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Measuring the effect of the use of financial engineering instruments and innovations on the value of the firms: An applied study on Saudi finance firms and banks

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ABSTRACT

This article examines the effect of the use of financial engineering instruments and innovations on the value of the establishment by conducting an applied study on banks listed on the Saudi Stock Exchange. The study was conducted on 11 banks, which represents all banks registered in the Saudi Stock Exchange and uses financial engineering Instruments and innovations to finance their management and provide the best banking services. The value of banks was measured using Tobin's models and price/book value. There was a significant positive effect of the use of financial engineering instruments and innovations on the firm's value. Measurement of the value of the firms was selected only two models of the study: The first model was Tobin's Q Model, while the second the market value model of the firm's shares.

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1. Introduction

The research aims to measure the effect of financial engineering Instruments and innovations on the value of the enterprise, where the use of financial engineering Instruments and innovations has recently spread to provide unconventional solutions to the financing problems of firms. However, It is noticed that the overuse of these instruments and innovations, and the and spread of it find what called "creative accounting", aiming to find suitable accounting treatments for these Instruments and innovations, and this has had many positive and negative effects on the existing accounting systems, therefore on the quality of accounting information in the financial reports Mechanism (outputs of accounting systems) and what may affect the value of the firm. The researcher through this research study to measure these effects on the value of the firms, where is first extrapolated from the literature on financial engineering Instruments and innovations and the rapid spread in their use, whether financial institutions or productivity. In addition, the researcher seeks to conduct an applied study to exam the positive and negative effects of financial engineering Instruments on the value of the enterprise. Applied on Saudi Arabia banks.

Financial engineering has emerged to provide unconventional solutions to corporate finance problems, but the expansion in the use of financial engineering instruments and innovations has caused many firms financial fail, and their losses have been magnified during the 2008 financial crisis. In addition, The Financial system failed to deal with these instruments.

Financial engineering emerged in the mid-1980s to support businesses in hedging risk. Then financial derivatives Beginner financial markets were small, transformed, and expanded significantly and allowed innovative investment strategies (Cooper, 2015).

Financial engineering has had a significant effect on aspects of economic activity. Despite the above, which shows the importance of financial engineering innovations, some argue that the expansion in the use of financial engineering instruments caused many firms to fail and inflated losses." Big firms and the recent financial crisis.

The successive collapse of many firms in the world has led to the loss of the rights of stakeholders, especially current investors, as well as to the loss of Trusting of prospective future investors in the published financial information contained in

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the published lists of those firms, as the most important of these collapses happened at World (Anderson, 2009), which is responsible for the audit of the accounts of this firm, is part of the responsibility of its collapse and accusations of manipulating the firm's accounting data using some of the accounting treatments and policies that show Accounting Nat consolidated financial reports and without its proper true.

The reason for the negative effect of financial engineering innovations on accounting systems may be that although management prepares the firm's financial statements according to its accounting standards, which aim at the integrity and objectivity of accounting measurement, and away from personal bias and fairness in presentation and disclosure, these are Standards The management of the Firm continues to give the firm wide flexibility in the choice of policies, procedures and alternative accounting treatments. On the other side, there are many accusations against the accounting system because of inconsistencies in dealing with financial engineering innovations and the effect on financial reports issued through this system, and many studies have proved that one of the main negative effects of financial engineering instruments and innovations is the failure of financial accounting systems. Based on accounting standards in dealing with financial engineering innovations, some have likened it to the cat and mouse game (Dye et al., 2015), because accounting standards makers often take a long time to formulate the process and accounting rules of the financial instrument. It does not take a long time to circumvent those standards, and the ensuing negative effect on the financial statements makes them misleading and lose objectivity and credibility.

Since financial reports are one of the most important means of communication through which the firm discloses the results of its activities, evaluates and deals with the external environment, and its plans to be implemented. The absence of the entity's performance increases the risks to which they are exposed, particularly investors; this will, in turn, lead to an increase in the cost of capital.

