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THE BEHAVIOR OF THE EXCHANGE RATES OF AN OIL RICH STATE, AND IMPLICATIONS FOR MARKET EFFICIENCY AND MONETARY POLICY

Key Words

Exchange Rates; Monetary Policy; Garch-M; Market Efficiency; Risk Premium; currency Basket Peg; News Models; Kuwait.

Abstract

A News model is estimated within a GARCH-M to examine the behavior of exchange rates in Kuwait. The model utilizes a unique data set consisting of observations on relevant domestic and international macroeconomic variables. The results indicate that the local exchange market is efficient in the sense that excess profit could not be generated from past information. The evidence also reveals that the domestic currency is effectively pegged to the U.S. dollar in the long run, and is freely floating against the other major currencies. In the short run, however, the dinar/dollar exchange rate may exhibit significant variations. Thus, the Kuwaiti dinar might be pegged to a basket of currencies, and the dollar seems to be the dominant currency in this basket. Hence, foreign trade and investments favor the U.S. markets. The current exchange rate policy of Kuwait, however, is only sustainable in the long run if the real growth in the local economy is not significantly less than that of the U.S. Thus, the growth in real economic activity in the U.S. market should be a relevant economic target.

Introduction

Developing countries, which have heavily regulated markets, are forced to drift toward more liberal economic policies as the effects of globalization start to take hold. Thus, policy makers in these countries are becoming more concerned than ever before about the management of their economies in this new and po-

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tentially more volatile environment. This is because the economies of less developed countries might be very susceptible to international capital flows as these markets are opened up. International organizations such as the IMF and the World Bank have provided suggestions to liberalize these economies. These suggestions, however, are crude at best and are not usually tailored to individual countries.

For economic reforms to succeed on the macro and micro levels, a better understanding of the current economic system is a necessary condition. The price of the local currency and rates of interest are two subjects that have attracted the attention of international economists as they attempt to better understand the economies of less developed countries. These attempts are hampered, however, by the lack of quality data, and underdeveloped financial markets. As a consequence, the amount of research conducted on these economies has, in general, been scarce. This is a major hurdle to a smooth transitional process to free market economies.

The oil rich states are not an exception in the sense that the research conducted on these economies has also been scarce. These economies are small, underdeveloped, and their incomes are mostly denominated in dollars. The case of most of these countries is somewhat straightforward, at least with respect to the analysis of the monetary policy, since their exchange rates are officially pegged to the U.S. dollar. The case of Kuwait is somewhat different. The domestic currency follows a basket peg, whereby changes in the domestic exchange rates are determined by changes in the index of a basket of currencies. But, neither the currencies used in the basket nor the weights of these currencies are declared to the public. This is expected to reduce the ability of the private sector to predict expected changes in the local exchange rates, and complicates the setting of the optimal rates of interest that should prevail in the domestic market.

This study seeks to examine the behavior of the domestic exchange rates to better understand its major determinants. The importance of such study stems from its ability to provide indications on how the domestic currency is priced vis-à-vis the dollar and the other major currencies. It also attempts to remove the confusion concerning whether or not the local exchange rates against the dollar should be treated as a fixed exchange rate system. The study is also designed to shed light on whether or not the foreign exchange market in Kuwait is efficient, and draws relevant implica-

tions on the conduct of the monetary policy and fiscal policies.

The study utilizes a GARCH (1,1)-M estimator with daily data that spans the period from 1993 till 1996.[1] It consists of observations on money supply, foreign and domestic exchange rates and interest rates. Moreover, the forward rate set at time "t" is proxy by the spot rate at that point in time.[2] This assumption becomes more realistic the shorter is the term of the forward contract.[3] The results indicate that the market is rational in the sense that past information does not impact current changes in the spot rate. It is also found that the Kuwaiti dinar might be effectively pegged to the dollar in the long run, and is freely floating against the other major currencies. In the short run, however, the dinar/dollar exchange rate exhibits significant deviations. Hence, the local currency is effectively pegged to a basket of currencies and the dollar might be the dominant currency in this basket. The findings imply that economic agents are better off transacting in the U.S. dollar with the rest of the world. A serious implication of this study relates to the need for local policy makers to target the optimal growth pattern of the U.S. economy. The failure of the local economy to grow in line with that of the U.S. will make the current exchange rate policy unsustainable in the long run. This necessitates a better coordination between the monetary and fiscal policies.

Literature Review

The early models of exchange rates assume that economic agents are risk neutral seeking to maximize expected returns. These agents allocate their wealth among different currencies so as to take advantage of possible changes in the exchange rates. Consequently, the spot rate, ex-post, might be written as:

$$S_t = f^t_{t-1} + u_t \qquad (1)$$

The term "s_t" is the home currency price of a unit of foreign currency at time "t". The first term to the right of

(1) Zhou (1996) have advocated the use of high frequency data for exchange rates models, such as hourly and tick by tick data in order to reduce misspecification. In other words, a high frequency data increases the amount of information available to the estimation process and reduces the probability of the model being misspecified. However, no such data is available for relevant domestic macroeconomic variables.

