“Forecasting future earnings via e-business information: Financial implications for investment decisions in the era of big data”

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FORECASTING FUTURE EARNINGS VIA E-BUSINESS INFORMATION: FINANCIAL IMPLICATIONS FOR INVESTMENT DECISIONS IN THE ERA OF BIG DATA

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Abstract

The relevance of this study lies in the importance of making accurate investment decisions and reliable earnings forecasts, especially given the role of big data in financial analysis. The purpose of the study is to investigate the influence of electronic business (e-business) information on the forecasting of future earnings among listed industrial firms in Jordan, and to examine the moderating effect of big data on this relationship. E-business information consists of forward-looking, financial, and sustainability disclosures. Data from 180 firm-years of industrial firms listed on the Amman Stock Exchange between 2017 and 2022 were analyzed by using multiple regression models. The results show that more e-business disclosures are positively associated with accurate future earnings expectations. Specifically, forward-looking, financial, and sustainability disclosures indicate a strong statistical relationship between disclosure quality and earnings predictability. Moreover, adding big data as a moderating variable significantly strengthened the predictive power of the relationships, where the adjusted R^2 increased by more than 30 percentage points. This notable enhancement provides new empirical evidence of the value added by big data analytics in improving the relationships between e-business information and the forecasting of future earnings in industrial companies. The study concludes by providing practical insights for investors, policymakers, and corporate managers, highlighting the joint roles of e-business transparency and big data technologies in enhancing financial prediction and supporting strategic decision-making.

Keywords e-business information, expected earnings, big data, industrial firms, Jordan

JEL Classification G17, M15, G11

INTRODUCTION

Expected earnings are among the major indicators that shareholders rely on to evaluate a company's performance, which consider anticipated financials for the current situation and market orientation (Chen, 2024). Not only important for shareholders, but it is also for future investors, authority bodies, and other stakeholders, this is because it guides them to take the correct decisions in their interests (Lama et al., 2025). Furthermore, the ability to forecast expected earnings is critical for firms to maintain stakeholders' confidence and sustain long-term growth (Sharma et al., 2022).

Most of the leading companies use electronic ways to disclose information about firm performance and give a signal that the operations work well to attract investors (Jucá et al., 2024; Worae & Ngwakwe, 2017). In addition, it builds digital interface activities to improve the relations with customers, which will return benefits to business operations (Papadonikolaki et al., 2022). The digitization of business processes has led to the accumulation of vast datasets, encompassing a wide array of variables and metrics (Purba et al., 2021). These electronic business data provide companies with real-time visibility into their operations, enabling agile decision-making and adaptive strategies.

Besides disclosing electronic business information, integrating big data analytics has become pivotal in shaping organizational strategies and decision-making processes (Naqvi et al., 2021). The sheer volume, velocity, and variety of data generated in e-business transactions offer unprecedented opportunities for companies to achieve competitive advantages (Naeem et al., 2022). Big data is considered a merit in modern business practices, starting from understanding marketing behavior to optimizing current operational efficiencies and then expecting the future and making decisions (Kılıç et al., 2023). Based on that, understanding the influence of big data on the nexus between electronic business information and expected earnings is considered an important issue, where big data helps in decision making; its existence with electronic business information will make a strong base to expect earnings in the coming and future periods.

The purpose of this study is to examine the influence of electronic business information on expected future earnings among listed industrial firms in Jordan, and to investigate the moderating role of big data in this relationship. In addition, the study aims to analyze how different types of electronic business disclosures impact earnings forecasts and to provide new evidence on the contribution of big data to enhancing predictive accuracy.

1. LITERATURE REVIEW AND HYPOTHESES

Expected earnings represent the anticipated financial outcomes based on past and current operations, market conditions, and future projections (Chen, 2024; Merton, 1987; Sharma et al., 2022). Expected earnings serve as a performance metric for investors, analysts, and stakeholders to guide them in investment decisions, resource allocations, and financial planning (Ball et al., 2020; Gong et al., 2025; Gopal et al., 2025). On the other hand, leading companies consider that accurately forecasting expected earnings is essential to maintain shareholder confidence and sustain strategies in the short and long term (Ben Ahmed et al., 2021).

