

The Role of the Effectiveness of Accounting Information Systems in the Relationship between the Earnings Management and Financial Performance

Adel M. Qatawneh

Associate Professor of Accounting - Faculty of Business, Al-Zaytoonah University of Jordan
a.qatawneh@zuj.edu.jo

Gaith Abu Alfalayeh

Cardiff Metropolitan University, United Kingdom
ghaith@amman-use.com

1. Introduction

The effectiveness of the Accounting Information System (AIS) is expected to strengthen mechanisms leading to the efficient functioning of capital markets. AIS provides information that flows from the firm to stakeholders continuously. This flow of information forms the basis for the decision-making of the stakeholders. Therefore, the published periodical financial reports are expected to be relevant, faithfully represented, comparable, verifiable, timely, and comprehensible (Qatawneh, 2022). Additionally, international financial reporting standards provide management with a wide scope for choosing from different alternatives to treat the same transaction or event.

Management can misrepresent the timing, amount, or intent of transactions and events related to revenues or expenses without being involved in fraud or falsification of the records (Gul et al., 2013; Kwon et al., 2020). Moreover, management can take advantage of generally accepted accounting principles (GAAP) to select from various methods when computing earnings and other financial measures, which could lead to lower-quality financial information (Fields et al., 2018). This discretionary room allows management to report the desired profit, achieving its goals in the interest of other parties. As a result, phrases such as earnings management and manipulation have emerged. Management can manage earnings by classifying good (bad) news, smoothing income, practicing big bath accounting, and choosing from different accounting methods (Brad et al., 2020), which is known as accruals-based earnings management.

As stated by (Rankin et al., 2012) earnings management has victims, and its potential victims include equity investors, bond investors, bankers, regulators, unions, suppliers, customers, and competitors. These groups are potential victims because they may make inappropriate decisions when depending on such misleading information. Because of the importance of the earnings management issue, it has been an area for extensive research to gain some insight into the ability of management, the motives, and the techniques used to manage or smooth the behavior of earnings over time. On theoretical grounds, there is a consensus relying on the statement that auditing is one of the main factors that affect the credibility of financial information. The assumed relation between accounting information systems, earnings management, and financial performance encourages studying this relation. It is expected to be useful to explore this issue for the benefit of all parties concerned with reliable information. (Qatawneh, 2019).

Keywords: Accounting, AIS, Earning Management, Financial Performance.

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1. The problem with the study

This study aims to answer the following questions, taking into consideration the special characteristics of the Jordanian market, the society, the economy, and the sectors to which the study will be applied:

The first main question is: Does earnings management affect the financial performance of industrial companies in Jordan?

The following sub-questions stem from the main question:

The first sub-question: is there any effect of System Application Production (SAP) on the likelihood that earnings management influences the financial performance of industrial companies in Jordan?

The second sub-question: is there any effect of Case-based Reasoning (CBR) Systems on the likelihood that earnings management influences the financial performance of industrial companies in Jordan?

The third sub-question: is there any effect of Decision Support Systems (DSS) on the likelihood that earnings management influences the financial performance of industrial companies in Jordan?

The fourth sub-question: is there any effect of Enterprise Resource Planning (ERP) Systems on the likelihood that earnings management influences the financial performance of industrial companies in Jordan?

2. Significance of the study

The assumed relation between accounting information systems, earnings management, and financial performance encourages studying this relation because it is expected to be useful to explore, for the benefit of all parties concerned with reliable information. This topic is important because the current economic environment reopens fundamental questions about the role of accounting information systems, in maintaining financial statement users' confidence in the audit report.

3. The objectives of the study

The relevance of the accounting information system means making a difference in the decision, otherwise, the users of financial statements will not read the report and will not be taken into account in the process of decision-making. The effect of the decision means that the report must have content information, it must affect investment decisions and credit decisions, and stock prices. Therefore, the basic objectives of this study are:

The first main objective is: Examine the effect of earnings management on the financial performance of industrial companies in Jordan.

The following sub-objectives stem from the main objective:

The first sub-objective: Examine the effect of System Application Production (SAP) on the likelihood that earnings management influences the financial performance of industrial companies in Jordan.

The second sub-objective: Examine the effect of Case-based Reasoning (CBR) Systems on the likelihood that earnings management influences the financial performance of industrial companies in Jordan.

The third sub-objective: Examine the effect of Decision Support Systems (DSS) on the likelihood that earnings management influences the financial performance of industrial companies in Jordan.

