

# Uncertain Supply Chain Management

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## The effect of management accounting and blockchain technology characteristics on supply chains efficiency

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### ABSTRACT

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Blockchain is a new boom for the use of the Internet and will change the way in accounting and auditing as well as management accounting (MA); Blockchain as the biggest evidence of the growing use of this technology in the accounting field, its use leads to lower costs in the long run, avoiding human errors and controlling manipulation and fraud through immediate control of information and enhancing its integrity. However, this paper aims to investigate the impact of management accounting and Blockchain technology characteristics on supply chain efficiency in Jordanian Manufacturing Companies (JMC). Besides, the descriptive approach was conducted using the survey, 258 respondents were included in the survey from JMC. The results indicated that the characteristics of Blockchain technology and MA has a positive and significant impact on the efficiency of supply chains in JMC. However, this paper contributes to identifying the characteristics of Blockchain as well as management accounting methods and their role in increasing the efficiency of supply chains; to survive and continue in different business environments.

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### 1. Introduction

Blockchain may be a new boom for the use of the Internet and will change the way in which different businesses are conducted in different fields including the field of accounting and auditing; As it is considered an important tool for automated control of data and ensuring its reliability, its use leads to lower costs in the long run, avoiding human errors and controlling manipulation and fraud through immediate control of information and enhancing its integrity (Bonson & Bednarova, 2019). However, Big Four headed towards the use of Blockchain as the biggest evidence of the growing use of this technology in the accounting field (Al-Saied & Abdel Fattah, 2019). In addition, Blockchain began to spread as the basic technology for the encrypted digital currency in order to complete all purchases, sales and other exchanges and by recording and storing all transactions in a time series, and that once the transaction is approved by the members of the network, it cannot be canceled or modified (Hughes et al., 2019). The inability to modify a transaction is critical to the Blockchain's integrity, as it ensures that all parties have accurate and identical records. Because the Blockchain is a distributed system, changes to the Blockchain are extremely difficult, and if they do happen (rarely), they will be visible to other participants (Abdul- Tawab, 2019). Moreover, Blockchain is characterized by an infrastructure and construction, which has many applications, uses and integration in various accounting fields (Zhang et al., 2020). The field of supply chains is one of the areas of use of trust chain technology (SCF) "Blockchain" as it provides significant benefits to all parties involved in supply chain transactions; such as speeding up operations and sharing data more efficiently, accurately and securely, accelerating cash flows, reducing overall costs and reducing complexity (Hofman et al., 2019). As well as providing detailed and accurate information with a large degree of confidence and achieving an added value for products, which may be reflected in increasing the efficiency of supply chains from the point of view of accounting thought.

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Recently, companies have tended to exchange many concepts and practices that enable them to face the increasing competition during the last two decades, and the most important of these practices and concepts is the concept of supply chain, where the supply chain is defined as an integration between the flows of products, information and funds through a group of parties that take the form of relationships between suppliers and buyers down to the final consumer (Al-Zaqeba & Al-Rashdan, 2020a). However, under traditional technologies, it is difficult to track supply chains to identify any defects that may occur in the production process, identify existing weaknesses, and deal with wrong suppliers using tracking information. It is also difficult to make them more transparent and more secure due to the risk of fraud (Fabian et al., 2018). Management accounting practices have the effect of tracking supply chains (Sanz-Bas et al., 2021).

In addition to the many problems facing the supply chain, which would lead to an increase in its costs, the most important of these problems are, the problem of inefficient inventory management, the problem of costly and time-consuming letters of guarantee, the problem of the inability to determine responsibility for theft and fraud, the problem of delay in follow-up Defective goods, the problem of managing administrative costs, the problem of relying on customs brokers to avoid fines, as well as the problem of inefficient routing and shipping of products, which affects shipping costs. Furthermore, increasing the efficiency of the supply chain requires the availability of a set of determinants, including transparency and mutual trust, based on the stability of the relationship between the parties to the chain, which stimulates the sharing and exchange of information (Farrag, 2019).