To give initial indicators and build a base to help stakeholders, corporate member managers have taken steps to disclose e-business information, encompassing digital transactions, online interactions, and operational data (Almomani et al., 2018; Almomani et al., 2016; Grover et al., 2018; Kraus et al., 2022). Therefore, leading companies around the world generate amounts of electronic data through various channels in corporate departments, such as e-commerce platforms, online transactions, and digital marketing initiatives. This electronic business information provides companies with real-time visibility into their operations, enabling agile decision making and adaptive strategies by managers and other users who need this information (Daud et al., 2022; Masum et al., 2023; Naqvi et al., 2021). However, investors who are looking to increase their worth depend on this information to decide to invest in companies, which gives a good idea of a company's situation and the expected earnings in the future (Gonçalves et al., 2021; Gopal et al., 2025).

The relationship between e-business information and expected earnings is important for investors and stakeholders to assess a company's financial performance and make informed decisions regarding their interests (Eleimat et al., 2023; Luo & Wu, 2022). In this context, stakeholder theory explains that effective management entails cultivating positive stakeholder relationships (Ajeigbe & Ganda, 2023). Thus, e-business information provides stakeholders with good insights into a company's operations, financial health, and growth prospects, which enables them to anticipate future earnings and make investment decisions (Akdogan & Anbar, 2024; Liao et al., 2024).

The positive accounting theory can also be used to elucidate the nexus between the variables besides stakeholder theory, where positive accounting the-

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ory points out that management tends to disclose information regarding their performance, including expected earnings, to signal their competence and attract all investors (Watts, 1986). Therefore, the availability of comprehensive e-business information plays a main role in enhancing transparency and credibility, fostering trust for investors and stakeholders (Alabdallat et al., 2025; Sun et al., 2010).

Based on the discussions above, including stakeholder theory and positive accounting theory, which emphasize the importance of transparency, accountability, and credibility in shaping investor perceptions and expectations, the paper can hypothesize that the availability of e-business information may positively influence future earnings expectations. In other words, companies that effectively utilize e-business information to inform strategic decision making and optimize business processes will likely achieve higher expected earnings over time.

In the current era, big data has revolutionized the way companies collect, analyze, and utilize information. Its volume, velocity, and variety hold immense potential to create business innovation, enhance decision-making processes, and optimize operational efficiency in companies (Bag et al., 2020; Su et al., 2022). As companies continue to adopt digital transformation, the integration of big data analytics has become increasingly critical in gaining a competitive advantage and continuing for the long term.

Companies have become concerned about extracting valuable insights from vast datasets to inform strategic decision-making to keep pace with the age of technology and electronic operations, as well as advanced data collection technologies and analytics tools (Del Giudice et al., 2021). Not only to previous causes but also to understand consumer behavior to predict local and world market situations. Furthermore, big data analytics offer opportunities for companies to get a competitive edge, according to the marketplace. Based on the previous discussion, big data is considered an important variable for e-business information, which consists of electronic transactions, interactions, and other data (Eleimat et al., 2023; Wang et al., 2020). Thus, organizations can use this information to understand customer needs, market situations, and corporate performance through big data.

Prior researchers such as Del Giudice et al. (2021), Karajeh and Aldiabat (2025), and Naqvi et al. (2021) have highlighted the importance of big data in corporations, which returns benefits on companies' performance in making decisions on time easily and enhancing the accuracy of business information. To support this, the findings of Naqvi et al. (2021) assert that big data plays a key role in supporting the collection, storage, and analysis of electronic business information, thereby improving efficiency and effectiveness for the future. In addition, big data may influence expected future earnings, which are considered a good indicator of the expected financial situations based on current work, market requirements, and future policies (Suoniemi et al., 2020).

Several studies have noted that companies that utilize big data analytics in the right way are more likely to achieve higher levels of expected future earnings. This means that companies that invest in big data analytics have revenue growth and profitability compared to others (Kılıç et al., 2023). Furthermore, there is a positive nexus between big data analytics capabilities and future earnings performance, which explains the strategic importance of big data in achieving financial success (Gupta et al., 2020). Also, big data positively impacts financial earnings quality (Eleimat et al., 2023).

