FINANCIAL INTEGRATION IN THE GCC STOCK MARKETS: EVIDENCE FROM THE EARLY 2000s DEVELOPMENT PHASE

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The GCC markets are the most advanced in economic reforms in the Middle East and have proceeded solidly towards regional integration during the early 2000s. Some of the GCC markets (for example, Bahrain and the UAE) had made solid progress in their expansion, reforms and openness. Over the period there is evidence of cointegration of the UAE market with the other GCC markets in prices. Causality analysis shows the UAE was the major influence over prices in the Saudi Arabian, Kuwait and Qatar markets. The UAE already presents a strong case to be the regional financial centre if development continues strongly.

1. INTRODUCTION

In their early stages of development and growth to the beginning of 2003, most GCC component stock markets were characterised by solid returns performance. However, issues relating to foreign investment openness, industry governance and transparency contributed to thin trading, lack of liquidity and a lack of informational efficiency throughout the GCC over this early period of development. Change for the better is occurring more quickly in the smaller UAE market where the authorities are taking a more visionary and proactive stance with regard to infrastructure and reform. However, while oil revenues flow strongly; while there remains a huge pool of overseas petro-dollar assets for repatriation; while the wealth is controlled by relatively few players and while new funds in strong oil revenues continue, there seems no immediate pressure for other GCC countries to implement faster macro and micro economic reform.

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Nevertheless, the GCC countries are conscious of the need to strengthen and expand their financial markets in relation to openness, listing, regulatory, trading and settlement procedures, as well as to improve transparency and informational efficiency. The speed at which this is taking place could be greater. The GCC economies have much in common including their growing levels of economic development and trade integration, and also their collective contribution to world oil production. The UAE, led by Dubai in terms of openness, has lately been regarded as the most progressive of the GCC economies as it actively seeks economic reform and diversification.

These issues are investigated over the period of this study through correlation, regression, cointegration and causality analysis. The interest lies primarily in testing the degree of cointegration and thus interdependence of GCC markets as a signal for future formal amalgamation and financial integration of the GCC. The secondary issue is which GCC country would more logically develop into the major financial hub for the GCC and the Middle East. It is posited that the country possessing the greater potential for influence or exogeneity over the other GCC countries would be the logical choice.

In the first part of this study, the particular characteristics of component GCC markets are discussed along with their performance and progress towards economic and market reform. Data, methodology and the model are then explained. This leads to the findings in relation to the above issues. In the conclusion, the research questions are answered and comment is made on the past, present and the future. Some of the opinions expressed are based on anecdotal and other evidence. (For example, comments provided in local financial press, UAE and GCC stock market websites, and various non academic business publications over the years from 2001 to 2005 such as, Dudley, 2004).

2. BACKGROUND

The GCC stock markets have performed soundly in returns over the three year period of establishment and growth to early 2003[2]. Performance has been underpinned by several important factors.

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[2] See Footnotes 7 to 12 in the following pages. One-year returns for the UAE were at 18.2% exceeded those of the largest market of Saudi Arabia, which were at 9.4% and those of the well developed Bahrain market which were at 7.4% and approximate the composite GCC returns which were at 18.4% as at January 2003.

Substantial investment from governments and institutions and wealthy individuals reinvesting overseas capital in the region occurred over the period. Development of physical infrastructure has been assisted in a large part by labour cost competitive advantages and facilitated, at a technical and management level, by imported Western expertise. Petro-dollars held in the West in equities, bank deposits, property or cash were returned to the region in greater volumes and local financial institutions, gained the skills necessary to effectively manage these funds. Revenues derived from oil and other industries were not and are not being invested internationally to the same extent as before year 2000. Subsequently to the period of study, high oil prices to mid 2006 continue to generate substantial cash flows within the GCC.

In most countries in the GCC, factors such as lagging domestic and political reforms, government interference and inflexible monetary policies had tended to block the globalisation, and foreign direct investment processes (Shachmurove, 2003). Desirable objectives of expanding stock market trading and informational efficiency had been frustrated. In the UAE, the innovative solutions of "one country, two systems" with maximum utilisation of free zones seemed to gather strength. The view is probably held in the more progressive countries of the GCC, such as the UAE, that theocracy or benevolent autocracy can co-exist with economic and financial democracy.

