Sustainability, Innovation, and Value Creation in Developing Countries: Evidence from Iraq

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Abstract: This paper examines the impact of integrating sustainability performance with innovation performance on value creation in developing countries. The study employs content analysis to assess the levels of sustainability performance and innovation performance in 21 companies listed on the Iraqi Stock Exchange from 2011 to 2022. To test the proposed hypotheses, the study utilizes pooled Ordinary Least Squares (OLS) and panel analysis. The findings reveal that sustainability performance and innovation performance positively influence company value, both independently and jointly. Furthermore, the results underscore the importance of investing in innovation processes to achieve a competitive advantage that fosters value creation. The study also highlights the critical balance between the increasing adoption of sustainable technologies in manufacturing and the effective application of diverse innovative technologies across production, operations, marketing, and organizational strategies as integral components of new product development. These findings hold significant implications for strategic decision-making, suggesting that companies in developing nations should pursue sustainable innovation pathways by adopting appropriate technologies and ensuring their long-term viability amid rapid technological advancements.

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SOSTENIBILIDAD, INNOVACIÓN Y CREACIÓN DE VALOR EN PAÍSES EN DESARROLLO: LA EVIDENCIA DE IRAK

Resumen: el presente artículo examina el impacto de integrar el desempeño en sostenibilidad y el desempeño en innovación sobre la creación de valor en países en desarrollo. El estudio emplea un análisis de contenido para evaluar los niveles de desempeño en sostenibilidad e innovación de 21 empresas cotizadas en la Bolsa de Valores de Irak, durante el período 2011-2022. Con el fin de probar las hipótesis formuladas, el estudio utiliza

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mínimos cuadrados ordinarios agrupados y análisis de panel. Los hallazgos revelan que tanto el desempeño en sostenibilidad como el desempeño en innovación influyen positivamente en el valor de una empresa, tanto de forma independiente como conjunta. Además, los resultados subrayan la importancia de invertir en procesos de innovación para lograr una ventaja competitiva que fomente la creación de valor. Esta investigación destaca el equilibrio crítico entre la creciente adopción de tecnologías sostenibles en los procesos de manufactura y la aplicación efectiva de diversas tecnologías innovadoras para la implementación de las estrategias de producción, operaciones, marketing y organizacionales como componentes integrales del desarrollo de nuevos productos. Estos hallazgos tienen implicaciones relevantes para la toma de decisiones estratégicas, al sugerir que las empresas en países en desarrollo deben seguir caminos de innovación sostenible al adoptar tecnologías adecuadas y garantizar su viabilidad a largo plazo en medio de un entorno de rápidos avances tecnológicos.
Palabras clave: sostenibilidad, innovación, creación de valor, desempeño en innovación, desempeño en sostenibilidad.

SUSTENTABILIDADE, INOVAÇÃO E CRIAÇÃO DE VALOR EM PAÍSES EM DESENVOLVIMENTO: EVIDÊNCIAS DO IRAQUE

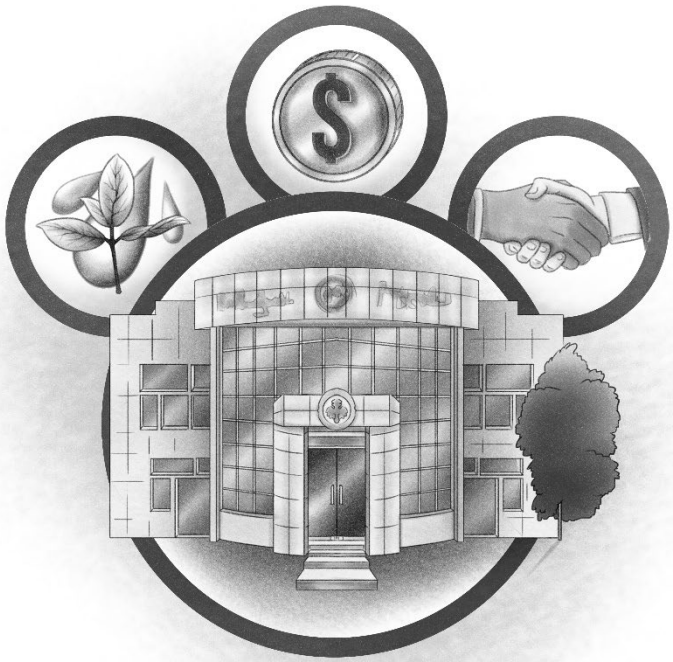
Resumo: Este artigo examina o impacto da integração do desempenho da sustentabilidade com o desempenho da inovação na criação de valor nos países em desenvolvimento. O estudo emprega análise de conteúdo para avaliar os níveis de desempenho de sustentabilidade e desempenho de inovação em 21 empresas listadas na Bolsa de Valores do Iraque de 2011 a 2022. Para testar as hipóteses propostas, o estudo utiliza Mínimos Quadrados Ordinários (MQO) agrupados e análise de painel. Os resultados revelam que o desempenho da sustentabilidade e o desempenho da inovação influenciam positivamente o valor da empresa, tanto de forma independente quanto conjunta. Além disso, os resultados reforçam a importância de investir em processos de inovação para alcançar uma vantagem competitiva que promova a criação de valor. O estudo também destaca o equilíbrio crítico entre a crescente adoção de tecnologias sustentáveis na manufatura e a aplicação efetiva de diversas tecnologias inovadoras na produção, operações, marketing e estratégias organizacionais como componentes integrais do desenvolvimento de novos produtos. Essas descobertas têm implicações significativas para a tomada de decisões estratégicas e sugere que as empresas nos países em desenvolvimento devem buscar caminhos de inovação sustentáveis, adotando tecnologias apropriadas e garantindo sua viabilidade a longo prazo em meio a rápidos avanços tecnológicos.
Palavras-chave: sustentabilidade, inovação, criação de valor, desempenho da inovação, desempenho da sustentabilidade.