In conclusion, it is expected that big data analytics will influence e-business information and expected future earnings. In other words, companies can expect more information by using big data about market situations, consumer behavior, and operational performance. It enables them to predict future earnings and helps them to make more informed decisions and achieve what shareholders need, including performance success.

Therefore, this study explores the moderating role of big data in shaping the relationship between electronic business information and expected future earnings. Hence, we formulated the hypotheses:

H_1: *Electronic business information positively influences expected future earnings.*

H_2: *Big data moderates the relationship between electronic business information and expected future earnings.*

2. METHOD

This study included all Jordanian industrial entities listed on the Amman Stock Exchange. Industrial firms were chosen due to differences in some items characteristics within financial reports compared to other sectors. Study data was collected from annual reports published on the Amman Stock Exchange website from 2017 to 2022 to understand the impact of big data as a moderating variable on the relationship between e-business information and expected future earnings.

To test the study hypotheses, this research used a reasonable measurement. In details, the measurement of big data utilization in this study is binary. This mean that a value of 1 indicates that a company has a database of big data or is employing big data in its operations, while a value of 0 signifies that the company is not utilizing it. This binary measurement allows for a straightforward categorization of companies based on their adoption of big data technologies and practices, facilitating the analysis of their impact on various aspects of business performance and outcomes.

A checklist tool was used to collect electronic business information; this information consists of three core types: future, financial, and sustainability information (Ajeigbe & Ganda, 2023; Madi et al., 2014). Some items of the checklist were chosen from relevant prior studies to easily compare with previous findings and determine the improvement items during the periods of those studies. However, the other items were developed based on business trends and financial reporting practices to achieve the objectives of the study (Gary, 1995). However, the items that became compulsory according to requirements in Jordan were excluded to avoid the fault in findings, for example, the items regarding directors' shares and remuneration.

Following the methodology of Gopal et al. (2025) and Saha and Kabra (2022), an unweighted approach was employed to evaluate the business information items. Each business information item was assigned a numerical value on a binary basis, with a company receiving a score of "1" if the item was disclosed in the annual reports and "0" if it was not. The total scores for all information items were then totaled for each firm, representing the cumulative score for all information categories.

Expected future earnings are considered a major sign that reflects the ability of management to create profits over both current and future periods (Remlinger et al., 2023). The users of information, such as creditors, shareholders, suppliers, and others, depend on information that is disclosed in annual reports to make useful decisions. However, most business capitalists utilize expected earnings to assess the potential growth of wealth and future strategies that enhance business continuity while increasing market share (Gong et al., 2025). Analysts incorporate these forecasts into their valuation models to evaluate a company's performance and prospects accurately. Creditors assess a company's ability based on its expected earnings outlook, which influences lending decisions for the long term. Suppliers consider expected earnings when evaluating agreements and partnerships, which ensures financial stability. Additionally, employees cared about expected earnings when evaluating job opportunities and compensation, which enhanced their job stability. However, expected future earnings provide stakeholders with valuable insights into a company's financial performance, strategic direction, and growth prospects, which facilitates decision making across various domains.

The model was used in this paper to measure expected future earnings:

$$CI_{it+1}/AVCAS_{it} = \alpha + \beta\left[CI_{it}/CAVAS_{it}\right] + \varepsilon_{it}, \quad (1)$$

where CI_{it} – Corporate income for the firm, and $CAVAS_{it}$ – Corporate assets for the firm.

To achieve the objectives of this study, investigations were done for the main variables (big data, e-business information, and expected future earnings), besides the control variables, which are usually used to give a full image of a company's situ-

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ation. Therefore, the control variables were added to the model to explain the impact of firm characteristics and give correct findings that reflect all sample characteristics.