(2) This assumption rules out the ability of economic agents to generate excess profit by using past information, which is a testable implication. For further discussion on this issue, see for instance, Copeland (1994) who advances the use of a random walk process instead of the forward rate. See page 359.

(3) The empirical model implicitly assumes that the forward contract has a maturity period of 24 hours.

the equal sign refers to the forward rate is the price of the home currency at time "t-1", paid for at time t, for one unit of the foreign currency. The last term is the residual. These early studies generally employ empirical models of the following form to test market efficiency:

$$S_t = a + bf^t_{t-1} + u_t, \qquad (2)$$

A market is said to be efficient when prices of assets reflect all available information, and thus, no economic profits may be generated based on available information. Hence, an implication of market efficiency of exchange rates is that the forward rate at time "t-1" reflects all available information at that time, and it is the best forecast of the spot rate at time "t". The spot rate at time "t", however, utilizes also any other bits of information that were revealed after time "t-1". Consequently, the spot might diverge from the forward rate in the short run, but on average the following relationship is assumed:

$$E_t\ (S_t - bf^t_{t-1}) = 0 \qquad (3)$$

If the market is efficient then excess returns obtained by economic agents should on average be zero. Thus, the null is a joint hypothesis stating that the coefficient of the forward rate "b" is statistically equals to unity, and the constant intercept is not significantly different from zero.[4] These studies in general employ the OLS estimator, which requires that the error term, u_t, to exhibit no serial correlation.

Studies that have applied this methodology have generally concluded that the forward market is generally efficient, especially for the pre Bretton-Woods era, when the exchange rates were fixed.[5] These results have been questioned on the ground that the inability to reject the null might be related to the possibility that the spot and the forward rates are first difference stationary. Therefore, if the co-integrating regression is not constructed properly, it will yield a coefficient that is equal to unity, which reflects the long run relationship between the spot and the forward rates.[6]

Studies that have utilized data sets for latter periods, however, have obtained mixed evidence. Edwards (1983) utilizes an augmented version of the empirical model shown above. By allowing for the role of news, mixed results were obtained. He con-

(4) Some authors have argued that rationality and/or risk neutrality does not necessarily imply that the constant intercept equals to zero. Frankel (1983) have argued that different assumed distributions for the exchange rates yield different values for the intercept because of Jensen's inequality.

(5) Please see Cornell (1977) and Frenkel (1981).

(6) See Mark et al. (1993).

cludes that either there is a mis-specification caused by an omitted variable and/or that risk premium is time varying.

Subsequent attempts to examine the relationship between the spot and the forward rates tended to subtract the lagged spot rate from both sides of Equation (3), to yield the following regression:

$$S_t - S_{t-1} = a + b(f^l_{t-1} - S_{t-1}) + u_t \quad (4)$$

Thus, the actual change in the spot rate is regressed on the current forward premium and a constant. The slope coefficient is not expected to be significantly different from unity if Rational Expectations is to uphold. The new specification is expected to reduce the serial correlation in the residuals and increases the efficiency of the estimates. This specification is along the lines of Rational Expectations, in the sense that the forward rates should on average be equal to the spot rate. This is a major tenant of rational expectations in the sense that economic agents will make just as much error in the upside as they well in the downside. On average, therefore, the expected value of the error term is equal to zero.

Research that utilizes such specification produced mixed results. Estimates of the slope coefficient ranged from positive unity to negative unity, and some estimates turned out to be not significantly different from zero. Bilson (1981), (Cumby and Obstfeld, 1984), (Hansen and Hodrick, 1983) all obtained estimates that were either significantly less than unity or less than zero.

This has shifted the attention to the possibility that risk premium might be time varying and/or some kind of errors in variables might be contaminating the estimated parameters. Edwards (1983), Fama (1984), (Hodrick and Srivastava, 1986), (Meese and Rogoff, 1983), and Hu (1997), among others, have attributed the rejection of rationality to the existence of time varying risk premium. Fama (1984) in an attempt to solve this problem, suggest decomposing the forward premium into expected depreciation and risk premium, where risk premia is the bias in the expectations of the forward rates. Cornell (1989), and (Bekaert and Hodrick, 1993) among others, attributed the failure not to reject the null of market efficiency, to measurement errors and the problem of omitted variables. Others such as (Froot and Frankel, 1989) have attributed the bias to errors in expectations rather than to risk premium.