The fourth sub-objective: Examine the effect of Enterprise Resource Planning (ERP) Systems on the likelihood that earnings management influences the financial performance of industrial companies in Jordan.

4. Literature Review

This study revisits the potential link between the effect of accounting information systems, earnings management, and financial performance. A wide stream of research has documented that the influence of effect accounting information systems, earnings management, and financial performance is noteworthy in the sense that many international studies provide mixed evidence on the nature of this relationship.

Qatawneh, A, (2022), Role of Accounting Information Systems (AIS) Applications on Increasing SMEs Corporate Social Responsibility (CSR) During COVID 19

The main aim was to highlight the role of AIS applications in increasing CSR during COVID-19. (132) individuals responded to an online questionnaire. Results indicated that AIS-supported CSR among SMEs in Jordan attributed to the credibility and reliability of AIS outcomes. In other words, the main hypothesis was accepted and there was a positive impact of AIS applications on CSR in the fields of legal, economic, ethical, and philanthropy and indicating that organizations were to support the community during the pandemic by organizing their finances, avoid corruption and support the society through funding, donations and charity work as they were aware of their profits and abilities.

Qatawneh, A (2020), The Impact of Taxation and Accounting Audit Systems on the Tax Revenue-Case Study of Income and Sales Tax Department in Jordan

This study aims to identify the impact of tax and accounting auditing systems on tax revenues at the Income and Sales Tax Department in Jordan. To achieve the objectives of the study and test hypotheses, the researcher used the descriptive and analytical approach, by designing a questionnaire and distributing it to the members of the study community, where the study population consists of a sample of the tax auditors accredited by the Jordanian Income and Sales Tax Department, who are the auditors of the following directorates, the Directorate of Large Taxpayer Office (LTO), the Directorate of Industrial Activity, the First Commercial Activity Tax Directorate, the Second Commercial Activity Tax Directorate, the Service Activity Tax Directorate. Where (150) questionnaires were distributed and (127) questionnaires were retrieved from them, it was found that (119) questionnaires were valid for statistical analysis.

Kashif, (2018) Impact of Accounting Information Systems on the Financial Performance of Selected FMCG Companies

The main objective of the study was to investigate the role of the accounting information system on the financial performance of major Indian FMCG companies. A self-administered questionnaire designed on a five-point likers scale has been used to collect data. The researcher collected data through a sample of 283 employees in Indian Listed Companies using a survey. Furthermore, the data collection period was ten months from May 2017 to February 2018. For analyzing the data, simple linear regression analysis has been used and hypotheses have been tested at a confidence level of 95%. All the hypotheses have been rejected which means that there is a significant impact of AIS on the financial performance of selected FMCG companies.

Al-Dalaïen and Khan (2018). Effect of Accounting Information Systems on Financial Performance

The primary objective of their study is to examine the impact of AIS on the financial performance of selected real estate companies in Jordan. A well-designed questionnaire has been used for collecting data from employees working in the companies namely Noor Capital, Jordan International Investment Company (JIIC), Ihdathiat Coordinates, Real Estate Development (RED), and Afaq Holding the selected real estate companies. Besides, financial performance was taken as the dependent variable whereas AIS was the independent variable. The researchers distributed 250 questionnaires from September to December 2017 wherein 75 questionnaires were rejected and 175 were accepted for analysis. Jordan International Investment Company has benefitted the most from AIS since the value of R square was 0.911 but no impact of AIS was revealed in Ihdathiat Coordinates. It means AIS on the financial performance of all except Ihdathiat Coordinates.

Khan, (2017). Impact of Accounting Information Systems on The Organizational Performance

The main objective of his study is to examine the impact of accounting information systems on organizational performance in Procter and Gamble by collecting data through questionnaires designed on a five-point likers scale. The author measured the role of AIS on marketing performance, job performance, and financial performance. The sample size of the study was 174 employees working in P&G Limited. Simple linear regression was used as the statistical tool for analysis. The maximum impact of AIS was revealed on marketing performance ($R^2=0.842$) followed by job performance ($R^2=0.705$). However, the least impact was found in financial performance because the value of R square was 0.632 and beta 0.484. To conclude, it can be said that there is a significant impact of the accounting information system on the organizational performance of P&G Limited.

