DETERMINANTS OF KUWAITI STOCK PRICES: AN EMPIRICAL INVESTIGATION OF INDUSTRIAL SERVICES, AND FOOD COMPANY SHARES

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I. INTRODUCTION

Kuwait Stock Exchange (KSE) is the first stock market in the Gulf region. It was officially established in 1971. The four–fold increase in oil prices of 1974 and the massive fund surpluses which followed have contributed to the flourishment and expansion of the market. However, it wsa not until 1983 when KSE went through a major restructuring in terms of organization, regulation, and methods of trading.

The number of companies whose shares are traded on the KSE was 54 in 1987. These companies belong to seven economic sectors, in addition to the non-kuwaiti companies group. The distribution of companies among sectors and the average daily volume and value of trading in 1987 are presented in Table (I) below.

Table (1)
Kuwait Stock Exchange Sectors,
Number of Companies, Volume and
value of Trading in 1987

Sectors	Number of Companies	Volume of Trading (000) shares	Value of Trading (000) KD
Banks	8	3,233	1,731
Investments	7	833	207
Insurance	4	130	268
Real Estate	6	1,602	334
Industrial	9	292	116
Service	7	3,882	571
Food	5	343	65
Non–Kuwaiti	8	1,680	165
Total	54	11,995	3,457

Source: Kuwait Stock Exchange.

The purpose of this paper is to study the factors which influence share prices in the Kuwait Stock Market. The findings of this stydy should be of interest to both academicians and stock market participants. For the former, it would open new avenues for research on securities prices in the KSE. The

latter including investors, security analysts, stock brokers, and corporate financial managers will benefit from empirically supported new perspective on determinants of Kuwaiti stock price changes.

II. Methodolgy and Data

A single equation model will be specified and tested empirically using the statistical method of multiple regression analysis. A sample of 19 companies consisting of 8 industrial, 6 services, and 5 foods is used. The sample represents 39 percent of the 54 companies listed on the KSE in 1987. Companies excluded belong to the banking, investments, insurance, and real estate sectors whose stock prices might be affected by another set of variables than those specified in the model below. Annual data for the variables in the model is collected for the 19 sample companies for the 6 year period 1982–1987. SAS computer system is used in the inter–temporal cross–section analysis.

III. The Model and Its Hypotheses

Two sets of factors are expected to affect Kuwaiti stock prices. The first set relates to company performance. Four variables are selected to measure the relevant aspects of company performance. These are earnings per share (E_{it-1}), dividends per share (D_{it-1}), debt to total assets (L/TA) it–1, and the ratio of fixed assets to total assets (FA/TA) it–1. the second set relates to macro–economic variables which are expected to affect the prices of all stocks traded in the market. Three variables are selected in this group. They include the stock market index (I_t), the interest rate on 3– months US$ deposits (i_t), and the currency exchange rate expreessed as KD per one US$ (EXCH)t. Assuming linearity, the model is specified in the following equation:

$$P_{it} = a_o + a_1 \, E_{it} - 1 + a_2 \, D_{it} - 1 + a_3 \, (L/TA) \, it - 1$$
$$+ a_4 \, (FA/TA) \, it - 1 + a_5 \, I_t + a_6 \, i_t + a_7 \, (EXCH) \, t + e_{it}$$

The variables pertaining to firm performance are lagged one period. This is due to the delays in the disclosure of financial information by firms, in the interpretation of the information by market analysts, and in the trading decisions by investors which will eventually affect the stock prices. These delays are estimated in a study by one of the authors to take from six months to one year and a half. Midani (1984-1987).

A–priori reasoning is now in order to justify the inclusion of each independent variable. Earnings per share is a measure of company overall performance. It reflects the productivity of a company assets protfolio and the efficiency

of its financing and operating policies. It is also an indicator of expected future profitability of the company. A positive relationship is hypothesized between earnings per share and stock prices.

Dividends per share represents the cash flow which accrues to the stockholder from investing in a stock. Valuation theory of Gordon (1962) suggests that dividends and growth of dividends are the most important determinants of a stock price. A positive relationship is also hypothesized between dividends and stock prices.

The ratio of liabilities to total assets is a measure of financial leverage. Excessive use of financial leverage increases financial risk of the company, raises its equity capitalization rate, and adversely affects the stock price. A negative relationship is hypothesized between debt ratio and stock prices.

The ratio of fixed assets to total assets is a measure of company capital intensity, and it is used as a surrogate for operating leverage. A high ratio indicates a high degree of operating leverage, which implies that company profits are highly sensitive to changes in sales (high business risk). Other things equal, this will lead to a higher equity capitalization rate, and a lower stock price. A negative relationship is hypothesized between the fixed asset ratio and stock prices.

A significant part of the variation in stock prices is caused by changes in the level of the stock market, as measured by some market index. This type of variation cannot be diversified away, and is referred to as systematic risk. It is hypothesized that a positive relationship exists between the Kuwaiti stock market index and stock prices. This is consistent with the capital asset pricing model (CAPM) theory developed by Sharpe (1963 & 1964) and elaborated by Linter (1965, 1967 & 69), Mossing (1966), Fama (1965 & 1968), and Black (1972).

