The Relationship Between Commercial Banks' Performance and Risk Measures: A Case of Saudi Arabia Stock Market

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Abstract:

The main objective of this paper was to examine the relationship between the performance and risk in the commercial banking industry in Saudi Arabia. The performance indicators included were earrings per share, dividend pay out ratio the ratio of total loans to total deposits, the ratio of equity to total deposits, return on assets and loan loss reserve. Total risk was measured by the standard deviation while systematic risk was expressed in terms of beta. Data on the dependent and the independent variables were obtained for 10 commercial banks operating in the Saudi Stock market for the period 1990-1999. The impact of the performance indicators on the risk measures was tested using both OLS and Spearman's rank correlation methods. The results produced by these models were mixed and did not compare favourably with previous studies carried out in some developed stock markets. Moreover, some of the independent variables failed to meet the hypothesized relationships and explain variability in the risk measures significantly such as dividend pay out ratio, the ratio of equity to total deposits and loan loss reserve. Others such as EPS and NA have significant relationship.

1- Introduction

Saudi Arabia has been operating an organized stock market since 1985 During the last ten years the market passed through a number of changes and developments with the objective of giving it a big role in the process of economic development. The number of stock companies totaled more than 80 in   1999 operating in banking, i ndustrial, service, agricultural, and electricity sectors. The market is expected to play a leading role in the accumulation of individual and institutional savings and to direct these savings to finance the investment projects and to foster the economic development.

However, since its emergence a number of studies have been conducted on three main domains or aspects of the stock market. The dominant empirical work has been in the area of market efficiency (Soufi 1988, Butler and Malaikah 1992, Abduallah 1994   and the problems hindering the

performance of the stock market (Khababa et al. 1998, Almidani 1987). The results on these studies have been inconclusive and mixed and many reasons have been set forward to explain the inefficiency and the constraints facing the Saudi stock market. Among the most mentioned reasons are the lack of information and the absence of market makers and financial intermediaries such as investment banks. The second line of research has concentrated on the organizational aspects of the market and the determinants of the behavioral patterns and attitudes of the individual investor and their impact on the performance and functioning of the stock market (ALSaigh and Hassan 1993, Elballat 1996, Khababa . et al. 1998). A third line of research has been concerned with investigating the impact of financial data and reports on the share prices of the stock companies using both annual and interim reports. The early empirical studies have been mixed indicating that the share prices either not very responsive to the announcement of accounting earnings or some variables have more effects than others on the share price (Bogamy et al. 1997, Abdelsalam and Satin 1988,1991and Abdullah 1993,1995)

One of the issues of the stock market on which little research has been carried out in the Arab world is risk. Apart from the study of Erol and EL-Bdour (1990) on the Jordanian Stock Market the author could not trace scientific research on the determinants of risk at least in Saudi Arabia stock market. This may be attributed to the absence of organized stock markets or to the difficulties in obtaining the required data to test the theoretical models developed mainly in the western economies.

The present study is conducted with the main objective of filling this gap via studying the relationship between the performance and risk measures in the commercial banks of Saudi Arabia.. In particular the paper investigates the factors that determine total and market risks (will be defined later) in the banking industry. The banking sector was selected because it is considered to be the most active sector in terms of shares trading and for which data is reasonably available. The paper is organized in six sections as follows: A review of the relevant literature is reported in section two. Section three spells out the model used and the hypothesis to be tested. In section four a description of the data and the methodology to be followed is provided. The main results obtained from the models are discussed in section five. Section six presents the summary and main conclusions.

II- Previous research

If an investor does not understand the risk of an investment he can not evaluate the performance of that investment with a high degree of accuracy (Crewell 1998). Markowitz (1959) defined the riskiness of a portfolio in terms of the variance of its returns $\sigma^2 R_m$. Sharpe (1964) has extended the work of Markowitz to what has come to be known the market model, which has been used to estimate the market risk (β). More specifically according to this model the return on a security is expressed as follows:

$$R_{it} = \alpha + \alpha\beta R_{mt} + e_{it} \qquad (1)$$

Where:

R_{it} = The rate of return on security i in period t

α = The intercept

β = The market beta coefficient for security i.

R_{mt} = The rate of return of the market in period t measured by some market index.

e_{it} = The disturbance term assumed to be normally distributed with mean of zero and constant variance.