INTRODUCTION

There is a growing momentum to leverage technological advancements to attain optimal advantages in the business realm. Increasing the company's worth is a primary objective for several organizations across different business sectors, particularly in emerging economies (Roque *et al.*, 2021). To enhance the value of companies, they must implement innovative policies and produce sustainable performance. These reports should disclose the company's procedures for achieving sustainable development while focusing on developing innovative processes. Most companies recognize the need to implement business activities in a way compatible with achieving sustainable business goals by adapting their plans and strategies to accommodate modern developments in this field. Some researchers have gone further regarding the need for companies to take responsibility for their environmental impact and contribute to achieving sustainable development at the macroeconomic level (Klettner *et al.*, 2014).

Sustainability in business is an approach that helps to develop long-term value by balancing environmental and social factors (Acosta-Prado *et al.*, 2017). Innovation becomes a significant way to achieve profitability and sustain high competitiveness in a corporate environment that is continually changing because of the relevance of innovation, which is shown in the widespread use of the phrase "Innovation" by industrial corporations (Brusca Alijarde & Montesinos Julve, 2014).

A successful business in an oversaturated market must devote all its innovative efforts to sustaining its existence and distinguishing itself from other businesses by achieving exceptional financial returns. Unconventional idea generation and development are crucial to the success of these companies. Innovation is a comprehensive phrase incorporating many actions and processes within the firm's operations to create a competitive advantage. The process encompasses creating novel concepts, converting these concepts into fresh items and procedures, and disseminating these advancements to prospective consumers (Kochetkov, 2023). Innovation may be defined as the systematic pursuit of new objectives, especially within management and organizational goals. Furthermore, innovation often results in the creation of enhanced goods, procedures, services, technologies, artworks, and business models that provide advantages to markets, governments, and society (Wang *et al.*, 2022).



It is crucial to consider innovation's societal, behavioral, and institutional dimensions and the economic and technical dimensions. Innovation encompasses diverse modifications and breakthroughs that foster development and enhancement across several disciplines. Innovation is essential for improving the competitiveness of companies and fostering sustainable growth (Dogaru, 2020). It encompasses developing and disseminating novel technologies to tackle environmental and social issues. Innovation encompasses a

range of technical, organizational, social, and systemic innovations that aim to minimize the environmental effect of production and encourage the sustainable use of natural resources. A comprehensive and unified strategy is necessary, which may be tailored to companies' various activities and practices.

Adopting Innovation may result in economic prosperity, enhanced competitiveness, and a commitment to environmental stewardship for enterprises (Cai & Li, 2018). Additionally, it aids in sustainable development by reducing resource use, regulating detrimental impacts, and promoting the creation of ecological goods. Nevertheless, the incorporation of Innovation encounters hindrances, and enterprises need more assistance at both national and European levels to integrate sustainability into their decision-making and economic aspects. In developing nations, integrating innovation activities poses a significant obstacle for accounting systems in business organizations. Innovation has a crucial role in enhancing competitiveness and ensuring companies' long-term growth and success in many sectors. It includes a variety of operations that improve operational efficiency and support environmental sustainability objectives.

This study highlights the prominent role of sustainable development and innovation activities in enhancing company value, including product, process, organizational, and marketing innovation. Despite the contributions of the literature, to our knowledge, the impact of integrating innovation activities and sustainability performance on firm value has yet to be comprehensively studied. This paper is among the few that examine the impact of sustainability performance and innovation performance on firm value in emerging economies, and provides a better understanding of the relationship between innovation performance, sustainable development, and investors' financial decisions in the stock market of emerging economies, especially regarding indicators of innovation activities in companies' annual reports. The paper also contributes to companies giving more attention to innovation activities and integrating them into sustainable development activities to rationalize investors' financial decisions in emerging economies.

The subsequent sections of this work are structured in the following manner. The text provides an overview of the most recent advancements in innovation and sustainable development practices. Subsequently, a comprehensive elucidation of the study strategy and methods is presented. Following that, we will share the results of our investigation. Afterwards, the study delves into the primary findings and gives the utmost significant conclusions and closing comments, along with a suggestion for future avenues of research.

LITERATURE REVIEW

Sustainability is a popular concept to ensure the maximum social welfare of current and future generations by creating a balanced state between the environmental, economic and social requirements of society. In practice, efforts to achieve sustainability include implementing a set of measures that enable us to conserve resources that meet the needs of current and future generations. In the economic field, the goals of commercial organizations expand beyond making profits to include a commitment to sustainability standards and achieving social welfare for society. This approach by companies reflects their desire to gain investor confidence and enhance profits by complying with environmental laws and regulations.

Recently, companies' internal and external environmental variables have posed a major challenge, especially in the environment of industrial companies that produce many environmental pollutants. These challenges require industrial sector companies to adapt their strategies to be in line with local and international environmental laws and regulations, thus contributing to reducing external pressures on them. (Al-Fatlawi *et al*., 2021). Moreover, corporate social responsibility is not limited to compliance with environmental regulations and instructions only but also includes employing efforts to enhance the confidence of stakeholders by disclosing their sustainability-related activities. In practice, many industrial companies respond to pressures from stakeholders and the general public by disclosing indicators of their economic, environmental and social performance (Almagtome *et al*., 2020).

At the macroeconomic level, companies often work within national sustainable development strategies by employing innovation activities to implement environmentally friendly industrial processes. In this context, innovation can be viewed more deeply as a new perspective on business that carries a new idea that goes beyond the traditional ideas within the existing business models (Tidd & Bessant, 2020). The concept of innovation is also relatively vague and unverified and always requires dynamic change to keep pace with rapid changes in technology as well as changes in the needs of stakeholders (Scott *et al*., 2008).