The main objective of adopting and applying modern information technology appears from its ability to build a network of parties and effective relationships that contribute to reducing costs, especially the cost of transactions between the parties to this network (Rikhardsson & Dull, 2016). Therefore, Blockchain, as one of the modern technologies, plays a key role in integrating the logistics processes that occur between the parties to the supply chain, as its compatible use leads to increased cooperation and coordination between the parties to the supply chain, and it is an emerging technology characterized by a set of characteristics that may make it able to address current problems. and making supply chain operations more efficient, transparent and safer. Blockchain lowers the company's cost structure by lowering transaction costs such as negotiation costs, research costs, and eliminating intermediary costs. This is what the financial services industry has made clear that it is expected that Blockchain technologies will allow annual cost savings of between 15 and 20 billion dollars by 2040, and these savings result from a reduction in Information Technology (IT) infrastructure costs and the elimination of manual processes that do not add much value to the company (Morkunas et al., 2019; Al-Zaqeba & Al-Rashdan, 2020b). By reviewing the available literature in this regard, it was found that the advantages of Blockchain within the supply chain and its impact at all stages have been studied, whether in terms of building relationships within the supply chain or events of integration between them (Abeyratne & Monfared, 2016; Hackius & Petersen, 2017; Triblmaier, 2018; Hald & Kinra, 2019; Aich et al., 2019; Cole et al., 2019; Wamba & Queiroz, 2020; Wong et al., 2020). It has also been found that most of the literature that has been conducted in the field of the impact of the use of Blockchain within the supply chain has been conducted in developed countries. On the other hand, there is a deficiency in the studies presented in developing countries in this field, and the reason for this is due to the novelty of the topic; Where that literature recommended that there is a need for more future research in the field of using Blockchain to increase the efficiency of the supply chain. In addition, Kottler (2018) pointed out that there are obstacles to the use of Blockchain in supply chains, as Kottler pointed out that there is a significant lack of knowledge in how to create chain at the industry level, as well as a lack of academic research for Blockchain technology in supply chain management. However, by this paper, the researchers try to reach reasonable confirmation of the possibility of benefiting from Blockchain through its characteristics of participation, verification, programmability, and traceability, and to identify the accounting impact of these characteristics on increasing the efficiency of supply chains.

## 2. Literature Review

### 2.1 Management Accounting (MA)

MA or Administrative accounting is one of the important branches of accounting that is concerned with providing sufficient, appropriate and appropriate information, using statistical methods in operations research, planning budgets, and others that help the administration in carrying out its main tasks and functions of planning, coordination, control, and performance evaluation in order to make decisions that enable the achievement of objectives the facility is effectively and efficiently with the largest possible return and at the lowest cost (Van-der Steen, 2022). Likewise, Al-Massudi & Al-Hussaini (2019) examine the approaches of emergency theory in managerial accounting to apply appropriate methods for calculating and managing the cost of products in economic units, and the researchers concluded that the economic entities that choose the accounting technique and the accounting system in proportion to the emergency situations in their work and achieve their goals as quickly as possible, and the internal factors And external matters that affect its accounting systems, such as its ability to cope with its technology or dealing with external environment variables on the implementation side, there appears to be an important effect of providing financial and non-financial information in achieving cost management. Supply chain cost management is gaining its importance through contemporary challenges facing business enterprises, where competition has shifted from competition between enterprises operating in competing industries to competition between supply chains at the industry level as a whole for the product and its components (Christopher & Holweg, 2011). These circumstances necessitate the continuation of attempts to reduce the cost through the optimal exploitation of resources, which can be achieved through cost management across the supply chain to build cost management systems that help exchange information. Likewise, Cooper & Slagmulder (2017) referred to supply chain cost management as an approach to coordinating activities in the supply chain to reduce the

total cost of a product jointly produced by supply chain members. Nevertheless, strategic costs in the supply chain can be managed through strategic cost management of a new product at the development and design stage, production, assembly and delivery services Strategic cost management with suppliers and alliance partners Strategic cost management with customers.

