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ABSTRACT

The paper aims to identify the effects of financial engineering on financial performance in Iraq Banks. The study follow the quantitative research approach. In addition, the research follow descriptive analytical approach to analyze the effects of financial engineering on the financial performance. The sample of study is 130 employees in Iraq banks. The limitation of study since 2000 to 2017. The results shows that there is a positive significant relationship between investments strategic and financial performance in Iraq banks. P value shows that there is positive significant relationship between strategic investment and financial performance. In addition, the result shows the direct effect between strategic investment and financial performance. The findings of the study discovered that technological innovation is not significant. Moreover, there is no direct effect between technological innovation and financial performance in Iraq banks. In addition, P value shows that 0.566. It is higher than the significant level 0.005. The result shows the negative effect between strategic investment and financial performance. The results of statistical analysis shows that the positive significant relationship between product innovation on financial performance in Iraq banks. The researcher recommend that the simulation effects can determine other new significant indicators to examine the effects on financial performance. On the other hand, this study covered the sample of study 30 banks. Thus, if this study covered the results on all Iraq banks it will be accumulate study. It also can achieve other related significant results. This study should also look on the reasons and justifications of using financial engineering in other similar country and compare both case studies to understand the relationship between variables

Keywords: investment strategies, technological innovations, product innovations, financial performance, Iraqi banks.

1. Introduction

The banking sector is considered as one of the most important economic sectors and is the most seductive and influential one in the growth of economies of countries. Technological innovations affect the financial performance of banks (Deloitte, 2007) through their ability to increase their profits and reduce their costs. This is supported by Yasiri (2014), who found that the use of investment strategies in private commercial banks in electronic services to appear on a small scale, ineffective in meeting good environment for growth.

Recently, the entry of non-banking institutions into the field of financial work has been observed Arabia (2005) increasing competition and forcing financial and banking institutions to provide a comprehensive range of financial and banking services, and thus increasing the functions of commercial and investment banks. A new type of banks has also emerged known as comprehensive banks, which use technology of financial engineering.

2. Problem Statement

The banking sector in Iraq is still suffering from weak use of modern technologies in its work. As technological progress in one of the most important factors for the growth of banks, it helps banks to provide services faster and at a lower costs and higher quality. Iraqi banks are still doing most of the operations and banking services manually, such as, disbursement and receipt of money, opening bank accounts, and communication with customers. Consequently, citizen's access of cash holidays was difficult because of the failure to adopt the ATM (Yasiri, 2014). Iraqi banks are small-sized compared to other banks in Arab or international markets. The value of their assets and capital is still small does not commensurate with recent development and technological innovation, with limited investments expansions, particularly when it comes to modern technologies. Consequently, this limits their competitiveness, and perpetuates non-performing loans due to pervious internal lending practices, which later worsened due to the general economic situation in Iraq. (Al-Najjar, 2012). Financial performance refers to a subjective measure of how firms can effectively employ assets from their main business mode and create revenues. Also, it is a general measure of the financial health of firms over certain time duration. Financial performance can be utilized in making comparison with identical firms across similar industry or in making cumulative comparison between industries or sectors. Financial performance is measurable in many ways but it is important that all measures are done in aggregation. Aside from total unit sales, line items including revenue from operations, operating income or cash flow from operations can be used as well. The analyst or investor may also meticulously study the financial statements and look for margin rates of growth or any declining debt (Yasiri, 2014). Thus, financial institutions are obliged to apply financial engineering to create innovative product line. This way, financial institutions can sustain their relevance in the marketplace while also gaining considerable market share. The notion of financial engineering, motivating factors, and the call for product innovations by way of financial engineering have been discussed in the works by Khrawish (2011) and Samhan and AL-Khatib (2015). The authors have also provided suggestions on the applicable strategies. Eugenio Domingo Solans of European Central Bank has provided a comprehensive description of the concept of financial performance. The model explains how factors can impact the effectiveness of banks financial performance development in the context of Iraq. Such understanding can greatly contribute to the increase in the level of technical methods of financial engineering in the context of developing economies. As the model is constructed based on the situation of developing economies, its usage is deemed to be more fitting for developing economies as well. Also, since the handful of local studies on similar bank performance domain has addressed the performance factor to the exclusion of other factors, the current study ascertains the relationship between financial engineering and financial performance of banks (FPB) in Iraq. As such, this study works to minimize these research gaps Central Bank of Iraq 2017).