Sun, L. (2017). The Effect of Firm Performance on Modelling Earnings Management Behaviour

In this paper, they formally derived the relation between firm performance and accruals. they showed the evolution of different models and demonstrate why firm performance should be controlled when estimating discretionary accruals. Using a sample of Australia Stock Exchange-listed firms with 5,947 firm-year observations from the period of 1999 to 2006, they estimate discretionary accruals based on Jones Model, Modified Jones Model, Cash Flow Modified Jones Model, and the Performance Adjusted Technique. The results show that the Performance Adjusted Technique tends to adjust the effect of performance on estimated discretionary accruals by removing the measurement in discretionary accruals that correlated with earnings performance and therefore improve the reliability of further detection of earnings management.

Alhadab and Al-Own, (2017). Earnings Management and Banks Performance: Evidence from Europe

The primary purpose of this study is to examine whether earnings management affects banks' current and future performance. It analyses the relationship between discretionary loan loss provision and both return on assets (ROA) and returns on equity (ROE). Using a sample consisting of 477 bank-year observations representing 55 European banks over the period from 2001 to 2015, they provide new evidence that European banks with high levels of earnings management that occurs via discretionary loan loss provision experience inferior performance (measured via ROA and ROE) in the current and subsequent years. Their results show that the negative impact of earnings management (which takes place in a specific year) feeds through into the following years. The results of the analysis emphasize the important implication to many interested parties across the European Union such as regulators, investors, audit firms, and standards setters who aim to improve the financial reporting quality in the banking industry.

Kumari, P., & Pattanayak, J. K. (2015). Earnings management and firm performance: an insight into Indian commercial banks.

The purpose of this study is to examine the impact of firm performance on the quality of reported earnings of publicly and privately owned commercial banks listed on the Indian stock exchange. They used data from 32 commercial banks for 11 years from 2003 to 2013. A bank-specific mode has been used to measure the earnings management practices existing in such banks. Banks' specific performance ratios and profit numbers have been used as performance indicators. The results indicate substantial differences existing among the significant factors influencing the earnings quality of public-sector and private-sector Indian commercial banks. This study also shows that profit before tax and appropriation, profit after tax and market ratio, PE ratio, and Yield have a significant impact on the earnings quality of Indian banking firms.

5. Research Methodology

This section will describe the methodology that was used to follow and understand this study. This section describes the methodology, the study population, and the sample, defines the study variables, data collection sources, and statistical techniques used, and designs the research model.

5.1. Population and Sample

The population of this study consists of all industrial companies listed in Amman Stock Exchange (ASE) during the period 2010 - 2017. To create a unifying theme between the firms in the study sample and to eliminate any

factors that might create noise and thus; affect the findings of this study, firms in the sample were selected based on the following criteria:

- a) The firm's shares should have been listed in Amman Stock Exchange for trading and their daily closing prices are available for not less than 180 days/year.
- b) Financial data needed to calculate the study variables must be available.
- c) The firm should have not been exposed to extraordinary events such as mergers or liquidation.

5.2. Data Collection sources

- 1- For the primary data collection: the data of this study was obtained from the annual reports of the sampled industrial companies listed in Amman Stock Exchange during the period (2010-2017), where these annual reports were available on the website of Amman Stock Exchange and contain. In addition, financial statements are disclosure about accounting information systems, earnings management, and financial performance issued by Jordan Security Commission.
- 2- For the secondary data collection: books, research and scientific journals, Arab and foreign as well as research publications that discussed the effect of accounting information systems, earnings management, and financial performance.

5.3. Research Hypotheses

To achieve the objective of the study and based on the literature, the hypotheses of the study were formulated as follows:

The main hypotheses:

H₀₁: There is no significant effect of earnings management on the financial performance of industrial companies in Jordan.

The following sub hypotheses are stems from the main hypotheses:

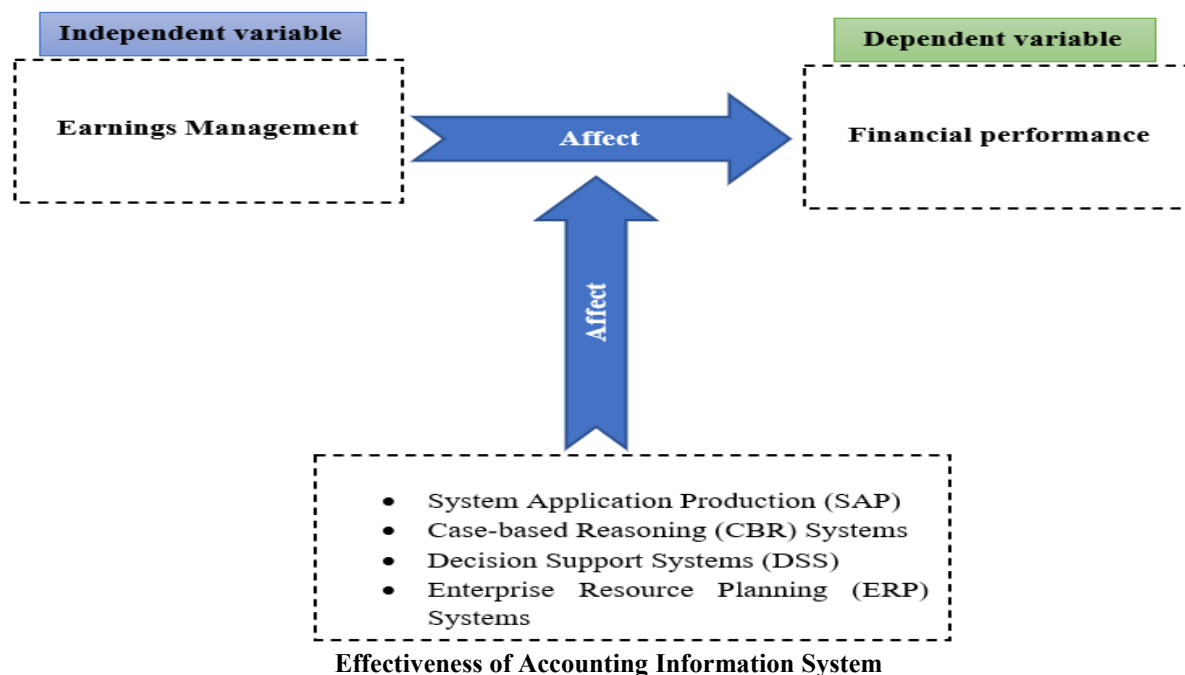
H01₁: There is no significant effect of System Application Production (SAP) on the likelihood that earnings management influences the financial performance of industrial companies in Jordan.

H01₂: There is no significant effect of Case-based Reasoning (CBR) Systems on the likelihood that earnings management influences the financial performance of industrial companies in Jordan.

H01₃: There is no significant effect of Decision Support Systems (DSS) on the likelihood that earnings management influences the financial performance of industrial companies in Jordan.

H01₄: There is no effect of Enterprise Resource Planning (ERP) Systems on the likelihood that earnings management influences the financial performance of industrial companies in Jordan.

5.4. Research model (framework)



5.5. Variables Measurement

The study variables are accounting information systems, earnings management, and financial performance.

5.5.1. Measurement of independent variables

5.5.1.1. Earnings Management

Previs researchers argued that the modified Jones model is the most powerful model for estimating discretionary accruals among the existing models (Dechow et al., 2010; Dechow and Skinner, 2000). Based on the above argument, DA can be measured as follows:

Equation 1: Total accruals as previously mentioned is the difference between earnings and cash flows from operating activities

$$TACC_{it} = NI_{it} - OCF_{it} \dots \dots \dots (1)$$

Where:

$TACC_{it}$ = total accruals for the company i in year t

NI_{it} = net income before extraordinary items for the company i in year t

OCF_{it} = operating cash flows for the company i in year t.

Equation 2: The equation below is estimated for each firm and fiscal year combination

$$TACC_{it}/TA_{it-1} = \alpha_1 (1/TA_{it-1}) + \alpha_2 [(\Delta REV_{it})/TA_{it-1}] + \alpha_3 (PPE_{it}/TA_{it-1}) + \varepsilon_{it} \dots (2)$$

Where:

$TACC_{it}$ = total accruals for the company i in year t

TA_{it-1} = Previous year's total assets

ΔREV_{it} = change in operating revenues for the company i in year t

ΔREC_{it} = change in net receivables for the company i in year t

PPE_{it} = gross property, plant, and equipment for the company i in year t.

α_1 - α_3 = regression parameters.

ε_{it} = error term.

Equation 3: Non-discretionary accruals are measured for each year and fiscal year combination using the equation as follows:

$$NDAC_{it} = \hat{\alpha}_1 (1/TA_{it-1}) + \hat{\alpha}_2 [(\Delta REV_{it} - \Delta REC_{it})/TA_{it-1}] + \hat{\alpha}_3 (PPE_{it}/TA_{it-1}) \dots (3)$$

Where:

$NDAC_{it}$ = non-discretionary accruals for the company i in year t

TA_{it-1} = Previous year's total assets

ΔREV_{it} = change in operating revenues for the company i in year t

ΔREC_{it} = change in net receivables for the company i in year t

PPE_{it} = gross property, plant, and equipment for the company i in year t

$\hat{\alpha}_1$ - $\hat{\alpha}_3$ = regression parameters.