Whereas, according to some studies (Martini et al., 2014; Tjia and Setiawati, 2012), that the value of the firm is the perception of the investor perception of the success of the firm, which is always associated with and expressed in stock prices, where the firm seeks in the first place to maximize its value, which It means maximizing the wealth of shareholders, as the value of the firm is what matters most to the investor, where the firm's valuation index in the market is represented by the value of its shares, meaning that the value of shares means higher value for the firm and the impression of the quality of the firm's current and future performance, and also expectations of the future value of the firm (Tjia and Setiawati, 2012), as there are many measurements As mentioned above, the use of financial engineering instruments and innovations may have a negative effect on the financial statements. Therefore, the researcher attempts to link the effect of the use of financial engineering instruments and innovations on the quality of financial reports issued by the firm. And the market value of the firm.

Therefore, the researcher can present the problem of the study by asking the following questions:

1. Is there an effect on the use of financial engineering instruments and innovations on the credibility of these firms' financial reports?
2. What is the effect of the application of the effect of the use of instruments and innovations of financial engineering on the decisions of investors in these firms?
3. What is the effect of applying the effect of the use of financial engineering instruments and innovations on the market value of the firm's shares?
4. What is the effect of the use of financial engineering instruments and innovations on the rate of return on equity of this firm?
5. What is the effect of using financial engineering instruments and innovations on the firm's stock returns?
6. What is the effect of applying the effect of the use of financial engineering instruments and innovations on the rate of return on assets of this firm?
7. What is the effect of the application of the effect of the use of instruments and innovations of financial engineering on the rate of return on investment for this firm?
8. What measurement and evaluation models can be used to measure the effect of the use of financial engineering instruments and innovations on a firm's value?

2. Research objectives

The objectives of this research are to try to measure the effect of the use of financial engineering instruments and innovations on the value of the firm used for these instruments and innovations by conducting an applied study on the banks in Saudi Arabia. For this, the researcher will discuss the following points:

a) What is the management of financial engineering instruments and innovations?
b) The effect of the use of financial engineering instruments and innovations on the firm's financial reports.
c) The effect of the use of financial engineering instruments and innovations on users of financial reports.
d) Financial and accounting concepts of firm value and methods used to measure them.
e) Applying the appropriate firm's value measurement models to the study sample to measure the effect of using financial engineering instruments and innovations on the value of the firm.

3. Research importance

The importance of research can be summarized in the following points:

a) Scarcity of accounting literature on the effect of the use of financial engineering instruments and innovations on the decisions of stakeholders.
b) Scarcity of studies related to the effect of the use of instruments and innovations of financial engineering on the value of the firm.
c) Researcher attempt to contribute to emphasize the negative and positive effects of the use of instruments and innovations of financial engineering on the decisions of stakeholders (especially investors) and the value of the firm.

4. Literary reference to derive hypotheses

4.1. The effect of financial engineering innovations on the financial performance of firms and the quality of financial reports

In extrapolating previous accounting studies in the field of the effect of financial engineering innovations on the quality of financial reports, we find that most of these studies have focused on the aspects of financial engineering or accounting engineering (creative) and its risks and that there is a relative scarcity in studies on the effects of financial engineering on the aspects of the accounting system in dealing with Innovations in financial engineering. In particular, the negative effects resulting from the flexibility of accounting standards to deal with financial engineering innovations.

Most studies have confirmed that the continuation of such innovations leads to the increase and increase of innovative engineering (creative accounting), where it became a management tool to achieve its own interests, based on the flexibility of accounting standards, the multiplicity of alternatives and methods of treatment and accounting policies for the same treatment, such as discretionary entitlements, deferral of gains or losses, capitalization of costs, depreciation methods, revaluation of assets.

In this section, the researchers will examine the effects of financial engineering innovations on the quality of financial reporting prepared by the firm's management.

4.1.1. Financial engineering challenges for accounting systems

Financial engineering has tried to formulate strong financial policies and create new financial products and instruments, and flexible financial strategies that interact and benefit from the ongoing changes in the financial markets, which has driven this growth is the competition in the capital markets to meet the needs of investors and borrowers. Therefore financial engineering is a means to implement financial innovation in the form of A system or set of ideas and principles that are used by financial institutions to face the needs of their clients.

Despite the importance of financial engineering in providing solutions to many problems for financial institutions and banks, in particular, it may result in many problems, which may be due to the greed of bank managers towards more lending and borrowing to obtain large rewards and advantages in the short term, which resulted in the exposure of the system Long-term financial risk and the global crisis.

