



Legal protection of Metaverse-Based Digital Assets and Its Impact on Accounting Information Quality in Jordanian Commercial Banks

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ABSTRACT

This paper aimed to demonstrate the impact of legal protection of digital assets in Metaverse on the quality of accounting information in Jordanian commercial banks. To achieve the paper's objectives, the descriptive analytical approach was used. The study population consisted of 12 Jordanian commercial banks, while the paper's sample consisted of financial managers, accounting department managers, internal audit managers, and legal advisors. A questionnaire was distributed to the sample, with 144 electronic questionnaires distributed to the employees, namely financial managers, accounting department managers, internal audit managers, and legal advisors in commercial banks. The statistical analysis tool SPSS was used to examine the 132 valid questionnaires. The results showed a statistically significant impact ($\alpha \leq 0.05$) of all dimensions of legal protection for digital assets in Metaverse (legislative and regulatory framework, legal accountability, and cybersecurity) on the quality of accounting information. This indicates that strengthening the legal and regulatory environment, activating accountability mechanisms, and ensuring the cybersecurity of digital assets positively impacts the accuracy and reliability of accounting information in Jordanian commercial banks. In order to guarantee accurate recording of financial transactions pertaining to the Metaverse, cryptocurrencies, and virtual assets, the study suggests creating integrated legal and regulatory frameworks that include explicit digital ownership policies, efficient accountability processes, and improved cybersecurity in addition to creating specialized accounting standards for digital assets.

1. INTRODUCTION

The metaverse has developed as a developing extension of the digital economy in light of the rapidly growing digital transformation. Digital assets in all of their manifestations, including non-fungible tokens (NFTs), virtual land, digital trademarks, and smart contracts, have supplanted traditional physical assets as assets (Al-Qassaymeh, 2020). This change has brought about

a new legal and accounting reality that forces businesses to reevaluate how to prove ownership of these assets, regulate them lawfully, and account for them in a way that takes into account their virtual borders and intangible nature (Al-Ajami, 2019).

Given how simple it is to duplicate, alter, or trade digital assets across ill-defined territorial boundaries, the growth of Metaverse transactions

has made the problem of safeguarding digital assets more challenging. Because of this, maintaining the stability of digital transactions and boosting confidence in the virtual world now depend heavily on legal protection. Reducing the legal ambiguity surrounding digital assets and lowering the risks of fraud or related disputes can be achieved through a clear legislative framework, legal recognition of digital ownership, smart contract regulation, and the activation of enforcement and accountability mechanisms (AlOmran & Al-Qassaymeh, 2023).

Beyond the regulatory aspect, legal protection has a direct impact on how these assets are treated in accounting. The accounting recognition of digital assets, as well as the accuracy of their measurement and disclosure, are adversely affected by the lack of clear legal protection. This could weaken the quality characteristics of accounting information, particularly relevance, faithful representation, and verifiability (Qasaimah et al., 2022). On the other hand, a thorough legal framework improves the accuracy of financial data pertaining to digital assets and boosts its capacity to assist decision-makers (Al-Naimiet et al., 2023). Additionally, advancements in blockchain technology and AI in the metaverse have brought about both new opportunities and difficulties. They help trace transactions and document ownership, but they also bring up legal issues with relation to jurisdiction, digital evidence admissibility, and legal liability regulation (Taha, 2023). Because a regulated legal environment is necessary to guarantee transparency, consistency, and trust in financial reports within the virtual economy, studying the legal protection of digital assets is a fundamental approach to understanding their impact on improving the quality of accounting information.

In order to improve trust and stability in digital transactions within virtual environments, the relationship between the legal protection of digital assets in Metaverse and the quality of accounting information represents a modern research focus that integrates the legal and regulatory dimension on the one hand, and the accounting and disclosure dimension on the other.

This study is important because of the significant shifts taking place in the digital economy, especially with the emergence of the metaverse environment as a virtual space where digital assets

with increasing economic value are produced. This creates previously unheard-of legal and accounting challenges. Clear legal protection that ensures ownership, regulates transactions, and reduces the risks of infringement or disputes is required due to the increasing use of digital assets such as virtual real estate, smart contracts, and non-fungible tokens (NFTs). This directly affects how legitimately these assets are treated in accounting. The merging of two complementing domains of knowledge—law and accounting—is what gives the subject its scientific value. It examines how the quality of accounting data is affected by the legal protection of digital assets in the metaverse. The study helps close a research gap on the inadequate integration of accounting standards for recognition, measurement, and disclosure with legal frameworks governing digital property, especially in intricate and quickly evolving virtual environments.