## 2.2 Blockchain

Blockchain technology is a leading innovation in information technology. Although this technology is still in its early stages and has not yet reached adoption by companies, the applications of trust chains are in a state of great progress (Petersson & Baur, 2018). With the succession of generations, this technology has multiplied its uses in various fields, especially in the accounting field, and in particular in the processing and exchange of financial data in a safe, reliable and transparent manner that enables easy and quick access. Moreover, Blockchain technology provides the ability to secure financing terms and costs, and it leads to lower cost as I describe how profits depend on the operating characteristics of the company such as operating costs, market size and inventory value (Chod et al., 2020). Moreover, Blockchain technology can create a transparent and efficient supply chain by exchanging data between stakeholders (Meidayanti et al., 2019). Medhi (2019) notes that reduced transparency of global supply chains has become a major risk to sustainability; This is due to the awareness of customers of their rights and government legislation in host countries, where companies are held accountable for the actions of their globally spread suppliers as well as customers' concerns about the quality and safety of the products, they use through the long supply chain. In addition, Azzi et al. (2019) indicate that the examining the benefits of introducing the trust chain into the supply chain and the challenges encountered in the supply chain management ecosystem enables knowledge of the power of the supply chain based on Blockchain technology, as well as the integration of trust chains into the supply chain architecture to create a reliable, real and transparent system.

Rabie (2020) demonstrated the importance of applying an accounting information system based on Blockchain technology in mitigating the effects of the spread of the Coronavirus pandemic. Nevertheless, the technology of trust chains may contribute to increasing the value of companies due to its ability to create new business models, enhance operational efficiencies and reduce risks, thereby motivating investors to invest in this technology (van Hoek, 2019; White et al., 2020) Blockchain trust chains with their ability to record, store and retrieve data, reduce long-term preparation costs and secure them as a result of their encryption and the difficulty of decoding and penetration of this technology's algorithms, as they showed the quality and integrity of stored financial data It is due to the fact that the entry processes are exposed to all relevant parties, as it is characterized by its ability to maintain the financial data and the possibility of renewing and updating it constantly, as the data is saved as a single block, and thus the data is updated according to the last modification and the last entry process according to the chronology. Hughes et al. say that the main advantage of Blockchain is that a secure transaction is signed by each party that wants to message another digital party, and the parties that want to participate in the transaction don't even need to know who it is. Blockchain technology is unusual in that it stores and maintains data without the use of a massive central server.

The largest accounting and auditing offices in the world (Four Big) headed towards the use of blockchain technology as the largest evidence of the growing use of this technology in the accounting field (Al-saied, 2019); The KPMG office was interested in launching a In 2016, the Financial Services Commission launched a digital ledger services initiative to assist financial services firms with investigate the application of Blockchain technology, as well as its strategic partnership with Microsoft and support for the Nodes Blockchain system that the company uses to provide Blockchain as a service to its customers, where it advised clients about how Blockchain helps improve the speed and security of transactions and lower costs. Many studies that dealt with the use of blockchain technology have targeted the benefits and advantages of using it in the accounting field (Fuller & Markelevich, 2019), where Tan & Low (2019) aimed to identify the extent of its impact on the accounting profession, and whether accountants will have a role and full authority over the accounting operations, or will their role be limited to entering information only and it will be automatically processed and updated first and the preparation of reports. Accountants will not be responsible for performing the calculations, but they will remain responsible for the informational content of the financial reports and that the use of this technology improves the efficiency of the audit process and reduces the rates of errors. While Schmitz and Leoni (2019) examining the impact of the use of blockchain technology and distributed ledger technology, which is one of its applications on the future of the accounting and auditing profession, and I have reached an increase in the efficiency of accounting data recording to ensure its integrity and detect fraud in various operations and reduce both the cost and time required to communicate accounting information in light of the use of those technology.