3. Research Questions

1. What is the relationship between Investment Strategies (IS) and Financial Performance of Banks (FPB) in Iraq?
2. What is the relationship between Technological Innovations (TI) and Financial Performance of Banks (FPB) in Iraq?
3. What is the relationship between Product Innovations (PI) and Financial Performance of Banks (FPB) in Iraq?

4. Research Objectives

1. To identify the relationship between Investment Strategies (IS) and Financial Performance of Banks (FPB) in Iraq**.**
2. To determine the relationship between Technological Innovations (TI) and Financial Performance of Banks (FPB) in Iraq.
3. To explore the relationship between Product Innovations (PI) and Financial Performance of Banks (FPB) in Iraq.

5. Research Significance

There is two significant contribution of this study theoretical and empirical. The theoretical contribution consider that provide the theoretical framework of the financial engineering factors and its direct effects on financial performance. On the other hand, the empirical contribution.

6. Literature Review

The Concept of Financial Performance

Performance is the result of the greater part of the association's operations and strategies (Wheclcn & Hunger, 2002). Measuring financial performance precisely is basic for accounting purposes and remains a vital concern for general associations. Performance estimation systems give the establishment a guide to create vital plans, survey consummation of goals, and compensate administrators. Despite the fact that evaluation of performance in the marketing literature is still essential, it remains highly difficult (Pont & Shaw, 2003). Financial performance of a venture is the capacity to use operational and investment choices and systems to accomplish business financial stability. It is the measure of an enterprise‘s accomplishment of its financial objectives guided by its financial related targets and benchmarks. Banks, as the basic piece of financial system, assume an essential part in contributing to a nation's economic improvement. On the off chance that managing a banking industry does not perform well, the impact to the economy could be huge and wide. Studies on -performance of saving money foundations are sufficient. Consequences of these investigations emphatically recommend that bank benefit determinants change crosswise over nations and furthermore among districts of the world (Doliente, 2003). As per the investigation of (Grier, 2007), profitability proportions are frequently utilized as a part of the indicators of credit examination in banks. Since profitability is related with the consequences of organization performance, bank performance demonstrates bank's ability to produce sustainable benefits.

Financial Engineering

Financial engineering is the phenomenon of product and/or process innovation in the financial industries the development of new financial instruments and processes that will enhance shareholders', issuers' or intermediaries (Abdulhai, 2014). As defined by Sweilem (2000) it is a development process based on the role played by the activation of global stock exchanges, as well as new innovations in investment institutions in general, in addition the impact of strategic thinking in the financial banking institutions and the appearance of emerging markets and financial centers. Bansal (2001) defined it is design, implement creative tools and innovative creative solutions to financial problems. This definition indicates the financial engineering involves types of activities Technological innovations represented by mobile technology banking services and ATM. Or innovations of new financial instruments such as credit card.

Investment Strategies

A set of rules, policies and procedures that are formulated by the concerned authorities to guide the selection of most appropriate investment, which achieves a balance between return and risks, as well as benefit from investment opportunities, and the ability to achieve the goal of adding value to the institution through investment (Kakanda, 2001). Financial engendering lead to investment strategies and improve institutions by encourage the opportunity of investment to value for implement the investment strategies in the long term (Hamdan & Al-Otaibi, 2016).