Financial economists have also attempted to model and construct exchange rate models that establish more tractable theories of risk premium. These newer models rely on the

covered interest rates parity conditions, and explicitly account for risk premium. These models, might be written as:

$$S_t = \rho^t_{t-1} + f^t_{t-1} + \upsilon_t \qquad (5)$$

Where "ρ^t_{t-1}" is the risk premium. Thus, the spot rate is composed of a risk premium, the forward rate, plus an error term. Subtracting "s_{t-1}" from both sides of Equation (5), the following expression is obtained:

$$S_t - S_{t-1} = \rho_{t-1} + (f^t_{t-1} - S_{t-1}) + \zeta_t \quad (6)$$

Which states that the actual rate of change in the spot is equal to the expected forward premium or discount, a risk premium, and an error term that is white noise. The residuals could reflect the innovations of relevant macroeconomic variables such as money supply, interest rates, prices of foreign currencies, inflation rates, and others. The residuals are expected to be identically and independently distributed. Equation (6) might also be rewritten as,

$$S_t - S_{t-1} = \rho_{t-1} + \chi_i Z_{it} + \delta(S_t - f^t_{t-1}) + \varsigma. \quad (7)$$

Where "z" reflects innovations of relevant variables, "χ" a vector of constants, and "ς" is a white noise. This specification is frequently used in the newer literature of exchange rates determination, and has been advocated by Hodrick (1989) among others. (Domowitz and Hakkio, 1985) utilize a similar model within an ARCH-M framework. The model is dynamic and follows along the lines of (Hodrick and Srivastava, 1984), which is an extension of the Lucas (1982). The risk premium is considered to be a function of the conditional covariance of the inter-temporal marginal rates of substitution.[7] Under the null, the joint hypothesis, the risk premium is equal to zero, forward premium equals to unity, and the residuals of the regression exhibit stationarity. The findings of the study reject the unbiasedness hypothesis for the currencies of the United Kingdom and Japan. Weak evidence of rationality is provided for the currencies of Germany, France, and Switzerland. The risk premiums obtained ranged from positive to being significantly below zero. They justified the inconsistencies to the possibility of time varying risk premium.

Hodrick (1989) derives a theoretical model for the risk premium in the forward foreign exchange market. The model is a modified version of Svensson (1985a,b). The empirical specification utilizes a general GARCH model, and imposes a smoothing technique following the Box-Jenkins approach.[8] The squared

(7) This is in line with such optimizing models of risk premium as those by Stockman (1978) and (Frenkel and Razin, 1982). In these models, risk premium depends on the concavity of the utility function and the probability distributions of the exogenous processes.

(8) Please see Bollerslev (1986) for a discussion of the GARCH model.

value of the expected forward premium is included as an exogenous variable in the conditional variance equation. Using the Likelihood Ratio tests with weekly data, the author rejects the null of no time variation in the conditional variance. The author also reported signs of errors-in-variables and warned of the effects of the Locus Critique on these models. He emphasizes the need to maximize the boundaries of the information set used in the estimation process, by including relevant exogenous macroeconomic in the regression and variance equations.

The Model

The model assumes that economic agents are risk averse, in the sense that they have concave utility functions. Further, it is assumed that expectations are rational, and trading in the foreign exchange market is continuous. The empirical specification is initiated by using the following equation:

$$S_t = -\rho_{t-1} + f^t_{t-1} + \gamma_1 z_{1t} + \gamma_2 z_{2t} + \cdots + \gamma_n z_{nt} + \varepsilon_t \quad (8)$$

Where "s_t" is the of the spot rate, "γ" is a vector of coefficients to be estimated representing the covariance structure between the dependent and independent variables for "n" relevant macroeconomic variables "z". The term "f" is the forward rate at time "t" set at time "t-1", "ρ" is the risk premium, and "ε" is an error term. The independent variables include such variables as foreign exchange rates, money supply, and foreign and domestic interest rates among others.

Now by lagging Equation (8) one period the following relationships is produced:

$$S_{t-1} = -\rho_{t-2} + f^{t-1}_{t-2} + \gamma_1 z_{1(t-1)} + \cdots + \gamma_n z_{n(t-1)} + \varepsilon_{t-1} \quad (9)$$

Subtracting Equation (9) from Equation (8) produces the following news model:[9]

$$S_t - S_{t-1} = (-\rho_{t-1} + \rho_{t-2}) + (f^t_{t-1} - f^{t-1}_{t-2}) + \gamma_1(z_{1t} - z_{1(t-1)}) + \gamma_2(z_{2t} - z_{2(t-1)}) + (\varepsilon_t - \varepsilon_{t-1}) \quad (10)$$

Equation (10) is slightly different from the general form used in the literature in the way the forward and risk premium rates are introduced in the model. Thus, if economic agents are rational and risk averse, then the coefficient of risk premium is expected to be zero, as long as it is not time varying. Moreover, since the variables are in the first difference form, the coefficient of the forward rates is expected to be zero. In other words, past

(9) For a simple presentation of the news models, please see Copeland (1994).

news about and forward rates should not impact current changes in exchange rates. Current innovations, however, may impact the spot rate.