Equation 4: The Difference between total accruals and the non-discretionary components of accruals is considered discretionary accruals (DACC) as stated in the equation as follows:

$$DACC_{it} = TACC_{it} - NDACC_{it} \dots \dots \dots (4)$$

Where:

$DACC_{it}$ = discretionary accruals for the company i in year t

$TACC_{it}$ = total accruals for the company i in year t

$NDTACC_{it}$ = non-discretionary accruals for the company i in year t

5.5.2. Measurement of dependent variables

5.5.2.1. Financial performance

This study's financial performance variable, the net profit margin ratio (as adopted in Gill and Biger, 2013; Obradovich et, al. 2015; Gill et, al. 2015; Aghajari et, al.

2015) where the measurements of these variables were as follows:

- 1- Net profit margin ratio of the firm (i) and end of period (t):

$$NPM_{it} = \text{Net income}_{it} / \text{sales}$$

Where

- **Net income**: net income of firm (i) and end of period (t)
- **Sales**: sales of the firm(i) and end of period (t).

5.5.3. Measurement of control variables

5.5.3.1. Effectiveness of Accounting Information System

To test the hypotheses of whether the accounting information system is related to earnings management and financial performance, the accounting information system will be measured into the following variable:

- 1- **System Application Production (SAP)**: (dummy variable), equals one if the companies have the system application production and zero other ways according to (Soudani, 2012).
- 2- **Enterprise Resource Planning (ERP) systems**: (dummy variable), equals one if the companies have the enterprise resource planning systems and zero other ways according to (Pallisserry, 2012; Abraham et al., 2008).

- 3- **Case-based Reasoning (CBR) Systems:** (dummy variable), equals one if the companies have the case-based reasoning systems and zero other ways according to (Emeka, 2012).
- 4- **Decision Support Systems (DSS):** (dummy variable), equals one if the companies have the decision support systems and zero other ways according to (Al-Dalaien and Khan, 2018).

5.6. Empirical Model

To test the hypothesis: the following models are used according to (Dechow et al., 2010; Gill and Biger, 2013; Obradovich et, al. 2015; Gill et, al. 2015; Pallisserry, 2012; Abraham et al., 2008).

$$NPM_{it} = \beta_0 + \beta_1 EM_{it} + \beta_2 SAP_{it} + \beta_3 CBR_{it} + \beta_4 ERP_{it} + \beta_5 DSS_{it} \dots\dots\dots (1)$$

Where:

NPM_{it} is the Net profit margin ratio for the company i in year t.

EM_{it}: Earnings Management for the company i in year t.

SAP_{it}: (dummy variable), equals one if the companies have the system application production and zero other ways for the company i in year t.

CBR_{it}: (dummy variable), equals one if the companies have the case-based reasoning system and zero other ways for the company i in year t.

ERP_{it}: (dummy variable), equals one if the companies have an enterprise resource planning system for the company i in year t.

DSS_{it}: (dummy variable), equals one if the companies have decision support systems for the company i in year t.

5.7. Statistical techniques used

The researcher dealt with the data collected for this study through the following financial and statistical analysis programs:

- (SPSS): Statistical Package for Social Sciences
- E- views

To use the following statistical purposes:

- 1- A descriptive statistic for all study variables through several parameters such as minimum, maximum, mean, and standard deviation.
- 2- Test, whether there is a multicollinearity problem, exists between the variables.
- 3- Test, whether there is a Heteroskedasticity problem, exists between the variables.
- 4- Test the correlation matrix and Variance inflation factor (VIF) between the variables.
- 5- Because the study data are cross-sectional and for years (2013-2017), the appropriate regression model is multiple regression using the method of ordinary least squares (OLS).

6. Hypotheses testing and results in discussion.

Table 1: Multiple Regression results for hypotheses.

