The Impact and Risks of Accounting Information System on Internal and External Audits Based on Experimental Analysis

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Abstract -This research aims to study the impact of accounting information systems on internal and external auditing and risks among them. To achieve this purpose, this study followed the analysis procedure of previous researches, and found that the accounting information system has an important influence on internal and external auditing. And at the end, it also analysed the internal, external, and technical risks the current accounting information system is facing.

Keywords: accounting information system, internal audit effectiveness, internal and external audits.

1 INTRODUCTION

The 21st century is the information age, and the world has already begun to be information-based. At this time, computer technology is widely applied in various industries. Therefore, information technology gets a good development momentum, and the importance of information technology in business is also increasing. In the business area, accounting serves as an indispensable part of a company. Every company that is proficient in successfully adopting an accounting information system brings convenience to customers.

Accounting information system (AIS) is a computer-based system that combines accounting activities and information technology resources to collect, store and process financial and accounting data for the company. [1] Therefore, it can provide accurate, timely, and secure financial data to financial and non-financial users before making significant decisions. Given the wide application of AIS, this paper will discuss its influence on internal and external auditing. Based on previous research data, using reliable tests, Structural equation model evaluation and regression model will be used to obtain results, and its potential risks will also be discussed.

2 THE COMPONENT OF AIS

AIS requires the following six components to work together in order to ensure proper functioning.

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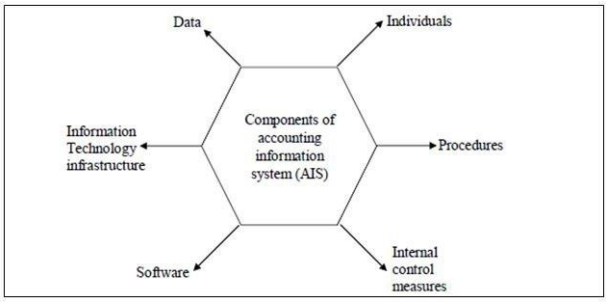

Figure 1 components of AIS [2]

Figure 1 shows that AIS consists of six parts: individuals, procurers, internal control, software, information technology infrastructure, and data. The individual component includes all the people who can access the information in AIS. Since AIS stores all relevant data in management and finance, people from different departments need to cooperate in using data and achieving financial objectives. AIS procedures include manual data collection, storage, retrieval, and processing of data. [3] The data can be coded into AIS software and processed from both internal and external data sources. From the perspective of internal control, there are all information security measures to ensure data security. Given the nature of AIS, it needs to have relatively complete internal control because the internal access is restricted from internal control and unauthorized computer access is unpermitted. Software in AIS includes all the computer programs that handle the collection, processing, and evaluation of financial information related to the organization. When the company chooses the more highly functional software, the more accurate the data can be guaranteed. Information technology infrastructure includes all the hardware required by AIS, such as computers and servers. The important factors of IT infrastructure are processing speed and storage capacity, in this way, the infrastructure can bear an increasing amount of internal and external data. In order to store information, AIS must have a well-structured database to process the content of the system fully. Structured Query Language is commonly used in AIS databases, so data of AIS can be quickly retrieved for reporting purposes. [2] The data of AIS should be relevant to the company and be authentic, so the company can better prepare accounting statements and financial reports based on these data to help financial non-financial users make decisions.

3 THE BASIC FUNCTION OF AIS

Since AIS can arrange all the data of the company's financial records into an orderly structure by computers, it provides three basic functions to users, which entails viewing and analysing financial data in an accordant way. The first function is data collection and processing. AIS effectively collects and stores data related to the company's financial activities, including all the transaction data, such as cash sales and payroll. The second functions are management reporting. Especially, it provides management and financial reports to decision-makers. In that way, decision-makers can use these two kinds of reports to analyse the company's current policies, operations situation, and financial position. Thereby, decision-making formulates the best policies and plans conducive to the company's long-term operation and profitability. The third function is data accuracy and security; the company ensures the safety and accuracy of company

data through internal control from AIS. The training of relevant knowledge of information systems ensures that the data entered in AIS by employees is accurate. Controlling access to the system can ensure the security of the company's financial dataTHE ROLE OF AIS

3.1 Internal auditor

The AIS system is indispensable for the management and implementation of the company's internal audit system. Therefore, when used by internal auditors, AIS is considered a key element in corporate decision-making and management. In addition, AIS also plays a significant role in the internal auditors' functions.

