

# Effectiveness of the Internal Control on Banking Risk Management of Commercial Banks in Libya

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**Abstract**— This study has the main aim of exploring the influence of internal control and its factors on risk management in commercial banks in Libya. The theoretical framework of this research includes five independent variables; control environment, risk assessment, control activities, information and communication; that have impacts on both internal control as a mediator and risk management as the highest outcome variable. This study is following the scientific approach; therefore, a quantitative approach and a deductive approach are applied. The population size of this study is 580 manager and departmental head of the Libyan commercial banks and the sample size of this particular study is estimated as 230 managers and department heads. The questionnaire is built based on different sources from previous studies and the translation to Arabic is done by professional translators by using translation back process. The actual dataset that used for analysis has 242 cases. The prediction constructs can explain more 60.3% of the risk management (RM) variance and the prediction constructs can explain more 35.5% of the effectiveness of internal control (EIC) variance. The study has sixteen hypotheses; which include ten direct effect hypotheses to assess the relationship from the five proposed antecedents to the effectiveness of internal control and to risk management, one relationship between both outcome variables, and five hypotheses associated with the mediating effect of internal control. Four hypotheses are rejected, which are all the assumptions related to the control environment variable.

**Keywords**— Internal Control, Risk Management, Banking, Risk Assessment, Monitoring.

## I. INTRODUCTION

Risks can easily result in obscure potential outcomes and choices. Risks are actually a common issue experiencing all associations, particularly economic organizations, although risks can certainly not be prevented, but they can be actually dealt with making use of an appropriate body. Risk management is just one of the absolute most crucial strategies that need to be carried out in banks (Hodson, 2019). Risk management helps make sure the trustworthiness of procedures and techniques that banks adhere to. Credit scores risk, cash money liquidity risk, currency risk, operational risk, market risk, rates of interest risk is several of the risks that banks encounter that might threaten the bank's sustainability (Nyasaka, 2017; TEKA, 2019). The globe economic situation has actually watched considering that the second year of 2009 the second worst situation in the final a century. The motivate of the problems started from the American real estate sector, and promptly infected the insurance policy sector and the banking industry (Sironi, 2018). Risk management is actually

accurately not totally free. Actually, it is pricey in both sources and in institutional disruption. The cost of delaying or even staying clear of appropriate risk management can easily be actually extreme: failure of a bank and potentially breakdown of a banking unit (Corelli, 2019).

There is actually substantial enthusiasm in the subject of inner managements and their addition to administration of any sort of service. This establishing part of the internal managements is because of their qualities of being actually "an unit of interior administrative and economic checks and harmonies designed through control, and assisted by corrective activities, to make sure that the goals and duties of the institution are actually obtained" (Sironi, 2018). These celebrations have actually brought about an increased enthusiasm in internal control devices, as they include guidelines, techniques and managements that make sure predictions of discrepancies that might give risks that are certainly not attended to and managed in a prompt manner (Kane, 2020).

On the local level, the Libyan commercial banks are beset with many risks, as the reports of the Administrative Accounting Bureau, which is the highest supervisory body in the country, during the years (2014 - 2019) confirmed that the commercial banking sector in Libya suffers from financial, administrative and operational crises, resulting On the aggravation of various risks without the ability to deal with On the other hand, the local Libyan literature confirmed this reality significantly, as commercial banks in Libya do not have a clear system in assessing risk management procedures (Al Mahjoub, 2015 - Saud and Mahjoub, 2017 - Al Hosh, 2019) the internal control and internal audit is limited to enhancing the performance of banking risk management. Therefore, it was necessary to activate the internal control in order to play its role towards managing banking risks effectively. And previous studies have confirmed (Al-Jabri, 2015 - think, 2016 - Ho Tuan, 2016 - Abu Safi, 2019).