Practically speaking, the study is significant because it gives corporate management, auditors, regulatory agencies, and decision-makers a clear understanding of how the legal environment affects the quality attributes of accounting information, including relevance, accurate representation, verifiability, and transparency. Good legal protection promotes more accurate and impartial financing and investment decisions and increases trust in financial reporting pertaining to digital assets.

By offering an analytical framework that can aid in the creation of laws and policies pertaining to digital assets within the metaverse and guarantee a balance between promoting digital innovation and defending economic rights and interests, the study also has regulatory and legislative significance. As a result, this study adds significantly to the current body of knowledge regarding the transition to the virtual economy and advances a thorough comprehension of the connection between legal protection and the caliber of accounting data in developing digital environments.

This paper's primary goal is to show how the quality of accounting data in Jordanian commercial banks is affected by the legal protection of digital assets in the Metaverse. This goal is further broken down into a number of smaller goals, such as illustrating how the legislative and regulatory framework in Metaverse affects the quality of

accounting information, illustrating how legal accountability in Metaverse affects the quality of accounting information, and illustrating how cybersecurity in Metaverse affects the quality of accounting information.

The following primary query is the issue this research attempts to solve: Does the quality of accounting data in Jordanian commercial banks change as a result of the legal protection of digital assets in Metaverse? The following sub-questions are derived from this question: Does the Metaverse's legal and regulatory environment have an impact on the caliber of accounting data? Does the quality of accounting information in the Metaverse change as a result of legal accountability? Does the integrity of accounting data in the Metaverse depend on cybersecurity?

Research Hypotheses

Main Hypothesis: Ho1: There is no statistically significant impact at the significance level ($\alpha \leq 0.05$) of the legal protection of digital assets in Metaverse, with its dimensions (legislative and regulatory framework, legal accountability, and cybersecurity), on the quality of accounting information in Jordanian commercial banks.

Ho1-1: There is no statistically significant impact at the significance level ($\alpha \leq 0.05$) of the legislative and regulatory framework on the quality of accounting information in Jordanian commercial banks.

Ho1-2: There is no statistically significant impact at the significance level ($\alpha \leq 0.05$) of legal accountability on the quality of accounting information in Jordanian commercial banks.

Ho1-3: There is no statistically significant impact at the significance level ($\alpha \leq 0.05$) of cybersecurity on the quality of accounting information in Jordanian commercial banks.

2. THEORETICAL FRAMEWORK

Over the past 20 years, the field of digital assets has seen tremendous growth in the digital world, especially with the rise of the Metaverse, a three-dimensional virtual environment that facilitates communication between people and organizations via cutting-edge digital platforms. Effective legal protection for digital assets has become crucial in light of this growth in order to guarantee the security of digital transactions, protect property rights, and boost user and investor confidence (Sheikh, 2025). Additionally, the quality of

accounting information that banks supply is strongly impacted by the legal protection of digital assets because a strong legal framework controlling the handling of these assets is directly tied to the correctness and dependability of this information (Al-Own et al., 2023).

Three primary criteria can be used to assess the legal protection of digital assets in the Metaverse: cybersecurity, legal accountability, and the legislative and regulatory framework. The quality of accounting information is impacted both directly and indirectly by each of these dimensions, which each reflect a distinct facet of the legal and regulatory landscape of digital assets (Saidat et al., 2023; Qasaimeh et al., 2025; Al-Jaghbeer et al., 2024).

1. The legislative and regulatory framework: The entire collection of laws, rules, and guidelines that control how digital assets are used in the Metaverse is referred to as the legislative and regulatory framework. This covers laws pertaining to financial transactions, smart contracts, digital ownership, and individual and institutional rights. The correctness, dependability, and comparability of accounting data are all improved by the availability of an integrated statutory framework, which offers a clear standard for documenting digital transactions and protecting ownership rights. According to recent research, the lack or inadequacy of the legal framework raises the possibility of accounting errors and information manipulation and results in poor management over digital hazards (Nugroho, 2023).