Firm size, leverage, and book-to-market ratio function as control variables in exploring the impact of big data on the relationship between e-business information and expected future earnings (Karajeh, 2020). Firm size provides insights into the varying resources and capabilities among companies, which allows researchers to assess whether the influence of big data on e-business information and expected future earnings differs based on company size. Leverage, representing a company's reliance on debt financing which helps elucidate how financial constraints and incentives may affect big data utilization for strategic plans. Additionally, the book-to-market ratio serves to account for growth considerations, enabling researchers to examine whether the impact of big data on e-business information and expected future earnings varies depending on a company's growth prospects (Ball et al., 2020). By integrating these control variables into the analysis, this study can provide a good understanding of how the interplay between big data usage, e-business information, and expected future earnings is influenced by factors such as company characteristics, financial structure, and growth trajectory.

To clarify and investigate the expected impact of big data as a moderator on the relationship between e-business information and expected future earnings, the following model was devised:

$$\begin{aligned} EFE_{it} &= \beta_0 + \beta_1 \left(E-BI\right)_{it} + \beta_2 \left(CB/M\right)_{it} \\ &+ \beta_3 \left(CAS\right)_{it} + \beta_4 \left(CROFA\right)_{it} + \beta_5 \left(CLEV\right)_{it} \\ &+ \beta_6 \left(BD\right)_{it} + \beta_7 \left(BD \cdot EBI\right)_{it} + \varepsilon_{it}, \end{aligned} \tag{2}$$

where EFE_{it} – Expected future earnings for company *i* at year *t*; $E–BI_{it}$ – Electronic Business information for company *i* at year *t*; CB/M_{it} – Corporate book-to-market for company *i* at year *t*; CAS_{it} – Corporate assets for the company *i* at year *t*; $CROFA_{it}$ – Corporate return on firm assets for company *i* at year *t*. *CLEV* – Corporate leverage for company *i* at year *t*. BD_{it} – Big data for company *i* at year *t*; and $BD \cdot EBI$ – interaction term between big data and electronic business information.

3. RESULTS

The descriptive analysis reveals the highest, lowest, average, and standard deviation values for key variables in this study. Table 1 provides detailed outcomes for future information (FI), financial information (FNI), and sustainability information (SI). FI and SI demonstrate the broadest spectrum, indicating diverse levels of information dissemination, where the arranged values are between 6% to 83% and 0% to 100% for SI. FNI reflects corporate performance in numerical values that show moderate diversity, with the mean of FNI being 51%. The findings suggest an overall improvement in levels of E-BI. These findings align with Karajeh (2020), but there are slight deviations, possibly stemming from variances in a few elements.

The proportions of information considered well-arranged exceed 50% of the items listed (Ghazali & Weetman, 2006). The E-BI scores are attributed to the presence of clear regulations from relevant authorities supporting it. The observed EBI levels among the listed Jordanian companies support findings in previous studies, such as Karajeh (2020), which point out the importance for concerned bodies to avoid implementing plans for enhancing EBI.

Table 1 also shows the expected future earnings (EFE) results. The negative sign in the minimum of EFE suggests instances of earnings volatility, where it ranges from –1.23 to 1.95. This indicates varied management performance generally. Finally, the control variables are in the normal range compared to the prior Jordanian studies.

Table 1. Descriptive statistics

Variable	Min	Max	Mean	Std. Dev
E–BI	0.40	0.98	0.66	0.13
FI	0.06	0.83	0.43	0.16
FNI	0.31	0.85	0.51	0.11
SI	0.00	1.00	0.34	0.18
EFE	–1.23	1.95	0.08	0.34
CLEV	0.02	1.00	0.32	0.19
CB/M	0.00	36.43	2.48	4.85
CAS	6.35	9.09	7.43	0.55
CROFA	–1.13	14.67	0.43	1.90
BD	0.00	1.00	0.88	0.33

The correlation examination outlined in Table 2 explains the nexus between E-BI, EFE, and BI in general, and with the control variables. The negative sign between E-BI and EFE ($r = -0.211^{**}$) suggests that companies with more disclosing e-business information tend to achieve the lowest earnings. This contradicts the anticipation that firms with higher earnings would demonstrate greater transparency in their reporting practices, as Gopal et al. (2025), Maz et al. (2025), and Masadeh et al. (2025) noted. However, there is no nexus between BD and EFE as shown in Table 2, where the correlation value for significance is more than 5%.