The risk of financial engineering (challenges) is compounded by the presence of several factors, the most important of which are:

1. Absence of continuous control over financial markets: In the light of the use of innovations and what may lead to gambling and not to calculate risks such as speculating on interest rates without the application of market risk criteria (Frame and White, 2004).
2. The weakness in accounting standards: It is generally agreed that the lack of accounting standards because of increased flexibility in the treatment of the same transaction, which was reflected mainly and led to the spread of creative accounting, and financial engineering contributed to this increase.
3. The gap between the speed of developments in financial engineering innovations and the responsiveness of the accounting system: This gap was confirmed by the prevalence of bankruptcies achieved by many economic entities, which confirmed that the accounting systems could not keep pace with these developments and show the financial results in the reports incorrectly.
4. Increase the chances of manipulation by the administration: The gap between the rapid development of financial innovations and the slow response of financial accounting standers has led to increased opportunities for manipulation of gains by the administration, and the abuse of the flexibility of accounting standards by many organizations.
5. Negative effect on financial and non-financial institutions (because of accounting treatments): Many researchers argued that the failure of the accounting system to appropriately adapt to financial engineering innovations was behind the global financial crisis in 2008, (Laux and Leuz, 2009), arguing that through securitization and the use of fair value accounting for financial instruments led to the global crisis.
6. Low level of transparency: Some also saw (Cerbioni et al., 2015), a low level of transparency for many financial engineering innovations, and accounting for securitization has effected a fundamental role in the global crisis by:

a) Off-balance sheet securitization: in cases where the bank exceeds capital adequacy requirements on a risk basis
b) Allow banks to reduce risk-based capital to pay dividends and thereby improve the financial situation by showing it better and less risk
c) Insufficient disclosure and representation in the financial statements of securitization transactions, in a way that makes it difficult for investors to understand the extent of banks exposure
d) Allow inconsistent benchmarks (through flexible accounting rules) for financial instruments (Butler, 2009) such as:

- allow certain assets to be valued at cost and others at fair value.
- Allow reserves to be created in a given year and then released in years of loss, such as disclosed in the report of the Superintendence of the Federal Real Estate Corporation Fanniemae.
- Differences in accounting treatments between US and international standards regarding securitization (Cerbioni et al., 2015).

4.1.2. Effect of the use of financial engineering instruments and innovations on financial performance and quality of financial reporting

From the previous presentation of the challenges of financial engineering innovations on the accounting system, since financial reports are the final product of the accounting system, the quality of financial reports depends on the availability of some characteristics in the report such as: Appropriateness, credibility, comparability, stability, verifiableness. This is stated in the first Accounting Standards (Presentation of Financial Statements). From the previous analysis of the effect of financial engineering innovations on the accounting system, it is clear that many of the fundamentals of the quality of financial reports are affected. For example:

1. It is noted that the use of financial engineering resulted in a breach of the verifiable accounting metric, which resulted in more opportunities for the manipulation of quantitative measurement to achieve personal benefits.
2. Innovations of financial engineering behind the failure of the large economic entities, which may prompt to confirm the lack of credibility and appropriateness of financial reports, and the transparency of the above, as it does not reflect fairly the true financial position.
3. In contrast, a study by Kariuki (2010), which aimed to measure the relationship between the use of financial engineering instruments and innovations and the financial performance of commercial banks in Kenya using open and closed questionnaire surveys, has also been obtained. The study found that the use of financial engineering instruments and innovations has had a positive effect on the performance of banks and the quality of their financial reports assuming the stability of other factors. This was supported by Felix et al. (2015), study, which aimed to measure the role of financial engineering. In financial markets, she emphasized the positive role of using financial engineering in improving corporate financial structures and reviving financial markets.
4. As previously noted by the researcher, financial reports are the means of communication through which the firm discloses it's results of activities and it's future projects for stakeholders especially for current and future investors. So the negative effect of financial engineering instruments and innovation on the financial reports and led to a heightened degree of risk through its bad effect in stakeholders and it's role as a means of communication for stakeholders.