Technological Innovations (TI)

A group of ideas, or a set of products, systems and modern technology that combine creativity and innovation (Lindgren, 2018). Proteins (2006) defined the banking industry’s technological innovations as represented by ATM, e-banking, e-transfer money, online banking, and open accounts online and mobile banking technique. The technological innovations concepts, techniques, policies and implementation strategies to banking services has become a subject of fundamental importance and concerns to all Banks and indeed a prerequisite for local and global competitiveness Banking.

Product Innovations (PI)

Azzaze (2005) defined product innovations as the creation of a new commodity or services or improvement to existing goods and services. It was defined by (Maulana, 2016) as offering new financial products or developing existing financial products because the development of new products is of paramount importance to the survival of the company. Similarly, Nwokan (2009) defined a variety of products as a combination of the company's products in particular in an industry, with multiple competitors.

Financial Indicators

There are a lot of scholars indicates that financial indicators that consider a key to interpret the financial performance in the companies. Michael (2013) reveals that financial indicators highlighted on the annual revenues and annual expenses in each companies. Mercy (2014) explores that there are two or more indicators that can interpret the financial performance. It can reflect that the significant aspect in the financial system that used in the institutions. Balduzzi (2016) illustrates that financial indicators should talking into consecration the tax and other expenses after achieve the annual revenues to allow to understand the extend of commitment of using this indicators in the institutions. It also examine how companies failed to choose the right path of using this indicators to achieve the organization goals. Consequently, the financial indicators deign the financial methods that all companies should following to implement planning and achieving organization goals (Bright & Joseph, 2016). Banface & Ambose (2015) discovered that there are several types of financial indicators. Each factor of financial engineering has some significant indicators to interpret the financial performance.

Strategic Investment Indicators

Strategic investment is an important factor that determine the improvement on the financial performance. By strategic investment the institutions may build the feasibility studies to expand to expand the annual revenue of the institutions. Osano (2013) explained that objectives and goals are suitable to be the important financial indicators. It allow to focus on the objective and seek for the possibilities and capabilities to achieve it. Yasiri (2014) reveals that the policies and procedures indicator allow to design the method of several investment and putting the roles to achieve it. Moreover, the procedures and policies indicator allow to discover the mistakes in this procedures and simulate other successful procedures. Tahir (2015) also indicates that investment opportunities is the significant indicators due to increasing this opportunities allow to the institution supporting its income. In addition, the investment opportunity allow to assess each opportunity and analyze in the light of the availability of resources. Kule (2016) reveals that values are able to be important indicator due to by enhancing the values the companies may achieve the goals of expanding the investment. However, the Iraq banks may using the procedures & policies indicators and investment opportunity indicators. Both are allow to pass the circumstances in Iraq to attract a lot of investment for increasing the magnitude of revenue. In addition, it allow to organize the procedures and policies and avoid the obstacles in front of investment opportunity.

Technological Innovation Indicators

In the literature, website indicator is widely used in the companies. Banface & Ambose (2015) reveals that website indicator allow to using the new technology to strength the financial performance. The website indicator reliance on the technological level that used in the companies. Thus, if the technological level is very high the website indicator can be useful for enhancing the financial performance. Goose (2002) indicates that electronic work indicator are very essential for almost companies.It may allow to provide full information to avoid misunderstanding between sectors. Bright & Joseph (2016) reveals that internet banking is the most recent indicator. The internet banking indicator allow to do all banking transaction by internet banking. Moreover, the internet banking need to develop the way of transaction to move on technological banking practices. Unfortunately, internet banking is the main indicator can used in Iraq banks. Iraq banks still collect between old way of work and a bit of online banking development. Thus, the website indicator and electronic indicator not suggested for Iraq banking system due to websites still need more structural changes.