However, the existence of a strong and effective system of internal control in any organization, especially in banks, is a basis and a pillar of modern management, this is essential in discovering any deviations or errors before they occur so that they can be avoided, and for this reason, the work to ensure the effectiveness of internal controls is a pillar in the work of risk management. An important element of secure bank management is actually made up by an effective and efficient

system of internal managements, which help to make certain that the objectives and goals of a bank will definitely be satisfied, that long-lasting earnings aim ats will be accomplished, and sustain reputable financial and supervisory reporting (Kane, 2020). Such a body can easily likewise make certain that the bank is going to adhere to rules and requirements as properly as plans, programs, internal regulations and treatments, and lessen the risk of unpredicted losses or even damages to the bank's track record (Golia, 2020).

Therefore, the problem of this research is directly on how to enhance the level of risk management in the Libyan commercial banks, which previous studies show their limitations in risk management, and this strengthening is only through activating the internal control system in banks. This is what the modern framework offers COSO issued by the Committee of Organizations affiliated with the Tradeway Committee in 2013. It is considered one of the most common models adopted by banks in order to reach effectiveness in internal control, and the internal control framework included COSO it has five interlinked components: control environment, risk assessment, monitoring activities, information and communication, and follow-up. (Chandel and Foster, 2019)

Many reports from Libyan Audit Bureau the Central Bank has issued its instructions to develop internal control mechanisms, address their weaknesses and study them. Accordingly, the researcher will examine the availability of these elements in commercial banks, and their impact on achieving an internal control system towards strengthening banking risk management.

## II. LITERATURE REVIEW

### Conceptual Framework

The conceptual framework of this study has five antecedents for the effectiveness of internal control. The five antecedents are managerial practices based on Coso's ("Committee of sponsoring organizations of the treadway commission") Principles of internal control (Coso, 2013). The study extends the exploration to include the influence of the five antecedents to the risk management. Figure 1 shows the research framework for this particular study.

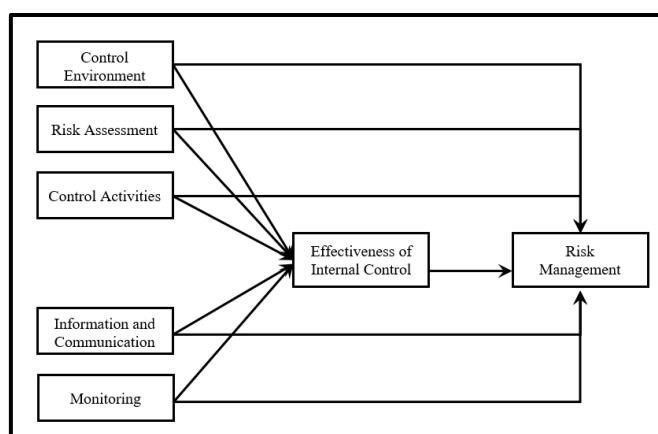


Fig. 1. Research Framework

### Relationship Between Control Environment and Internal Control

A control environment, likewise called "Internal control environment" (Yang & Marzetta, 2017), is a term of monetary audit (T. Li, Zhang, Xue, & Wang, 2017), interior audit and enterprise risk management (T. Li et al., 2017; Yang & Marzetta, 2017). It indicates the general mind-set, awareness and activities of directors and monitoring concerning the internal control system and its value to the entity (Iwendi et al., 2019; Y. Li Et Al., 2018). Furthermore, according to many scholars and researchers that have studied control environment, control environment will help to make a greater understanding of companies activities and way of doing thing right, and this will lead to a better and effectiveness of internal control in commercial banks at the end. based on that, the researcher is expecting significant positive direct effect of control environment on effectiveness of internal control in commercial banks as (Bruwer, 2016; Ferrón-Vílchez, 2016; T. Li et al., 2017; Y. Li et al., 2018; Sun et al., 2018). Therefore, the following hypothesis hypothesis is consistent and compatible with other hypothesis in others studies

- The control environment has a statistically significant effect on the effectiveness of internal control in commercial banks in Libya.