Following the definition of the riskiness of a portfolio developed by Markowitz (1959) and from the market model developed by Sharpe (1964) the total risk of security i (σ) can be expressed as follows:

$$\sigma^2 R_i = \beta_i\sigma^2 (R_m) + \sigma^2(e_i) \qquad (2)$$

The first term on the right hand side of the equation is the systematic risk and the second term is the unsystematic risk, which can be reduced to zero through diversification. This in effect means that the only relevant risk of a security for a risk-averse investor is the systematic or market risk as measured by β. However, it should be noted that two firms having the same β does not necessarily imply that they have identical total risk due to differences in firm-specific risk.

Building on the above notions of risk the pioneering work of Beaver, Kettler and Scholes (1970) examined the relationship between the market - determined risk (β) and single indicators of financial performance using simple correlation. They discovered some relationship between β and dividend payout and financial leverage ratios. Hamada (1972) examined the

relationship between β and financial leverage while Lev (1974) examined the relationship between β and operating leverage. Beighley, Boyd and Jacobs (1975) examined the relationship between financial leverage and the stock market price in the banking industry. They reached the conclusion that: The higher a bank's degree of financial leverage, the lower is the bank's stock price. Despite the importance of their study, their work was criticized because it ignored the behaviour of the stock price over time. Moreover, the dependent variable, which is the average stock price, did not capture the true measure of benefit to the investor measured by return on investment (ROI) in common stock.

Instead of concentrating on univariate analysis a number of studies have emerged adopting a multivariate approach in their analysis of the relationship between risk and financial performance both in the banking and other sectors. Logue and Merville (1972) utilized the balance sheets and income statements of industrial firms to test the relationship between risk (measured in terms of beta) as a dependent variable and more than five financial ratios as explanatory variables. They found statistically significant relationship between β as a dependent variable and the return on assets, the size of the firm and financial leverage. In the electric utilities Melicher (1974) found a significant relationship between β and the asset size, payout ratio, return on equity(ROE), financial leverage and firm activity. Gonedes (1973) reached a relationship between β as a measure of market-determined risk and the co-variability between annual first differences in net income of the firm and those of the economy. In examining the impact of the bank's capital position on the risk faced by the bank, Pettway (1976) reached the conclusion that investors were not very sensitive to the presence of unacceptable level of risk due to their capital ratios.

Jahankhani and Lynge (1980) addressed directly the relationship between market - determined measures of risk and a number of independent variables as proxies for accounting risk in the banking industry. Systematic risk (β) and total risk (standard deviation) were used as dependent variables. The independent variables include among others the dividend payout ratio, leverage, liquidity, and volatility of deposits and earnings per share (EPS). Using β as a dependent variable, three variables were found to be statistically significant and these were dividend payout ratio, coefficient of

variation of deposits and loan to deposits ratio. The accounting variables in that model explained 25% of the variability in systematic risk. Using total risk as a dependent variable, all variables, with the exception of loans to deposits ratio, were found to be statistically significant and they explained 43% of the variability in total risk. Building on their earlier work of Jahankhani and Lynge (1980) Mansur,Zangeneh and Zitz (1993) extended the studies on the relationship between financial ratios and two measures of risk namely beta and the standard deviation as dependent variables. The independent variables were similar to those adopted by Jahankhani and Lynge (1980) with minor adjustments manifested in using net income to total assets in place of dividend payout ratio and earning per share and shareholders equity to total deposits ratio instead of shareholders to total assets ratio. Using β as a dependent variable only loan loss and coefficient of variations of deposits were found to be statistically significant and they explained 35% of the variability in systematic risk. Using total risk as a dependent variable only the liquidity ratio was found to be statistically significant and the independent variables explained 25% of the variability in total risk.

The issue of measuring risk in financial institutions and other settings continued during the late 90' and 21st Century. Saita (1999) addressed the allocation of risk capital in financial institutions where he argued that the measure of risk chosen should be based on the characteristics of a business unit and the degree of centralization and decentralization of the allocation process., Eftekhari et al. (2000) investigated the statistical properties of various measures of risk other than the variance and the standard deviation. They concluded that there is little reason to reject measures of risk other than the variance based on the a view that they are too volatile. Badrinath and Kini (2001) examined the sensitivity of the abnormal profitability of the earnings' yield (E/P)- based contrarian investment strategy to two risk measures using the capital asset pricing model. They found that the estimates of systematic risk of E/P ranked portfolios are not sensitive to the return- measurement interval. Leslie and Zoubair (2000) reviewed the issues related to measuring and monitoring financial risk and the evolution of risk management and the likely role of the risk manager in the 21th century .