Product Innovations Indicators

In the literature, there are several indicators. On the most significant indicator is technological information indicator. This indicator reveals that providing background to alleviate the misunderstanding surrounding the institutions (Azzaze, 2005). Strategies indicators also organize product innovations (Maulana, 2016). Moreover, the indicator of human resource effects on the type of employees that may allow to improve the product innovation. However, the suitable indicators in Iraq banks may determine by technological information and strategies indicators. By this type of indicators Iraq banks will cover all circumstances of promoting product innovations. Otherwise, the indicator of human resource cannot used in Iraq banks due to the increase hiring this type of human resource. Moreover, this indicators are suitable for the banking system in developed countries. In addition, strategies and technological information have characteristics of developing products thought strategies

7. The Relationship between Investment Strategies and Financial Performance.

Osano, (2003) the aim of this study is to identify the investment strategies adopted by the investment funds in Kenya and their relationship with financial performance. The study used questionnaire and the number of respondents 458. The concluding that the investment in companies with high liquidity showed a positive relationship ROA, leverage, liquidity and investment strategies, while companies with less liquidity were weak relationship (Yasiri, 2014) agrees with Osano who followed the analytical descriptive approach , the data were collected by questionnaire which included five private Commercial banks in Iraq. The sample 100 managers of banks, for period (2007-2011). The purpose of study to determine the impact of strategic flexibility with its three dimensions: Principles, investments, monitoring on performance banks. The results showed a strong correlation between strategic flexibility and banking performance. Consequently, yasiri (2014) is useful for this research. It allow to describe the investment strategies in each of organizations. In addition, yasiri (2014) reveals provide the most important terminologies of financial performance. Moreover, it focus on the relationship ROA, leverage, liquidity and investment strategies. Furthermore, it helps us to understand the statistical analysis to achieve the research objectives.

8. The Relationship between Technological Innovations and Financial Performance Gooser (2002) conducted a study on individual banking sector in South Africa, using the survey to collect data. It has been found that technological innovations positively correlate with individual performance of the financial institution and these Sectors are under intense competitive pressure because customer's demands has increased exponentially. Bright & Joseph (2016) agree with Gooser (2002) this study used Achi-square analysis to test the impact of electronic banking services on the development of financial performance by Measuring customers satisfaction on a sample of 30 banks in China. The study concluded that there an important relationship between technological innovation and satisfaction of Customers, thus led to increased profits. Banks that focus on electric banking services also had unconditional competition. However, this study had determinants because it used a small Sample for interviews to collect data. As well as the questionnaire and study for one year. Gooser (2002) and Bright & Joseph (2016) are very useful to develop the framework of this study. It reveals the effects of the relationship between technologic innovations and Financial Performance. Moreover, both studies guide to improve the analytical statistics between variables. The study of Bonface & Ambose (2015) aimed to measure the impact of mobile Banking technologies on financial performance for sample of Kenyan banks (43). Researchers used descriptive design. Statistical data was analysed according to SPSS Program.

9. The relationship between product innovation and financial performance.

Nzioka (2013) aimed at measuring the impact of the size of financial companies on financial performance. The study included 43 commercial banks in Kenya. The size of the Banks measured by total assets, total loans and total deposits and financial performance was measured by ROA. Researcher analysed the data statistically through pearson correlation coefficient and linear progression equation. The results showed a moderate correlation between total assets, total loans and total deposits with ROA also found that there is no correlation between the number of employees and financial performance of commercial banks. This study (Kenyatta, 2016) focused on the impact of the competitive strategies adopted by the management of the financial company. On the financial performance, 95 Respondents in this study. And the data was obtained from the questionnaire a researcher Analysed data using pearson correlation analysis and linear regression. The result revealed a statistically significant relationship between the competitive strategies adopted by the bank's management and financial performance but the strength of this relationship depends on cooperation with other banking institutions to increase the marketing of banking services. (Al-Basheer, 2015) agree with (Kenyatta,

2016) that the study aimed to know the role played by total quality management (TQM) in achieving the competitive advantage of Islamic banks in Jordan. The researcher used the questionnaire and annual financial reports for 2012- 2013 to collect data.