4.2. The value of a firm (project) pointed economic and accounting

The value of firm is an economic concept that refers to the value of its business, or the value of wealth at a certain date, where some argue that the value of an enterprise is theoretically the amount of money currently sacrificed for the purpose of this project (as net assets), which depends either on the book value or Fair value. In general, it is the market value of the firm (Cherewyk, 2018). Some studies (Martini et al., 2014; Tjia and Setiawati, 2012) have also indicated that the value of the project is the extent of the investor's perception of its success, as the main objective of any project is to maximize its value, In order to maximize shareholders' wealth, Tjia and Setiawati (2012) emphasized the importance of the concept of value of the enterprise in particular to investors because it means the value of the firm in the market in general, which is reflected in the price of its shares, as some studies have confirmed (Dagiliene, 2013) that the value The firm is its market value because the firm naturally maximizes shareholders' wealth when the market value of its shares rises. It reflects the firm's value is that the rise in stock prices could provide welfare for shareholders. As seen (Mukhtaruddin et al., 2014) that the perceived value of the firm by the investor linked to high stock prices, the firm stock prices are high.

As for the value of the firm from the accounting perspective, the financial statements are supposed to influence the value of the firm as it provides financial information to users that may be used to determine the value of the firm, where some believe that the financial statements affect the decisions of many stakeholders inside and outside the firm.

4.2.1. Measures to determine the value of the firms

The measurements used in determining the value of an entity are numerous and vary between accounting measurements, which are based on accounting information in determining the value of

an enterprise and financial measurements that depend on market values in determining the value of an enterprise. There are also measurements based on both accounting and market information (Dagiliene and Gokienė, 2011).

Measurements based on accounting information

- Return on Equity Scale (Fadul, 2004)
- Earnings per share (Bae et al., 2012)
- Return on assets (Dagiliene, 2013)
- Rate of return on investment

Measurements based on market value and accounting information

Some studies have defined the book value of the firm as the value of the firm through its books (net assets), which is the difference between assets and liabilities and is recorded to equity, the market value is the value as reflected by the stock market, and book value and market value are two different concepts (Borad, 2018).

There are many indicators that can be used to determine the value of a firm based on market values and accounting information (statements and financial reports).

Tobin's ratio measure

Tobin's ratio measure which assumes that the market value of all firms in the stock market should be equal to the replacement cost and the model results that when Q is greater than one, this means that investments will result in a higher return on assets than If the Q is less than one, the investment in this firm is useless. Tobin's Q ratio is calculated as follows:

- **Tobin's Q=** (Book value of Assets-Book value of equity - Deferred tax + Market value of equity)/Book value of assets
- **Market value of equity**= Closing price per share * Number of shares at year-end and rounding of market values of liabilities to book values at year-end
- **E V scale** (Borad, 2018)

where, the value of the firm is calculated through the claims of its creditors, meaning that the value of the firm is the sum of the claims of creditors and shareholders, by calculating the market value of debt, shares and minority rights through the following formula:

- **Firm Value (EV)**= Market Value of Preferred Shares + Market Value of Debt, Minority Rights - Cash and Investments

This measure has gained importance because it is more comprehensive than the market value scale, which includes besides property rights on the value of debt, reserves, and cash, because of its importance in determining the value of the firm, where the buyer must recognize this because it will inevitably pay off the firm's debts at the acquisition, which can be collected in cash or the equivalent of the firm's assets.

- **F C F scale** (Borad, 2018): This measure is based on the determination of the present value of operating cash flows, by comparing the free operating cash flow of two firms of similar size and type of industry, to be the best firm with the best future cash flows, and OFCF (Operating Free Cash Flow) is calculated by deducting the tax rate and capital expenditure The formula is as follows:
- **F C F= EBIT**(1-T) + Deprecation- CAPEX - Wprking Capital - any other assets

where, EBIT is EBITDA; T is tax deduction rate; CAPEX is Capital expenditure.

This method is characterized by giving a more accurate picture of the firm's cash-generating possibilities. After calculating OFCF and using the appropriate discount rate, the current value of OFCF is calculated as the total present values of future cash flows make the acquisition decision easier.

Through the previous presentation of studies on the impact of the use of financial engineering instruments and innovations on the quality of financial reports of the firm, and measures to determine the value of the firm and some studies to measure the impact of the use of financial engineering instruments and innovations on the value of the firm which was characterized by scarcity and conducted on the application to some countries with capital markets Advanced, others in emerging capital markets. The researcher also found many variations in the results of these studies, which may be due to different methodologies and mechanisms of testing the hypotheses of these studies.