III- The models and Hypothesis

In the light of previous literature and in the sprit of the earlier work of Jahankhani and Lynge (1980) and the study of Mansur, Zangeneh and Zitz (1993) we formulated two models. The first model is the market risk model in which the systematic risk (the dependent variable) is defined in terms of beta (β). The second model is the total risk model in which risk (the dependent variable) is defined in terms of the standard deviation of the changes in the stock price (σ). The independent variables are the same for both models and include the followings:

Coefficient of variations of deposits (DP): measured through dividing the standard deviation of deposits of the individual bank by their mean over the study period 1990- 1999. A positive relationship is hypothesized between this variable and both systematic and total risk. Deposits represent the main source of finance for commercial banks and as they become more volatile the commercial bank has to resort to alternative sources to finance its investments which may result in the volatility of the bank's earnings and profitability.

Profitability: Profitability is approximated by two ratios. The first is coefficient of variations of earnings per share measured via dividing the standard deviation of earnings per share of the individual bank by their mean over the study period 1990- 1999(EPS). EPS is widely used as accounting measure and therefore we expect a positive relationship between this variable and both systematic and total risk. The second ratio is net income divided by total assets (NA). For this ratio the hypothesized relationship can either be positive or negative with both measures of risk. It is expected to be positive if the increase in the income of the bank results from high – return – high – risk investments. However, the relationship is expected to be negative if the increase in the income of the bank results from the acquisitions of high quality assets (Mansur, Zangeneh and Zitz (1993). It has been left to the models to uncover the behaviour of the relationship.

Dividend payout ratio (DV): measured in terms of average cash dividend paid during the study period divided by the average earnings available to common stockholders over the same period. Since cash dividends are perceived by shareholders to be more certain than capital gains we expect an

inverse relationship between DV and both measures of risk because lowering the pay out ration is interpreted by stockholders as a sign of potential problem and risk.

Leverage: Leverage can be approximated by the ratio of total equity divided by total deposits (ED) This ratio express the impact of leverage on both total and systematic risks. A decrease in this ratio indicates an increase in both measures of risk. Therefore, an inverse relationship is expected between ED and both measures of risk.

The ratio of total loan (LD): provided to total deposits held by the bank. This ratio reflects both liquidity and credit risks facing the bank. As the bank provides more loans the lower are the holdings of liquid assets and the most likely the bank will be exposed to liquidity problems. In addition, the loan portfolio includes the most risky asset held by the bank and therefore an increase in loans will increase the bank's risk credit. Therefore, a positive relationship is expected between loan to deposits ratio and both systematic and total risk.

Represents the ratio of loan loss reserve to total loans (LS): Banks have to guard themselves against any potential loss resulting from the inability of borrowers to pay back their loans (i.e. credit risk). Therefore, a higher ratio of LS indicates a higher degree of expected loss in the loan portfolio. Thus a positive relationship is expected between this ratio and both systematic and total measures of risk.

Therefore, the models to be tested empirically can be stated as follows:

Market risk model:

$$\beta = \int (DP, DV, ED, EPS, LD, LS, NA) \tag{3}$$

Total risk model:

$$\sigma = \int (DP, DV, ED, EPS, LD, LS, NA) \tag{4}$$

Where:

β= The beta coefficient

σ   = The standard deviation of the monthly returns of the bank.

DP = The coefficient of variations of deposits.

DV = Dividend payout ratio.

ED = The ratio of equity to total deposits.

EPS = The coefficient of variations of earnings per share.
LD = The ratio of total loan to total deposits
LS = Loan loss reserve
NA = The ratio of net income divided by total assets.

IV- Data and methodology

The Saudi stock market has experienced rapid growth both in terms of the number of stock companies and in terms of the volume and value of shares traded during the period 1985 to 2000. The number of companies reached more than 80 companies by the end of 2000. The annual volume of shares traded has increased from 4 million shares in 1985 to 555 million shares in 200. The annual number of transactions executed has increased from 7842 to 498135 transactions during the same period. The annual value of shares traded increased from 203 US million dollars to 17411 million dollars over the period mentioned and finally the market index jumped from 691 in 1985 to 2258.3 by the end of 2000 (SAMA 2001 p.92).