Further, given the assumptions that volatility is serially correlated and economic agents are risk averse, the following GARCH (1,1)-M model is used:

$$S_t = c_0 + \mu_1 h_t + \mu_2 F_{t-1} + \sum_{i=1}^{n} \mu_{i+2} Z_{ti} + \varsigma_t, \quad (11)$$

$$h_t = c_1 + \kappa_1 \varsigma_{t-1}^2 + \kappa_2 h_{t-1} + \sum_{i=1}^{n} \kappa_{i+2}\{f(Z_{ti})\} \quad (12)$$

The use of capital letters in Equations (11) & (12) is meant to convey that these symbols refer to first difference series.[10] Within such a model, a test of rationality might be performed by testing the null that $\mu_1 = 0$ and $\mu_2 = 0$ and that the residual is not serially correlated.

Methodology

The regression equation used in the estimated process is shown below:

$$S_t = c_0 + \mu_1\{c_1 + \kappa_1 \varsigma_{t-1}^2 + \kappa_2 h_{t-1} + \sum_{i=1}^{n} \kappa_{i+2}\{f(Z_{ti})\}\} + \mu_2 F_{t-1} + \sum_{i=1}^{n} \mu_{i+2} Z_{ti} + \varsigma_t \quad (13)$$

and,

$$\varsigma_t \sim N(0, h_t)$$

Equation (13) states changes in the spot rates might be explained by a constant intercept, unanticipated changes in risk premium, the forward rate, and is a function of other relevant variables. Further the forward rates are replaced by the spot rate that prevailed when the forward rate is set.[11] The current innovations of the fundamentals, Z_i, are first difference of daily observations that extends from the beginning of 1993 till January 1996.[12] These variables include currency issued, the Mark/dollar exchange rates, the Yen/dollar exchange rates, and the one-month interest rates on deposits denominated in Dollars and dinars.

If risk premium is fixed or non-existent, then the coefficient of risk premium is expected to be insignif-

(10) Similar specifications have been used in the literature extensively. See for instance (Campbell and Hentschel, 1991).

(11) There is no forward market for the Kuwaiti dinar, and no expert opinion polls or market surveys for expected changes in exchange rates. Besides, modeling exchange rates changes as a random walk process has been advocated in the literature in light of the disappointing performance of forward rates, even in the presence of a forward market. See Copeland (1994), chapters 11 and 12.

(12) See Exhibit (1) for a detailed description of the data set.

icant. A positive and statistically significant coefficient conveys the possibility of a time varying risk premium. The coefficient of forward rates is expected to be insignificant. This is because the informational content of these variables is based on the data sets available at times "t-1" and "t-2", which are expected to be orthogonal to the information set at time "t". The coefficient of the money supply is expected to be positive, since the unanticipated increase in money supply leads to an unanticipated depreciation of the local currency caused by the unanticipated increase in capital outflows.

The coefficients of foreign exchange rates are expected to be positive. In essence, it is assumed that the price of the domestic currency is inversely related to the prices of the Deutsche mark and Japanese ten. Further, an increase in foreign and domestic interest rates is expected to depreciate the local currency.[13] Hence, the coefficient of the inverse of interest rates should be negative. The variance equation is expected to yield coefficients that are positive, except for the coefficient of foreign interest rates, which is in the reciprocal form.

Empirical Results

The results of the mean equation are shown in the upper portion of Table (1). In line with the literature on financial data, the estimated standard error and the covariance matrix are adjusted according to the method outlined in (Bollerslev and Wooldridge, 1992). This procedure assures that the covariance matrix is consistent, even if the error term is not normally distributed; a necessary condition is a correctly specified model.

But before we discuss the results obtained, it is worthwhile to examine the robustness of these estimates.[14] First, since these types of models tend to exhibit serial correlation, therefore, a Lagrange Multiplier test as outlined in Godfrey (1988) is used.[15] As shown in Exhibit (2), the results indicate that there are no signs of serial correlation. Further, Exhibit (3) shows the distribution of the standardized residuals. The geometric mean is not significantly dif-

(13) This is in line with the assumptions of covered interest parity theorem.

(14) It seems that there were some predictable components in the estimates that are not explicitly accounted for, which was reflected by the existence of serial correlation. This necessitated the application of the Box-Jenkins approach to remove these predictable components. After filtering, the residual turned out to be white noise.

(15) For further discussion, please see (Ljung and Box, 1979) and Harvey (1990, 1993).

ferent from zero, and the standard deviation is practically equal to unity. These are indications that the model is well specified.

Further the null that $\mu_1 = 0$ and $\mu_2 = 0$ is carried out using the Wald test, the results did not reject the null.[16] Hence, the estimates obtained support the notions of rationality and market efficiency. The coefficient of the money supply is positive and significant at the 10% significance level. Algebraically, however, it is relatively small. The unexpected changes in the German mark and the Japanese yen significantly impact the local exchange rates.

By calculating the elasticity around the mean, it is found that a 1% depreciation of the dollar against the Japanese yen results in a depreciation of the local currency against the yen by about .87%, which is not significantly different from one-percent. Similarly, a one-percent depreciation of the dollar against the Deutsche mark leads to a depreciation of the local currency against the mark by .63%; this coefficient is also not significantly different from one-percent.