2- Legal Accountability: Legal accountability refers to the existence of clear mechanisms for holding violators and those responsible for damages or violations related to digital assets accountable. This includes legal penalties, judicial proceedings, and digital dispute resolution mechanisms (Mokoena et al., 2025). The clearer and more effective the legal accountability mechanisms, the greater the commitment of individuals and institutions to legal standards, thus limiting illegal or fraudulent practices that could affect the quality of accounting information. In commercial banks, a robust legal accountability system is a crucial element for ensuring the reliability of financial reporting and transparency in dealing with digital assets (Mark, 2025).

3. Cybersecurity: Cybersecurity includes the technological and operational safeguards to

guarantee the confidentiality and integrity of related financial data as well as to prevent breaches, theft, or damage to digital assets. Legal frameworks are not enough to secure digital assets; cybersecurity is a supplement. To avoid any violations that would jeopardize the accuracy of accounting data, they must be combined with strong technology safeguards (Mokoena et al., 2025). Research shows that improved cybersecurity improves the dependability and accessibility of accurate information while decreasing accounting errors related to data loss or change (Chen, 2025; Qasaimeh & Jaradeh, 2022). Researchers believe that these three dimensions, taken together, create an integrated legal and regulatory environment that protects digital assets in metaverse. A clear legislative framework defining rights and obligations, effective legal accountability mechanisms ensuring compliance with laws, and enhanced cybersecurity protecting data from technical risks all contribute to improving the quality of accounting information in commercial banks in terms of accuracy, reliability, comparability, and completeness. Therefore, these dimensions are considered essential elements for measuring the strength of legal protection for digital assets and their impact on accounting performance.

The goal of Qasaimeh & Jaradeh's (2022) study was to show how artificial intelligence—including expert systems, neural networks, genetic algorithms, and intelligent agents—affects the successful implementation of cyber governance in Jordanian commercial banks. The findings demonstrated a relationship between the successful implementation of cyber governance in Jordanian commercial banks and artificial intelligence technologies and applications (expert systems, neural networks, genetic algorithms, and intelligent agents), since these technologies and applications help to improve cyber governance's efficacy.

The goal of Khalaf's (2025) research was to investigate digital asset accounting in the Metaverse. The metaverse, an advanced virtual environment, is now an essential part of the world's digital economy. Digital assets have become essential components of financial and economic processes due to the quick development of technology and virtual reality. The study looked at accounting techniques for valuing and recording

these digital assets in the Metaverse. The findings showed that interest in digital transformation as a crucial tactic for attaining economic growth has significantly increased on a global scale. The results also demonstrated the increasing significance of blockchain technologies in facilitating these digital shifts. The study further indicated that digital assets face a range of risks in the digital environment, such as fraud and scams, underscoring the urgent need to develop new accounting standards specifically designed for dealing with digital assets, including cryptocurrencies and virtual assets, within the Metaverse environment.

Although the goal of Hassan's (2023) study was to bridge the gap between legal regulation and metaverse technologies while developing the legislative system to keep up with the remarkable advancements in artificial intelligence technologies for communication and the metaverse, the study's findings demonstrated both the benefits and risks of using the metaverse in various fields. The study also established the scope of behaviors via metaverse and the crimes committed via this technology, the application of existing legal rules to emerging crimes via metaverse, the problems of crimes committed via metaverse, and the inadequacy of criminal adaptations for these crimes. The study then clarified the inevitability of legislative intervention to confront crimes via metaverse technology, and the expected features in the text that can be put in place to confront the emerging developments arising from this technology.

3. RESEARCH METHODOLOGY

In order to describe and methodically analyze the phenomenon being studied, this study used a descriptive-analytical methodology. This was accomplished by creating a questionnaire to assess the research variables and investigate their relationships, as well as by interpreting the data that was retrieved to produce the intended outcomes. All twelve commercial banks in Jordan were the focus of the study.