### Relationship Between Risk Assessment and Internal Control

Broadly talking, a risk assessment is the cooperation of: determining and evaluating prospective occasions that may adversely affect individuals (Kullak-Ublick et al., 2017), Properties, and/or the setting; and making judgments "On the tolerability of the danger on the basis of a danger analysis" while thinking about affecting factors (Curry et al., 2018; Lyu, Sun, Shen, & Zhou, 2020). Furthermore, many scholars and researchers have studied risks assessment and found out that risks assessment will help to address the problems and risks because it will show the deficits and how danger is it, and this will lead to a better and effectiveness of internal control in commercial banks at the end such as (Boldog et al., 2020; Kavlock et al., 2018; Lyu, Shen, Zhou, & Yang, 2019; Lyu Et Al., 2020; Smiley, Matheny, & Lilly, 2017; Suter, 2020). Based on that, the researcher is expecting significant positive direct effect of risks assessment on effectiveness of internal control in commercial banks; the following hypothesis is consistent and compatible with other hypothesis in others studies.

- The risks assessment has a statistically significant effect on the effectiveness of internal control in commercial banks in Libya.

### Relationship Between Control Activities and Internal Control

Control activities are the plans, procedures, techniques, and systems that aid make sure that management's response to reduce dangers recognized during the risk assessment process is performed (Eskandari, Kramer, Hecht, Jaber, & Marwick, 2016; Wheeler et al., 2019). Simply put, control activities are activities taken to minimize risk (Acree, Puckett, & Neri, 2017; Morris et al., 2017). Many scholars have studied the control activities impact on internal control and conclude that control activities manage and deal with the unexpected problems

during the work. This will lead to a better and effectiveness of internal control in commercial banks at the end (Boldog et al., 2020; Casado-Vara, González-Briones, Prieto, & Corchado, 2018; Curry et al., 2018; Kavlock et al., 2018; Kullak-Ublick et al., 2017; Lyu et al., 2019; Morris et al., 2017; Wheeler et al., 2019). Based on that, the researcher is expecting a significant positive direct effect of control activities on effectiveness of internal control in commercial banks and this hypothesis is consistent and compatible with other hypothesis in others studies.

- The control activities have a statistically significant effect on the effectiveness of internal control in commercial banks In Libya.

*Relationship Between Information and Communication, and Internal Control*

Information and Communications Modern Technology (ICT) is an extensional term for information technology that worries the duty of linked communications and the combination of telecoms and computer systems; Besides to the needed venture software application, middleware, storage and audio-visual systems, that enable users to accessibility, store, transfer, and control information (Jayakody et al., 2017; Luo, Ji, Wang, Chen, & Li, 2018). According to many scholars and researchers that have studied information and communication, information and communication will help to make a better data collection and analysis which will make a better problem solving and monitoring. This will lead to a better and effectiveness of internal control in commercial banks at the end (Luo et al., 2018; Mirkovski, Lowry, & Feng, 2016; Morales-Cespedes, Paredes-Paredes, Armada, & Vandendorpe, 2017; Park, Kim, & Shin, 2017; Shabani & Shahnazi, 2019; Ukpabi & Karjaluoto, 2017; Wheeler et al., 2019). Based on that, the researcher is expecting significant positive direct effect of information and communication on effectiveness of internal control in commercial banks. Moreover, this hypothesis is consistent and compatible with other hypothesis in others studies.

- Information and communication has a statistically significant effect on the effectiveness of internal control in commercial banks in Libya.

*Relationship Between Monitoring and Internal Control*

Monitoring is the systematic process of collecting, utilizing and analysing info to track a programme's progress toward reaching its goals and to guide management decisions (Al-Ali & Lee, 2018; Jiang & Yan, 2018; Tai et al., 2018). According to many scholars and researchers that have studied monitoring, monitoring will help to make sure that the actual performance is meeting the expected performance and vice versa. This will lead to a better and effectiveness of internal control in commercial banks (Al-Ali et al., 2016; Al-Ali & Lee, 2018; Tai et al., 2018; Wang, Liu, & Zhang, 2017; Zhao et al., 2019) They Found Out That (Jiang & Yan, 2018; Wang et al., 2017). Based on that, the researcher is expecting significant positive direct effect of monitoring on effectiveness of internal control in commercial banks. And this hypothesis is consistent and compatible with other hypothesis in others studies.

- The monitoring has a statistically significant effect on the effectiveness of internal control in commercial banks In Libya.

