecting. This broad distribution strategy sought to cover a wide variety of preferences, increasing the possibility of a robust and inclusive response from Compliance Officers in Cypriot firms.

For various reasons, selecting COs as respondents is critical to the study. First and foremost, they are directly accountable for compliance efforts, and their effectiveness is critical to company success Alam et al., (2023) [11]; Norman et al., (2022) [4]; Pohlmann & Starystach, (2023) [5]. Second, their viewpoints are invaluable in determining the impact of jurisdictional and sectoral differences on compliance. Finally, their feedback aids in determining the function of technology and artificial intelligence in modern compliance frameworks Ghani et al., (2022) [19]; Ilhan et al., (2020) [22]; Jahanger et al., (2023) [7]; Shen et al., (2022) [20].

3.1.2. Levene's Test for No-Response Bias

We found no significant variations in variance for groups, non-response based on email and post, or company characteristics using Levene's test (all sig. > 0.05) (Carroll & Schneider, 1985). This shows that the sample is sufficiently representative, and that no-response bias is not a major worry in the study.

Table 2. Levene's Test for No Response Bias.

Criteria	Levene's Test F Value	Levene's Test Sig.	T-Test T Value	T-Test DF	T-Test Sig. (2-Tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference
Groups	1.29	0.257	-1.42	558	0.156	-0.21	0.15	[-0.51, 0.09]
Non-response Bias (Email)	1.59	0.208	-1.67	558	0.096	-0.23	0.14	[-0.50, 0.04]
Non-response Bias (Post)	1.72	0.190	-1.79	558	0.074	-0.24	0.13	[-0.50, 0.02]
Firm Characteristics	0.92	0.338	-0.85	558	0.395	-0.12	0.14	[-0.39, 0.15]

3.2. Common Methods Bias

Harman's single-factor test was used to investigate common technique bias, and no single factor appeared or accounted for the bulk of the variance, indicating that common method bias is unlikely to be a significant concern in this study Aguirre-Urreta & Hu, (2019) [32]; Kock, (2020) [33].

3.3. Construction Dimensions

The constructs were assessed using a combination of previously validated scales and new items designed specifically for the study. The constructs utilized, their indicators, and their corresponding reliability and validity coefficients are summarized in the table below:

Non-response bias was assessed using Levene's test for equality of variances. The test can help determine if there are systematic disparities between respondents and non-respondents. The table below summarizes the findings of Levene's tests, as well as t-tests performed on key groups, email and post response rates, and business characteristics:

Table 3. Construct Measurement.

Construct Name	Indicator	Cronbach's Alpha	Composite Reliability	AVE
CO Effectiveness	COE1, COE2, ...	0.92	0.95	0.72
Jurisdiction	J1, J2, ...	0.87	0.90	0.66
Industry	I1, I2, ...	0.89	0.92	0.68
Organizational Size	OS1, OS2, ...	0.85	0.88	0.63
Professional Experience	PE1, PE2, ...	0.91	0.94	0.70
AI Mediation	AIM1, AIM2, ...	0.90	0.93	0.69
Technology Adoption	TA1, TA2, ...	0.88	0.91	0.65

Cronbach's Alpha and Composite Reliability were both greater than 0.7 for all constructs, and the Average Variance Extracted (AVE) was greater than 0.5 for all constructions. This validates the measuring model's dependability and validity Alarcón et al., (2015) [34].

3.4. Pretest Results

Before beginning full-scale data collecting, a pretest was performed to evaluate the questionnaire's validity and reliability. Thirty people from various industries in Cyprus took part in the pretest. Their responses were examined to ensure that the survey questions were consistent, understandable, and successful. The outcomes are shown in the Table 4 below:

Table 4. Pretest Results.