Consequently, the Kuwaiti dinar is practically pegged to the dollar in the long run, but exhibits significant deviations in the short run. The slightest movement in the dinar/dollar rates reflects relatively large changes in the major currencies against the dollar, see Table (2) below.

Table 1
The regression results of the GARCH (1,1)-M model:

$$S_t = C_0 + \mu_1 h_t + \mu_2 F_t + \mu_3 M_t + \mu_4 S_{tJY} + \mu_5 S_{tDM} + \mu_6 \Delta(1/i^*) + \mu_7 \Delta(1/i) + \zeta_t$$

Symbol	Coefficient	Standard Error	Z-Statistic	P-Value
C_0	-0.013587	0.006493	-2.092466	0.0364
μ_1	-0.049408	0.186821	-0.264465	0.7914
μ_2	-0.026909	0.023296	-1.155052	0.2481
μ_3	0.001221	0.000600	2.036794	0.0417
μ_4	0.190029	0.012614	15.06486	0.0000
μ_5	17.95792	0.803781	22.34180	0.0000
μ_6	-0.017292	0.083873	-0.206169	0.8367
μ_7	-22.52547	5.084429	-4.430285	0.0000
AR(2)	0.819699	0.062510	13.11311	0.0000
AR(3)	0.046501	0.015781	2.946686	0.0032
MA(2)	-0.769591	0.074775	-10.29215	0.0000

(16) (Kadhim and Almahmeed, 1990) utilized lower frequency data and reported that the domestic exchange rates are serially correlated. Pippenger (1991), on the other hand, reported that the forward rates and the future spot rates are not significantly different in the long run, implying that risk premia might be zero and that the market is efficient.

Table 1 (Cont)

Variance Equation

$$h_t = C_1 + \kappa_1 \zeta_{t-1}^2 + \kappa_2 h_{t-1} + \kappa_3 F_t^2 + \kappa_4 M_t^2 + \kappa_5 S_{tJY}^2 + \kappa_6 S_{tDM}^2 + \kappa_7 \Delta(1/i^*)^2 + \kappa_8 \Delta(i)^2$$

Symbol	Coefficient	Standard Error	Z-Statistic	P-Value
C_1	-1.47E-05	2.13E-05	-0.689690	0.4904
κ_1	0.165871	0.064441	2.573980	0.0101
κ_2	0.343278	0.043702	7.854979	0.0000
κ_3	0.036926	0.019400	1.903439	0.0570
κ_4	2.37E-06	4.24E-06	0.559009	0.5762
κ_5	0.021040	0.004261	4.937290	0.0000
κ_6	7.565722	10.21158	0.740896	0.4588
κ_7	-1.249022	0.340897	-3.663929	0.0002
κ_8	0.491284	0.226600	2.168062	0.0302

Other Relevant Statistics

R-squared	0.703077	Mean of dependent variable	-0.005461
Adjusted R-squared	0.695453	S.D. of dependent variable	0.384409
S.E. of regression	0.212139	Akaike information criterion	-1.121229
Sum of squared residuals	33.30217	Schwarz criterion	-0.999299
Log likelihood	446.0669	F-statistic	92.22236

Inverted AR Roots .93 -.06 -.88

Inverted MA Roots .88 -.88

Table 2

Some Relevant Statistics of Domestic and Foreign Exchange Rates

	JY/USD	DM/USD	KD/USD
Mean	102.45	1.57	299.15
Minimum Price	125.95	1.76	307.55
Maximum Price	80.1	1.35	289.47
Maximum Rate of Change	0.572409	0.303704	0.062459
Standard Deviation	8.97	.118	2.64
Kurtosis	3.5	1.68	5.04

As the table shows, the variability of the Kuwaiti dinar against the dollar is much smaller than the variability of the dollar against the major currencies. Hence, the dinar must be highly variable against the other major currencies in order to maintain parity among these currencies.[17] This is an indication that the local currency might be effectively pegged to a basket of currencies, and the dollar might be the dominant currency in this basket, as one would expect.[18] This finding refutes the presumption that the local exchange rate system is fixed.

The unanticipated increase in domestic interest rates is expected to cause the local currency to depreciate; this is line with the monetary theory. Further, as expected, an increase in the reciprocal of domestic interest rates leads to an appreciation of the local currency. Foreign interest rates, however, do not significantly impact the local exchange rates.[19]

The results from the variance equation show that the sum of the ARCH and GARCH components is significantly less than unity. This implies that volatility of domestic exchange rates does not tend to persist. Further, the long-term constant variance is insignificant, implying that the market on average is stable. The variability of lagged domestic exchange rates is found significant at the 10% significance level and exhibit positive correlation with the conditional variance. The coefficient of the variability of money supply is found to be statistically insignificant. Among the foreign exchange rates, only the volatility in the yen-dollar market seems to impact the conditional variance. Lastly, higher volatility in domestic and foreign interest rates is positively correlated with the conditional variance. Thus, volatility in the domestic market is influenced by domestic and international variables.[20]

Consequently, the interaction between the local and the foreign financial markets might lead the monetary authority in Kuwait to decrease the price of its currency against the dollar, when the U.S. markets heat-up. A strong performance of the U.S. markets is expected to create an upward pressure on domestic interest rates, since the Fed is expected to increase the cost of borrowing to reduce inflationary pressures. Similarly, the

(17) For a discussion of the basket peg, see for instance, Takagi (1988).