This uncertainty is not just a result of innovation; it is an inherent quality that influences the innovation process. Several studies have shown that implementing innovation and sustainability performance benefits the firm's overall value. According to Chenhall and Moers (2015), innovation refers to the act of creating and implementing new goods, services, and processes that lead to substantial improvements in outcomes. They argue that creativity is the first step in the process of innovation. Abernethy *et al*. (2014) conducted a study. Innovation refers to creating and using novel goods and processes that contribute to establishing and maintaining a sustainable environment. This phenomenon enables the attainment of environmental objectives. It minimizes the environmental impact across the production processes and product life cycle, hence successfully improving firms' productivity, corporate reputation, and market expansion.

Khanchel *et al*. (2023) demonstrate that innovation and environmental, social, and governance (ESG) factors favorably impact financial performance. Similarly, Sahetapy (2023) concludes that sustainability performance creates a favorable market value, suggesting that corporations must disclose their sustainability performance. However, Widayanto *et al*. (2023) indicate that intellectual capital does not impact the firm value, while Fadillah and Noormansyah (2023) have shown that sustainability performance negatively affects the value of manufacturing companies listed on the Indonesian stock market. These data indicate that the correlation between Innovation, sustainability performance, and business value may differ based on the industry and setting. The existing literature generally indicates that innovation and sustainability performance may enhance the firm's value. However, further study is required to comprehensively comprehend the precise processes and circumstances in which this correlation occurs.

Delving deeper into the description of innovation activities and their various dimensions certainly leads to a set of features that achieve sustainable development goals in modern business organizations. Therefore, we notice that many global companies are working to develop and create innovative products and services and integrate them into the sustainability activities of those companies to enhance their competitive position in the market. The relationship between sustainability performance and innovation activities in various forms is evident through companies' efforts to create integrated business strategies that combine innovation and

sustainability activities. In other words, companies work to create ideas for innovative projects that contribute to achieving the maximum possible profits while minimizing environmental damage as much as possible (Yuan *et al.*, 2023). These innovation projects include the presentation of innovative ideas in the areas of product or service design, organizational, marketing and operational fields (Novitasari & Tarigan, 2022).

Innovation can maximize the potential for economic development, tackle shared issues such as climate change and resource depletion, and improve the competitiveness of firms (Garcia Pineda & Macías Urrego, 2022). Conversely, sustainability performance entails disclosing an organization's environmental, social, and governance performance (Tomashuk & Baldynyuk, 2023). Sustainable development is crucial since it may bolster firms' environmental responsibilities, improve operational efficiency, and foster customer loyalty (Sun, 2023). In summary, Innovation and sustainability performance are vital in attaining sustainable development and enhancing enterprises' economic, environmental, and social influence.

Dainienė and Dagilienė (2016) define innovation as introducing new physical and programmatic elements in goods or processes. This includes energy storage and conservation advancements, pollution avoidance, trash recycling, green product design, and corporate environmental management. Basu (2012) states that ecological innovation generates novel and advantageous concepts about environmentally friendly goods. The product life cycle includes technical, managerial, and organizational innovations that help preserve the surrounding environment and contribute to energy savings, pollution prevention, and waste recycling. Innovation management literature has several viewpoints on innovation (Natário & Couto, 2022). These disparities have ramifications for the definition of innovation in accounting for sustainability. The primary and most ancient definition of innovation highlights the creation, approval, and execution of novel concepts, procedures, goods, or services.

Innovation refers to implementing novel processes and products inside a company, resulting in stakeholder advantages. The extent of these innovations might vary, ranging from incremental changes to radical transformations, depending on the degree of divergence from existing approaches. Innovations are developed via procedures that are seen as controllable and manageable (Lampikoski *et al.*, 2014). Barnett (2020) provides further information. Significant literature on innovation management focuses on the core obstacles and strategies for surmounting issues in innovation processes. The statement asserts that innovation is a gradual social process in which individuals share their understanding of a new concept, and inventions emerge via testing, refinement, and social exchange. Therefore, in the process of generating and adopting sustainability technologies, information is crucial. To promote sustainability, it is necessary to assist innovations in production, goods, and business models (Lubberink *et al.*, 2017). An effective foundation for disseminating knowledge on matters of sustainability. Considering that accounting plays a crucial role in providing necessary information to decision-makers inside businesses and considering the notable limitations of standard accounting methods in addressing sustainability concerns, there is a need for innovative ways to account for sustainability.

The influence of sustainability performance on a company's value creation is substantial, including several aspects such as economic, environmental, and social disclosures. Comprehensive and transparent sustainability performance of high quality improves a company's worth by increasing investor trust and indicating possibilities for long-term development. Nevertheless, the effects of different kinds of disclosures

might differ. For instance, economic disclosures have a substantial positive influence on a company's worth. However, environmental and social disclosures may not necessarily directly impact until adjustments are made to considerations like profitability (Jantana *et al*., 2024). In addition, including external verification in sustainability performance does not automatically reduce the influence of sustainability performance quality accuracy on a company's worth. This implies that investors are more concerned with the amount and accuracy of information disclosed. These observations highlight the significance of thorough and excellent sustainability performance in increasing a company's market worth by strengthening transparency, mitigating risk, and meeting investors' demands for sustainable business practices. Thus, we can construct the first hypothesis as follows:

H1. There is a statistically significant impact of Sustainability performance on a firm's value.