## 2.3 Efficiency of Supply Chains (ESC)

The concept of supply chain management emerged, optimizing activities across the value chain and coordinating resources in order to gain competitive advantages. This concept is inclusive of all parts of the value chain, but also of other business processes (e.g. inventory management, transportation, warehousing, order processing, customer relationship management, demand management, order fulfillment and purchasing; respectively). This concept also takes an integrated approach to managing operations and relationships across supply chain participants, with an emphasis on supply chain operations (Madhani, 2016). The objective of SCM is to improve productivity, reduce uptime, reduce inventory, increase market share and externalize the supply chain process; Supply Chain Management improves company performance and keeps them

competitive in the marketplace (Chin et al., 2015). In general, the supply chain's goals are to support competitive advantages, whether at a local or global level, establish a link between customer needs and supply chain activities, deliver the right services as well as products at the right time and price, with a high level of quality, and reduce costs along the supply chain through effective alliance management and improved relations between chain members (Tian et al., 2022).

There are research trends focused on measuring supply chain efficiency in three basic dimensions of supply chain performance: increasing customer satisfaction, reducing cost, and improving responsiveness among the supply chain parties (Yadav et al., 2022). Nevertheless, there are studies that have added other dimensions necessary to measure the efficiency of the supply chain, which are the market performance of the company represented in the size of the market share and the financial performance represented in the profits and the volume of annual revenues (Mouzas & Bauer, 2022). Moreover, other studies in the field of supply chain performance have attempted to summarize and classify the dimensions of efficiency in a general classification by reviewing the literature systems that classified them into quantitative and non-quantitative dimensions, cost-dependent and non-cost-dependent dimensions, strategic dimensions, operational other dimensions, and financial dimensions and other non-financial (Ghosh et al., 2014). Other studies have identified the dimensions of supply chain efficiency in detailed dimensions covering reducing manufacturing cost, reducing total cost, reducing inventory cost, increasing response to customer requests, increasing the level of service provided to customers, reducing stock out rates, improving the company's market share, improving growth rates and increasing sales volume (Singhry, 2015).

The efficiency of the supply chain is affected by the presence of many problems facing the supply chain, which would lead to an increase in its costs, and the most important of these problems are the problem of inefficient inventory management, the problem of costly and time-consuming letters of guarantee, the problem of the inability to determine responsibility for theft and fraud, the problem of Customer dissatisfaction, the problem of delay in following up on defective goods, the problem of relying on customs brokers to avoid fines, the problem of inefficient routing and shipping of products, which affects shipping costs (Pinheiro et al., 2018).

Blockchain technology with distinct characteristics of verification, sharing, traceability and programmability, contributes to increasing the efficiency and effectiveness of the supply chain due to its ability to build trust in the relationship between the facility, customers, suppliers and all parties; where all parties' transactions are recorded in the form of blocks that are approved and validated in real time. Blockchain technology also contributes to maintaining integrated records of customers, their whereabouts and preferences, effectively dealing with customer complaints, and surveying their opinions on a regular basis. It also contributes to improving the relationship with suppliers to ensure the flow of production inputs with appropriate specifications with regard to prices, quality and required quantities. Moreover, Blockchain technology contributes to the management of reverse flows (such as: sales returns and damaged products and work to reduce these flows) as well as ensuring the continuity of information flow for the management of origin, quantitatively and qualitatively between the parties to the supply chain and between departments. It also contributes to the exchange and sharing of information in a timely manner, thus reducing the cost of products, meeting customer needs and reducing uncertainty, and finally, Blockchain contributes to reducing product life cycle time, improving inventory management and thus reducing spoilage costs, and reducing product production costs by Improving cooperation with facility departments (Rejeb et al., 2019; Behnke & Janssen, 2020; Wang et al., 2020).