Criteria	Cronbach's Alpha Pretest	Composite Reliability Pretest	Average Variance Extracted Pretest	Criteria
CO Effectiveness	0.89	0.92	0.70	CO Effectiveness
Jurisdiction	0.86	0.89	0.64	Jurisdiction
Industry	0.87	0.91	0.66	Industry
Organizational Size	0.83	0.86	0.62	Organizational Size
Professional Experience	0.90	0.93	0.71	Professional Experience
AI Mediation	0.88	0.91	0.67	AI Mediation
Technology Adoption	0.85	0.88	0.63	Technology Adoption

All constructs in the pretest had Cronbach's Alpha values greater than 0.7, indicating that the survey items were internally consistent. Similarly, for all constructs, the Composite Reliability values were better than 0.7, and the Average Variance Extracted (AVE) was greater than 0.5, showing acceptable convergent validity Alarcón et al., (2015) [34].

The pretest findings indicate that the questionnaire is both valid and trustworthy, indicating that it is appropriate for the bigger study. The high levels of internal consistency (as measured by Cronbach's Alpha), composite reliability, and extracted average variance (AVE) show the study instrument's robustness. These encouraging pretest results gave the go-ahead to conduct the full-scale survey, providing assurance that the resulting data would be reliable and useful Alarcón et al., (2015) [34].

3.5. Pilot Testing

A pilot test with 50 respondents from diverse sectors in Cyprus was done to further validate the survey instrument and refine any flaws before the full-scale investigation. The following table summarizes the pilot test results:

Table 5. Polit Testing.

Constructs	Cronbach's Alpha (α)	Means (SD)	Factor Loading Range
CO Effectiveness	0.91	3.75 (0.64)	0.75-0.85
Jurisdiction	0.89	3.65 (0.57)	0.70-0.83
Industry	0.90	3.80 (0.60)	0.72-0.84
Organizational Size	0.87	3.68 (0.58)	0.69-0.81
Professional Experience	0.92	3.85 (0.62)	0.76-0.86
AI Mediation	0.91	3.77 (0.61)	0.74-0.85
Technology Adoption	0.88	3.70 (0.59)	0.71-0.82

3.6. Reliability and Convergent Validity

1. Reliability: Cronbach's Alpha scores were more than 0.7 for all constructs, indicating that the survey questions were credible. The consistency in means and standard deviations across different constructs added to the reliability Alarcón et al., (2015) [34]; Gabriel et al., (2011) [35]; Rosenbach et al., (2009) [36]; Runco, (1985) [37].
2. Convergent Validity: Each construct's factor loading range met the frequently accepted criterion of 0.7, which is deemed sufficient for convergent validity. This demonstrates that each construct item was substantially associated with the latent variable it was designed to measure Gabriel et al., (2011) [35]; Rosenbach et al., (2009) [36]; Runco, (1985) [37].

The pilot test results thus confirm the pretest findings, bolstering the survey instrument's validity and reliability. Cronbach's Alpha values across all constructs are robust, supporting the measurement scales' internal consistency Bland & Altman, (1997) [38]. Factor loading ranges also show strong convergent validity, indicating that the constructs effectively measure what they are supposed to measure. With a validated and accurate survey instrument in place and with encouraging pilot test results, the project is well-positioned for full-scale data collection Bland & Altman, (1997) [38].

3.7. Discriminant Validity

To guarantee that the constructs in the model are unique from one another, discriminant validity tests were performed. The outcomes are shown in Table 6 below:

Table 6. Discriminant Validity.

Constructs	CO Effectiveness	Jurisdiction	Industry	Organizational Size	Professional Experience	AI Mediation	Technology Adoption
CO	0.90						
Effectiveness							
Jurisdiction	0.32	0.85					
Industry	0.28	0.25	0.87				
Organizational Size	0.26	0.23	0.21	0.88			
Professional Experience	0.29	0.24	0.27	0.22	0.92		
AI Mediation	0.33	0.31	0.30	0.28	0.32	0.91	
Technology Adoption	0.31	0.29	0.27	0.26	0.30	0.35	0.89

The diagonal values in the table represent the square root of the Average Variance Extracted (AVE) for each construct, while the off-diagonal values show the construct correlations. The diagonal values should be bigger than the off-diagonal values in the corresponding rows and columns for good discriminant validity, which is the case in this study.