In conjunction with the technological development in the global industrial sector, innovation has become a fundamental pillar for industrial companies in achieving a competitive advantage that enables them to continue to compete globally. To achieve this, industrial companies seek to employ innovation activities to enhance production efficiency and sustainability of their economic activities in order to enhance the company's value in the long term. Enhancing innovation activities in industrial companies has become necessary to create sustainable business models that achieve maximum profitability. To adapt to the rapid changes in market conditions and customer tastes, innovation management works to create creative innovation activities that are characterized by dynamism and modernity and meet changes in the company's external environment. Consequently, it will contribute to enhancing the company's value in financial markets as well as its competitive position (Ranta *et al*., 2020). The second hypothesis can be constructed as follows:

H2. There is a statistically significant effect of innovation performance on a firm's value.

Companies seeking to enhance their market value and competitive position in light of the digital transformation of business models should prioritize innovation activities and sustainable development initiatives to gain the trust of stakeholders by launching innovation-based sustainability strategies. Such strategies will certainly contribute to enhancing financial performance indicators as well as achieving corporate social responsibility goals. Accordingly, achieving the goal of enhancing corporate value and enhancing sustainable performance requires companies to adopt innovation as one of the main pillars to achieve the company's goals and within its plans at the medium and long-term levels. Developing a company's innovation strategy based on sustainability in industrial companies enables them to enhance the operational efficiency of their operations and achieve sustainable development goals (Harsanto *et al*., 2024). Companies' interest in promoting innovation activities does not only seek to promote sustainable development, but it is an activity that is primarily aimed at enhancing profitability, but at the same time it is in line with achieving sustainable development goals and creating value for the company from the perspective of stakeholders (Pizzurno & Cammarano, 2024). In summary, organizations can gain a lasting competitive edge by incorporating sustainability into their innovation strategies and leveraging digital technologies and stakeholder engagement frameworks. This approach helps all stakeholders in the long term. Thus, the third hypothesis can be constructed as follows:

H3. There is a statistically significant impact of Sustainability and Innovation performance levels on a firm's value.

RESEARCH MODEL AND VARIABLES MEASUREMENT

The paper formulated a research hypothesis by using the content analysis approach and drawing upon the theoretical underpinnings and findings of earlier research. This hypothesis included all the variables and their dimensions that are relevant to the present investigation. The content analysis approach is used to quantify the independent factors of sustainability and innovation performance. The sustainability performance index used in this research comprises 108 performance indicators extracted from GRI guidelines G4, including the primary four areas of sustainability performance. The level of innovation performance was also measured using innovation scorecard metrics. To achieve this goal, we used the Marcon, de Medeiros, and Ribeiro (2017) innovation matrix, which comprises 30 indicators of innovation. This matrix has four essential dimensions: product, organizational, process, and marketing innovation. The TobinQ scale was established to quantify the corporate value of the firms. Tobin's q is a commonly used metric in financial research that compares the market worth of a company's assets to their replacement cost. The theoretical attraction of this resides in its capacity to determine whether a company's market value surpasses the cost of its assets, indicating prospective investment prospects or overvaluation (Butt *et al.*, 2023).

Figure 1 illustrates the relationships between the study's main variables, clearly depicting the study's nature and the directions of correlation and influence among the variables.

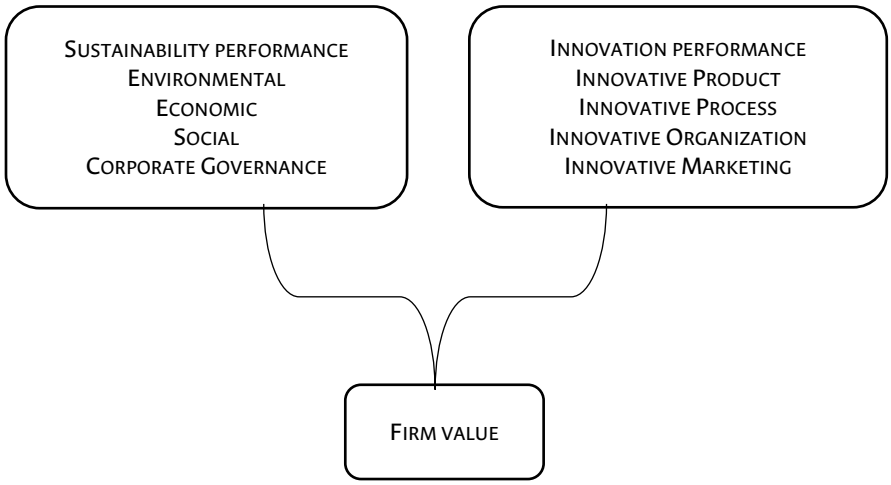


Figure 1. *Theoretical research model.* **Source:** authors, based on literature.

Variables measurement

Innovation performance

Innovation performance is strongly correlated with research and development efforts, which are critical for achieving commercial success and maintaining a sustainable competitive advantage in today's complex competitive landscape. Innovation performance indicators are essential for assessing and enhancing innovation efforts across various sectors in contemporary markets. These indicators are pivotal in monitoring

the success and impact of innovation activities both at the firm level and within the broader national economy.

Previous research highlights the importance of different indicators depending on the specific innovation system organizations belong to, including radical innovators, technical innovators, efficient producers, developers of value innovations, and imitators (Oikonomaki & Belivanis, 2023). Furthermore, it is crucial to establish metrics for assessing innovation success in order to effectively track the outcomes of policies aimed at fostering economic growth, generating employment opportunities on a national scale, and attaining sustainable development objectives. Innovation measurement is a relatively new area gaining momentum as companies rely more on innovation to drive growth. Organizations that want to use innovation as a primary catalyst for success have recognized the significance of measuring innovation. As businesses progressively acknowledge the significance of innovation, the approaches for assessing it have undergone substantial development. Historically, the focus of measuring innovation performance was on control and monitoring. However, there has been a recent trend towards a more supporting role for managers, which aims to improve strategic decision-making and inspire people to engage in innovation.