To choose its sample, which included every commercial bank in the study population, the research used a thorough survey approach. Given their direct involvement in the measurement and accounting disclosure of digital assets and their supervision of the pertinent legal frameworks, 144

electronic questionnaires were sent to employees of commercial banks, including financial managers, heads of accounting departments, internal audit managers, and legal advisors. 139 surveys were gathered from these. The Statistical Package for the Social Sciences (SPSS) was used to analyze the 132 questionnaires that were considered appropriate for statistical analysis after six were eliminated due to considerable similarity in responses.

To accomplish the goals of the study, a custom created questionnaire was created. It was thoughtfully designed to efficiently and methodically gather the required data. The

participants' opinions and attitudes were measured using a five-point Likert scale, which numerically determined how much they agreed or disagreed with the things that were presented. "Strongly Agree" (5), "Agree" (4), "Neutral" (3), "Disagree" (2), and "Strongly Disagree" (1) are the five rating levels on this scale. This scale made it possible to analyze data objectively and accurately. It also offered trustworthy quantitative indications that help understand respondents' responses and form scientific findings that support the goals of the study.

$$\text{The length of the period} = \frac{\text{The upper limit of the alternative} - \text{the lower limit of the alternative}}{\text{Number of levels}} = \frac{1 - 5}{3} = 1.33 =$$

It includes the following to show the degree of interest and practice of the banks in the study sample for the research variables: Low = 1-2.33, Medium = 2.33-3.66, and High = 3.66-5.00.

3.1. Cronbach's Alpha

The values must be more than (0.70) in order for the research instrument to be trusted. The parameters of the independent variable (Legal Protection of Digital Assets in Metaverse) are displayed in the following table.

Table 1: Internal Consistency Coefficient Test

variable	alpha value
Legislative and regulatory framework	0.731
legal accountability	0.752
Cybersecurity	0.804
Legal protection of digital assets in Metaverse	0.856
Quality of accounting information	0.939
Search tool	0.914

In Table 1 Cronbach's alpha internal consistency coefficient values ranged from 0.731 to 0.939, with the independent variable (legal protection of digital assets in Metaverse) having an alpha value of 0.856, the dependent variable (quality of accounting information) having an alpha value of 0.939, and the research instrument having an alpha value of 0.914. Since all values are greater than 0.70, it is possible to trust the research instrument to perform the statistical analysis.

3.2. Multicollinearity test

The issue of variable correlation is exposed by this

test. A correlation issue between the variables is indicated if the value is more than 0.80.

Table 2: Matrix for Independent Variables

Variable	Legislative and regulatory framework	legal accountability	Cybersecurity
Legislative and regulatory framework	1.000		
legal accountability	0.662**	1.000	
Cybersecurity	0.621**	0.612**	1.000

In Table 2 there is no multiple linear association between the variables since the correlation coefficient between the two variables (legal and regulatory framework) and (legal accountability) was (0.662), which is less than (0.80) (Guajarati, 2004). The following test was run in order to verify the prior outcome:

Table 3: VIF & Variance

Variable	VIF	Tolerance
Legislative and regulatory framework	3.145	0.318

legal accountability	3.512	0.385
Cybersecurity	3.334	0.299

In Table 3 the multiple linear correlation analysis's findings show that there are no multiple linear correlations between the study model's independent variables. The absence of inflation in the variance was demonstrated by the Variable Intensity-Fluctuation Index (VIF) values, which Table 4: Average of arithmetic and materiality of the dimensions of legal protection of digital assets in Metaverse

No	Variable	Average of arithmetic	standard deviation	Rank	Materiality
1	Legislative and regulatory framework	4.124	0.415	1	high
2	legal accountability	3.781	0.614	3	high
3	Cybersecurity	3.947	0.415	2	high
Legal protection of digital assets in Metaverse		3.951	0.493		high
Quality of accounting information		4.218	0.399		high

In Table 4 the independent variable's overall average was (3.951), indicating a strong overall average in terms of relative relevance. Legislative and regulatory framework was the characteristic with the highest relative importance, followed by cybersecurity in second place and legal accountability in third and last place. The monitored variable (quality of accounting information) received a high relative relevance, with an overall average of 4.218.