*Relationship Between Control Environment and Risk Management*

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- The control environment has a statistically significant effect on the risk management in commercial banks in Libya.

*Relationship Between Risk Assessment and Risk Management*

As defined, a risk assessment is the cooperation of: determining and evaluating prospective occasions that may adversely affect individuals (Kullak-Ublick et al., 2017), Properties and/or the setting (Lyu et al., 2020). besides making judgments "On the tolerability of the danger on the basis of a danger analysis" while thinking about affecting factors (Curry et al., 2018; Kullak-Ublick et al., 2017; Lyu et al., 2020). Furthermore, and according to many scholars and researchers that have studied risks assessment, risks assessment will help to address the problems and risks, as it will show how danger is it. This will lead to a better and risk management in commercial banks at the end (Plh et al., 2018; Aerts et al., 2018; Boldog et al., 2020; Kavlock et al., 2018; Kullak-Ublick et al., 2017; Lyu et al., 2019, 2020; Zio, 2018). Based on that, the researcher is expecting significant positive direct effect of risks assessment on risk management in commercial banks. And this hypothesis is consistent and compatible with other hypothesis in others studies.

- The risks assessment has a statistically significant effect on the risk management in commercial banks in Libya.

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As defined, control activities are the plans, procedures, techniques, and systems that aid make sure that management's response to reduce dangers recognized during the risk assessment process is performed (Eskandari et al., 2016; Wheeler et al., 2019). simply put, control activities are activities taken to minimize risk (Acree et al., 2017; Morris et al., 2017).

According to many scholars and researchers that have studied control activities, control activities manage and deal with the unexpected problems and errors during the work and daily work activities. This will lead to a better and risk management in commercial banks at the end (Casado-Vara et al., 2018; Curry et al., 2018; Eskandari et al., 2016; Kullak-Ublick et al., 2017; Lyu et al., 2019; Morris et al., 2017; Wheeler et al., 2019). Based on that, the researcher is expecting significant positive direct effect of control activities on risk management in commercial banks. In addition, this hypothesis is consistent and compatible with other hypothesis in others studies.

- The control activities have a statistically significant effect on the risk management in commercial banks in Libya.

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As defined, information and communications modern technology (ICT) is an extensional term for information technology (IT) that worries the duty of linked communications and the combination of telecoms (Jayakody et al., 2017; Morales-Cespedes et al., 2017). Besides to the needed venture software application, middleware, storage and audio-visual systems, that enable users to accessibility, store, transfer, and control information (Hussain et al., 2018; Luo et al., 2018). Furthermore, and according to many scholars and researchers that have studied information and communication, information and communication will help to make a better data collection and analysis, which will make a better problem solving and activities monitoring. This will lead to a better and risk management in commercial banks at the end (Hussain et al., 2018; Jayakody et al., 2017; Luo et al., 2018; Mirkovski et al., 2016; Morales-Cespedes et al., 2017; Park et al., 2017; Rodger & George, 2017; Shabani & Shahnazi, 2019; Wu, Guo, Huang, Liu, & Xiang, 2018). Based on that, the researcher is expecting significant positive direct effect of information and communication on risk management in commercial banks. In addition, this hypothesis is consistent and compatible with other hypothesis in others studies.

- Information and communication has a statistically significant effect on the risk management in commercial banks in Libya.

*Relationship Between Monitoring and Risk Management*

As defined, monitoring is the systematic process of collecting, utilizing and analysing info to track a programme's progress toward reaching its goals and to guide management decisions (Al-Ali & Lee, 2018; Tai et al., 2018). According to many scholars and researchers that have studied monitoring, monitoring helps to make sure that the actual performance is meeting the expected performance and vice versa. this will lead to a better and risk management in commercial banks at the end (Al-Ali, Kinast, & Muhsin, 2018; Al-Ali et al., 2016; Al-Ali & Lee, 2018; Danne et al., 2017; Güntner et al., 2019; Jiang & Yan, 2018; Tai et al., 2018; Wang et al., 2017; Zhao et al., 2019). Based on that, the researcher is expecting significant positive direct effect of monitoring on risk management in commercial banks. And this hypothesis is consistent and compatible with other hypothesis in others studies.