10. Data Analysis

The data contains 130 employees in Iraq banks. Table 1 shows that the demographic profile of the sample of study. The demographic contains gender, age, education level, nature of work and experience. The table shows that male is higher than female. In addition, the age ranking above 50 is the highest portion. In addition, the bachelor degree also is highest among employees. In addition, the employees who working on technology department is the highest. The experience between 5 to 10 years has been achieved 48.6%.

Table1: Summary of Frequency Table for Demographic Profile

Category	Frequency	Percentage (%)
Gender		
Male	70	53.9
Female	60	46.10
Age		
20-30	26	20
31-40	29	22.3
41-50	28	21.5
Over 50	47	36.5
Education Level		
Diploma	20	15.3
Bachelor degree	82	63.1
Master	27	20.8
PHD	1	0.8
Nature of work (Departments)		
Executive	19	14.7
Finance	10	7.7
ICT	32	24.6
Audit	16	12.3
Credit	12	9.2
Liabilities	13	10
HR	13	10
Others	15	11.5
Experience		
Below 1 Years	4	3
Between 1-5 years	27	20.8
Between 5-10 years	63	48.6
Over 10 years	36	27.6

Table 2 shows the outer loading of the variables of the study are significant. In addition the average variance also is above 0.5. Moreover, Cronbach's Alpha is also significant. Moreover, Composite Reliability is also above 0.7.

Table 2: Construct Validity

Table 3 reveals the cross loading of the study. The results shows that the significant cross loading among the other variables. Moreover, the measurement model is also significant in each items. In addition, table 4 laten correlation variable reveals the significant relationship between variables.

Variable	Items	Outer Loading	Cronbach's Alpha	Rho_A	Composite Reliability (CR)	Average Variance Extracted (AVE)
FP	FP1	0.806	0.916	0.879	0.903	0.539
	FP2	0.773				
	FP3	0.823				
	FP4	0.837				
	FP5	0.868				
	FP6	0.700				
	FP7	0.729				
	FP8	0.783				
	FP9	0.770				
SI	SI1	0.823	0.874	0.884	0.861	0.508
	SI2	0.746				
	SI3	0.771				
	SI4	0.765				
	SI5	0.688				
	SI6	0.688				
	SI7	0.657				
	SI8	0.722				
TI	TI1	0.785	0.810	0.821	0.853	0.592
	TI2	0.691				
	TI3	0.872				
	TI4	0.725				
	TI5	0.590				
PI	PI1	0.666	0.877	0.885	0.852	0.542
	PI2	0.706				
	PI3	0.780				
	PI4	0.693				
	PI5	0.821				
	PI6	0.825				
	PI7	0.816				

Table 3: Cross Loading

variable	Items	FEB	SI	TI	PI
FP	FP1	**0.806**	0.415	0.461	0.376
	FP2	**0.773**	0.488	0.532	0.456
	FP3	**0.823**	0.455	0.456	0.411
	FP4	**0.837**	0.523	0.461	0.497
	FP5	**0.868**	0.524	0.502	0.520
	FP6	**0.700**	0.512	0.462	0.517
	FP7	**0.729**	0.376	0.377	0.326
	FP8	**0.783**	0.534	0.543	0.537
	FP9	**0.770**	0.464	0.514	0.441
SI	SI1	0.426	**0.823**	0.415	0.410
	SI2	0.360	**0.746**	0.400	0.396
	SI3	0.416	**0.771**	0.479	0.474
	SI4	0.337	**0.765**	0.427	0.404
	SI5	0.315	**0.688**	0.321	0.404
	SI6	0.405	**0.688**	0.384	0.452
	SI7	0.442	**0.657**	0.381	0.335
	SI8	0.407	**0.722**	0.402	0.394
TI	TI1	0.472	0.426	**0.785**	0.454
	TI2	0.481	0.435	**0.691**	0.361
	TI3	0.413	0.445	**0.872**	0.460
	TI4	0.338	0.316	**0.725**	0.374
	TI5	0.303	0.334	**0.590**	0.340
PI	PI1	0.449	0.506	0.442	**0.666**
	PI2	0.394	0.488	0.455	**0.706**
	PI3	0.450	0.461	0.475	**0.780**
	PI4	0.430	0.487	0.502	**0.693**
	PI5	0.463	0.487	0.526	**0.821**
	PI6	0.410	0.490	0.503	**0.825**
	PI7	0.510	0.500	0.503	**0.816**