Other macro-economic factors may have an effect on stock prices. This is strongly advocated by proponents of the arbitrage pricing theory (APT) such as Ross (1976), Chen (1980), and Burmeister and McElroy (1988). It is in accordance with these recent theoretical and empirical developments on the pricing of risky assets that the last two variables in the Model are selected.

The market rate of interest represents an opportunity cost for investing in stocks. It is also a component of the equity capitalization rate. As interest rise, bonds become a more attractive investment given their risk–return characteristics. This motivates investors to adjust their investment protfolios by buying bonds and selling stock, thus depressing stock prices. Furthermore, the rise in interest rates raises equity capitalization rates, which also leads to

lowering stock prices. It is hypothesized that a negative relationship exists between the interest rate and stock prices. The three–months US$ deposit rate is used as the measure of the market rate of interest in view of its sensitivity to changes in credit market conditions, and because of the emphasis placed upon it as an opportunity cost by the Kuwaiti investment community.

Finally, it is hypothesized that depreciation in the exchange rate of the currency has a positive effect on stock prices. In a deteriorating exchange rate environment, investors tend to convert part of their currency and fixed income securities holdings into stocks which are likely to appreciate in value. Especially targeted will be the stocks of companies which can attain a net foreign asset position, and those which have export and/or imports substitution potential. The former group would include banks, insurance, and investment companies to the extent they have and can maintain a growing net foreign asset position. The latter may include industrial, food, and service companies.

IV Empirical Findings

A. Analysis of Regression Results of the Original Seven Variable Model

Results of the inter–temporal cross–section multiple regression analysis for the original seven independent variable model are presented in Table II. Two sets of results, with and without the use of an intercept term, are shown. The parameter estimate of the intercept is relatively large, but is statistically insignificant as can be ascertained from its t-value of 0.62. Removal of the intercept term improves the explanatory power of the model tremendously, as R^2 increases from 47.37 to 72.55 percent. The F–value increases by about three folds from 8.48 to 25.30.

In the following, only the regression results without the use of intercept term are analyzed. Out of the seven independent variables included, three are statistically significant.

TABLE II
Regression Analysis Results: Original Seven - Variable Model

	With Intercept Estimated Coefficients	t– Values	Without Intercept Estimated Coefficients	t– Values
a0	6.551	0.503	–	–
a1	4.666	2.845**	4.725	2.905**
a2	8.374	1.512	8.115	1.480
a3	0.044	2.054*	0.044	2.062*
a4	−0.012	−0.953	−0.0116	−0.909
a5	0.000	2.400**	0.000	2.539**
a6	−0.124	−0.324	−0.242	−0.800
a7	−0.019	−0.375	0.006	0.743

R^2	0.4737		R^2	0.7255
F	8.485 at .0001		F	25.296 at .0001
DW	2.109		DW	2.113
N	74		N	74

* Significant at the 0.05 level.
** Significant at the 0.01 level.

Earnings per share (EPS) has the highest level of statistical significance as would be expected. Its estimated coefficient is relatively large and has the anticipated positive sign. It indicates that a one percent change in company EPS will lead, on average, to 4.72 percent change in stock prices.

The stock market index is also statistically significant at 0.01 level, however, its estimated coefficient is so small such that it can be considered zero. This is a very surprising result, for it suggests that changes in the level of the stock market have no effect on the stock prices of companies operating in the industrial, food, and service sectors of the Kuwaiti economy. Alternatively, this result is saying that these sectors of the economy are highly stable (non–cyclical) in terms of demand, and that it takes a large change in the stock market index (or economic conditions) to have an impact on the stock prices of companies in these sectors. While this explanation might be acceptable for the food sector which is traditionally known for the stability of its

sales and earnings, it is not plausible for the industrial and service sectors which have more volatile demand. Further research is needed on this point before any solid conclusions can be made.

Debt ratio is the third statistically significant variable in the model. Its estimated coefficient is relatively small and has a positive sign, contrary to what is expected. It implies that a one percent change in debt ratio will lead to a 0.044 percent change in stock prices. This result can be explained in either one of two ways. First, it is possible that the debt ratios of the sampled companies fall within an acceptable range, thus enabling companies to enjoy the benefits of financial leverage with little adverse effect on their stock prices, since little or no change in financial risk has occurred. A quick review of the sample debt ratio data shows that only 26 percent of the companies have a debt ratio greater than 50 percent. This provides some but not a strong enough explanation of this result. Second, it is possible that this result says something about the risk–return preference function of traders in the Kuwait Stock Market. Specifically, it may suggest that traders in the Kuwait Stock Market are so illusioned by the advantages of financial leverage during good times to completely neglect its adverse effects when the economy goes into a recession. This is probably due to their lack of sophistication in financial analysis and/or to having a low degree of risk aversion.