Country reports suggest that the development of financial markets in some centres is on the right track (For example, the UAE and Bahrain). Bahrain has long been established as one of the leaders in the Middle Eastern region with established international financial markets in both debt and equity, though it has probably declined in size and importance over the past decade. In the UAE it is recognised by government that there is need for continued macro and micro economic reforms so that the best features of a modern financial system may be captured over time (Arab Financial Analysis Network, 2003 and Country Analysis Briefs, 2002).

This study builds on previous work in regional market efficiency undertaken by, for example, Rao and Shankariah (2003), who endeavoured to develop strategies for component GCC stock markets. Apart from their findings that these markets were neither developed nor

informationally efficient, their view was that the GCC component markets needed to build on the experiences of developed financial markets. The UAE is a leader in this endeavour. Better networking, cooperation and the creation of investor awareness are being seen as important. The simultaneous listing of GCC countries in order to reduce the "thin trading" problem introduced several years ago (from year 2003) is a step in the right direction towards full financial integration.

2.1. RECENT DEVELOPMENTS TO 2003

Some of the reasons for the retention of new funds and the repatriation of overseas petro-dollar investments back to the GCC stock markets are as follows:

1. Western economies and stock markets have suffered over recent years with factors that include an over-heated "dot com" market (For example, the paring back of the extraordinarily high price to earnings ratios with many "hi tech" companies listed on the NASDAQ); corporate governance and agency issues (For example, the negative perceptions of the markets induced by the failure of companies such as Enron and Worldcom) and the weakness of the US Dollar during 2003 (this has continued to mid 2005)[3].

2. United States interest rates fell substantially during 2002/2003 in an attempt to "kick start" a less than robust economy. More recently from mid 2005 to mid 2006, USA rates have started to rise. This is partly due to inflationary expectations, but also due in part to the need to continue to fund a bourgeoning current account deficit. In turn this has probably been exacerbated by the repatriation of Middle Eastern financial assets.

3. Political risk factors have played a part in the US economy. Investors from GCC may have become reluctant to invest in the West following the terrorist attacks of "9/11". An anti-USA sentiment in some parts of the region has increased in intensity in the wake of the wars in Iraq and Afghanistan and the continuing conflict between Israel and Palestine and Lebanon. In addition,

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[3] The exchange rate problem was in part a function of the health of the US economy; the current account deficit in the US and political factors following the "9/11" terrorist attacks. It may have also resulted in a significant increase of the pace of redemption and return to the region of realised overseas petro-dollar assets.

fears of the West freezing Arab assets have become greater. The rationale for this is that Western authorities might try to attach blame for terrorist acts to innocent Arab investors or perhaps initiate class actions against Arab investors.

4. Oil prices have climbed in the period of the study to 2003 (prices remained high reaching in excess of USD75 per barrel by mid 2006). GCC Government budget surpluses have burgeoned. Governments had more funds to invest and business benefited from government spending and faster payments for services and goods purchased by governments.

5. Countries such as the UAE had taken positive steps towards diversification of their economy away from oil sector reliance.

3. MACRO AND MICRO ECONOMIC REFORMS

Economic reforms including improved governance and transparency are gradually being introduced commencing over the period of the study. Some of these steps and trends are as follows:

1. The concept of independent stock exchange regulation has been recognised as a way to reduce problems of poor governance and lack of transparency, which could lead in turn to insider trading and agency problems (For example, Saudi Arabia introduced a Capital Markets Law in 2003, transforming their stock market to a formal market with the exchange to be regulated by a Securities and Exchange Commission. Bahrain's exchange has been regulated through the Central Bank).

2. There has been an increase in the types of equity and debt instruments tradeable in GCC money and capital markets and there has been a growing pace privatisation (For example, the successful float of Saudi Telecom in late 2002; The UAE Airline has issued Dinar and US Dollar bonds, which have been quoted in Dubai financial markets; Bahrain has issued short term government treasury instruments, which are liquidity backed and tradeable in money markets).

3. The GCC stock markets opened up within the GCC and in the UAE have permitted limited access to their markets by foreigners. Substantial Saudi Arabian and Iranian investments

are said to have been made in the UAE and particularly in Dubai share and property markets.