Based on the above, the researcher believes that there is a need for many studies in this subject, especially in the Arab countries and the Middle East, in order to reach positive or negative facts using financial engineering instruments and innovations on the value of the firm.

In light of the problem and objectives of the research and extrapolation of previous studies, the researcher was able to formulate the main hypothesis of the research as follows:

H_0 main hypothesis

The use of financial engineering instruments and innovations for listed banks and finance companies in Saudi Arabia affects the value of these companies.

The main hypothesis emanates from the following two sub-hypotheses:

Sub-hypothesis $H_0$1: The use of financial engineering instruments and innovations for listed banks and finance companies in Saudi Arabia affects the value of these companies as measured by Tobin's Q model.

Sub-hypothesis $H_0$2: The use of financial engineering instruments and innovations for listed

banks and finance companies in Saudi Arabia affects the market value of equity (price/book value).

5. Research methodology

The researcher relied on the deductive approach and the inductive approach. The researcher used the study, and the researcher used the financial statements data for a sample of financing companies and banks listed on the stock exchange in the Kingdom of Saudi Arabia. The researcher will then present the applied study, the objectives of the study, the population and sample of the study, characterization, and measurement of study variables, instruments and procedures of the deductive method in the applied study conducted to test the validity or invalidity of the study hypotheses, and the study hypothesis tests. And its results, and finally a summary and findings and recommendations of the study.

5.1. Objectives of the applied study

The study aims to show the impact of the use of financial engineering instruments and innovations on the value of finance companies and banks listed on the Saudi Stock Exchange.

5.2. Community and sample of the study

The study population is banks (as financial institutions using financial engineering instruments) registered in the Saudi Stock Exchange (Tadawul) and the number of the study sample consists of a bank whose data and financial statements were obtained and used for financial engineering instruments during the period 2014-2018. Thus the study sample consists of a watch.

5.3. Measurement of study variables

By reference to the study hypotheses, the variables of the study, and how to measure them can be determined as follows:

- **Independent variable:** The use of financial engineering instruments and innovations in a financial institution is measured here by the number of financial instruments used by the bank as a financial institution.
- **Dependent variable**: The value of a company is defined as the market value of shares, as the company can maximize shareholders' wealth by rising share prices (Dagiliene, 2013) and will depend on some of the methods used in previous studies:

(1) Tobin's Q model by the following formula: Company Value= Market Value + Commitment Value/Total Asset Value for Equity (Tjia and Setiawati, 2012).
(2) Company value=market value of equity where:

A. Market value of equity = number of shares traded * Share closing price on the last day of the year.
B. Price to Book Value = Market Price / Book Value per Share.
C. The present value model of CFCF is determined by comparing two companies that are similar in size and type of industry. The best company is the company with the highest future operating flows and is measured by the following equation (Borad, 2018).

OFCF= EBIT (1-T) + Deprecation–CAPEX-Working Capital - any others assets

where; EBIT is profits before tax and interest; T is tax rate; CAPEX is Capital expenditure.

Due to the difficulty of obtaining and not applying the tax laws in the Kingdom of Saudi Arabia, the above equations will be applied, but only to the application of Forms A, B, since there is no data available for the third model to determine the value of the establishment for the non-application of tax regulations in the Kingdom.

- **Regulatory variables:** There are several factors that need to be considered for their impact on the main relationship under consideration, such as company size, leverage, and liquidity (Nguyen et al., 2015) and thus these elements will be added to the model as measured variables. As follows:

- **Firm Size**: As the Company's total assets, measured by the Company's total assets at the end of the financial year (Nguyen et al., 2015).
- **Leverage:** Measures the company's risk and is measured by the ratio of total liabilities to total assets at the end of the financial year (Nguyen et al., 2015).
- **Liquidity**: Measures the company's ability to pay its current liabilities by dividing current assets by current liabilities (Nguyen et al., 2015).

5.4. Instruments and procedures for applied study

5.4.1. Study tools

To achieve the objectives of the research, an applied study was carried out on the banks registered in the Saudi Stock Exchange, which have been consulted on the data published on the website of the Tadawul (the official website of the Saudi Stock Exchange). From 2014 to 2018, the number and price of its shares and closing prices, and then the application of models for measuring the value of the firm (Tobin's Q, the market value of equity).