- The monitoring has a statistically significant effect on the risk management in commercial banks in Libya.

*Relationship Between Internal Control and Risk Management*

Internal control, as defined by accounting and auditing, is a process for assuring of an organization's goals in functional effectiveness and performance (Bassey, N.D.; Gad, 2016), trustworthy financial reporting (Ioana, Ionela, & Cătălin, 2017; Liu, 2019), and conformity with legislations, policies and laws (Chen, Yang, Zhang, & Zhou, 2020; Riso & Castellini, 2019). While risk management is the recognition, assessment, and prioritization of threats complied with by coordinated and economical application of sources to decrease, keep an eye on, and regulate the chance or effect of regrettable occasions or to take full advantage of the realization of chances (Johari & Jaffar, 2020; Loishyn, Tkach, Liashenko, Zinchenko, & Lobanov, 2019). According to many scholars and researchers that have studied effectiveness of internal control, internal control helps to make predictions of company performance and effectiveness of daily organizations activities and what is the right things to do. this will lead to a better and risk management in commercial banks at the end (Anyim, 2020; Bento, Mertins, & White, 2018; Ji, Lu, & Qu, 2018; Johari & Jaffar, 2020; Loishyn et al., 2019; Mandzila & Zéghal, 2016; Riso & Castellini, 2019; Shi, N.D.). Based on that, the researcher is expecting significant positive direct effect of monitoring on risk management in commercial banks. In addition, this hypothesis is consistent and compatible with other hypothesis in others studies.

- The Effectiveness of internal control has a statistically significant impact on risk management in commercial banks in Libya.

III. MATERIALS AND METHODS

This research study is conducting the scientific method, therefore quantitative strategy and deductive technique are actually used. The population of this study include 580 manager and departmental head of the Libyan commercial banks and based on the sampling schema that illustrated by Morgan and Kerjici (1980), the sample size of this particular study is estimated as 230 managers and department heads. For collecting the data, different methods are used including online digital survey and direct collection by distributing the survey in a variety of commercial banks within Libya. The questionnaire is built based on different sources from previous studies and the translation to Arabic is done by professional translators by using translation back process.

The survey design has six demographic questions and multiple opinion-based questions asked for 7 different constructs. Control Environment has six items that adapted from Nguyen (2018) and Anh, (2020), Risk Assessment has five items that adapted from COSO, (2013) and Anh, (2020), Control Activities has five items that adapted from COSO, (2013) and Anh, (2020), Information and Communication has six items that adapted from COSO, (2013) and Anh, (2020), Monitoring has six items that adapted from COSO, (2013) and Anh, (2020), Effectiveness of Internal control has four items that adapted from COSO, (2013) and Anh, (2020), and Risk

Management has six items that adapted from Maky & Mahjoub (2017).

The survey was organized to ask questions in Likert-5 format. Likert 5 questionnaire style has been used in social science studies for a long time and proved to be a suitable style for measuring human perceptions. For data analysis, SmartPLS software package is used to test the relationships in the model, which is used in management and social science studies such as (Salem & Alanadoly, 2020; Salem & Salem, 2018).

IV. RESULTS AND DISCUSSION

Validity and Reliability of Constructs

The paper follow the steps and rule of thumb that proposed by (Hair Jr, Hult, Ringle, & Sarstedt, 2016; Sekaran & Bougie, 2016). As revealed and shown in Table I, All items loadings have a good and proper loading that above critical value of 0.708 except ten main questions, and those items are (CE4, CE6, MO5 and RM6). All main four weak items have been excluded and deleted from the final analysis. All items and its associated variables are illustrated in Table I. In addition, Figure 2 shows the structural model of this particular study.

The Cronbach's alpha reliability, the values are ranging between 0.837, 0.897, which show adequate, and good levels of internal consistency above the threshold value of 0.7. The highest value of Cronbach's Alpha is for Monitoring. Table I is showing the details.