(18) Since 1993, the imports from the U.S. markets constitute roughly 60% of total imports.

(19) This might be attributed to the high correlation that is expected to exist among the independent variables.

(20) For a discussion of the inclusion of relevant variables in the variance equation, see Attanasio (1991).

monetary authority is expected to allow the currency to marginally appreciate against the dollar when the U.S. economy is sluggish. This reduces domestic interest rates, since the U.S. rates are expected to fall.

Currently, however, it is not clear to the public on what basis the Central Bank of Kuwait conducts its monetary policy, since the monetary authority does not have any announced economic targets. This is complicated by the fact that the basket weights are also not revealed. The evidence, however, seems to indicate that the price of one dollar in the domestic currency is, on average, about 0.300 Kuwaiti dinar. The maximum variation in the KD/$ exchange rate during the period under study does not exceed 6.25%. Therefore, it seems that the KD is, on average, pegged to the dollar at $3.33 for a unit of the domestic currency.

In the short run, however, domestic interest rates do not seem to be well aligned with the U.S. rates. This is concluded because the interest rate differentials, between domestic and foreign interest rates, are found to be nonstationary.[21] Further, as Table (3) shows, the interest rates differentials between the local currency and the Kuwaiti dinar declined significantly after the end of 1993.

The large spread, in the first period, might be attributed to the eagerness of the central bank upon liberation to attract capital inflows to the local economy to help finance the budget deficit and the reconstruction efforts. Nevertheless, whether or not the domestic interest rates are aligned with the U.S. rates is a topic for future research.

Conclusion and Implications

The overall evidence seems to indicate that risk premium is constant or nonexistent, and economic agents exhibit rational behavior. The exchange market is found to be efficient, in the sense that past news does not impact current changes in the domestic spot rate. The study also reveals that the dinar exhibits low variation against

Table 3
The Interest Rates Differential During the Period Under Study

Period	Interest Rates Differentials
3/1/93-31/1/94	3.8%
3/1/94-25/1/96	1.49%

(21) This, however, does not rule out the possibility that foreign and domestic interest rates might be cointegrated in the long run.

the dollar, but it is highly variable against other major currencies.[22] This is because the domestic currency is freely convertible, hence, the cross rates of the dinar with the other major currencies must exhibit approximately the same degree of variations that exist in the major markets if parity among the major currencies is to be maintained in the local exchange market.

This has an important implication on the currency risk that domestic agents face. In other words, it is less risky for local economic agents to transact with the rest of the world using the U.S. dollar rather than other major currencies.[23] Hence, assuming that the exchange rates policy remains unchanged, it is advocated that the dollar be used almost exclusively for international trade. Local investors, wishing to invest abroad, are also advised to invest in the American markets or in dollar denominated assets.[24]

Further, it seems reasonable that the monetary authority maintains a relatively stable exchange rate with the dollar, since the value of imports denominated in the U.S. dollar dominates the total value of imports. More importantly, it is also justified on the grounds that almost all the country's foreign income is denominated in dollar. As a consequence of such monetary policy, the local economy is strongly connected with the U.S. economy. When, the dollar appreciates, real purchasing power of the oil revenue increases, and the reverse takes place when the dollar depreciates against the major currencies.

It is imperative that the monetary and fiscal policy be coordinated so that such policy of parity might be feasible in the long run. First, it is suggested that the monetary policy maintains a rate of inflation equals to that which prevails in the U.S. markets. This is expected to take place automatically, at least, in the tradable goods sector, given that Kuwait has a small and a relatively open economy.[25] Real economic activity in the U.S. market should also be an important economic target. A significantly lower real economic growth in the local economy relative to that in the U.S. will eventually lead to the depreciation of the local currency and prices will significantly increase. To accomplish such ends, better coordination

(22) See Exhibit (4) for some relevant statistics for the dinar/dollar exchange rates.

(23) Most of the government's portfolio of assets is invested abroad in dollar denominated assets.

(24) It is implicitly assumed that the real rates of return are equated across countries.

(25) The Kuwaiti economy has a relatively more open current account as compared with the capital account. This is because of the regulations imposed on the commercial banking sector, especially with respect to their ability to transact with the rest of the world.

between the monetary and fiscal policies should be established. Relevant domestic macroeconomic data should be available in a timely manner, if policy makers are to maximize the effectiveness of their policies. This is particularly so for data on such variables as changes in the growth rates of the different sectors in the economy, unemployment rates, and inflation rates, among others.[26]

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(26) Most of this information is supposed to be published monthly, quarterly, and yearly by the Ministry of Planning and other government agencies, but is usually available weeks if not months after the due date.