García-Granero *et al*. (2018) have shown that literature study supports the use of 30 metrics to quantify innovation success. In order to include both innovation performance and sustainability performance measures, our research has classified them into four distinct environmental innovation categories, as shown in table 1. The four types of innovation are as follows:

- Innovative Product
- Innovative Process
- Innovative Organization
- Innovative Marketing

In order to create this categorization, we adhered to the analysis conducted by Marcon *et al*. (2017), which categorizes innovations into four types. Table 1 displays a collection of eco-innovation indicators that were condensed by García-Granero *et al*. (2018). It should be noted that several articles were assigned to multiple categories.

Table 1.

Innovation Performance Scorecard.

Innovation categories	Details
Product innovation	Use new, cleaner materials, or new inputs with less environmental impact
	Use of recycled materials
	Reduce/improve the use of raw materials
	Reduce the number of product components
	Disposal of inferior ingredients
	Product with a longer life cycle
	Product's ability to recycle
Process innovation	Reduce chemical waste
	Reduce water use
	Reduce energy use

Innovation categories	Details
	Minimize waste
	Reuse of components
	Recycling waste, water, or materials
	Use of environmentally friendly technologies
	Renewable energy use
	Research & Development
	Acquisition of modern machinery and software
	Obtaining patents and licenses
Organizational innovation	Green hr
	Pollution prevention plans
	Environmental objectives
	Environmental audit
	Environmental Consulting
	Investing in r&d
	Collaboration with stakeholders
	Switching to new markets
	Use of new systems (remanufacturing systems and transport systems)
Marketing innovation	Use returnable/reusable packaging
	Packaging using green design
	Quality certificates
Total Score	30

Source: authors, based on García-Granero *et al.* (2018).

Because sustainability performance disclosure is often descriptive, measuring sustainability performance has become relatively difficult. It does not include quantitative data as is the case with economic performance indicators, but rather includes descriptive information about sustainability activities: environmental, social and governance. A three-dimensional measure of sustainability performance is usually used, which includes three main aspects: economic, environmental and social, and recently another aspect, governance, has been added. The current study uses a sustainability performance measure that includes 108 performance indicators covering the four main aspects according to the Global Reporting Initiative (GRI) (Almagtome *et al.*, 2020). The GRI G4 framework is a popular tool for measuring the level of sustainability performance in companies and covers four main areas: economic, environmental, social and governance, and includes 108 indicators.

Sustainability performance

Enhancing sustainability performance requires achieving maximum efficiency in economic, environmental and social activities and the quality of corporate governance implementation within the company. To achieve this goal, companies should work to create a business strategy that combines the objectives of economic profitability, social justice and environmental management within a single initiative that leads to enhancing their value from the perspective of stakeholders. In this context, gaining the trust of stakeholders requires companies to provide financial and non-financial information on their sustainability performance indicators, whether economic, environmental, social or governance (Al Amin *et al.*, 2022). For this purpose, the GRI indicators are the most popular in the sustainability literature as an effective tool for providing unbiased measures of sustainability performance in companies that meet the needs of information users and investors in particular.

Firm value

Tobin's Q combines market factors and book values of assets to determine a firm's value and is a common measure in accounting literature and widely used in financial market research. Ghani *et al.* (2023) assume that the main factors in determining the value of a company are the level of revenue generation, financial leverage, liquidity level, and profitability indicators of the company. In this context, the TobinQ measure reveals the ability of a company to achieve levels of economic growth using intangible assets. Therefore, it gives higher values to new companies that rely heavily on intangible assets in their asset structure and lower levels of debt, which increases their overall value (Cardao-Pito, 2022). Therefore, this study uses Tobin's Q to measure the value of the company by combining the market values of the company's shares and the book values of the company's assets and liabilities.

METHODOLOGY

Data collection

The current study used the content analysis approach as a tool to measure the level of sustainability performance and the level of innovation performance as non-quantitative indicators that can only be collected by evaluating the descriptive information announced in the annual reports of companies. The study sample included 21 Iraqi industrial companies registered in the Iraq Stock Exchange. The annual reports of the companies were used to collect quantitative and descriptive data for the study variables for a period of 12 years from 2010 to 2022. The content analysis technique included a scale of 108 performance characteristics developed from the G4 of GRI. Innovation scorecard measures were used to quantify the extent of innovation. We used Marcon's (2017) innovation matrix, which consists of 30 markers of innovation. The matrix has four fundamental components of innovation: product, process, organizational, and marketing innovation. The TobinQ scale was ultimately used to determine the values of the enterprises in the sample being studied.

The study population consists of a varied assortment of Iraqi industrial businesses that are registered on the Iraq Stock Exchange. The research sample comprises Iraqi industrial enterprises listed on the Iraq Stock Exchange. Specifically, there are three companies in the soft drinks and others sector, four construction companies, two companies in the cardboard and packaging sector, two companies in the food and dates sector, four companies in the medicines and chemicals sector, five companies in the electronics and light mining sector, two companies in the clothing and sewing sector, and three other miscellaneous companies.

A sample of these companies was selected in a way, representing 21 Iraqi industrial companies out of a total of twenty-five industrial companies, so that the sample represented (84) % of the study population for the period (2010-2020), and the companies were selected due to several of the following controls and conditions:

1. All 21 companies are listed on the Iraq Stock Exchange.
2. These companies work within the industrial activity sectors in the Iraqi environment.

3. The lists of companies and their data are officially fixed in the Iraq Securities Exchange for use and benefit.
4. All these companies were established before 2010, indicating they have sufficient experience to conduct their business properly.
5. All companies continued to carry out their productive work throughout the study period, and their ownership has not been transferred or merged during that period (2010-2020).
6. The shares of these companies were not suspended, and their trading in the financial market was not interrupted throughout the study period (2010-2019).
7. The sample companies are characterized by transparency and the disclosure of their accounts, which are available to all interested parties and researchers using the Iraq Securities Market.