An organization with an effective internal audit system can sustain the qualitative characteristics of accounting information. [4] A good internal audit system with strict control over internal audits enables the company's managers to use more reliable data to perform financial activities and make decisions correctly. Furthermore, AIS is more advantages than manual accounting. Especially, it can help the company's internal auditors process all transaction processes and financial report data through the computer system. AIS can easily eliminate redundantly and misrepresented data. Moreover, AIS can reduce the chance of error and store and compare previous years' data more conveniently.

3.1.1 Conceptual model

The data came from Almaliki et al.'s [8] research and were collected by sending questionnaires to the interviewees (including accountants, managers, and internal auditors) of 120. A total of 400 questionnaires were sent out and 375 were recollected. Random sampling methods were used to analyse the relationship between AIS and Internal Audit Effectiveness.

3.1.2 Measurement

According to the research of Oday et al. [8], the following characters were used as measuring variables to study the relationship between AIS and IAE.

3.1.2.1 Integration

It refers to the process of combining old and new software systems into a new system. The integrated system in AIS collects extracts data from public databases and expands the scope of data selection. [5]

3.1.2.2 Flexibility

AIS information needs to be flexible because a flexible can make it easier for managers to manipulate accounting signals. Basically, a good AIS is a judge based on its flexibility [6]. Moreover, the flexibility of the organization reflects the company’s ability to adapt to future needs. [7]

3.1.2.3 Reliability

AIS is required to provide information reliability, which means that the data in AIS needs to be true, accurate, complete, and verifiable. The reliability of information can improve the credibility of accounting information.

3.1.2.4 Relevance

The function of AIS is to help financial and non-financial users evaluate and make decisions on past and future events, so the information needs to be relevant events.

3.1.2.5 Timelines

AIS needs to convey information to users in time. Providing information in time can enable users to make decisions promptly when there is a bad economic condition.

3.1.2.6 Experience

Experience is the working and academic experience of internal auditors. These experiences include the skills and knowledge of internal auditors to manage, organize, and develop relevant information and make correct decisions based on information.

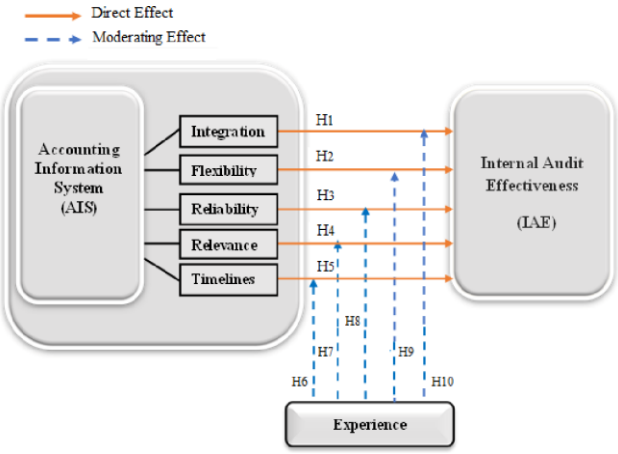

Figure 2 Conceptual model [8]

3.1.3 The conceptual model origination

Almaliki etal's research [8] indicates the relationships between AIS and IAE in this study (as shown in figure 2). It can be divided into two parts: direct relationships and the moderating effects:

3.1.3.1 Direct relationships:

H1: There is a significant effect of integration on IAE

H2: There is a significant impact of flexibility on IAE

H3: There is a significant impact of reliability on IAE

H4: There is a significant impact of relevance on IAE

H5: There is a significant impact of timeliness on IAE

3.1.3.2 Moderating hypotheses:

H6: Experience moderates the effect of timelines on the IAE

H7: Experience moderates the effect of relevance on the IAE

H8: Experience moderates the effect of reliability on the IAE

H9: Experience moderates the effect of flexibility on the IAE

H10: Experience moderates the effect of integration on the IAE

3.1.4 Results and Discussions

3.1.4.1 Reliable test

No	Construct	Number of Items	Alpha Value
1	Integration	10	0.976
2	Flexibility	10	0.986
3	Reliability	10	0.981
4	Relevance	10	0.985
5	Timeliness	10	0.951
6	Internal Audit Effectiveness	10	0.977
7	Experience	8	0.943

Figure 3 reliability test of all constructs. [8]

As shown in Figure 3, the Cronbach Alpha values of all constructs are greater than 0.7, which means that all constructs are highly internally stable. Therefore, we can rely on these constructs to study the relationship between AIS and IAE and get results.