TABLE I. Constructs Reliability and Validity

Construct	Item	Loading	AVE	Cronbach's alpha
Control Activities	CA1	0.791	0.620	0.848
	CA2	0.719		
	CA3	0.830		
	CA4	0.867		
	CA5	0.720		
Control Environment	CE1	0.746	0.666	0.837
	CE2	0.808		
	CE3	0.866		
	CE4	0.651		
	CE5	0.807		
Effectiveness of Internal Control	EIC1	0.878	0.731	0.875
	EIC2	0.937		
	EIC3	0.738		
	EIC4	0.857		
Information and Communication	IC1	IC1	0.586	0.858
	IC2	IC2		
	IC3	IC3		
	IC4	IC4		
	IC5	IC5		
	IC6	IC6		
Monitoring	MO1	0.805	0.710	0.897
	MO2	0.801		
	MO3	0.951		
	MO4	0.836		
	MO6	0.784		
Risk Assessment	RA1	0.821	0.681	0.883
	RA2	0.849		
	RA3	0.863		
	RA4	0.780		
	RA5	0.810		
Risk Management	RM1	0.777	0.624	0.850
	RM2	0.800		
	RM3	0.776		
	RM4	0.835		
	RM5	0.752		

The average variance extracted (AVE) is varying between 0.586 and 0.731. The lowest average variance extracted (AVE) is for the variable information and communication. The highest average variance extracted (AVE) is for the variable effectiveness of internal control. All data is showing a value of more than 0.5, which means all are accepted and ready for the next analysis. Table I is illustrating the details.

The Fornell & Larcker criterion matrix. The matrix is a refined matrix of the latent variable's correlations. The highest value detected here is 0.855, which is for the variable effectiveness of internal control. The lowest value assigned in the table is for the variable information and communication with a value of 0.765. Table II shows the results, in which all diagonal scores are higher than other scores in the same row and column; therefore discriminant validity is achieved.

TABLE II. Discriminant validity – Fornell-Larcker Criterion

	CA	CE	EIC	IC	MO	RA	RM
CA	0.788						
CE	-0.010	0.816					
EIC	0.434	0.131	0.855				
IC	0.063	0.010	0.159	0.765			
MO	0.391	0.095	0.473	0.040	0.843		
RA	0.302	0.183	0.418	0.136	0.292	0.825	
RM	0.514	0.167	0.667	0.213	0.504	0.559	0.790

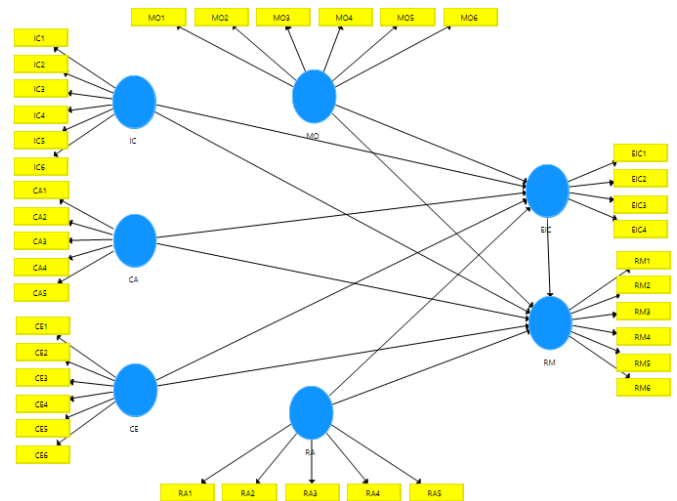


Fig. 2. Structural Model Outer Loading Estimates

Relationships Examinations and Discussions

To assess the power of the model construct in predicting the outcome variables, predictive power R<sup>2</sup> and predictive relevance were used (Hair Jr et al., 2016). Results of the main dependent variable, risk management (RM), illustrate a moderate predictive power and a large predictive relevance. As seen in the table, the related R square value is 0.603 (a power of 60.3%) and the related Q square is 0.370 (a relevance of 37.0%). The prediction constructs related to the variable can explain more 60.3% of the risk management (RM) variance. Results of the mediator/dependent dependent variable, effectiveness of internal control (EIC), illustrate a satisfactory predictive power and a medium predictive relevance. As seen in the table, the related R square value is 0.355 (a power of

35.5%) and the related Q square is 0.262 (a relevance of 26.2%). The prediction constructs related to the variable can explain more 35.5% of the market effectiveness of internal control (EIC) variance.