4. New stock exchange indices have been developed that are representative of the component GCC markets to assist in investment and diversification decisions. For example, the Gulf Investment Corporation (GIC) indices of composite and component GCC markets.

4. THE DATA

This study uses daily data from the GIC GCC stock market indices as they are felt to be well considered and formulated stock market benchmarks. In establishing their indices some six or seven years ago, the GIC provided evidence that the GCC GIC Composite Index had increased from around 1000 in January 2000 to around 1600 in January 2003. Volumes of shares traded showed an increase from a peak of around USD100, 000,000 in January 2000 to a peak of around USD220, 000,000 in January 2003. The markets have since continued to grow through 2003 to late 2005. The GIC elaborated on their efforts to design, implement and maintain their indices[4] to provide reliable regional performance benchmarks. The object being to assist investors to assess risk and return relationships and also to assess the benefits of portfolio diversification.

The GIC emphasise their objectivity, and claim that their indices are consistent and possess a globally accepted calculation methodology. They note that a true reflection of the regional asset mix over the period of the study required that banking and Saudi Arabian stocks are a substantial percentage of the indices. In addition they stated that the indices are suitable for both fundamental and technical analysis. They use official sources for trading data and corporate actions in their calculations.

Securities are selected for inclusion on the basis of their actual trading liquidity (as opposed to large ownership transfer transactions). Included stocks need to have adequate market representation and be reassessed

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[4] All indices are US. Dollar based and weighted according to the market capitalisation of the included companies.

quarterly. The prime concern of the GIC, when considering additions or deletions of indices constituents is continuity and reduction in turnover. For example, a security that is not a constituent must satisfy all inclusion criteria over at least two out of three consecutive quarters before it qualifies for addition to the indices with the reverse applying to deletions. This rule reduces turnover in the indices and provides improved predictability. It also provides greater index stability.

Where needed, subjective decisions are made based on the spirit of the objectives. To demonstrate transparency and provide predictability a policy of pre-announcing all quarterly changes to index series two weeks in advance is adhered to (GIC, 2003a and 2003b). Government ownership of shares is excluded from indices calculations. The GIC Composite Index is made up of a market capitalisation weighted addition of all GIC Country Indices for the GCC States of Bahrain, Kuwait, Oman, Qatar, Saudi Arabia and the UAE. As at January 2003, Saudi Arabia dominated with 50.9% of the total weightings followed by Kuwait (24.5%), the UAE (14.5%), Qatar (5%), Bahrain (3.7%) and Oman (1.4%)[5]. In this study level series prices indices data are obtained from GIC indices for each of the GCC component markets as well as from the GIC Composite Stock Market Price Index.

Appendix 1, Table 1 shows a comparison of the UAE with other GCC markets and illustrates the strength of Saudi Arabian and banking stocks in the region and in the GIC Composite Index as sourced from GIC (2003a and 2003b). The oil royalties to the UAE and GCC are substantial and Saudi Arabia is the largest oil producer in the region. Immense regional petro-dollar cash flows are processed through UAE and other GCC owned banks. Over the period of the study all GIC GCC component indices [6] were between 90% and 97% correlated with their official stock market indices in each GCC country.

This adds credibility to the acceptance and analysis of the data supplied by GIC (also refer to Bahrain Stock Market, 2003; Kuwait Stock

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[5] In January 2003 the GIC Composite Index contained 90 companies with a total private sector market capitalisation of USD77 billion and an average daily turnover of USD 140 million in the preceding quarter. The one-year return was 18.4% and the three-year annualised return was 16.6% (GIC, 2003a and 2003b).
[6] All index data are as at the end of January 2003.

Market, 2003; Oman Stock Market, 2003; Qatar Stock Market, 2003; Saudi Arabian Stock Market, 2003; UAE Stock Market, 2003)[7]. It is evident that the GIC has designed realistic and objective benchmark indices for the region.