Our present investigation used structural equation modeling (partial least squares) to examine hypotheses H1-H3 (Hair Jr *et al.*, 2021). Three structural equation models were developed for each of the three assumptions, as shown below:

Model 1

$$Y1 = \alpha + \beta1x1 + \beta2x2 + \beta3x3 + \beta4x4 + \varepsilon \quad (1)$$

Where:

Y1 = firm value: proxied by Tobin Q ratio.

α = a constant

β1 to β1 = regression coefficients for independent variables x1 to x4, respectively.

x1 to x4 = independent variables: Economic (ECO), Environmental (ENV), Social (SOC), and Corporate Governance (GOV), respectively.

ε = error term.

Model 2

$$Y1 = \alpha + \beta1x1 + \beta2x2 + \beta3x3 + \beta4x4 + \varepsilon \quad (2)$$

Where:

Y1 = firm value (FMV): proxied by Tobin Q ratio.

α = a constant

β1 to β1 = regression coefficients for independent variables x1 to x4, respectively.

x1 to x4 = independent variables: Product Innovation (PRO), Process Innovation (PRS), Organizational Innovation (ORG), and Marketing Innovation (MRK), respectively.

ε = error term.

Model 3

$$Y2 = \alpha + \beta 1x1 + \beta 2x2 + \varepsilon \quad (3)$$

Where:

Y1 = firm value: proxied by Tobin Q ratio.

Y2 = dependent variable: financial performance, proxied by program costs ratio (PCR).

α = a constant

β1 to β2 = regression coefficients for independent variables x1 to x2, respectively.

x1 to x2 = the independent variables: Corporate Sustainability performance (CSP) and Innovation Performance (INV), respectively.

ε = error term.

RESULTS

Descriptive statistics

Table 2 provides a thorough descriptive analysis of the research variables for all firms in the sample. This study is essential since it condenses and clarifies the primary characteristics of the information, offering a valuable understanding of the financial well-being and performance indicators of the organizations involved. The table shows the total average of all search variables.

Table 2.

Descriptive Statistics.

	N	MIN.	MAX.	MEAN	STD. DEVIATION
ECO	194	2.00	8.00	4.1083	1.83903
ENV	194	3.00	11.00	6.2733	2.08191
SOC	194	3.00	11.00	5.8712	2.49122
GOV	194	4.00	9.00	5.4795	1.41132
CSP	194	9.00	36.00	21.7321	7.70576
PRO	194	1.00	6.00	1.8867	1.12786
PRICE	194	2.00	8.00	5.7114	1.02264
ORG	194	3.00	6.00	3.9279	.65575
MRK	194	1.00	4.00	1.1908	.49842
INV	194	4.00	19.00	12.7166	2.98998
FMV	194	1.00	1.766	.02577	.09989
VALID N (LISTWISE)	193				

Source: authors based on SPSS outputs.

Whereas:

ECO = Economic performance

ENV = Environmental performance

SOC = Social functioning

GOV = Governance

CSR = Sustainability reporting

PRO = Product-level innovation

PRS = Process-level innovation

ORG = Organizational innovation

MRK = Marketing innovation

INV = Total innovation index

FMV = Firm value using Tobin Q

Hypotheses testing

Table 3 shows the results of hypothesis testing. Each hypothesis is accepted when the Ts value is more than 1.96, and the P-value is below 0.05.

- **H1:** states that: There is a statistically significant impact of Sustainability performance on a firm's value.

The results indicate a significant relationship between sustainability performance (CSP) and firm value (FMV) at a statistically significant level of 0.01. Sustainability performance (CSP) contributed 19% of the variation in the dependent variable, the firm value (FMV), as indicated by an R2 value of 0.193. This result demonstrates that the performance of a company in terms of sustainability is of utmost importance in determining its value, as supported by several theories and empirical research. The correlation between sustainability practices and financial performance is intricate, shaped by factors such as sustainability disclosure, investor perception, and incorporating environmental, social, and governance (ESG) standards into business plans. The essence of this connection is centered upon the notion of sustainability performance, which pertains to the quantifiable results of a company's sustainability endeavors.

The practical implications of these results are evident in their impact on the company's overall value and performance level. The high evaluation of stakeholders of the company's performance in terms of innovation and sustainability reflects a positive image of the company and shows business risks at their lowest values, which enhances the company's market value and attracts investors. In addition, the accounting literature reveals a link between the level of sustainability performance and the level of financial performance of companies. Therefore, it is expected that the financial performance indicators of companies that have a clear strategy to integrate innovation into sustainable development initiatives will increase. This

is because enhancing innovation and sustainability performance enhances the company's positive image among stakeholders and reduces the level of perceived risks among investors. Consequently, increasing the level of innovation performance will lead to reducing capital costs and improving the competitive position, especially in environmentally sensitive industrial companies. This result is consistent with our hypothesis that integrating sustainability and innovation activities will lead to enhancing the company's value, as integrating these activities together into the company's plans will reduce risks and enhance the company's value in the long term. Stakeholders' perception of the level of business risk is especially important in explaining the interrelationship between sustainability, innovation and company value.

On the other hand, investors are not only interested in financial considerations when comparing investment alternatives, but they also take into account social and environmental considerations, which constitutes a shift in investor orientations and has a direct impact on determining stock prices in the stock market. Therefore, companies resort to enhancing innovation management practices and reporting them in the financial statements to enhance their image among stakeholders and enhance their confidence in the company's activities, which is reflected in increasing the company's value. Companies that successfully oversee their sustainability processes will likely see improved financial performance and create long-term value.

Table 3.

Summary of Regression results.