5.4.2. Study procedures

It includes studying the extent of using the banks under study for financial engineering instruments and innovations (degree of use), calculating the

value of the firm (the bank), and calculating the control variables from the reality of the financial statements of these banks.

5.5. Statistical models for examine hypothesis and sub-hypotheses

To exam, the effect of the use of financial engineering instruments and innovations in banks listed on the Saudi Stock Exchange on the value of the firm, multiple regression models were formulated as follows:

- **The first model:** This model is used to exam the first hypothesis (P1) through Tobin's Q model as follows:

$$Yt=\beta o + \beta 1x1t + \beta 2x2t + \beta 3x3t + \beta 4x4t + \alpha$$

where, Yt is Bank value calculated by Tobin's Q model; X1t Degree of bank use of financial engineering instruments (number of financial instruments used); X2t Liquidity ratio in your; x3t Bank leverage; x4t Firm size.

- **The second model:** This model is used to exam the second sub-hypothesis through the price/book value model. This is as follows:

$$Yt = \beta o + \beta 1x1t + \beta 2x2t + \beta 3x3t + \beta 4x4t + \alpha$$

where; Yt is the value of the bank calculated through the price/book value model; X1t is the degree of bank use of financial engineering instruments (number of financial instruments used); X2t is Liquidity ratio in your; x3t is Bank leverage; x4t is The firm size.

5.5.1. Results of the applied study

PASW Statistics was used to analyze the study data and calculate regression coefficients to exam the effect of using financial engineering instruments and innovations on the value of the firm using the Regression model at the level of 0.05. The exam results for each model were as follows.

5.5.2. The result of the first sub-hypothesis exam P1

The effect of the use of financial engineering instruments and innovations of banks listed on the Saudi Stock Exchange was measured on the value of the firm using the Tobin's Q model. The operating results were as Tables 1-3. It is clear from the previous analysis of the results of a significant correlation between the use of financial engineering instruments and innovations in the banks registered in the Saudi Stock Exchange, and the value of the firm where the value of the level of significance factor of the variable X1=. Analysis of the exam results also showed that the control variable x3 (leverage) also had a positive effect on the value of banks at the level of (.001).

Table 1: The operating result

Model1	R	R Square	Adjust R Square	Std Error of the Estimate
1	0.689*	.083	0.56	173.8896176

*Predicators: (Constant) x3, x1, x4, x2

Table 2: Coefficients*

Model	Unstandardized Coefficients		Standardized Coefficients	T	Sig.
	B	Std.Error	Beta		
1 (Constant)	14.115	16.738		0.843	0.401
X1	1.634	5.908	0.023	3.327	0.873
X2	-10.127	10.483	0.080	0.966	0.336
X4	5.356E.10	.000	0.24	0.295	0.769
X3	55.344	16.175	0.283	3.422	0.001

*Dependent Variable: y

Table 3: ANOVA[b]

Model	Sum of Squares	Df	Mean Square	F	Sig
Regression	233718.488	4	58429.622	3.073	.018[a]
Residual	2666727.788	135	19013.547		
Total	280054.286	139			

a: Predictors:(Constand, x3, x1, x4, x2); b: Dependent Variable: y

5.5.3. The exam result of the second sub-hypothesis P2

The effect of the use of financial engineering instruments and innovations in banks listed on the Saudi Stock Exchange was measured on the value of these banks through the price/book value model. The model was operated using the statistical program referred to as PASW. Some results wereshown in Tables 4 and 5.

The results indicated in the Table 5 can be inferred that there is an effect of the use of financial engineering instruments and innovations on the value of Saudi banks listed on the stock market at the price/book value of the stock, where the level of commitment 2.479 and a significant level of 0.6642, where the correlation coefficient is 1,871 at the level of significance 0.558.

Because of examining the two sub-hypotheses F1 and F2, there is a significant positive effect of the use of financial engineering instruments and innovations on the value of banks registered in the Saudi Stock Exchange.

Therefore, the researcher can conclude that there is a significant effect of the use of financial engineering instruments and innovations on the value of banks registered in the Saudi Stock Exchange as measured by Tobin's models, price/book value, and the result is consistent with most of the previous studies (Felix et al., 2015).