In late 2002, the Bahrain GIC index contained 10 companies with a total private sector market capitalisation of USD2.8 billion and an average daily turnover of USD0.5 million over the quarter ending December 2002[8]. Appendix 1, Table 2 illustrates the dominance of banking stocks in the Bahrain index, as sourced from the Bahrain Stock Market (BSE, 2003) and GIC (2003a and 2003b). Bahrain is the 5th largest market after the UAE and Qatar and as in the UAE, banking stocks predominate.

The UAE GIC Index contained around 15 companies late in 2002 with a total market capital capitalisation of USD11.2 billion and an average daily trading of USD3 million in the quarter ended December 2002[9]. Appendix 1, Table 3 shows the proliferation of banking in the UAE stock market and its consequent representation in the GIC Index as sourced from the UAE Stock Market (2003) and GIC (2003a and 2003b). It is noted that in the UAE telecommunications are very important, followed by banking, real estate and tourism as contributors to the UAE stock market index.

At the same time the Kuwait GIC Index contained 20 companies with a total private sector market capitalisation of USD18.9 billion and an average daily trading of USD72 million in the quarter ended December 2002[10]. Appendix 1, Table 4 shows the dominance of banking in the Kuwait Stock Market as sourced from KSE (2003) and GIC (2003a and 2003b). The Oman GIC stock market index contained 10 companies with a total private sector market capitalisation of USD1.1 billion and average daily trading of USD1.5 million in the quarter ended December

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[7] The indices are calculated daily at market close using Reuter's data and distributed by e-mail. The data are to be published daily in print media and regional news channels (GIC, 2003a and 2003b).

[8] The one-year return of the Bahrain index as 7.4% and the three-year annualised return was –4.3% as at January 2003 (GIC, 2003a and 2003b).

[9] The one-year return was 18.2% and the three-year annualised return was 11.1% as at January 2003 (GIC, 2003a and 2003b).

[10] The one-year return was 26.5% and the three-year annualised return was 27.8% as at January 2003 (GIC, 2003a and 2003b).

2002[11]. Appendix 1, Table 5 illustrates the major contribution of banking in the Oman stock market (MSM, 2003) and GIC index (2003a and 2003b).

The Qatar GIC Index contained 10 companies with a total private sector market capitalisation USD3.8 billion and an average daily trading of USD1.3 million in the quarter ended December 2002[12]. Appendix 1, Table 6 shows that banking is second in importance to telecommunications in the Qatar stock market (DSM, 2003; GIC, 2003a and 2003b).

The Saudi Arabian GIC Index contained 25 companies with a total private sector market capitalisation of USD39.3 billion and an average daily trading of USD65 million [13]. Appendix 1, Table 7 demonstrates that banking is dominant in the Saudi Arabian stock market and in the GIC Index (TASI, 2003; GIC, 2003a and 2003b). A basic market model in both unlagged and lagged data is formulated for the purposes of this study.

The daily data gathered in this study is, as mentioned, from the development and growth period from 1st January 2000 to the 10th November 2003. Level series prices data are analysed using the E Views4 (2001) statistical package, undertaking tests for normality, stationarity, structural breaks, serial correlation and heteroskedasticity of the error terms in subsequent regression and multivariate analysis of basic market models in unlagged and lagged data. Appendix 1, Summary, shows the overall constituents of the GCC component stock markets during the period of the study.

5. THE MODEL

The efficient market hypothesis (EMH) in its strong-form, as formulated by Fama (1971), maintains that share prices will fully reflect all public and private information. With regard to tests for strong-form efficiency,

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[11] The one-year return was 54.8% and the three-year annualised return was –4.2% as at January 2003 (GIC, 2003a and 2003b).
[12] The one-year return was 38.6% and the three-year annualised return was 29.7% as at January 2003 (GIC, 2003a and 2003b).
[13] The one-year return was 9.4% and the three-year annualised return was 12.4% as at January 2003 (GIC, 2003a and 2003b).

the major studies have examined insider trading and the activities of exchange trading specialists. There is generally little support in either developed or developing stock markets for this form of efficiency. The semi strong-form of EMH posits that stock prices will adjust very quickly to the release of public information. Public information includes security market information as well as earnings and dividend announcements, price to earnings ratios, dividend yield ratios, price-book value ratios, stock splits, news about the economy and political news. Results of studies of semistrong-form efficiency (using time series, cross sectional data or event studies) are mixed. Developing stock markets have not achieved this level of efficiency.