3.1.4.2 Structural equation model evaluation (SEM)

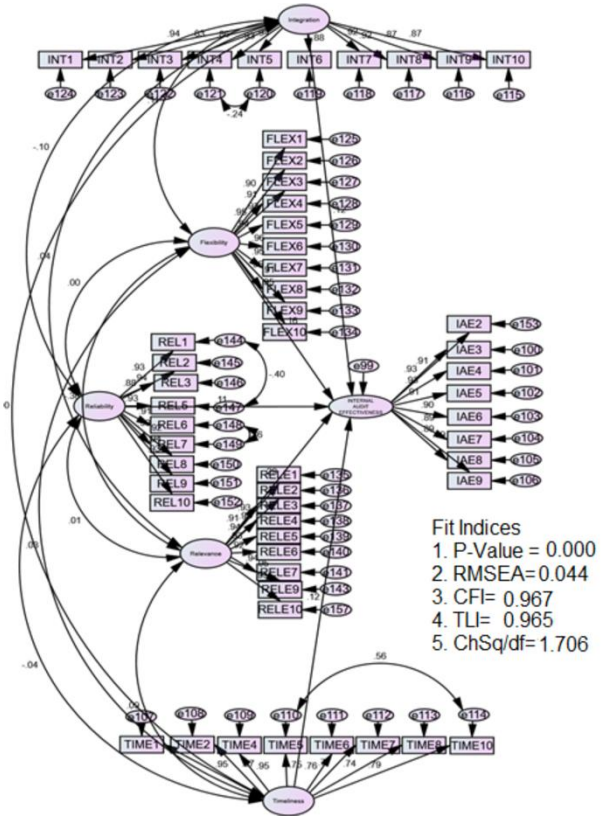

Figure 4 SEM without moderating [8]

In figure 4 model, fit indices are determined by SEM without moderate and using the same exponent as the measurement model. It can be seen that the goodness of fit and value are within acceptable ranges. It also shows that SEM is consistent with the data and the construction is sufficient.

Fit index	Modified Model	Recommended values	Source
χ^2/df	1.706	≤ 5.00	Hooper *et al.* (2008)
GFI	0.920	≥ 0.90	Hooper *et al.* (2008)
AGFI	0.914	≥ 0.90	Hooper *et al.* (2008)
CFI	0.967	≥ 0.90	Hooper *et al.* (2008)
IFI	0.967	≥ 0.90	Hooper *et al.* (2008)
TLI	0.965	≥ 0.90	Hair *et al.* (2006)
RMSEA	0.044	≤ 0.10	Hooper *et al.* (2008), Hair *et al.* (2010)

χ2/df=normed chi-square, GFI= comparative fit index, AGFI= adjusted goodness-of-fit statistic, CFI= comparative fit index, IFI= Incremental fit indices, TLI= Tucker-Lewis, Index, RMSEA= root mean square error.

Figure 5 Goodness of fit of the SEM [8]

This model is used to show the relationship between AIS and IAE. Each index constructed by AIS is multiplied by each index of the moderating variable to produce an index of potential interaction terms. The statistical significance of the moderating effect was tested using a bootstrap program. Therefore, the experience indicator is multiplied by AIS and IAE indicators to create a new interactive term called Experience * (AIS), which includes INAC-EXP-INT, INAC-EXP-REL, INAC-EXP-RELE, INAC-EXP-FLEX, INAC-EXP-TIME. [8] The interaction between AIS and IEA was evident in this model

3.1.4.3 Regress analysis

Hypothesis	Relation			Estimate	St. Error	C.R.	P
H1	IAE	<---	INT	.109	.048	2.287	.022
H2	IAE	<---	FLEX	.150	.050	2.979	.003
H3	IAE	<---	REL	.098	.046	2.123	.034
H4	IAE	<---	RELE	.273	.050	5.453	***
H5	IAE	<---	TIME	.095	.039	2.429	.015

INT=Integration; FLEX=Flexibility; REL=Reliability; RELE= Relevance; TIME=Timeliness; IAE= Internal Audit Effectiveness; SE= standard error; CR =critical ratio; P=probability.