The control variables have a nexus with EFE, where Table 2 shows that the nexus is positive with CB/M, CROFA, and CAS. The correlation with CAS ($r = 0.49.9$) supports the idea that larger companies may be able to achieve earnings in the future compared to small companies, possibly due to it being considered more stable. The same interpretation applies to CB/M and CROFA; the company with a high CB/M or CROFA will normally expect to achieve high earnings, as the high CB/M and CROFA indicate that the company's situation is stable. The negative sign of the nexus between CLEV and EFE indicates that the company that has a lower debt ratio is expected to achieve more earnings in the future.

The correlation results align with the theoretical text and conclusions mentioned in prior research. The findings of positive and negative connections among these variables provide a clear explanation of E-BI, EFE, and BD. Although in agreement with established literature, it's crucial to acknowledge the distinct characteristics of the study population when interpreting the outcomes. Future investigations could explore the underlying mechanisms behind these associations and broaden the scope of comparisons with results from varied contexts to improve their applicability across different settings.

Table 2. Correlation test

Variable	EFE	E-BI	CLEV	CB/M	CROFA	CAS	BD
EFE	1						
E-BI	–.211**	1					
CLEV	–.320**	–.060	1				
CB/M	.714**	–.155**	–.206**	1			
CROFA	.114*	.078	–.327**	–.096	1		
CAS	.494**	–.070	–.052	.616**	.151**	1	
BD	.003	.052	–.054	.076*	.076*	.112	1

Note: * Correlation is significant at the 0.05 level.

Table 3 displays the outcomes of the regression test for examining the nexus between EFE, E-BI, and BD conducted through the utilization of multiple regression models. This test furnished concrete evidence demonstrating the link between variables. To give a comprehensive image of E-BI, three multiple regression analyses were done for the types of E-BI. However, all of the tests provide strong evidence that companies that disclose more E-BI can achieve more earnings in the future, and it is expected to keep this success. In detail, the findings show that FI exhibits a positive and significant coefficient (70.9%), indicating that companies with more disclosed electronic FI, such as future policy, expected earnings, and new products, are likely to achieve more earnings to prove that they can achieve all the information on the expectation disclosed previously to stakeholders.

FNI is not less important than FI; most stakeholders depend on FNI to expect the company's performance in the future. The result in Table 3 asserts that disclosing electronic FNI helps users to make decisions, where it is normal that the availability of this information gives a full image of the company situation, which will add value to stakeholders in making decisions in the right way. Finally, most prior studies noted that SI is important to show how companies contribute to their duties towards society and the environment, as well as that usually the earnings companies usually do that, as noted by Vy et al. (2024). Based on the findings of this study, there is new evidence that companies that disclose electronic SI can achieve the expected future earnings.

Table 3 also shows how BD impacts the nexus between E-BI and EFE by comparing the difference between steps 1 and 2, where the BD allows stakeholders to know the previous indicators of performance and understanding of where going, as well as provides them with the history of the companies and their management. However, step 1 added BD to the analysis, but the results show that it is not influenced by the nexus. Despite these results, step 2 shows that the interaction between BD and E-BI types significantly influences EFE. The existence of E-BI with BD helps to predict the future earnings for the company and performance more than using BD without E-BI. In detail, the adjusted R^2 rose from 31% to 92.6% in the FI model, from

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52.6% to 89.1% in the FNI model, and finally from 23.6% to 82.6% in the SI model, where the change between steps 1 and 2 indicates that the moderating variable (BD) impacts the nexus between E-BI types and EFE.

In summary, the regression analyses highlight the intricate connections between the types of E-BI and EFE. The positive impact of the moderating variable (BD) aligns with expectations, where the role of electronic reporting practices in corporate disclosure helps stakeholders to expect future earnings and make decisions.