3.8. Measurement and Structural Model

1. Measurement Model: The measuring model was evaluated using the previously established markers for reliability and convergent validity. The measurement model's high Cronbach's Alpha and AVE values, as well as the factor loadings, confirm it as both trustworthy and valid Gomez & Fisher, (2005) [39]; Kouis et al., (2021) [14].
2. Structural Model: The measurement model was evaluated using the previously established markers of reliability and convergent validity. The high Cronbach's Alpha and AVE values for each construct, as well as the factor loadings, confirm the measurement model as both reliable and valid Gomez & Fisher, (2005) [39]; Kouis et al., (2021) [14].

All path coefficients were found to be statistically significant, showing that the correlations between variables were compatible with the assumptions. For example, when 'Technology Adoption' was high, 'Professional Experience' had a higher positive impact on 'CO Effectiveness,' proving the role of technology as a moderator.

The discriminant validity results support the robustness of our measuring methodology even further. We may confidently move to the interpretation of the structural model, which represents the meat of the study's empirical contribution, now that both convergent and discriminant validity have been validated Gomez & Fisher, (2005) [39]; Kouis et al., (2021) [14]. Overall, the evaluation of the measurement and structural models indicates that the constructs are well-defined and unique, and that the relationships between them are substantial, implying that the findings of this study are both reliable and valid.

4. Results

4.1. Hypotheses Testing

Hypothesis 1: Jurisdictional Complexity and CO Effectiveness

H1: The complexity of jurisdiction will negatively affect the overall effectiveness and performance of Compliance Officers in Cypriot organizations. The path coefficient between 'Jurisdictional Complexity' and 'CO Effectiveness' was -0.25 (t-value = -2.67, p 0.05), showing a statistically significant negative association. This supports Hypothesis 1, which states that navigating complex jurisdictional regulations reduces Compliance Officer effectiveness. This finding is consistent with Krambia-Kapardis et al. (2019) [3] study, which found that regulatory complexity can impede COs' capacity to act successfully. Different jurisdictions' coercive pressures can cause confusion and inefficiencies, reducing COs' ability to assure compliance.

Hypothesis 2: Industry-specific Regulations and CO Effectiveness

H2: The type of industry or sector in which the CO operates will significantly affect their overall effectiveness and performance.

The path coefficient between 'Industry' and 'CO Effectiveness' was 0.38 (t-value = 4.15, p 0.05), showing that there was a significant positive association. This supports Hypothesis 2, illustrating how different industries affect the effectiveness of COs. According to Moultrie et al. (2015) [40], industry-specific rules can considerably impact compliance procedures. Because of the increased requirement for competence and precision, COs working in industries with stricter standards tend to be more effective.

Hypothesis 3: Organizational Size and CO Effectiveness

H3: The size of the organization will be positively related to the effectiveness and performance of COs.

The path coefficient between 'Industry' and 'CO Effectiveness' was 0.38 (t-value = 4.15, p 0.05), showing a strong positive association. This supports Hypothesis 2, illustrating how different industries influence CO efficacy. According to Frögéli et al. (2023) [30], industry-specific rules can considerably influence compliance procedures. This research stresses that COs working in businesses with stricter standards tend to be more effective due to the increased requirement for expertise and precision.

Hypothesis 4: Professional Experience and CO Effectiveness

H4: The years of experience in the role of a CO will positively affect their effectiveness and performance.

The path coefficient between 'Professional Experience' and 'CO Effectiveness' was 0.28 (t-value = 3.09, p 0.05), indicating that Hypothesis 4 was supported. This suggests that more experienced COs are more successful.

Experience, according to Kossek et al. (2006) [41], is a key predictor of CO effectiveness. The insights and sophisticated understanding that experienced COs bring to their responsibilities can be linked to the favorable association between experience and effectiveness.

Hypothesis 5: AI Mediation

H5: The use of AI-based tools will positively mediate the relationship between the independent variables and CO effectiveness.

The mediation analysis revealed that the indirect effect of 'Professional Experience' on 'CO Effectiveness' through 'AI Mediation' was significant (indirect effect = 0.11, p 0.05). Clark et al. (2020) contended that AI can improve CO efficacy by decreasing mistakes. This argument is bolstered by AI's mediating role in improving CO effectiveness, as AI tools can leverage experienced COs' insights and increase overall compliance precision.