TABLE III. Predictive Power and Predictive Relevance of Proposed Model

	Predictive Power		Predictive Relevance	
	R Square	Status	Q Square	Status
Effective Internal Control	0.355	satisfactory	0.262	Medium
Risk Management	0.603	moderate	0.370	large

Table IV shows the results of path coefficient of the five variables. Control environment has a weak P value below the threshold of 0.05; therefore CE, have no significant relationship to RM. The relationship between the mediator EIC and RM is significant with beta value of 0.365. in addition, the other four variables have adequate P value and the relationships are significant. Risk assessment has the first impact with beta score of 0,274. Control activates have the second impact with beta score of 0,201. Monitoring has the third impact with beta score of 0,161. Information and communication has the fourth impact with beta score of 0,102. Figure 3 shows the t-statics infographic model.

TABLE IV. Path Coefficient Assessment of Risk Management

Relationship	Path Coefficient	Standard Deviation	T Statistics	P-Value (one-tailed)	Status
CE -> RM	0.055	0.049	1.125	0.131	Non-Significant
RA -> RM	0.274	0.042	6.501	0.000	Significant
CA -> RM	0.201	0.054	3.798	0.000	Significant
IC -> RM	0.102	0.044	2.241	0.013	Significant
MO -> RM	0.161	0.054	3.030	0.001	Significant
EIC -> RM	0.365	0.069	5.247	0.000	Significant

TABLE V. Path Coefficient Assessment of Effective Internal Control

Relationship	Path Coefficient	Standard Deviation	T Statistics	P-Value (one-tailed)	Status
CE -> EIC	0.067	0.052	1.165	0.122	Non-Significant
RA -> EIC	0.228	0.052	4.481	0.000	Significant
CA -> EIC	0.242	0.068	3.551	0.000	Significant
IC -> EIC	0.109	0.055	1.819	0.035	Significant
MO -> EIC	0.304	0.061	4.950	0.000	Significant

TABLE VI. Mediating Assessment of Effective Internal Control

Relationship	Direct Effect			Indirect Effect			Total Effect		Status (Mediation)
	Beta	P-Value	Status	Beta	P-Value	Status	Beta	P-Value	
CE -> EIC -> RM	0.055	0.131	Non- Sig	0.025	0.141	Non- Sig	0.081	0.062	No- mediation
RA -> EIC -> RM	0.274	0.000	Sig	0.084	0.001	Sig	0.358	0.000	Partial mediation
CA -> EIC -> RM	0.201	0.000	Sig	0.089	0.004	Sig	0.290	0.000	Partial mediation
IC -> EIC -> RM	0.102	0.013	Sig	0.041	0.061	Non- Sig	0.142	0.001	No- mediation
MO -> EIC -> RM	0.161	0.001	Sig	0.111	0.000	Sig	0.272	0.000	Partial mediation

Table V shows the results of path coefficient of the five variables. Control environment has a weak P value below the threshold of 0.05; therefore CE, have no significant relationship to EIC. However the other four variables have adequate P value and the relationships are significant. Monitoring has the highest impact with beta score of 0,304. Control activates have the second impact with beta score of 0,242. Risk assessment has the third impact with beta score of 0,228. Information and communication has the third impact with beta score of 0,109. Figure 3 shows the t-statics infographic model.

Effectiveness of internal control is a mediator between monitoring and risk management in commercial banks. After doing the analysis of the data, the researcher found out that the direct impact shows that p-value is 0.001 and the Path Coefficient is 0.161, which indicated to significant effect. While the indirect effect shows that, the p-value is 0.000 and the Path Coefficient is 0.111, which also indicated a significant effect. The total effect of this relationship shows a p-value is

0.000, and the Path Coefficient is 0.272. Effectiveness of internal control is a mediator between control activities and risk management in commercial banks. After doing the analysis of the data, the researcher found out that the direct impact shows that p-value is 0.000 and the Path Coefficient is 0.201, which indicated to significant effect. While the indirect effect shows that, the p-value is 0.004 and the Path Coefficient is 0.089, which also indicated a significant effect. The total effect of this relationship shows a p-value is 0.000, and the Path Coefficient is 0.290. Effectiveness of internal control is a mediator between risks assessment and risk management in commercial banks. After doing the analysis of the data, the researcher found out that the direct impact shows that p-value is 0.000 and the Path Coefficient is 0.274, which indicated to significant effect. While the indirect effect shows that, the p-value is 0.001 and the Path Coefficient is 0.084, which also indicated a significant effect. The results are illustrated in Table VI.