Figure 6 regression analysis [8]

According to Figure 6, there are significant impacts of integration, flexibility, reliability, relevance, and timeliness on IAE (p>0.05), and all these relationships are positive. Taken together, H1, H2, H3, H4 and H5 are supported.

Hypothesis	Relation			Estimate	St. Error.	C.R.	P
H6	IAE	<---	INAC_EXP_TIME	.058	.030	1.929	.054
H7	IAE	<---	INAC _EXP_RELE	-.009	.036	-.246	.805
H8	IAE	<---	INAC _EXP_REL	.002	.036	.063	.950
H9	IAE	<---	INAC _EXP_FLEX	.111	.038	-2.894	.004
H10	IAE	<---	INAC _EXP_INT	.094	.039	2.426	.015

IT=integration, FLEX=flexibility, REL=reliability, RELE=relevance, TIME=timeliness, IAE=internal audit effectiveness, CR= critical tio, p= probability of getting CR, INAC=interaction.

Figure 7 regression analysis[8]

As depicted in Figure 7, the moderating roles of experience in the impacts of flexibility on IAE (p=0.004<0.05) and integration on IAE (p=0.015<0.05) are significant respectively, which indicates that H9 and H10 are valid. However, the remaining three hypotheses in Figure are not supported (p>0.05).

The above results indicate that the characteristics of AIS are significant for improving IAE. Based on the conceptual model and regression analysis, all the direct hypotheses confirmed that AIS significantly influences IAE. However, in terms of moderator hypotheses, experience only plays a moderating role in the relationships between AIS characteristics (i.e., flexibility and integration) and IAE. While experience does not exert any moderating effect on timelines, relevance, and reliability assumptions, it has no significant effect on IAE. In general, AIS promotes the process of the internal auditors so that internal auditors have flexible discretion. With the intervention of AIS, data is more accurate, relevant, and timely, making it easier for internal audits to access information. Additionally, AIS improves the operating mode between

internal audit and management to improve management's decision-making ability and help them make correct decisions.

3.2 External auditor

The role of AIS in external auditing is to improve the accuracy and quality of the financial information provided by the company. The rational use of AIS can affect the economy and support economic decisions that affect income, wealth, and resources. External audits need to perform audit steps according to the financial information provided by the company. The audit steps consist of planning, collecting evidence, risk assessment measures, evaluation measures, substantive testing and communicating audit results. [9] AIS can help external auditors to access the data quickly and accurately. AIS can reduce the possibility of falsifying the financial information provided by the company and help the external audit to evaluate the company more objectively.

3.2.1 Hypotheses model

The purpose of the model is to verify that AIS impacts improving the quality of external audits. The data was collected for analysis by Almasria et al. [9]. Based on the data of the sample questionnaire, Nashat used a regression test to explore the role of AIS in improving the quality of external audits.

3.2.2 Measuring variable

The external audit process is regarded as a variable to analyse whether AIS impacts the external audit. The external audit has the following four processes: planning audit process, conducting tests of conformity, assessing risks, and implementing audit plan.

3.2.2.1 Planning audit process

The first step of external audit is to collect the data used in the audit plan of AIS, including understanding in advance how to organize computer-related accounts; identifying the company's software and computer hardware; understanding the pre-concept of each basic computer processing accounting application, and determine the proposed implementations. [10]

3.2.2.2 Conducting tests of conformity (Audit testing process)

There are two control methods for external auditing: general control and efficiency control. The external audit is based on the information provided by the AIS for task allocation, disaster planning, data backup, tag use, access management, procurement procedures, and the implementation of new programs and facilities. Allocate tasks, plan for a catastrophe, backup of data, use of marks, access regulation, procurement procedures, and news and facilities implementation. However, when it is found that the data in AIS is insufficient, external audits cannot rely on AIS information to make judgments. [9]

3.2.2.3 Risk assessments process

External audits need to conduct risk assessments and check whether the control work and functions meet expectations. Generally, there are three test methods: the first is the data method of consistency test. The auditor needs to deal with the customer's system test and then compare

the results with the pre-set results. The second is the integration testing facility approach, which requires dummy transactions and predetermined results. Third, parallel simulation method: when the actual transaction can be processed through the same program as the client system, and the parallel system developed by the auditor sample is available and executed correctly, the auditor should be aware of the results. [9]

3.2.2.4 Implementing audit plan

In the last process, auditors need to collect and review the claim information submitted by the company's managers. It can be divided into five claims: completeness, rights, and duties; assignment assessment; presence or incident; statements and divulgations' presentation. [9] External audit needs to use these assertions to prioritize audits and plan substantive evaluations. The premise is that auditors need to have sufficient qualified evidence to provide their evaluation results.