#### 2.4 Supply Chains (SC)

Suppliers, manufacturers, wholesalers, retailers, and customers are all part of the SC network, which includes suppliers, manufacturers, wholesalers, retailers, and customers (Madhani, 2016). It is also defined as the network of relationships between companies, activities, organizations and technology that perform the functions of managing customer needs for services, products, money or information in the form of pre-manufacturing or post-manufacturing flows from source to customers (Ahi et al., 2016). Supply chains are also defined as a set of value-adding activities across several companies with the aim of satisfying the needs of the final consumer. Of course, achieving the previous goal requires the need to coordinate logistical activities and operations within the supply chain based on informational materials, including the capabilities and capabilities of technology, human and communication (Priyadarshi et al., 2021; Almatarneh et al., 2022). Supply chain includes a basic group of parties called the members of the supply chain, which are suppliers of materials and parts, manufacturers, suppliers of logistics services and distributors in the form of wholesalers and retailers (Hingley et al., 2015). However, integration and the success of the supply chain can be achieved through the good selection of supply chain members and the search for the best available ways to reduce costs during chain activities, with the development of incentives for suppliers in the event of reducing their sales prices for the facility, because the success of the facility in achieving a strong competitive position in the age of the Internet depends largely on the extent The strength of the connection and joint performance among the members of the supply chain, with the need for corporate managers to adopt that vision (Wiengarten et al., 2016). Nevertheless, competition is no longer important for companies to give maximum, but between entire supply chains. Therefore, the supply chain has become a dimension of concern in order to excel in a competitive environment, and the efficiency of the supply chain is increased by improving and achieving supply chain objectives.

## 2.5 The characteristics of blockchain technology in increasing the efficiency of supply chains.

Information technology plays a key role in integrating the logistics processes that occur between the supply chain parties, as the compatible use of information technology leads to increased cooperation and coordination between the supply chain parties. The importance of integrating the relationship between the seller and the buyer within the supply chain is due to the ideas of Michael Porter when he presented the value chain model, which emphasized the importance of integrating business processes through a series of logistical activities within the supply chain. In order to help achieve financial and strategic successes in markets, especially global markets, and given the increasing importance of information technology within the supply chain, some writers and researchers have described it as the backbone of building and managing the supply chain (Boje et al., 2020). Deraman et al. (2012) examines the role of information and communication on supply chain performance, as it showed the role and positive impact achieved by compatible information and communication systems on supply chain performance. Kalian (2016) and Bakhtiarzadeh et al. (2019) pointed to the indirect positive role that information plays on creating and strengthening integration relationships within the supply chain, which contributes to achieving the highest level of company performance and this is also confirmed by Singhry (2015). With regard to the need to improve the capabilities of companies by paying attention to the support and development of information technology capabilities necessary to achieve the integration of suppliers and customers within the supply chain. Previous literature emphasized the need to provide modern information systems capable of breaking down barriers between suppliers and buyers to ensure improving the performance of the supply chain parties. The benefits achieved by information technology within the supply chain can be limited to reducing transportation times, availability of information when needed, providing accuracy, improving customer service. Increased productivity, reduced paperwork, on-time delivery, and improved energy use (Sabeti et al., 2019). However, Blockchain technology, as one of the information technologies, is a very effective way to verify the correctness and integrity of the information provided through it. It is of great use in many different fields other than the financial fields.

The application of Blockchain technology is working to bring about changes in various business sectors such as financial markets, governance, banking, supply chains, health sector, taxation and smart government. Some previous studies, such as Karajovic et al. (2019), indicated the importance of supply chain application of Blockchain technology in improving financial performance and its importance in improving operational performance, reducing risks, reducing inventory volume and uncertainty, as well as achieving sustainable development in addition to its importance in achieving technical and technological benefits.

## 2. Hypothesis Development

Blockchain technology and a distributed ledger offer significant benefits to all parties involved in supply chain transactions, as well as speeding up processes and sharing data more efficiently, accurately, and securely, accelerating cash flows, lowering overall costs and reducing complexity (Hofmann et al., 2018; Fanning & Centers, 2016). However, Treiblmaier (2018) indicate that the uses of Blockchain technology in supply chain financing speeds up operations, reduces the overall costs of financing programs, reduces transaction fees, increases speed and transparency, and enables companies to contract on prices, quality and delivery dates, through the use of smart contracts feature. Likewise, Azzi et al. (2019) stated that the supply chain is a system consisting of organizations, individuals, activities, information and resources involved in transferring a product or service from a supplier to a customer. Al-Amyan and Safhan (2020) stated that the uses of Blockchain technology in the supply chain according to the characteristics of the Blockchain leads to the creation of a truly reliable, transparent and secure system, as the integration of Blockchain has an impact on the structure of the supply chain. Besides, Rabie (2020) found that the application of an accounting information system based on Blockchain technology has a significant impact in mitigating the spread of the Corona virus; It works to standardize data across the supply chain, provide accurate, reliable and timely information, avoid accounting errors and adjustments, as well as provide accounting information as soon as the event occurs, in addition to monitoring the performance of all parties within the supply chain, increasing transparency among all parties within the supply chain, reducing the time it takes to satisfy customers, reduce transaction costs and increase supply chain sales and profits.