Variables		Coefficient	p-Value
Earnings Management (EM)		-0.532	0.000
system application production (SAP)		0.055	0.040
The case-based reasoning system (CBR)		0.057	0.037
Enterprise resource planning system (ERP)		0.053	0.030
Decision support systems (DSS)		0.260	0.009
Model	R Square	Adjusted R Square	
1	0.342	0.305	
F-statistic		Sign. F	
9.048		0.000	

The table provides OLS regression results for the main hypotheses model of the study.
 The model is: $NPM_{it} = \beta_0 + \beta_1 EM_{it} + \beta_2 SAP_{it} + \beta_3 CBR_{it} + \beta_4 ERP_{it} + \beta_5 DSS_{it} \dots\dots\dots (1)$
 NPM is the Net profit margin ratio for the company i in year t. EM, it: Earnings Management for the company i in year t.
 SAP it: (dummy variable), equals one if the companies have the system application production and zero other ways for the company i in year t. CBR it: (dummy variable), equals one if the companies have the case-based reasoning system and zero other ways for the company i in year t. ERP it: (dummy variable), equals one if the companies have an enterprise resource planning system for the company i in year t. DSS it: (dummy variable), equals one if the companies have decision support systems for the company i in year t.

The main hypotheses testing:

H₀₁: There is no significant effect of earnings management on the financial performance of industrial

companies in Jordan.

The results reveal that the model is strong with 34.2% R Square and 30.5% Adjusted R Square, meaning that the all-independent variables explain 30.5% of financial performance variation for the total sample in Jordanian companies. Moreover, this model is significant with an F-statistic value of (9.048) and $p = 0.000$, suggesting that the model is statistically valid. As a result of these statistics, there is a significant effect of earnings management on the financial performance of industrial companies in Jordan. This result agreed with (Obradovich et, al. 2015; Gill et, al. 2015; Pallisserry).

The following sub hypotheses are stems from the main hypotheses:

H01: There is no significant effect of System Application Production (SAP) on the likelihood that earnings management influences the financial performance of industrial companies in Jordan.

As can be observed from table (1), the value of coefficients for the system application production is (0.055) at the level of significance (0.040), which is less than 0.05; therefore, the effect of System Application Production (SAP) on the likelihood that the earnings management influences financial performance is statistically significant. Thus, this study can reject the null hypothesis and accept the alternative hypothesis, which states: there is a significant effect of System Application Production (SAP) on the likelihood that earnings management influences the financial performance of industrial companies in Jordan.

H01₂: There is no significant effect of Case-based Reasoning (CBR) Systems on the likelihood that earnings management influences the financial performance of industrial companies in Jordan.

It can be observed that from table (1), the value of coefficients for the case-based reasoning systems is (0.057) at the level of significance (0.037), which is less than 0.05; therefore, the effect of case-based reasoning systems on the likelihood that the earnings management influences financial performance is statistically significant. Therefore, this study can reject the null hypothesis and accept the alternative hypothesis, which states: there is a significant effect of Case-based Reasoning (CBR) Systems on the likelihood that earnings management influences the financial performance of industrial companies in Jordan.

H01₃: There is no significant effect of Decision Support Systems (DSS) on the likelihood that earnings management influences the financial performance of industrial companies in Jordan.

It can be argued that from the table (1), the value of coefficients for the decision support systems is (0.053) at the level of the significance (0.030), which is less than 0.05; therefore, the effect of decision support systems on the likelihood that the earnings management influences financial performance is statistically significant. Furthermore, this study can reject the null hypothesis and accept the alternative hypothesis, which states: there is a significant effect of Decision Support Systems (DSS) on the likelihood that earnings management influences the financial performance of industrial companies in Jordan.

H01₄: There is no effect of Enterprise Resource Planning (ERP) Systems on the likelihood that earnings management influences the financial performance of industrial companies in Jordan.

It can be argued that from table (1), the value of coefficients for the enterprise resource planning systems is (0.260) at the level of significance (0.009), which is less than 0.05; therefore, the effect of enterprise resource planning systems on the likelihood that the earnings management influences financial performance is statistically significant. So thus, this study can reject the null hypothesis and accept the alternative hypothesis, which states: there is a significant effect of Enterprise Resource Planning (ERP) Systems on the likelihood that earnings management influences the financial performance of industrial companies in Jordan.

7. Recommendations

The results of the study and the limitations of the study are considered as implicit recommendations for industrial companies, regularity, and future studies where:

- 1- It is recommended that client firms properly select the accounting service provider based on the AIS service providers and should have taken other courses, and training as well as having several years of working experience. Moreover, they should be aware of the new technologies and new systems.
- 2- It is recommended to future studies deal with firm characteristics as context-dependent rather than simply as a "control variable", increasing the observations could also be useful in enabling the researcher to generalize the results and enhancing the quality of the results themselves.
- 3- It is recommended to future studies could take the effect of other financial performance mechanisms such as sales growth, their relatives, and return on assets.
- 4- The researcher would also recommend applying this study to the insurance and banking sectors and other periods.

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