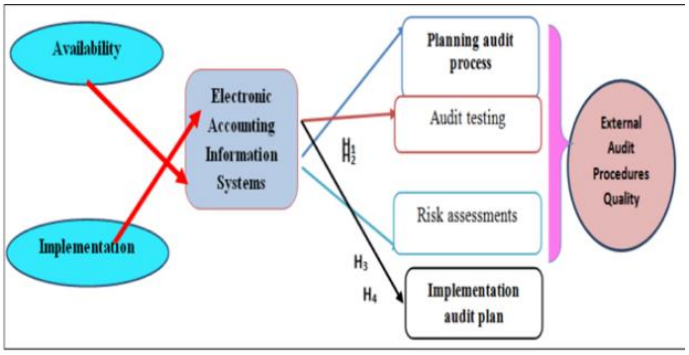

Figure 8 Model of hypotheses [9]

3.2.3 Hypotheses:

H1: there is a significant impact of the availability and application of computerized AIS on the planning audit process.

H2: there is a significant impact of the availability and application of computerized AIS on the audit testing process.

H3: there is a significant impact of the availability and application of computerized AIS on the risk assessments process,

H4: there is a significant impact of the availability and application of computerized AIS on implementation process.

3.2.4 Results and discission

3.2.4.1 Reliable test

Variables	Variable symbol	Cronbach's Alpha	N of Items
Electronic Accounting Information Systems	X1	0.829	7
Planning audit process	Y1	0.728	4
Audit testing	Y2	0.792	4
Risk assessments	Y3	0.639	4
Implementation audit plan	Y4	0.699	4

Figure 9 reliability test of all variables [9]

Figure 9 shows that the Cronbach Alpha values of all variables are over 0.7, which means that we can rely on the questionnaire results to test AIS and external audit procedures quality.

3.2.4.2 Regression analysis and the results

RESULTS OF REGRESSION FOR FIRST HYPOTHESIS		
		Model
		1
R		0.659
R^2		0.434
Adjusted R^2		-0.118
Std. Error of the Estimate		0.11187
Change Statistics	R Square Change	0.068
	F change	0.366
	df1	1
	df2	5
	Sig. F Change	0.006

Figure 10 regression analysis for first hypothesis [9]

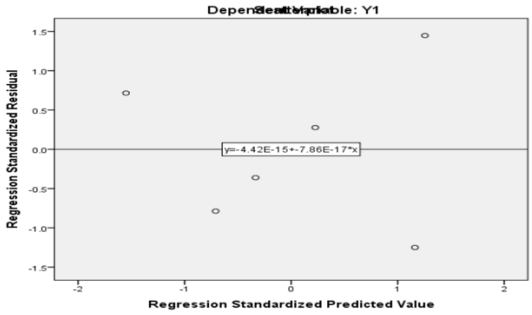

Figure 11 [9]

Figure 10, 11 indicate that AIS significantly influences the planning audit process (R^2 =0.434).

RESULTS OF REGRESSION FOR SECOND HYPOTHESIS		
		Model
		1
R		0.724
R^2		0.524
Adjusted R^2		-0.048
Std. Error of the Estimate		0.21584
Change Statistics	R Square Change	0.127
	F change	0.725
	df1	1
	df2	5
	Sig. F Change	0.004

Figure 12 regression analysis for second hypothesis [9]

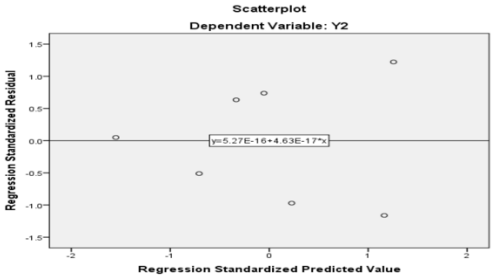

Figure 13 [9]

Figure 12, 13 indicate that AIS significantly influences the audit testing process (R^2=0.524).