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الملخص

سلوك سعر العملة لدولة نفطية غنية وتداعيات ذلك على كفاءة السوق والسياسة النقدية

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تم استخدام نموذج الأخبار في إطار المقدر الإحصائي (Garch-M) لدراسة سلوك أسعار الصرف للعملة المحلية. ودلت النتائج على أن سوق العملات الكويتي يتصف بالكفاءة، وأن الدينار والدولار مترابطان على المدى الطويل، بينما سعر الدينار متغير بالنسبة إلى العملات العالمية الأخرى. أما على المدى القصير، فإن هناك تغيراتٍ ملموسة في سعر الصرف بين العملة الكويتية والدولار. لذلك يمكن الاستنتاج أن سعر العملة المحلية مربوط بسلة عملات وأن الدولار هو العملة الرئيسية في هذه السلة. ومن هنا يمكن التوقع أن التجارة الدولية والاستثمارات الخارجية الكويتية ستكون منحازة للأسواق الأمريكية. ولا يمكن أن تستمر سياسة تسعير العملة المحلية بهذا الشكل على المدى الطويل إذا كان النمو الحقيقي في الاقتصاد المحلي يقل بصورة ملموسة عما يماثله في الولايات المتحدة. لذلك على محددي السياسة النقدية والمالية العمل على توافق النمو الحقيقي في الدولتين عبر الزمن.

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Exhibit 1

This Exhibit briefly describes the source of the data and defines the variables used in the empirical model. The daily data used are obtained from the Central Bank of Kuwait and spans the period from January 1993 to January 1996. The variables used in the regression model are:

i: the daily average of one month customer deposit rates, denominated in the Kuwaiti dinar, which is based on the daily transactions of the banking system in Kuwait.

i*: the one month customer deposit rates, denominated in the US dollar, which are based on the daily transactions of the banking sector in Kuwait.

s_{tDM}: the average price of one dollar in Deutsche marks, DM/$, and is calculated as the average daily exchange rates, based on the transactions of the Central Bank of Kuwait with domestic and foreign banks.

s_{tJY}: the price of one dollar in Japanese yen, JY/$, and is calculated as the average daily exchange rates, based on the transactions of the dealing room of the Central Bank of Kuwait with domestic and foreign banks.

s_t: the price one dollar in the Kuwaiti currency, KD/$, and is calculated as the average daily exchange rates, based on the transactions of the dealing room of the Central Bank of Kuwait with domestic and foreign banks.

m_t: value of currency issued, which includes cash with local banks and currency in circulation, in million of dinars.

Exhibit 2

The Ljung Q-statistic Test with 36 Lags is Tsed to Test for Serial Correlation

	AC	PAC	Q-Stat	P-value
1	-0.027	-0.027	0.5426	
2	0.022	0.021	0.9035	
3	0.023	0.024	1.3059	
4	0.010	0.011	1.3879	0.239
5	0.036	0.036	2.4004	0.301
6	0.012	0.012	2.5020	0.475
7	-0.059	-0.061	5.2163	0.266
8	-0.001	-0.007	5.2170	0.390
9	0.038	0.039	6.3319	0.387
10	0.023	0.027	6.7354	0.457
11	-0.041	-0.041	8.0203	0.431
12	0.067	0.067	11.485	0.244
13	-0.023	-0.019	11.907	0.291
14	0.066	0.057	15.281	0.170
15	0.007	0.005	15.316	0.225
16	-0.039	-0.035	16.514	0.222
17	0.009	0.003	16.572	0.280
18	-0.001	-0.006	16.572	0.345
19	0.005	0.008	16.594	0.412
20	0.006	0.005	16.618	0.481
21	-0.023	-0.016	17.020	0.522
22	-0.057	-0.062	19.587	0.420
23	0.032	0.028	20.391	0.434
24	0.008	0.004	20.445	0.493
25	-0.030	-0.019	21.140	0.512
26	-0.058	-0.066	23.816	0.414
27	-0.006	-0.005	23.844	0.471
28	0.031	0.034	24.597	0.485
29	0.047	0.041	26.317	0.446
30	-0.082	-0.071	31.673	0.244
31	0.013	0.016	31.814	0.282
32	0.029	0.029	32.483	0.299
33	0.017	0.007	32.705	0.335
34	0.028	0.034	33.335	0.354
35	0.009	0.019	33.399	0.399
36	-0.067	-0.057	36.977	0.290