Variables	Model 1		Model 2		Model 3	
	Coefficient	t	Coefficient	t	Coefficient	t
Constant	-.0981	-5.0611	.1861	6.7991	.2411	6.3251
ECO	.0221	6.0891				
ENV	.0221	7.0871				
SOC	.0171	6.4681				
GOV	.0321	7.0981				
CSP	.0061	6.7761			.0061	2.0621
PRO			.0421	7.5311		
PRS			.0321	4.7301		
ORG			.0631	6.3151		
MRK			.1401	13.4471		
INV			.0171	7.9501	.0311	4.2951
R2	.193		.2481		.2641	
R2adj	.189		.2441		.2561	
F	45.911		63.2061		34.2641	
P	< .001**		< .001**		< .001**	

Source: authors based on SPSS outputs.

Note: displayed coefficients are unstandardized coefficients. * *p* less than 0.05, ***p* less than 0.01.

- **H2:** states that: There is a statistically significant effect of innovation performance on the firm value e).

The findings suggest that innovation performance (INV) substantially influences the firm value (FMV) at a statistically significant level of 0.01. The innovation performance (INV) contributed to 25% of the variation

in the dependent variable, the firm value (FMV), as indicated by an R2 value of 0.248. This hypothesis demonstrates a significant 25% impact of innovation performance on the value of the business. An enhancement in the firm's ability to innovate will lead to an improvement in its overall worth. This result demonstrates that the success of innovation is a crucial factor in determining the value of a company since it directly affects several areas of the company's performance, such as market capitalization, productivity, and overall financial well-being.

Firm value is often represented by its market capitalization, which indicates the whole market worth of a company's shares and is greatly influenced by its ability to innovate and perform well. This research suggests that a company's application of creative ideas, or applied innovation activities, positively correlates with its market value. Conversely, fundamental innovation efforts do not demonstrate the exact correlation, emphasizing the significance of concentrating on practical ideas that may be converted into concrete advantages in the market. Therefore, it is necessary for companies to focus on creating innovative products or services as well as innovative processes that contribute to enhancing the company's operational efficiency and competitive position in the market.

Several studies have revealed that creating innovative products or services greatly helps in achieving economic success for companies and strengthening their market position in front of competitors. Introducing new items not only boosts revenue but also improves the company's reputation and market position, thus improving its worth. The outcomes of innovation, which include the outcomes of many innovation endeavors, are crucial for enhancing a company's performance indicators, such as sales and labor productivity. Higher sales are intricately linked to improved business value since they indicate effective expansion into the market and consumer approval of new items. In addition, innovation enhances worker productivity by optimizing resource use, so bolstering the financial performance of the organization. In addition, innovation promotes the expansion of employment, which not only improves the firm's ability to operate but also has a favorable effect on its value by producing a stronger workforce capable of driving more innovation and productivity. Companies who carefully allocate resources towards developing new products and improving their operational processes will likely see substantial enhancements in their market worth, highlighting the crucial importance of innovation in the current competitive environment.

- **H3** states that: There are statistically significant impact of Sustainability and Innovation performance levels on the firm's value.

The findings indicate that the performance of sustainability (CSP) and innovation (INV) exert a substantial influence on the value of a firm (FMV). In addition, the two separate factors, taht is, sustainability performance (CSP) and innovation (INV). Account for 26% of the variability in the outcome variable, firm value (FMV). This hypothesis demonstrated a substantial correlation between incorporating sustainability and innovation performance, contributing to 26% of the firm's overall value. Consequently, enhancing sustainability and innovation performance will positively impact the firm's value. The shift towards renewable energy and the enhancement of sustainability practices would attract investors due to the company's environmentally friendly goods and their capacity to reduce emissions, thus enhancing the overall worth of the business.

The results show that sustainability performance and innovation affect the value of the company. Sustainability strategies based on innovation can contribute to the creation of innovative goods and services that enhance the competitiveness of companies and meet customer needs while being socially and environmentally beneficial. The compatibility between sustainability performance and innovation fulfills the company's obligations towards shareholders on the one hand and meets customer needs, which enhances the company's sustainability in the long term. Moreover, the concept of environmental innovation essentially means integrating innovation activities into sustainability initiatives, and companies that adopt this strategy are expected to succeed in achieving competitive superiority in the market.

In this context, the application of artificial intelligence and modern technology in the fields of production, organization, operations and marketing can ultimately lead to enhancing companies' market returns by adopting sustainability activities as a catalyst for innovation. Innovation motivates companies to reformulate their business models to keep pace with rapidly changing market and competition levels, which leads to achieving a competitive advantage for their customers. In addition, integrating sustainability and innovation activities into the business model creates many advantages for stakeholders, including enhancing investor confidence. Following this approach stems primarily from the need for companies to adapt to external influences on their activities and enhance the company’s value in the long term by addressing environmental, social and governance challenges that directly affect the company’s value. This highlights that innovation and sustainable development activities are a strategic investment for companies in order to enhance their market value in the medium and long term and not just expenses.

DISCUSSION

Innovation activities in modern companies are an essential element for economic success and enhancing the competitive position of companies in a dynamic competitive environment. In addition, creating corporate strategies that integrate innovation activities within sustainable development initiatives will contribute to achieving sustainable development goals at the national level on the one hand and preserving the environment on the other hand. This strategy works to align the company's goals in enhancing its competitive position and market value with sustainable development goals at the national level. Therefore, combining innovation and sustainability activities will contribute to providing effective and sustainable solutions that improve productivity and achieve profit while enhancing the company's value from the perspective of stakeholders.