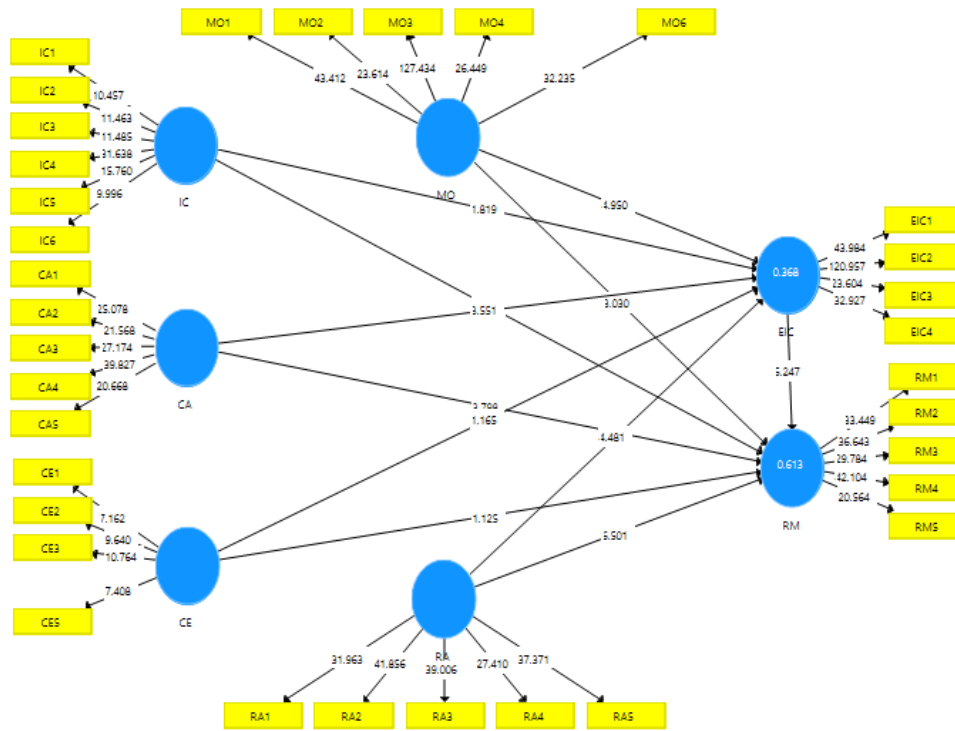


Fig. 3. T Statistics Estimates of the Proposed Model

The identified antecedents of internal control are five; control environment, risk assessment, control activities, information and communication. However, only four variables have a significant relationship, but control environment has no significant relationship to risk management. Therefore the model of risk management predictors has four variables; risk assessment, control activities, and information and communication.

#### V. CONCLUSION AND RECOMMENDATIONS

The study contributes to the knowledge of risk management and effective internal control in Libyan banks. The proposed combination of variables, especially the emphasis on effective internal control as a mediator with all his five antecedents as independent variables is another theoretical contribution, especially when it is applied in the commercial banking industry. The study also adds knowledge about risk management and the practices of internal control that applied in the Libyan commercial banks.

This study is limited to the empirical examination of Libyan commercial banks; however, replicating the same design with the same research design but in different banks and different countries will support the model validity and generalization of the results. The impact of control environment in the relationship to risk management and internal control are found to be no significant; additional work is needed to reveal the reason and explain this rejection. The model can also explain up to 60.3% of the risk management variance; scholars are welcome to investigate more antecedents to increase the model power and provide a strong explanation model.

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