Table 4: Latent Variable Correlations (Fronell-Lacer crite

variable	FP	IS	PI	TI
FP	0.789			
IS	0.514	0.729		
PI	0.731	0.434	0.761	
TI	0.721	0.549	0.597	0.739

The effect size could be expressed using the following formula. Table 5 reveals that strategic investment variable has been achieved small effect size. Strategic investment variable has been achieved medium effect size. Technological innovation variable has been achieved medium effect size.

Table 5:

F Square	
IS	0.021
PI	0.381
TI	0.256

Although the acceptable level of R2 value depends on the research context (Hair, 2010), propose an R-squared value of 0.10 as a minimum acceptable level. Chin (2010), suggested that the values of R^2 that above 0.67 considered high, while values ranging from 0.33 to 0.67 are moderate, whereas values between 0.19 to 0.33 are weak and any R^2 values less than 0.19 are unacceptable. Thus, R squre is 0.66 is medium also R square adjusted is 0.65 also medium.

	R Square	**R Square Adjusted**
FP	0.667	0.659

According to the statistical findings, there is a positive significant relationship between investments strategic and financial performance in Iraq banks. P value shows that there is positive significant relationship between strategic investment and financial performance. In addition, the result shows the direct effect between strategic investment and financial performance. The finding of this objectives is consistent with the result of literature review especially Kule (2016) and Tahir (2015) that mentioned the significant and direct effects of the strategic investment on financial performance in Iraq banks. Thus, the first objective has been achieved and the hypothesis also has been achieved.

The findings shows that the hypothesis has been rejected. The findings of the study discovered that technological innovation is not significant. Moreover, there is no direct effect between technological innovation and financial performance in Iraq banks. In addition, P value shows that 0.566. It is higher than the significant level 0.005. The result shows the negative effect between strategic investment and financial performance. The finding of this objectives is inconsistent with the result of literature review especially Thakur (2018) and Halili (2014). The literature mentioned the positive significant and direct effects of the technological innovation on financial performance in Iraq banks. Thus, the second objective has been rejected and the hypothesis also has not been achieved.