The four other variables specified in the original model are statistically insignificant. Of the four, dividends is the closest to being significant, since it has a statistical significance at the 0.1435 level. The interesting finding about dividends is that its estimated coefficient is the largest, suggesting that a one percent change in dividends leads to an 8.12 percent change in stock prices. This result would have been expected in view of the emphasis stockholders place on dividends income and growth of dividends.

The ratio of fixed assets to total assets, the measure of operating leverage, is statistically insignificant, and its estimated coefficient has a very small value of 0.0116. However, it does have the correct negative sign indicating that more capital intensive companies have more volatile earnings, which have an adverse effect on their stock prices.

The interest rate is also statistically insignificant, with a small estimated coefficient of 0.242. It has the anticipated negative sign, which suggests that an increase in interest rates lowers stock prices as stockholders required rate of return increases, as investors reduce the proportion of stocks and acquire more bonds in their investment portfolios, and as the increase in the cost of borrowing inhibits the growth of business firms.

Finally, the exchange rate is statistically insignificant, and has a very small parmeter estimate of 0.006. The sign of the parameter is the correct positive sign.

B. Regression Results of a four – Variables Model.

In the seven – variables model, four variables turned out to be statistically in-significant. This, as well as the high incidence of multi–colinearity, have prompted attempts to reduce the number of independent variables. As a first step, the model is reduced into a four–variables model. Included are the three statistically significant variables of earnings, debt ratio, and stock market index; in addition to dividends. Dividends is kept in the model due to the relatively large value of its parameter estimate and to its being somewhat statistically significant.

The empirical results of the four-variables model are presented in Table III, with and without the intercept term. As before, eliminating the intercept term in-creases R2 from .46 to .72 and causes the value of F to jump from 14.72 to 44.86. In comparing the regression results of the four– and seven– varibles models without intercept, three observations can be made. First, excluding the fixed asset ratio, the interest rate, and the exchange rate variables affect the ex-planatory power of the model only in a negligible way. R2 is reduced from 0.7255 to 0.7194. Second, the significance of the entire model is improved in a

TABLE III
Regression Analysis Results: Four–Variables Model

$$P_{it} = a0 + a1\ E_{it} - 1 + a2\ D_{it} - 1 + a3\ (L/TA)_{it} - 1 + a4\ I_t + e_{it}$$

	With Intercept Estimated Coefficients	t–Values	Without Intercept Estimated Coefficients	t–Values
a0	−0.2716	−0.277	—	—
a1	5.220	3.350**	5.302	3.488**
a2	7.400	1.423	6.973	1.413
a3	0.047	2.261*	0.043	2.624**
a4	0.000	2.338*	0.000	2.695**
R^2	0.4605		R^2 0.7194	
F	14.723 at .0001		F 44.862 at .0001	
DW	2.102		DW 2.084	
N	74		N 74	

* Significant at the 0.05 level.
** Significant at the 0.01 level.

fundamental way, as the value of F increases from 25.29 to 44.86. Third, the same three independent variables remain statistically significant, but all at the .01 level this time.

C. Regression Results of a Three – Variables Model.

At a second step, the dividends variable is eliminated due to its possible high multi–colinearity with earnings, and because of its low level of significance. The regression results of the three-variable model are presented in Table IV. The findings show that exclusion of the dividends variable reduces R2 only marginally as it falls from 0.7194 to 0.7110. However, further improvement in the statistical significance of the entire model is obtained as the F-value increases from 44.86 to 59.05. All three variables are significant at the .01 level, and the parameter estimate of earnings is still by far the largest in value.

TABLE IV
Regression Analysis Results: Three–Variables Model
$$Pit = ao + ai Eit - 1 + a2 (L/TA) it - 1 + a3 It + eit$$

	With Intercept Estimated Coefficients	t– Values	Without Intercept Estimated Coefficients	t– Values
a0	0.133	0.142	—	—
a1	6.745	6.240**	6.751	6.293**
a2	0.049	2.413*	0.051	3.247**
a3	0.000	2.083*	0.000	2.663**
R^2	0.4416		R^2 0.7110	
F	18.713 at .0001		F 59.047 at .0001	
DW	2.102		DW 2.173	
N	74		N 75	

* Significant at the 0.05 level.
** Significant at the 0.01 level.

V. Summary and Conclusion

This study has presented and analyzed the results of a multiple regression model which examines the effect of seven independent variables on stock prices of 19 Kuwaiti companies operating in the industrial, service, and food sectors. A reduced form of the model with only three variables inclu ed gave the best results. The findings of the latter indicate that Kuwaiti stock prices are most sensitive to changes in company earnings measured by EPS. To a much lesser extent, they are influenced by the degree of financial leverage of the company. Finally, the stock market index is statistically significant but has no effect on stock prices of the sampled companies.

These findings should be viewed as tentative only. Sample size and data limitations may have biased the results. Thus, further research is needed before more conclusive results can be obtained.

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