Despite this rapid growth the Saudi market is classified as an emerging thin market and surrounded by major constraints (Al-Bogamy 1997). The commercial sector that constitutes the sample employed in this study consists of all commercial banks operating in Saudi Arabia stock market since 1985. The number of local commercial banks reached 11 in 2000 including a local branch of the Gulf International Bank of Bahrain. The other 10 commercial banks have continuous data over the period under study. The total number of branches reached 1184 in 2000 and the annual volume of shares traded has increased from 442648 shares in 1985 to 92 million shares in 2000 (200% increase). The annual number of transactions executed has increased from 1507 to 119576 transactions during the same period (80%). The annual value of shares traded increased from less than one US million dollars to 7872 US million dollars over the period mentioned (SAMA 2001 p.97 and 350-353).

The main data used in this study came from two main sources. The first was the National Centre for Financial and Economic Information (NCFEI) and the second source was the financial statements of the stock companies compiled and reproduced by many organizations in Saudi Arabia (see for example Zughaibi and Kabbani 2001. The first source was used to calculate the dependent variables (Total and systematic risks), while the second

sources was employed to calculate the independent variables The total risk of the security is measured by the standard deviation of the monthly returns of the bank and β coefficients (the systematic risk) were estimated using the diagonal or market model of Sharpe (1964) mentioned earlier and reproduced below.

$$R_{it} = \alpha + \beta R_{mt} + e_{it}$$

Where R_{it} is the monthly return on a security. R_{mt} is the monthly rate of return on the National Centre for Financial and Economic Information index (NCFEI) on month t and e_{it} is the disturbance term. α and β are the intercept and slope associated with the linear relationship. β reflects the investors' expectations about the relationship between the return of the bank and that of the market. A high β reflects the expectations of the investors regarding a bank whose returns are more volatile compared to the returns of the market and vise versa with respect to low β.

The independent variables as defined before were calculated for each bank either as average values over the study period or as a coefficient of variations as in the case of deposits and earnings per share. Annual financial data from the financial statements were used in calculating the dependent variables since quarterly or semi annual data were not available on regular bases. The 10 years chosen are the most recent years for which complete data is available to the researcher.

The estimation of β and the standard deviation and the t-values and R^2 for each bank are shown in appendix (1). It has been emphasized that ordinary least squares technique OLS may be the best method to obtain estimates of the systematic risk when dealing with a thin market (Marie 1997). The values of the independent variables for each bank are shown in appendix (2).

V- Empirical Results and Discussion

The small sample is considered to be one of the main limitations of this study. We have only ten banks and therefore it is unwise to run a multiple regression model with seven independent variables. Therefore, we restrict ourselves to a simple regression analysis where we take one independent variable at a time with the objective of uncovering its relationship with the

risk measures. Moreover, a non-parametric test, specifically Spearman's rank correlation, was employed. However, before we proceed with these techniques we will examine the direction and strength of the relationship between market measures of risk and the individual performance measures. Table (1) shows the correlation among all the independent variables and the two measures of risk.

By examining the first two rows of table (1) we observe that out of the seven independent variables only three of them exhibit the hypothesized sign. These are EPS, LD and NA. The remaining four independent variables do not postulate the expected sign. However, all variables are not statistically significant at 5% level in their relationship with the two risk measures. The lower part of table (1) shows the degree of association among the independent variables, which may tend to support some of the relationship between these variables and the types of risk. For example LD demonstrates a positive significant relationship with LS which means the ability of LD to proxy liquidity and credit risk. The presence of high correlation among the independent variables indicates the presence of multicollinearity a problem we are not going to face because we are not employing a multiple regression procedure.

Table (1)
Correlation Matrix of Dependent and Independent Variables

	B	α	DP	DV	**ED**	EPS	LD	LS	NA
β	1	0.9	-0.4	0.3	0.3	0.4	0.1	-0.2	0.1
α		1	-0.4	0.2	0.4	0.4	0.02	-0.2	0.10
DP			1	-0.2	-0.3	-0.3	0.1	0.3	-0.3
DV				1	0.3	0.4	-0.1	-0.6	0.4
ED					1	0.2	-.8**	-0.35	0.6
EPS						1	0.06	-.9**	0.7
LD							1	0.2	-0.5
LS								1	-.9**
NA									1

**Significant at 1% level. *Significant at   5% level.

The regression analysis: Market risk model:

The presence of either a positive or negative correlation does not always indicate causality because the correlation coefficient only measures the degree of association between the two variables. A cause and effect relationship is but one of many reasons why the presence of correlation may be observed. Variables may appear correlated if they affect each other, if both are related to a third one or if they are systematically associated with coincidence. This in fact induces us to resort to the use of regression analysis to measure the closeness of the relationship through the use of the coefficient of determination. The objective is to test hypotheses about the regression coefficient and therefore the coefficient of determination R^2 should be looked at as additional information not as the summary indicator of the quality of the results.