However event studies in developed markets (examining events such as stock splits, initial public offerings, and accounting changes) have consistently provided support for semistrong-form efficiency (Reilly & Brown, 2003). The weak-form of efficiency makes the assumption that security prices fully reflect all security market information which includes the historical sequence of prices, rates of return, trading volume data, odd lot transactions, block trades and transactions by exchange specialists (Reilly & Brown, 2003). Moreover, past rates of return should bear no relationship to future rates of return and substantial positive abnormal returns cannot thus be enjoyed.

The results of most statistical tests of independence of time series data (predominantly involving autocorrelation tests) in developed and strongly developing stock markets consistently support the weak-form level of efficiency (Reilly & Brown, 2003). The proposition that GCC markets are either semistrong or strong-form efficient is appropriately not dealt with in this paper. This study focuses on basic or weak-form efficiency utilising statistical tests of independence of daily time series price data obtained from GIC indices.

The first part of the analysis deals with the random walk in prices involved in weak-form efficient share markets. In accordance with the EMH the share price today (P_t) incorporates all relevant information. Price changes between t and $t+1$, will occur because of the arrival of news. News itself is a random variable, being sometimes "good" and sometimes "bad". Forecast errors (e_{t+1}), represented by the difference

between P_{t+1} and $E_t P_{t+1}$, should be zero on average and uncorrelated with today's information available at the time forecasts are made. This describes the property of rational expectations (RE).

Thus;

$$e_{t+1} = P_{t+1} - E_t P_{t+1} = 0 \qquad\qquad 1)$$

Where the implication of zero forecast errors ($E_t e_{t+1} = 0$) is that the forecast of P_{t+1} is unbiased. This is the property of orthogonality. That is, on average, actual price equals expected price and e_{t+1} represents unexpected profit or loss between t and $t+1$. If e_t is serially correlated (ρe_t), the orthogonality property is violated, and is a first order autoregressive process represented by;

$$e_{t+1} = \rho e_t + v_t \qquad\qquad 2)$$

Where;

v_t is white noise (the random element and independent of information at time t).

The assumption of no serial correlation in e is subsumed under the EMH assumption that news today should be of no use in forecasting tomorrow's price. The EMH/RE assumption places no restrictions on the form of the second and higher moments of the distribution of e_t. That is the variance of e_{t+1} may be related to the variance of its past value (the variance of e_t) without violating RE, which only places restrictions on the behaviour of the first moment (that is, expected value) of e_t.

The second part of the study involves the specification of a basic market model in unlagged prices, which is initially tested using OLS regression analysis. Pairwise analysis of each component GCC market against the composite GCC market is considered.

$$P_{i_t} = \alpha_t + \beta_t P_{j_t} + e_t \qquad\qquad 3)$$

Where:

P_{i_t} is the price index value of GCC country i at time t

α and β are the regression intercept and coefficient at time t

P_{j_t} is the price index value of the composite GCC index at time t

e_t is the error tem of the regression at time t (Our main area of interest here is in the error term to the extent that it provides evidence of or of the absence of serial correlation, stationarity and heteroskedasticity).

Then optimally lagged data are examined in a vector autoregressive model (VAR). Based on Granger (1981) findings that financial and economic time series may contain unit roots and in the development of the theory of non-stationary time series analysis, the unlagged regression model is re-specified into a model to implement VAR based tests for both cointegration and causality in optimally lagged data.
The respecified model is as follows:
$$P_{i_t} = a_1 P_{i_{t-1}} + ...a_n P_{i_{t-n}} + bP_{j_t} + e_t \qquad\qquad 4)$$
Where;
P_i is a vector of endogenous variables being price index values for GCC country i (at times t to $t-n$)

P_{j_t} is the vector of exogenous composite GCC price index values at time t

$a_1.....,a_n$ and b are matrices of coefficients to be estimated

e_t is the error term (It represents a vector of innovations that may be contemporaneously correlated but are uncorrelated with their own lagged values and uncorrelated with all of the right hand side variables). Note that this VAR model is expanded in the study to include all component GCC markets.