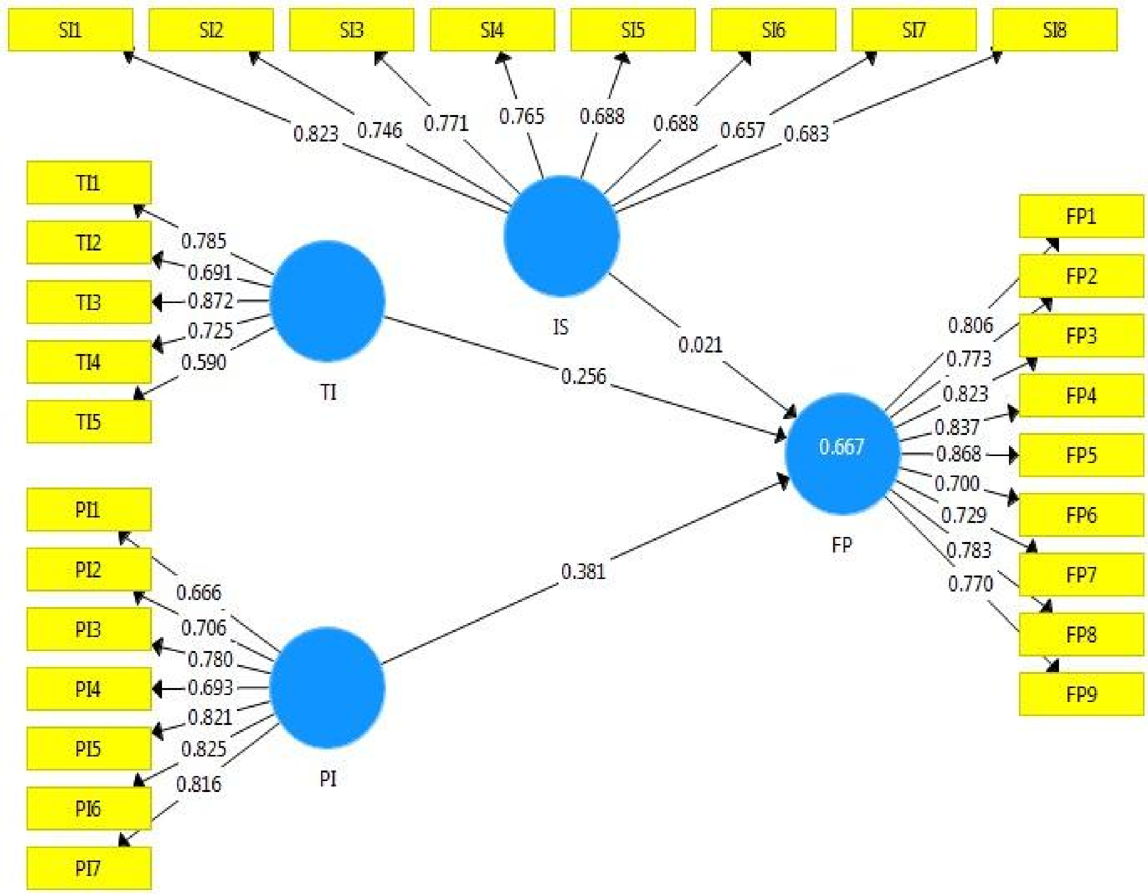
The results of statistical analysis shows that the positive significant relationship between product innovation on financial performance in Iraq banks. The finding of this objectives is consistent with the result of literature review especially Maulana (2016) and Azzaze (2005) that mentioned the significant and direct effects of the product innovations on financial performance in Iraq banks. Thus, the third objective has been achieved and the hypothesis also has been achieved. The main justification of successful aspect in product innovation is strategies indicators that implemented in Iraq banks. This strategies led to improve TQM in Iraq banks. Thus, the objective and hypothesis has been achieved in positive significant relationship between product innovations on financial performance in Iraq banks. Moreover, the focal point in positive and significant relationship between product innovations on financial performance is technological information indicator that led to attract more investments. Technological information also success to enhance competitive strategies with other banks. On other hand, strategies indicators also has been organized the commercial banks.

Hypothesis		Std. Beta	Sample Mean (M)	Std. Error	T-value	P-value	Decision
H1	Strategic investment on financial performance	0.220	0.218	0.061	3.640	0.000	Accepted
H2	Technological innovations on financial performance	-0.024	-0.023	0.041	0.575	0.566	Rejected
H3	Product innovations on financial performance	0.182	0.186	0.062	2.956	0.003	Accepted

11. Conclusion

Figure 1 shows the significant effects of the strategic investment, product innovation and technological innovation on the financial performance. The researcher suggest to expand searching in financial engineering. The Iraq bank should restructure the level of technology that used to implement ATM machine system and other related facilities. Iraq, the future transaction focus on mobile internet and other transactions the financial engineering seeks to simulate the significant experience especially Oman experience to examine factors of financial engineering on financial performance. Moreover, the simulation effects can determine other new significant indicators to examine the effects on financial performance. On the other hand, this study covered the sample of study 30 banks. Thus, if this study covered the results on all Iraq banks it will be accumulate study. It also can achieve other related significant results. This study should also look on the reasons and justifications of using financial engineering in other similar country and compare both case studies to understand the relationship between variables. This study covered only the banking sector. However, if it covered all factor sectors like productive sectors the results will be more strength than before.

Figure 1: The Research Model



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