In applying the regression analysis we proceed with taking only one independent variable at a time in order to assess its relation to the dependent variables (β and σ). Table (2) displays the ordinary least squares results of both market (β) and total risk (σ) models. It should be noted that the figures in parentheses are t- values. With respect to the results generated when β has been taken as a dependent variable, all independent variables display the expected relationship with the independent variables. However, none of them has any statistical significance in explaining the variation in the market risk. As with respect to the explanatory power the highest explanation in the variation of market risk is given by the leverage variable ED. The results are rather surprising when we examine the results generated by the model when the total risk variable (σ) is taken as a dependent variable. Although none of the independent variables is statistically significant in explaining the variation in the total risk (in this aspects the two models are similar), the signs of the coefficients of four out of the seven variables do not conform to the hypothesized relationships. These are DV, DP, ED, and LS.

Table (2)
OLS Estimated Coefficients

| | The dependent variables | | | | | |
| | Systematic risk β | | | Total risk σ | | |
	α	β	R^2	α	β	R^2
DP	-385 (3.35)	0.222 (0.68)	0.05	572* (2.22)	-1995 (-1.5)	0.20
DV	0.49 (9.12)	- 0.244 (-0.75)	0.06	153 (1.1)	1.3 (0.5)	0.024
ED	0.62 (6)	- 0.48 (1.64)	0.23	-133 (-0.5)	32 (1.3)	0.152
EPS	0.46 (13.6)	0.021 (0.064)	0.0	179* (2.2)	124 (1.2)	0.131
LD	0.32 (3.3)	0.44 (1.5)	0.191	195 (0.7)	0.34 (0.05)	0.0
LS	0.45 (10.3)	0.13 (0.4)	0.02	246* (2.23)	-27.5 (-0.52)	0.03
NA	0.486 (11.9)	- 0.34 (-1.07)	0.112	185 (1.7)	17.9 (0.29)	0.01

 *Significant at 1% level.

   When we examine the results generated by the non parametric test in table (3) we find that the situation is narrowly different. When the market risk measure (β) is correlated with each one of the independent variable the results are similar to those arrived at through the ordinary least squares method (OLS) both in terms of the magnitude of the relationship and its significance. In the case where the total risk measure is correlated with each one of the independent variables, the results are similar to those generated by the OLS in terms of the direction of the relationship (signs of the coefficients). With respect to the statistical significance two variables out of the seven independent variables turned out to be statistically significant. These are EPS and NA.

Table (3)
Spearman s Correlation

Variable	β	σ
DP	0.33	-0.3
DV	-0.24	0.25
ED	-0.47	0.40
EPS	0.15	0.42**
LD	0.35	-0.25
LS	0.42	-0.34
NA	-0.451	0.67

*Significant at 1% level.
**Significant at 5% level.
***Significant at 10% level.

    The results of this study do not compare favourably with the results of similar studies carried out in the most developed stock market mainly those of Jahankani and Lynge (JL 1980) and Mansur, Zangeneh and Zitz (MZZ 1993). When the systematic risk is used as a dependent variable in this study, the coefficients of the independent variables turned out to be statistically insignificant. In the case of JL study the payout ratio, the coefficient of variations of deposits and the LD appeared to have a significant statistical relationship with β, while in the case of MZZ study only the loan loss reserve and coefficient of variations of deposits have a significant relationship. When the total risk (σ) is used as a dependent variable our present study revealed again the insignificance of the independent variables. The JL study showed that all independent variables with the exception of LD ratio were having significant relationships with the risk measures. To the contrary, the MZZ study indicated that only the liquidity variable showed a significant relationship with the dependent variable. The difference between the present and the above-mentioned studies is more pronounced when we examine the hypothesized relationship between the dependent and the independent variables. Where the most of the independent variables in the study of JL and MZZ met most of the hypothesized relationships, the present study revealed that only four out of the seven independent variables met the hypothesized relationships. Such differences between the present study and prior ones in the western stock

markets are expected. Despite the fact that the Saudi stock market (SSM) is the largest market in the Arab world, it is characterized as an emerging one. Many reasons are put forward to explain the intagerisation of the market among which are low percentage of shares that are freely available for individual investors (30%) and the control of the majority of shares by the Saudi government, foreign investors and a minority of small powerful investors who control the market. These facts no doubt affect the external and operational efficiency of the market, which in turns weakens the financial decisions taken by the firms under consideration.