6. PRELIMINARY ANALYSIS

Descriptive statistics reveal that the level series prices in each series including the GIC composite are not normally distributed. Jarque-Bera test statistics [14] confirm that in each case there are problems with

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[14] Jarque Bera (1987).

skewness and kurtosis, with test statistics significantly different from zero and three respectively and exhibiting long negative tails in the case of skewness and either flatness or peakedness in the case of kurtosis. Chow stability tests were undertaken to investigate whether or not there were structural breaks in the series due perhaps to major global events such as the World Trade Centre (9/11) terrorist attack in 2001 and the conflict in Iraq in 2003. The Chow breakpoint test [15] was undertaken on appropriately sized sub-samples (reflecting the events of November 2001 and March 2003) and the results showed no significant differences in the estimated equations for each sample. Similarly, the Chow forecast test indicated no structural breaks in the data before and after 9/11 and the commencement of the conflict in Iraq.

When the level series data were examined for stationarity and serial correlation using the Augmented Dickey Fuller (ADF) and the Durbin Watson (DW) tests respectively (Dickey & Fuller, 1981; Durbin & Watson, 1971), in each case, the value of the t statistic lay to the right of the critical values and thus a unit root exists and the series were found to be nonstationary. Similarly the error terms of the regression of the level series were found to be nonstationary. With a DW statistic significantly great than 1, serial correlation in the errors of the level series regression was not deemed a problem.

The first difference series and the residuals of the regressions of the first difference series were found to possess bell shaped distributions, but there again problems appeared with positive skewness and peaked kurtosis. The distributions in each case are neither uniform nor normal. These findings detract from the explanatory power of the OLS models. When the first difference series and error terms of the regression of first differences were analysed these were found to be stationary. When DW tests were applied to the errors of the regression the statistic in each case was very close to two. Evidence significant at the 1% level is that no problem existed with serial correlation of the error terms of the first difference regressions (See Appendix 2). White

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[15] Under the Chow breakpoint test (Eviews4, 2001) the F statistic at 294.1853 and the Log Likelihood ratio at 1151.284 were both highly significant with a probability of 0.0000. This means no significant differences in estimated equations.

heteroskedasticity tests were applied to the error terms of the regressions. A limitation of this study is that evidence is quite strong indicating the existence of heteroskedasticity in the error terms of the regressions (See Appendix 2).

7. RESULTS

7.1. Basic Market Efficiency and Interdependence of UAE and GCC Markets

Based on the application of Equations 1 and 2, evidence of market inefficiency in prices is that correlograms of the level series of prices (and associated Q statistics) indicate significant temporal dependence in time series data. (See Appendix 1, Table 8). The order of lags was tested from one to thirty six. The results indicated that all series are first order serially correlated. The daily data points for each index are not independent of each other. There is strong evidence that component GCC markets are not weak-form efficient.

Appendix 1, Table 9 illustrates the strong degree of interdependence between the GCC component markets in price values and with GCC composite level series index when the correlations of unlagged level price index data are investigated. Note that the UAE market is the 4th most highly positively correlated with the GCC composite index, following the larger oil dominated economies of Qatar, Kuwait and Saudi Arabia, but is ahead of Oman and Bahrain. The UAE is highly positively correlated with Qatar, then Kuwait, Saudi Arabia, Oman and Bahrain markets, in that order, in unlagged data. This is a basic indicator of stock market interdependence and integration over the period of the study.

7.2. Cointegration and Causality of UAE and GCC Markets

As the first differences series and regression errors (See Equation 3) were found to be stationary and therefore integrated, the study moved to testing the stability of a VAR (1) model (See Equation 4, which included the UAE and all other GCC markets) on one to twenty lags. An AR Root

test showed that the VAR (1) model was stable as all roots lay inside the unit circle[16].

A Johansen (1991) unrestricted cointegration and ranking test was undertaken and the trace and maximum eigenvalue statistics indicated at least one cointegrating equation at the both the 5% sand 1% levels on a 7 period lag (See Appendix 3). The optimal lag of 7 for the VAR was supported by the Wald Chi Squared statistic for lag exclusion. Appendix 4 shows results confirming that the various GCC markets including the UAE have a tendency to move together in prices over time and achieve equilibrium or stability together in the medium to long-term.