RESULTS OF REGRESSION FOR THIRD HYPOTHESIS		
		Model
		1
R		0.531
R^2		0.281
Adjusted R^2		0.652
Std. Error of the Estimate		0.25637
Change Statistics	R Square Change	0.710
	F change	12.233
	df1	1
	df2	5
	Sig. F Change	0.017

Figure 14 regression analysis for third hypothesis [9]

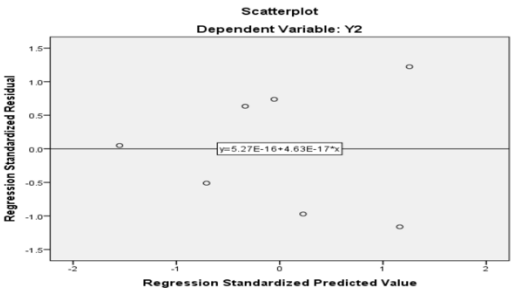

Figure 15 [9]

Figure 14, 15 indicate that AIS significantly influences the risk assessments process (R^2=0.281).

RESULTS OF REGRESSION FOR FOURTH HYPOTHESIS		
		Model
		1
R		0.748
R^2		0.559
Adjusted R^2		0.522
Std. Error of the Estimate		0.22041
Change Statistics	R Square Change	0.602
	F change	7.558
	df1	1
	df2	5
	Sig. F Change	0.040

Figure 16 regression analysis for fourth hypothesis [9]

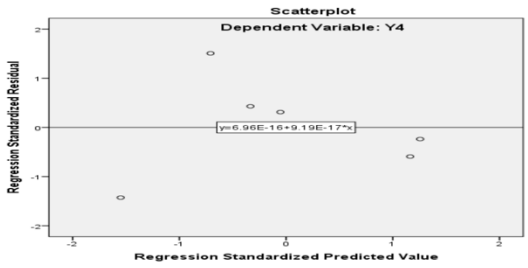

Figure 17 [9]

Figures 16, 17 indicate that AIS significantly influences the implementation plans (R^2=0.559).

The results prove that AIS plays an important role in external auditing. Regression analysis is used to verify whether all variables affecting external audits will significantly affect the external audit. In general, AIS impacts planning, evidence collection, risk assessment measures, and

implementation. It can help external auditors accurately obtain company information, quickly classify accounts, and conduct risk assessments. AIS can reduce the possibility of tampering with the financial information provided by the company and help external auditors make a more objective assessment of the company.

4 Risks of AIS

With the growth and innovation of the science and technology economy, people's way of thinking is also developing towards diversification, posing a great challenge to enterprise financial management. Therefore, in the internal operation of the enterprise, the quality of the internal financial personnel needs to be improved. The enterprise supervision and management forces are not perfect, there is no scientific reward mechanism, and some internal employees lack a sense of responsibility and have poor work performance. As a result, this will lead to the low efficiency of information system operation, the lagging progress of accounting work, and the lack of authenticity and reliability of the information. The internal control of AIS in some enterprises is also not perfect. Although the importance of AIS' prevention function has been emphasized, some companies lack effective supervision means in practical work and have not implemented AIS internal control. If the company does not take effective preventive measures, it will hinder the company's future development. At the same time, technical security problems will occur when running AIS, resulting in information errors.

4.1 Internal risks

The causes of internal risks can be classified as unintentional actions and intentional actions. Both unintentional actions and intentional actions can lead to errors in AIS. [11] Unintentional actions are caused by internal employees and are also an input risk, such as improper operation, unintentional data input error, accidental deletion, or data change. This will cause management, internal and external auditors to obtain wrong information and make wrong decisions. Intentional action is also called computer crime, and its aim is to undermine AIS for personal interests. The company's employees have a high understanding of the company's AIS, understand the company's internal AIS loopholes, and steal data or money. This will lead to the input of false data into the system for personal interests, which is difficult for management to find.