Table 4: ANOVAP2

Model	Sum of Squares	Df	Mean Square	F	Sig
Regression	152.306	4	38.076	0.751	0.559[a]
Residual	6845.860	135	50.710		
Total	6998.166	139			

a. predictors:(Constant), x3, x1, x2, x4; b. Dependent Variable: y

Table 5: Coefficients [a]

Model	Coefficients Unstandardized		Standardized Coefficients	T	Sig
	B	Std.Error	Beta		
Content 1	3.152				
X1	0.907	0.878		3.590	0.000
X2	0.027	0.743	0.526	2.479	0.642
X4	-	0.542	0.004	0.050	0.961
X3	7.399E-12	0.000	0.007	0.078	0.938
	0.957	1.099	0.275	1.871	0.585

The results indicated in the previous table can be inferred that there is an effect of the use of financial engineering instruments and innovations on the value of Saudi banks listed on the stock market at the price/book value of the stock, where the level of commitment 2.479 and a significant level of 0.6642, where the correlation coefficient is 1,871 at the level of significance 0.558.

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Therefore, the researcher can conclude that there is a significant effect of the use of financial engineering instruments and innovations on the value of banks registered in the Saudi Stock Exchange as measured by Tobin's models, price/book value, and the result is consistent with most of the previous studies (Felix et al., 2015).

6. Conclusion, findings, recommendations and future studies

6.1. Conclusion

The study aimed to measure the effect of financial engineering instruments and innovations on the value of firms through an applied study on Saudi banks registered in the Saudi Stock Exchange. The study was applied to 11 banks, which represents all banks registered in the Saudi Stock Exchange. The value of banks was measured using Tobin's models and price/book value. The study found that there was a significant positive effect on the use of financial engineering instruments and innovations on the firm's value.

6.2. Results of the study

1. Some studies have found that the use of financial engineering has resulted in the breach of verifiable measure of accounting measurement, which has resulted in more opportunities for manipulation of quantitative measurement to achieve personal interests. The innovations of financial engineering were behind the failure of the giant economic entities, which may lead to the assertion of the lack of credibility and appropriateness of their financial reports, and the lack of transparency.
2. While other studies have found that the use of financial engineering instruments and innovations has had a positive effect on the performance of banks and therefore the researcher can deduce the possibility of a positive effect on the value of the firm.
3. Measures used in determining the value of the establishment are different and vary between accounting measures which depend on the accounting information in determining the value of the firms, and financial measures, which depend on the market values in determining the value of Banks of the chosen sample.
4. The applied study conducted on the registered banks in Saudi Arabia during the period 2014-2018 showed a significant effect on the use of financial engineering instruments and innovations in these banks on their value using Tobin's Q model. The analysis of exam results showed that the control variable x3 (leverage) also There is also a significant positive effect on the value of banks, as well as the effect of the use of financial engineering instruments and innovations on the value of Saudi banks listed on the stock exchange at the price/value scale.
5. The researcher attributed the possibility of analyzing the results of this study after referring to the financial market situation in Saudi Arabia and the behavior of using financial engineering instruments and innovations to investors' awareness and the effectiveness of financial engineering instruments and innovations in increasing the market value of these banks.

6.3. Recommendations of the study

1. The need for professional organizations in Saudi Arabia to evaluate the effect of the use of financial engineering instruments and innovations on the values of firms, and to guide all positive and negative effects resulting from this use on stakeholders.
2. The necessity of introducing Saudi accounting standards or amending existing standards to help regulate the use of these instruments, and obliging Egyptian firms to abide by the rules of disclosure of data and information necessary to determine the extent to which firms' administrations use financial engineering instruments and innovations.

3. Developing a Saudi auditing standard to guide auditors and government regulatory agencies to detect the effect of using financial engineering innovations and instruments, using the help of professionals and academic researchers in the fields of accounting and auditing.
4. To draw the attention of researchers for further studies on quantitative methods to determine the positive and negative effects of the use of financial engineering instruments and innovations.

6.4. Future studies and research

- Studying the effect of the use of financial engineering instruments and innovations on the quality of the audit process.
- Study the relationship between profit management practices with investment and financing activities and financial engineering innovations
- Study the relationship between the use of financial engineering instruments and innovations and the quality of profits in various sectors
- An applied study of the effect of financial engineering instruments and innovations on the efficiency of financial markets.

Compliance with ethical standards

Conflict of interest

The authors declare that they have no conflict of interest.

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