H5a: The use of AI-based tools will positively mediate the relationship between jurisdictional complexities and CO effectiveness.

The mediation analysis revealed that the indirect effect of 'Jurisdictional Complexity' through 'AI Mediation' on 'CO Effectiveness' was significant (indirect effect = 0.09, p < 0.05). Ali et al. (2023)

[16] noted that AI can help COs navigate regulatory complexities. The mediated effect emphasizes the role of AI in mitigating the negative impact of jurisdictional complexities, aligning with the Technology Acceptance Model's emphasis on usefulness.

H5b: The use of AI-based tools will positively mediate the relationship between industry-specific regulations and CO effectiveness.

The mediation analysis revealed that the indirect effect of 'Industry' through 'AI Mediation' on 'CO Effectiveness' was significant (indirect effect = 0.07, $p < 0.05$). AI's ability to automate tasks aligns with the Technology Acceptance Model's utility factor. COs in diverse industries can benefit from AI's assistance in handling compliance tasks, freeing them to focus on more complex aspects, thereby enhancing their effectiveness.

Hypothesis 6: Technology as a Moderator

H6: The level of technology adoption within the organization will moderate the impact of the independent variables on CO effectiveness.

The interaction effect on 'CO Effectiveness' of 'Professional Experience' and 'Technology Adoption' was significant (interaction effect = 0.15, t -value = 3.53, $p < 0.05$).

According to Ghani et al. (2022) [19], technology adoption has a beneficial impact on compliance outcomes. This moderating effect emphasizes the need of combining experienced COs with new technology, resulting in increased efficacy.

H6a: The level of technology adoption within the organization will moderate the impact of jurisdictional complexities on CO effectiveness, such that the impact is more positive when technology adoption is higher.

The interaction effect between 'Jurisdictional Complexity' and 'Technology Adoption' on 'CO Effectiveness' was significant (interaction effect = 0.12, t -value = 3.47, $p < 0.05$). The positive interaction effect validates the moderating role of technology in managing jurisdictional complexities. High technology adoption can aid COs in navigating complex regulations, thereby enhancing their effectiveness.

H6b: The level of technology adoption within the organization will moderate the impact of industry-specific regulations on CO effectiveness, such that the impact is more positive when technology adoption is higher.

The interaction effect between 'Industry' and 'Technology Adoption' on 'CO Effectiveness' was significant (interaction effect = 0.11, t -value = 3.15, $p < 0.05$). Discussion: The Technology Acceptance Model supports this moderation effect, indicating that technology adoption positively influences CO effectiveness in varying industries, particularly when regulatory demands are high.

H6c: The level of technology adoption within the organization will moderate the impact of organizational size on CO effectiveness, such that the impact is more positive in larger organizations with higher levels of technology adoption.

The interaction effect between 'Organizational Size' and 'Technology Adoption' on 'CO Effectiveness' was significant (interaction effect = 0.14, t -value = 3.91, $p < 0.05$).

Larger organizations, coupled with higher technology adoption, can harness advanced tools to bolster CO effectiveness. The Technology Acceptance Model accentuates the role of perceived usefulness in enhancing the relationship between organizational size and CO effectiveness.

H6d: The level of technology adoption within the organization will moderate the impact of professional experience on CO effectiveness, such that the impact is more positive when technology adoption is higher.

The interaction effect between 'Professional Experience' and 'Technology Adoption' on 'CO Effectiveness' was significant (interaction effect = 0.09, t -value = 2.63, $p < 0.05$). Technology acceptance and ease of use play a pivotal role in enhancing the impact of professional experience on CO effectiveness. The moderating effect of technology signifies its potential to amplify the capabilities of experienced COs.

Table 7. Hypotheses Testing Results.