This study aims to test the impact of sustainability performance and innovation activities on company value in developing countries with a focus on the Iraqi environment, as well as exploring the importance of integrating innovation activities within companies' sustainable development initiatives. The results show that the level of sustainability performance positively affects company value in the companies in the study sample. This result is consistent with the findings of Ayuningtiyas and Mildawati (2023), who confirmed that the level of sustainability performance enhances the value of the company by providing useful information to investment decision makers. In addition, Sahetapy (2023) found that investors in the financial market view sustainability performance positively, indicating that companies that disclose their level of sustainability performance gain significant market advantages. In contrast, Fadillah and Noormansyah

(2023) discovered that sustainability performance had a detrimental effect on corporate value in their research.

In summary, the collective findings of this research indicate that sustainability performance is vital for improving the worth of a firm, particularly when prioritizing economic and social factors. The findings align with prior research suggesting that innovation success benefits financial profitability, market value, and overall firm performance (Denlertchaikul *et al.*, 2022). The study indicated that innovation directly benefits a company's value, and this link is mediated by financial success (dos Santos *et al.*, 2023). Nevertheless, economic policy fluctuations may diminish corporate innovation's beneficial impact on company value, highlighting the need to maintain economic policy stability to foster enterprises' inventive endeavors.

Our findings suggest that sustainability and innovation performance levels positively impact the company's value. This is because sustainability and innovation performance contribute favorably to the company's value and financial outcomes. Research indicates that using sustainability tools, such as innovation and ESG reporting, positively impacts financial performance, which is directly correlated with the overall worth of a firm (Claudia-Larisa, 2023). Furthermore, the market places a high importance on sustainability performance, which suggests that they have a beneficial influence on the value of a firm (Afeltra *et al.*, 2022). Moreover, the performance of sustainability mitigates business risk, while not directly impacting the organization's value (Mehedintu & Soava, 2023). The release of sustainability reports benefits financial performance metrics, particularly profitability and leverage. This effect is more pronounced as organizations increase in size.

The study's findings on integrating sustainability performance and innovation performance are vital for comprehending the factors and consequences of innovation on different aspects of organizations and economies. The results also emphasize the significance of innovation processes, such as product, process, organizational, and marketing innovation, in influencing knowledge management and attaining a competitive advantage. These findings highlight the significance of documenting sustainability and innovation achievements to enhance success and performance and foster corporate and national development.

Hence, innovation and sustainability performance are linked concepts, aiming to streamline investment choices for stock market investors. Innovation activities encompass any form of invention that significantly contributes to sustainable development by mitigating environmental impact and advocating for the responsible utilization of resources within the firm. Innovation efforts encompass technical, organizational, social, and marketing advancements. Sustainability-based innovation activities are an essential element in developing the competitive strategy of modern companies, as creating new innovative products or services that comply with sustainability requirements will enhance the company's economic growth and meet customer desires.

Companies can integrate new innovative ideas into development activities to create innovative and environmentally friendly products that give them a competitive advantage in the market and thus lead to an increase in their market value. Implementing innovative activities directed towards sustainable development may lead to a reduction in the level of business losses, which leads to a better competitive position. Therefore, companies should prepare their competitive plans and strategies based on integrating innovation

and sustainability activities together to achieve market superiority and economic success for the company in the environment in which it operates.

CONCLUSIONS

This study aims to test the impact of sustainability and innovation on firm value in developing countries by studying a sample of Iraqi industrial companies. The results show that there is a statistically significant impact of sustainability performance on firm value. The results also show that there is a statistically significant impact of innovation performance on firm value in the Iraqi industrial companies in the study sample. These results confirm that building corporate strategies on integrating innovation and sustainable development activities will lead to enhancing firm value by reducing perceived business risks and enhancing investor confidence in the company's current and future performance. Effective management of sustainable innovation processes is crucial. Companies that demonstrate exceptional proficiency in creating and overseeing these procedures may effectively compete in established markets while actively pursuing new market prospects.

This study highlights the prominent role of sustainability and innovation tools in enhancing corporate value. Despite the contributions of the literature, to our knowledge, the effect of integrating innovation activities and sustainability performance for value creation in developing countries has not yet been comprehensively studied. In this study, innovation activities are employed to achieve sustainable development from the perspective of the financial market movement and the investors' decisions.

This paper is among the few studies that examine the impact of sustainability performance, including the economic, environmental, social, governance, and innovation dimensions, on the financial decisions of investors in the financial markets and their reflection on the company’s value. The current study's results are limited to companies voluntarily disclosing their innovation performance and sustainability performance indicators. It also includes only Iraqi companies; therefore, the results only enhance the efficiency of financial decisions in emerging economies.

Further research on innovation performance should prioritize unexplored dimensions that have not received significant attention in existing scholarly works. We propose examining innovation performance at the corporate level, including ideas, definitions, and measures. Additionally, we recommend investigating the factors and levels of analysis that drive innovation, such as product, process, organizational, and marketing innovation. Furthermore, it is recommended that future studies include a combination of content analysis and quantitative data analysis models to uncover key performance indicators pertinent to innovation initiatives. Moreover, it is crucial to comprehend the elements that influence innovation success in nations with varying wealth levels. This knowledge may provide valuable insights for future study, particularly in the cultural and social aspects. Future research may substantially improve the areas that benefit from innovation efforts in organizations and economies by focusing on these drivers.

The study findings contribute by elucidating the influence of sustainability performance, innovation activities, work engagement, and an interactive performance management system that facilitates robotic process automation and artificial intelligence on firm value. This emphasizes the significance of innovative

activities, the favorable attitude towards work that the company encourages, and the relevance of the interactive performance management system as a formal instrument for communicating corporate objectives and establishing a shared vision. The findings of this research enhance our comprehension of the connection between innovation tools and sustainable development activities, as well as their influence on the value creation in the firms. This study also offers insights for governments and economic policymakers regarding the significance of including information about innovation activities in integrated reports on sustainable development.

DISCLOSURES

Authors declare no institutional or personal conflicts of interest.

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