4.2 External risks

External risks can be classified as human risks and non-human risks. External human risk is an outsider of the company that destroys data, including third parties (such as hackers) accessing AIS without authorization. Natural disasters and policies pose non-human external risks. These disasters are unpredictable and directly affect the company’s AIS, including fires, earthquakes, and wars. These disasters can damage not only AIS but also cause a system crash. In general, both external human and non-human external risks can destroy data. These will cause the AIS of the company to collapse or even be unavailable, all actions of the company will be affected, and even the problem of going concerned will occur.

4.3 Technology risks

Technology risks consist of software errors and equipment failures, which come from the imperfection of the company's authorized institution. Due to the collapse of technology, the system will be invaded by the outside, and the computer virus will be implanted. Specifically, these technology risks include the company's internal AIS, incomplete data coverage, mismatched business processes, inability to check incorrect data, and data insecurity.

5 CONCLUSION

Good AIS provides accurate, timely, and easy-to-understand information for financial and non-financial users and plays an important role in internal and external audits. We draw the following conclusions through regression analysis and hypothesis test: an effective audit information system can improve internal audit. The characteristics of AIS strengthen the operation mode between the internal audit process and management. It brings a convenient operation mode for the company, and the management can quickly understand its current situation and future trends. With AIS, you can obtain financial reports with satisfactory, accurate, timely, and easy to understand data. Good use of AIS can enable the company to discover risks in time, make correct decisions and ensure sustainable operation. In the external audit, AIS plays a significant role. Computer software helps external auditors understand the relevant information of the company and formulate corresponding audit plans. It can accurately and quickly help complete the external audit of mobile phone data, carry out a relevant risk assessment and make appropriate judgments on inappropriate data. External audit obtains accurate company information, which makes it easier to make a correct and objective evaluation. Although AIS has improved the efficiency of internal and external audits, there are still potential risks. Specifically, intentional, and unintentional misconduct will affect the accuracy of AIS data, bring wrong information to users, and mislead them to make incorrect decisions. Additionally, AIS is a computer system, so there will still be loopholes in computer technology, resulting in system crashes. Therefore, the company should strengthen its internal control and take relevant measures, such as approval, authorization, and review. In addition to strengthening internal control procedures, formulating reward and punishment mechanisms, strengthening risk prevention systems, timely remedying problems found, and minimizing losses, the company also needs to timely update the system and train operators.

References

[1] S. N. Soudani, "The usefulness of an accounting information system for effective organizational performance," International Journal of Economics and Finance, vol. 4(5), pp. 136-139, 2012.

[2] M. B. Romney, P. J. Steinbart and B. E. Cushing, Accounting information systems, vol. 2015, Boston: MA: Pearson., 2015.

[3] A. Fontinelle, "Introduction to accounting information systems," Finance Journal, 2011.

[4] D. Neogy, "Evaluation of efficiency of accounting information systems: A study on mobile telecommunication companies in Bangladesh," Global Disclosure of Economics and Business, pp. 40-41, 3(1).

[5] C. S. Chapman, "Not because they are new: Developing the contribution of enterprise resource planning systems to management control research," Accounting, Organizations and Society, Vols. 30(7-8), pp. 685-689, 2005.
[6] M. Heidmann, U. Schäffer and S. Strahringer, "Exploring the role of management accounting systems in strategic sensemaking," Information Systems Management, vol. 25(3), pp. 244-257, 2008.
[7] M. Ramazani and A. Allahyari, "Compatibility and Flexibility of Accounting Information Systems," ournal of Emerging Trends in Computing and Information Sciences, vol. 4(3), 2013.
[8] O. J. Almaliki, N. A. Rapani, A. A. Khalid and R. M. Sahaib, "Structural equation model for the relationship between accounting information system and internal audit effectiveness with moderating effect of experience," International Business Education Journal, vol. 12, pp. 62-82, 2019.
[9] N. Almasria, R. M. Airout, A. I. Samara, M. Saadat and T. S. Jrairah, "The role of accounting information systems in enhancing the quality of external audit procedures," Journal of management Information and Decision Sciences, vol. 24(7), pp. 1-23, 2021.
[10] K. S. Pickett, udit planning: a risk-based approach, John Wiley & Sons., 2013.
[11] Y. El-Ebiary and N. Alawi, "The Risks of Accounting Information Systems," International Journal of Engineering Trends and Technology, pp. 2231-2381., 2020.