Exhibit 3
Histogram of the Standardized Residuals

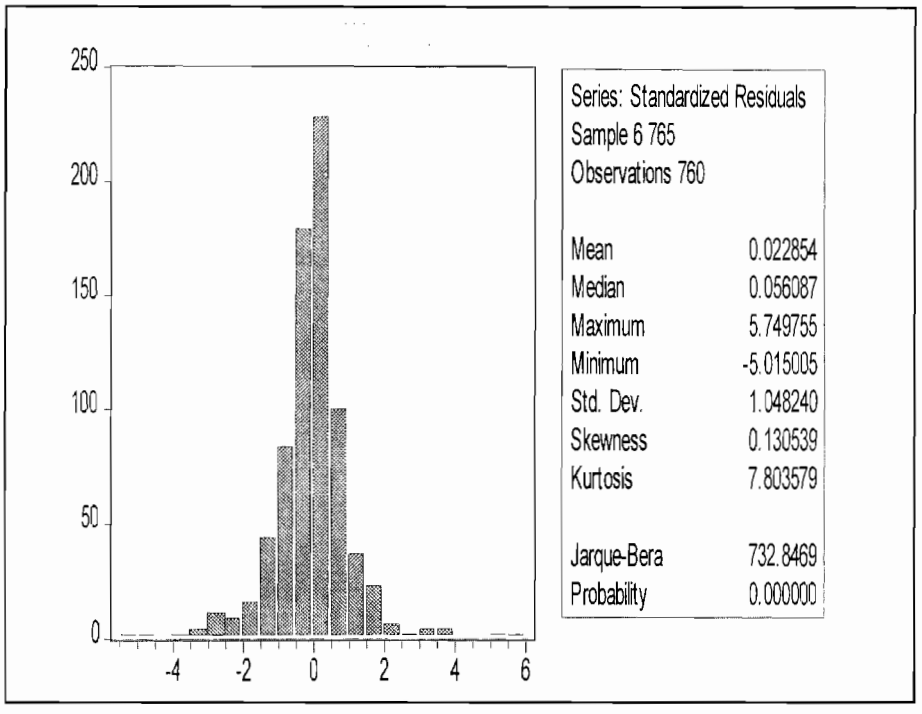
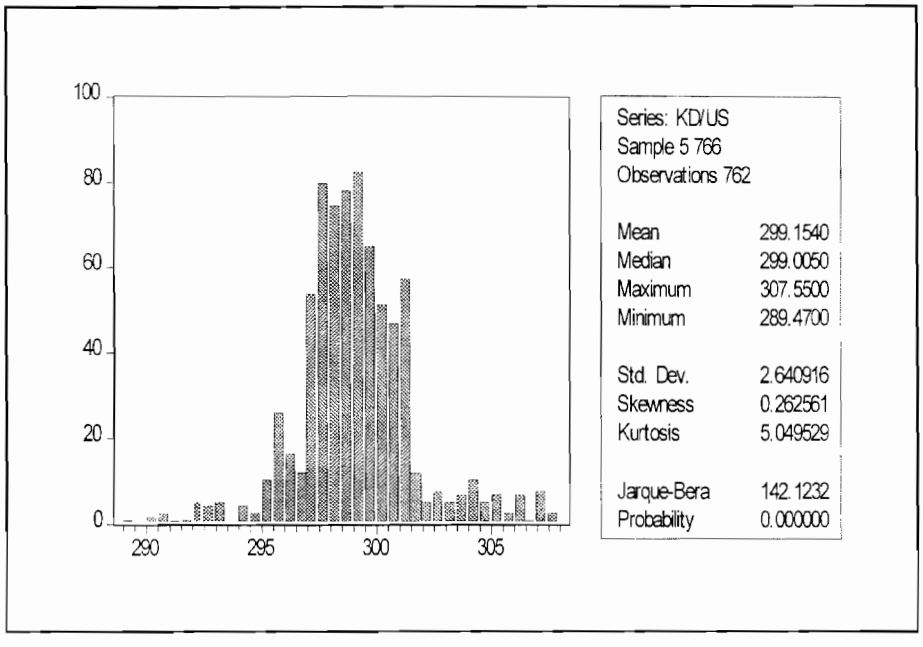


Exhibit 4
The Frequency Distribution of KD/dollar Exchange Rate



مجلة الشريعة والدراسات الإسلامية

علمية محكمة تعنى بالبحوث والدراسات الإسلامية
فصلية تصدر عن مجلس النشر العلمي في جامعة الكويت

رئيس التحرير: الأستاذ الدكتور: عجيل جاسم النشمي

صدر العدد الأول في رجب ١٤٠٤ هـ - ابريل ١٩٨٤م

* تهدف إلى معالجة المشكلات المعاصرة والقضايا المستجدة من وجهة نظر الشريعة الإسلامية .
* تشمل موضوعاتها معظم علوم الشريعة الإسلامية : من تفسير ، وحديث ، وفقه ، واقتصاد وتربية إسلامية ، إلى غير ذلك من تقارير عن المؤتمرات ، ومراجعة كتب شرعية معاصرة ، وفتاوي شرعية ، وتعليقات على قضايا علمية .
* تنوع الباحثون فيها ، فكانوا من أعضاء هيئة التدريس في مختلف الجامعات والكليات الإسلامية على رقعة العالمين : العربي والإسلامي .
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