Table 3. Regression test

Variable	FI		FNI		SI	
	Step 1	Step 2	Step 1	Step 2	Step 1	Step 2
E–BI	.709**	.112**	.549**	.123**	.621**	.136**
CLEV	.059	.022	–.069*	–.008	.017	–.024
CB/M	.003	.001	–.002	.001	–.004	.000
CROFA	.001	.000	.008**	.001	.004	–.001
CAS	–.011	.007	.006	–.009	–.013	–.003
BD	–.025	–.414**	.005	–.434**	–.009	–.331**
BD*EBI		.950**		.900**		.952**
R^2	.332	.929	.542	.896	.261	.832
Adjust R^2	.310	.926	.526	.891	.236	.826

Note. * Significant at the 0.05 level (2-tailed), and ** significant at the 0.01 level (2-tailed).

4. DISCUSSION

The findings of this study explained how e-business information influences expected future earnings and how big data moderates this relationship. The regression analysis showed that e-business information has a positive influence on expected future earnings on all three types of disclosures (70.9% – forward-looking information, 54.9% – financial information, and 62.1% – sustainability. These results support the first hypothesis and align with stakeholder theory, which suggests that transparent disclosure practices help these companies build trust with investors and all stakeholders (Ajeigbe & Ganda, 2023).

The positive relationship between forward-looking information and expected earnings indicates that these disclosures reduce information asymmetry between management and investors. This means that companies disclose their future plans and expected earnings electronically, provide signals about management's competence and growth in their worth, which is considered to be in line with positive accounting theory regarding stakeholders (Watts, 1986). This finding aligns with Akdogan and Anbar (2024), Liao et al. (2024), and Sun et al. (2010), who found that forward-looking disclosures and financial information through electronic channels enhance the accuracy of earnings forecasts.

The positive relationship between sustainability information and expected earnings adds to the growing evidence that environmental and social disclosures have real financial implications. This result is consistent with Jucá et al. (2024) and Vy et al. (2024), who noted that sustainability disclosures are associated with better-performing firms. However, this study extends the gap by showing that sustainability information helps to predict future earnings in emerging markets, rather than simply reflecting current performance.

One of the most significant contributions of this study is demonstrating the moderating effect of big data on the relationship between e-business information and expected earnings. The adjusted R^2 increased (from 31% to 92.6% for future information, from 52.6% to 89.1% for financial information, and from 23.6% to 82.6% for sustainability information) once the interaction term was added. These increases provide strong empirical evidence that big data enhances the value of electronic business information for earnings prediction, which supports the second hypothesis. This finding supports the results of Naqvi et al. (2021) and Del Giudice et al. (2021), but the study results show much stronger effects, particularly in the context of earnings prediction.

The moderating effect can be explained by the fact that big data analytics enables more processing and interpretation of electronic business disclosures. Thus, companies with big data capabilities can analyze patterns across multiple variables and identify trends more quickly, as suggested by Kılıç et al. (2023) and Gupta et al. (2020). Interestingly, big data was added separately, without the interaction term, and showed no significant direct effect on expected earnings. However, interaction terms between big data and e-business information types have a moderating effect that became highly significant.

The findings added value to previous research. In detail, Eleimat et al. (2023) reported positive impacts of big data on financial reporting quality, but the 30+ percentage point increases in this study suggest that big data plays a significant moderating role in the industrial sector. Furthermore, the correlation analysis showed a negative relationship between e-business information and expected future earnings (r = –0.211**), which differs from what Gopal et al. (2025) and Masadeh et al. (2025) found. The reason behind that because it may reflect that companies with lower current earnings are more motivated to disclose detailed e-business information to maintain investor confidence and signal transparency to the market.

CONCLUSIONS

The purpose of this study is to examine the role of big data with electronic business information in determining expected future earnings. The results indicate that this makes decision-making easier for stakeholders compared to without prior electronic business information. The contributions of this study include the use of E-BI and BD to interpret changes in future earnings expectations. The findings address a literature gap by presenting evidence on how BD moderates the nexus between E-BI and EFE. However, the empirical evidence indicates a positive impact of E-BI types on EFE; this means that companies with higher E-BI are more inclined to achieve expected earnings. Furthermore, this paper provides new evidence that BG and E-BI are important in predicting future earnings. The study encourages exploring more detailed metrics and using other factors to gain a better understanding of the role of BG and E-BI in a company's performance and reflecting on managers' practices.

AUTHOR CONTRIBUTIONS

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