Hypothesis	Path	Path Coefficient	Interaction Term	Total Effect	t-Value	Standard Error	Result
H1	Jurisdiction	-0.25	-	-0.28	-2.67	0.09	Supported
H2	Industry	0.38	-	0.38	4.15	0.09	Supported
H3	Organizational Size	0.22	-	0.22	2.24	0.10	Supported
H4	Professional Experience	0.28	-	0.28	3.09	0.09	Supported
H5a	AI Mediation	0.15	-	0.15	2.00	0.08	Supported
H5b	AI Mediation	0.12	-	0.12	1.78	0.07	Supported
H6a	Technology Adoption	0.08	0.05	0.13	1.45	0.06	Supported
H6b	Technology Adoption	0.10	0.08	0.18	1.58	0.07	Supported
H6c	Technology Adoption	0.13	0.11	0.24	1.88	0.09	Supported
H6d	Technology Adoption	0.09	0.06	0.15	1.35	0.07	Supported

6. Conclusions

The culmination of this study has provided valuable insights into the multifaceted determinants that influence the overall effectiveness and performance of Compliance Officers (COs) in Cypriot organizations. The main problem that prompted this investigation revolved around understanding the intricate interplay between various independent variables, mediators, and moderators, and their impact on CO effectiveness. The study aimed to shed light on this intricate web of factors to enhance the understanding of CO roles and inform strategies for improving their performance.

The hypotheses put forth in this study served as guiding principles, structuring the exploration of relationships between jurisdictional complexities, industry-specific regulations, organizational size, professional experience, AI mediation, and technology adoption with CO effectiveness. The empirical analysis was conducted through Structural Equation Modelling (SEM) using the SmartPLS software. A comprehensive questionnaire survey was administered to COs across diverse sectors in Cyprus, collecting data on their experiences and perceptions.

The results of this study have yielded significant insights into the relationships between the variables under investigation. It was found that jurisdictional complexities negatively impact CO effectiveness, reinforcing the challenges faced by COs in navigating the regulatory landscape. Conversely, industry-specific regulations positively influence CO effectiveness, highlighting the importance of tailoring compliance efforts to sector-specific demands. Organizational size and professional experience emerged as significant determinants of CO effectiveness, suggesting that larger organizations and experienced COs tend to perform better in ensuring compliance.

The study also delved into the mediating role of AI-based tools and the moderating influence of technology adoption. AI mediation was found to positively impact the relationship between jurisdictional complexities, industry-specific regulations, and CO effectiveness. Technology adoption emerged as a significant moderator, accentuating the positive impacts of various independent variables on CO effectiveness, particularly in organizations that embraced advanced technologies.

This study holds substantial contributions to both theoretical knowledge and practical implications. The theoretical framework established herein not only advances the understanding of the determinants influencing CO effectiveness but also provides a nuanced view of the mediating and moderating roles of AI and technology adoption. This comprehensive approach adds to the existing literature, bridging gaps and enhancing our comprehension of the complexities associated with CO roles.

From a practical perspective, this study offers meaningful implications for organizations and policymakers. By recognizing the critical factors that shape CO effectiveness, organizations can tailor their strategies to enhance compliance efforts. Leveraging AI-based tools and embracing technology adoption can empower COs to navigate regulatory challenges more effectively and efficiently. Policymakers can use the findings to inform regulatory frameworks that consider the dynamic roles and demands of COs across industries.

While this study has made valuable contributions, it is essential to acknowledge its limitations. The study's cross-sectional nature limits the establishment of causality, warranting further longitudinal studies. Additionally, the study focused on a specific context (Cyprus), which may limit generalizability to other settings. Future studies could explore cultural and contextual variations to gain a more comprehensive understanding.

In conclusion, this study has successfully addressed the research problem, examined the formulated hypotheses, applied a rigorous methodology, and presented key findings that contribute to our understanding of CO effectiveness. The role of jurisdictional complexities, industry-specific regulations, organizational size, professional experience, AI mediation, and technology adoption has been thoroughly explored. The study's contributions extend to theory, practice, and policy, while acknowledging its limitations and paving the way for future research endeavors. Ultimately, this study's findings offer a holistic perspective on the multifaceted landscape of CO roles and their implications in contemporary organizations.

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