3.4. Hypothesis testing

Main Hypothesis (Ho1): There is no statistically significant impact ($\alpha \leq 0.05$) of the legal protection of digital assets in Metaverse, with its dimensions (legislative and regulatory framework, legal accountability, and cybersecurity), on the quality of

ranged from 1 to 10 and were within statistically acceptable bounds. Additionally, the tolerance values demonstrated satisfactory equilibrium, falling within the permissible range of 0.1 to 1, indicating the validity of the statistical model employed and the appropriateness of the variables for relationship analysis free from detrimental interference from their interactions.

3.3. Description of search variables

the dimensions of legal protection of digital assets in

accounting information in Jordanian commercial banks.

The following sub-hypotheses stem from this main hypothesis:

Ho1-1: There is no statistically significant impact ($\alpha \leq 0.05$) of the legislative and regulatory framework on the quality of accounting information in Jordanian commercial banks.

Ho1-2: There is no statistically significant impact ($\alpha \leq 0.05$) of legal accountability on the quality of accounting information in Jordanian commercial banks.

Ho1-3: There is no statistically significant impact ($\alpha \leq 0.05$) of cybersecurity on the quality of accounting information in Jordanian commercial banks.

Table 5: * Results of the impact test on "Legal Protection of Digital Assets in Metaverse" on "Quality of Accounting Information"

Dependent Variable	Model Summery		ANOVA			Coefficients				
	R	R ²	F calculated	Df	Sig F*	Dimensions of the independent variable	B	standard error	T calculated	Sig t*
Quality of accounting information	0.824	0.679	301.215	3	0.000	Legislative and regulatory framework	0.514	0.038	13.526	0.000
						legal	0.298	0.033	9.030	0.000

						accountability				
						Cybersecurity	0.361	0.035	10.314	0.000

In Table 5 the findings show a statistically significant correlation between the variable (quality of accounting information) and the variable (legal protection of digital assets in Metaverse). The test results show that the combined dimensions of (legal protection of digital assets in Metaverse) account for 67.9% of the variance in (quality of accounting information). The quality of accounting data is also significantly impacted by all aspects of the legal protection of digital assets in Metaverse, including cybersecurity, legal accountability, and the legislative and regulatory environment.

Therefore, we reject the main hypothesis and accept the alternative hypothesis:

There is a statistically significant impact ($\alpha \leq 0.05$) of the legal protection of digital assets in Metaverse, with its dimensions (legislative and regulatory framework, legal accountability, and cybersecurity), on the quality of accounting information.

There is a statistically significant impact ($\alpha \leq 0.05$) of the legislative and regulatory framework on the quality of accounting information.

There is a statistically significant impact ($\alpha \leq 0.05$) of legal accountability on the quality of accounting information.

There is a statistically significant impact ($\alpha \leq 0.05$) of cybersecurity on the quality of accounting information.

4. CONCLUSION

Through an examination of its three dimensions—the legislative and regulatory framework, legal responsibility, and cybersecurity—this study seeks to provide light on how legal protection for digital assets in the Metaverse affects the caliber of accounting information in Jordanian commercial banks. The research is significant because it offers a workable model that improves digital asset protection and guarantees the accuracy and dependability of accounting data. This helps reduce digital risks like fraud and deception and boosts banks' financial performance.

In terms of relative relevance, the results indicated that the independent variable had a high overall mean of 3.951. The legislative and regulatory

framework came in first, followed by cybersecurity and legal accountability, all of which had significant relative importance. With an aggregate mean of 4.218, the dependent variable (the quality of accounting information) also demonstrated strong relative relevance.

The analysis revealed a statistically significant impact ($\alpha \leq 0.05$) of all dimensions of the independent variable on the quality of accounting information. The null sub-hypotheses were rejected, while the alternative hypotheses for the legislative and regulatory framework, legal accountability, and cybersecurity were accepted. This indicates that strengthening the legal and regulatory environment, activating accountability mechanisms, and ensuring the cybersecurity of digital assets positively impact the accuracy and reliability of accounting information in Jordanian commercial banks.

Based on the findings, the study recommends developing integrated legal and regulatory frameworks that include clear digital ownership policies, effective accountability procedures, and enhanced cybersecurity, along with developing specialized accounting standards for digital assets, ensuring accurate recording of financial transactions related to Metaverse, cryptocurrencies, and virtual assets. These measures contribute to enhancing transparency, supporting informed financial decision making, and increasing the confidence of investors and stakeholders in Jordanian commercial banks within the modern digital environment.

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