As mentioned by Fabian et al. (2018), traceability improves the quality of the supply chain, and creates value through a set of different mechanisms within the framework of two different structures of the supply chain in parallel, as it has the ability to track suppliers and also has the ability to improve the feasibility of cash flow for buyers. Also, van Hoek (2019) found that Blockchain technology has helped increase the value of companies in case they adopt a long-term view that it will take some time to understand how to take advantage of the capabilities of Blockchain and turn them into tangible and sustainable sources of value, creating the appropriate strategic and operational support. In addition, Hald and kinra (2019) found that Blockchain technology is an opportunity to exploit resources and efficiencies in the supply chain through the traceability feature that derives from its ability to provide highly stable data. Hastig and Sodhi (2020) found that applications of trust and blockchain are very important for supply chain tracking. Additionally, Ghode et al. (2020) indicate that adopting the concept of supply chains based on Blockchain technology has a significant impact in lowering the cost of the product and increasing the market share in the current competitive situation. Al-Sagheer (2020) found that there is a positive correlation between the application of Blockchain technology in tracking the manufacturing supply chain, coordinating efforts and relationships, and supporting value chain analysis, as well as activating the target cost method and the method of open records accounting as tools for managing the cost across the chain and supporting the competitive advantages of that chain as well. Chod et al. (2020) indicate

that Blockchain technology is an open-source protocol that uses Bitcoin to provide supply chain transparency on a large scale at a cost. In addition, Mohd-Jamal & Tayles (2014) pointed out that management accounting practices have a positive relationship with supply chain performance; That is, management accounting methods improve the effectiveness of supply chain performance. Moreover, Khademi & Mehran (2019) indicate that Blockchain has positively affected the supply chain performance.

Based on the literature review, it is clear that there is a positive effect of these study variables on the supply chain. However, this paper assumes the following hypotheses:

**H1:** *The characteristics of Blockchain technology (Programmability, Share, Traceability and Verification) has a positive and significant effect on the efficiency of supply chains.*

**H1.1:** *Programmability has a positive and significant effect on the efficiency of supply chains.*

**H1.2:** *Share has a positive and significant effect on the efficiency of supply chains.*

**H1.3:** *Traceability has a positive and significant effect on the efficiency of supply chains.*

**H1.4:** *Verification has a positive and significant effect on the efficiency of supply chains.*

**H2:** *Management accounting has a positive and significant effect on the efficiency of supply chains.*

### 3. Research Methodology

The descriptive approach was conducted using the survey. Moreover, the questionnaire was developed from some relevant literature to examine the impact of management accounting and Blockchain technology characteristics on supply chain efficiency. Furthermore, the questionnaire consisted of three parts; Demographic factors, management accounting, Blockchain technology as independent variables (IV) with four sub-IV (Programmability, Share, Traceability and Verification). followed by supply chain efficiency as a dependent variable. Moreover, 258 respondents were included in the survey from Jordanian Manufacturing Companies (JMC). Likewise, the data were analyzed using SPSS. However, all the questions are related to examine the impact of management accounting and Blockchain technology characteristics on supply chain efficiency in JMC.

### 4. Results

The main hypotheses were subjected to Multiple and Stepwise Linear Regression analysis, and the subsidiary hypotheses were subjected to Simple Linear Regression analysis.