Summary and Conclusions

Knowledge of the impact of financial decisions on risk is an important issue to the management of the stock company trying to maximize the wealth of shareholders. With this notion in consideration the present study has been carried out to examine the relationship between the performance indicators and two measures of risk in the commercial banks sector in an emerging stock market of Saudi Arabia. The performance ratios or indicators for 10commercial banks and bank holding companies over the period 1990 – 1999were obtained from the balance sheet and income statement data. The performance indicators used include the coefficient of variations of deposits, dividend payout ratio, the ratio of equity to total deposits, the coefficient of variations of earnings per share, the ratio of total loan to total deposits, loan loss reserve and the ratio of net income divided by total assets. These indicators which represent the independent variables are related to the systematic risk (β) and total risk (σ) also calculated for the same time period. Parametric and non-parametric tests are performed to test the relationship. In the case of the parametric test the independent variables failed to explain the variations in the dependent variables. As independent variables used to explain the total risk measure in the non parametric test, the coefficients of earnings per share, the net income on assets turned out to be significant. The short time series used in this study stands clearly as the main limitation of this study.

Appendix (1)

Bank	β	σ	SE	T	R^2	D-W	N
RIY	.353	968	13.37	3.16	.125	2.053	72
GAZ	.474	71.4	.927	4.51	.225	2.557	72
INV	.403	107.3	1.45	3.68	.162	1.847	72
SH	.635	146.1	1.667	6.87	.403	2.104	72
SF	.428	100.3	1.338	3.97	.184	1.836	72
SB	.384	124.7	1.70	3.5	.148	2.134	72
AW	.487	166.2	2.143	4.7	.237	2.024	72
SA	.435	251.3	3.34	4.04	.189	1.831	72
UNI	.455	156.2	2.053	4.28	.207	2.315	72
RAJ	.330	129.5	1.805	2.9	.109	1.98	72

Source: Based on the calculation carried out by the researcher using SPSS computer package.

Appendix (2)
The values of the independent variables used in the models

	DP	DV	ED	EPS	LD	LS	NA
RIY	0.111	0.54	14.2	0.92	36.47	1.05	1.14
GAZ	0.222	0.0	8.85	-1.93	36.19	6.0	-2.19
INV	0.212	0.0	6.32	0.44	42.92	2.17	0.77
SH	0.193	0.09	8.7	0.441	41.25	1.25	0.94
SF	0.117	0.92	9.95	0.21	43.6	0.962	1.01
SB	0.234	0.60	9.5	0.28	37.37	0.573	1.44
AW	0.298	0.76	10.8	0.346	37.47	0.742	1.47
SA	0.118	0.59	8.92	0.493	37.3	0.407	2.24
UNI	0.162	0.13	12.0	0.236	40.02	1.16	2.24
RAJ	0.167	0.55	17.8	0.223	1.83	0.265	3.47

Source: Based on the calculations carried out by the researcher using financial statements of the sample banks

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العلاقة بين أداء البنوك التجارية والمخاطرة في سوق الأسهم السعودي

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الملخص:

يتمثل الهدف الأساسي لهذا البحث في دراسة العلاقة بين أداء البنوك التجارية المساهمة في سوق الأسهم السعودية والمخاطرة. لقد تم التعبير عن أداء البنوك التجارية من خلال عدد من المؤشرات من بينها نصيب السهم من الأرباح المحققة والموزعة ونسبة القروض إلى إجمالي الودائع ومعدل العائد على الأصول ونسبة حقوق الملكية إلى الودائع واحتياطي خسائر القروض. أما المخاطرة فقد تم قياسها عن طريق الانحراف المعياري ومعامل بيتا. البيانات المتعلقة بالمتغيرات المختلفة تم جمعها عن عشر بنوك للفترة من ١٩٩٠ – ١٩٩٩م وتم تحليل العلاقة بين المتغيرات باستخدام أسلوبي الانحدار البسيط ومعامل الرتب لسبيرمان. النتائج التي أفرزتها النماذج متباينة ولا تتفق كثيرا مع الدراسات السابقة التي تمت في الأسواق الأكثر تطورا. إضافة إلى ذلك فإن اتجاه بعض المتغيرات المستقلة وعلاقتها مع المتغير التابع جاءت مختلفة عن العلاقة الافتراضية ومثال ذلك نسبة الأرباح الموزعة ونسبة حقوق الملكية إلى الودائع ونسبة احتياطي خسائر القروض.