**H1:** *The characteristics of Blockchain technology (Programmability, Share, Traceability and Verification) has a positive and significant effect on the efficiency of supply chains.*

A simple linear regression analysis was used to test the hypotheses that branched off from this one as the following:

**H1.1:** *Programmability has a positive and significant effect on the efficiency of supply chains.*

**Table 1**

Impact test results after (Programmability) supply chains efficiency

D.V	Model Summary		ANOVA		Coefficients			
	R	R <sup>2</sup>	F	Sig F*	B	standard error	T	Sig T*
The Efficiency of Supply Chains.	0.715	0.513	249.712	0.000	0.487	0.027	17.548	0.000

\*The effect is statistically significant at the level ( $\alpha \leq 0.05$ )

Table 1 shows the value of ( $R = 0.715$ ), indicating that there is a positive link between the dimension of (Programmability) and the dimension of (Programmability) (supply chain efficiency). The result of the coefficient of determination turns out to be ( $R^2 = 513$ ), which implies that the (Programmability) domain has explained (51.3 percent) of the variance in (supply chain efficiency) when all other variables are held constant. It was also proven that at a confidence level ( $\text{sig} = 0.000$ ), the value of (F) reached (249.712), confirming the significance of the regression at the level of significance ( $\alpha \leq 0.05$ ).

**H1.2:** *Share has a positive and significant effect on the efficiency of supply chains.*

**Table 2**

Impact test results after (Share) supply chains efficiency

D.V	Model Summary		ANOVA		Coefficients			
	R	R <sup>2</sup>	F	Sig F*	B	standard error	T	Sig T*
The Efficiency of Supply Chains.	0.842	0.681	176.683	0.000	0.548	0.031	14.397	0.000

\*The effect is statistically significant at the level ( $\alpha \leq 0.05$ )

The value of ( $R = 0.842$ ), which indicates that there is a positive relationship between the dimension of (Share) and the value of ( $R = 0.842$ ), indicates that there is a positive link between the dimension of (Share) and the value of ( $R = 0.842$ ). (Supply chain efficiency). The value of the coefficient of determination turns out to be ( $R^2 = 681$ ), which implies that the (Share) domain has explained (68.1 percent) of the variance in (supply chain efficiency) when all other variables are held constant. It was also proven that at a confidence level ( $\text{sig} = 0.000$ ), the value of (F) reached (176.683), confirming the significance of the regression at the level of significance ( $\alpha \leq 0.05$ ).

**H1.3:** Traceability has a positive and significant effect on the efficiency of supply chains.

**Table 3**

Impact test results after (Traceability) supply chains efficiency

D.V	Model Summary		ANOVA		Coefficients			
	R	R2	F	Sig F*	B	standard error	T	Sig T*
The Efficiency of Supply Chains.	0.698	0.583	214.019	0.000	0.547	0.024	15.382	0.000

\*The effect is statistically significant at the level ( $\alpha \leq 0.05$ )

Table 3 shows the value of ( $R = 0.698$ ), indicating that there is a positive association between the dimension of (Traceability) and the dimension of (Traceability) (supply chains efficiency). The value of the coefficient of determination turns out to be ( $R^2 = 583$ ), which implies that the (Traceability) domain has explained (58.3%) of the variance in (supply chain efficiency), with all other components held constant. It was also proven that at a confidence level of ( $\text{sig} = 0.000$ ), the value of (F) reached (214.019), confirming the significance of the regression at the level of significance ( $\alpha \leq 0.05$ ).

**H1.4:** Verification has a positive and significant effect on the efficiency of supply chains.

**Table 4**

Impact test results after (Verification) supply chains efficiency

D.V	Model Summary		ANOVA		Coefficients			
	R	R2	F	Sig F*	B	standard error	T	Sig T*
The Efficiency of Supply Chains.	0.621	0.474	130.758	0.000	0.553	0.036	16.187	0.000

\*The effect is statistically significant at the level ( $\alpha \leq 0.05$ )

Table 4 shows the value of ( $R = 0.621$ ), indicating that there is a positive link between the dimension of (Verification) and the dimension of (Verification) (supply chain efficiency). The value of the coefficient of determination turns out to be ( $R^2 = 474$ ), which implies that the (Verification) domain has explained (47.4%) of the variance in (supply chain efficiency), with all other components held constant. It was also proven that at a confidence level of ( $\text{sig} = 0.000$ ), the value of (F) reached (130.758), confirming the significance of the regression at the level of significance ( $\alpha \leq 0.05$ ). However, the first main hypothesis results were as follows:

**Table 5**

Results of Testing the Impact of Blockchain technology characteristics on supply chains efficiency

D.V	Model Summary		ANOVA		Coefficients				
	R	R2	F	Sig F*	variable	B	standard error	T	Sig T*
The Efficiency of Supply Chains.	0.873	0.638	71.582	0.000	Programmability	0.194	0.036	4.185	0.001
					Share	0.243	0.041	2.643	0.007
					Traceability	0.155	0.029	3.981	0.000
					Verification	0.207	0.048	2.978	0.012

\*The effect is statistically significant at the level ( $\alpha \leq 0.05$ )

The correlation coefficient indicates that there is relationship between Iv and DV ( $R=0.873$ ), and the effect of the independent variable (Blockchain technology characteristics) on the dependent variable (Supply Chain Efficiency) is statistically significant, according to Table 5. Where the calculated value F was (71.582) and the significance level ( $\text{sig} = 0.000$ ) was less than (0.05), where the value of the determination coefficient ( $R^2 = 0.638$ ) indicated that the variance in Blockchain technology characteristics can explain (63.8 percent) of the variance in (The SC Efficiency).

Simple regression analysis was employed to evaluate the second main hypothesis, and the results as the following:

**H2:** Management accounting has a positive and significant effect on the efficiency of supply chains.

**Table 6**

The impact of management accounting on supply chains efficiency

D.V	Model Summary		ANOVA		Coefficients			
	R	R2	F	Sig F*	B	standard error	T	Sig T*
The Efficiency of Supply Chains.	0.675	0.458	172.183	0.000	0.529	0.043	11.377	0.000

\*The effect is statistically significant at the level ( $\alpha \leq 0.05$ )

Table 6 shows that ( $R = 0.675$ ), which means there is a positive relationship between the dimension of (management accounting) and (supply chain efficiency). It turns out that the determination coefficient value is ( $R^2 = 0.458$ ) and this means that the (management accounting) domain has explained (45.8%) of the variance in (supply chain efficiency), with other factors remaining constant. It was also shown that the value of (F) reached (172.183) at a confidence level ( $\text{sig} = 0.000$ ) with significance of the regression at ( $\alpha \leq 0.05$ ).

## 5. Discussion and Conclusion

The results indicated that the characteristics of Blockchain technology have a positive and significant impact on the efficiency of supply chains, these results confirmed by Hofmann et al. (2018), Azzi et al. (2019), Al-Amyan and Safhan (2020) and Chod et al. (2020). In addition, the findings of this paper shows that programmability, share, traceability, and verifiability also have a positive and significant impact which supported from previous studies such as Treiblmaier (2018), Khademi & Mehran (2019), Rabie (2020), Ghode et al. (2020), Al-Sagheer (2020) and Hastig & Sodhi (2020). However, this paper is a response to Hald & kinra (2019)'s study and Medhi (2019), where it recommended the need for more future research in the field of Blockchain technology and its relationship to the supply chain to identify its important effects and complexities (Jarrah & Almatarneh, 2021). The findings also support the findings with other studies which showed that MA has a positive and significant impact on the efficiency of supply chains in JMC, such as Christopher & Holweg (2011), Cooper and Slagmulder (2017), Al-Massudi and Al-Hussaini (2019) and Van-der Steen, (2022). Likewise, management accounting is concerned with providing information to managers in the sense that it provides this information to officials within the organization and those in charge of managing and controlling its business. Thus, management accounting differs from financial accounting, which is concerned with providing information to shareholders, lenders and others from outside the organization, and given that management accounting aims to serve managers, the importance of the study It stems from the effective and important role played by management accounting, which helps the facility or organization to take the appropriate decision by providing adequate information suitable for the facility or institution, as well as the important role of managerial accounting in supervisory and control processes. However, this paper contributes to identifying the characteristics of Blockchain as well as management accounting methods and their role in increasing the efficiency of supply chains. JMC are urging the importance of applying Blockchain technology to increase the efficiency of their supply chains in light of the current competitive conditions and their desire to survive and continue in different business environments.

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