Pairwise Granger causality tests were run to test the short-term dynamics of the model. With significance levels set at 10%, the optimal lag is again confirmed (when the F values were highest and the probabilities lowest) on a seven-lag scenario (See Appendix 5). There is no significant one-way or two-way causality between the UAE and Bahrain and the UAE and Oman markets. However, the UAE significantly (at the 1% level) Granger causes Saudi Arabia, Kuwait and Qatar markets.

It is also quite clear from the cointegration and causality results that there is substantial evidence of interdependence in the UAE and GCC markets reflecting greater investment and trade integration over the past few years in the GCC. The UAE market still possesses a degree of exogeneity in some of the GCC markets (For example, the Saudi Arabian, Kuwait and Qatar markets at a 10% level of significance).

8. CONCLUSION

This study has addressed basic informational efficiency, cointegration and causality in the stock markets of the UAE and other states of the GCC during the period 2000 to early 2003 to demonstrate the early development of GCC financial markets. The study analyses both unlagged and lagged price index data over this crucial growth period. The GIC indices are recommended benchmarks for stock market

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[16] The estimated VAR is stable if all roots have modulus less than one and lie outside the unit circle. If the VAR is not stable, some results such as those under impulse response functions may not be valid.

analysis. They are considered representative and are highly correlated with official indices of the various markets.

The evidence in this study shows that UAE and other GCC markets performed strongly in terms of returns whilst still in their development growth stage in the period of three years to early 2003. Though the markets generally were not informationally efficient in prices, they were cointegrated and interdependent in prices and this probably reflects the growing GCC interrelationships in trade and investment over the period.

The study demonstrated, in analysis of optimally lagged price data, that the UAE market possessed the greater endogeneity (independence) of GCC markets. However, in a system involving all GCC markets with the Saudi Arabian market treated endogenously, the UAE is the strongest exogenous force on the Saudi Arabian market (and the second strongest influence on the Kuwait market when the Kuwait market is treated endogenously). This may represent evidence that the UAE market was, at the time, more open, efficient, and progressive and developed than the other GCC markets. It may also represent evidence of the strength of Saudi Arabian investment in the UAE.

A good case may be put forward for the UAE, led by Dubai, to become the hub of any formal amalgamation of GCC stock markets. Dubai above all other GCC economies has demonstrated a commitment for faster macro and micro economic reform and for the rapid establishment of suitable commercial, legal and physical financial infrastructures. The need for diversification of the economy, away from oil reliance, and of the stock markets, away from reliance on telecommunications and banking, has been well recognised in Dubai. The UAE authorities as a whole have demonstrated in the early 2000s that they are proactive and possess the necessary vision and desire for highly successful financial market development.

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APPENDIX 1

SUMMARY

Constituents of the GIC Indices (2003):

Bahrain (Bahtri)

Contains 10 companies with a total private sector market capitalisation of USD10 billion and average daily trading in the last quarter of 2003 of USD0.5 million. The companies in the index represent 63% of the market.

Kuwait (Kutri)

20 companies: Private sector market capitalisation USD18.9 billion: Average daily trading USD72 million: Represents 66% of the market.

Saudi Arabia (Sautri)

25 companies: Private sector market capitalisation USD 39.3 billion: Average daily trading USD65 million: Represents 69% of the market.

Qatar (Qatri)

10 companies: Private sector market capitalisation USD38 billion: Average daily trading USD1.3 million: Companies represent 71% of the market.

The UAE (Emtri)

15 companies: Private sector market capitalisation USD11.2 billion: Average daily trading USD3 million: Representation not available.

Oman (Omtri)

10 companies: Private sector market capitalisation USD1.1 billion: Average daily trading USD1.5 million: Companies represent 61% of the market.

NOTE: The coding names for each market are in parenthesis**.**

Table 1: The Main Composition of GCC stock markets 2000-2003

Company	Sector/country	% Weight in GIC Composite Index
Saudi American Bank	Banking/Saudi Arabia	10.3
Al Rajhi Banking and Investment Corporation	Banking/Saudi Arabia	9.6
National Bank of Kuwait	Banking/Kuwait	6.9
Riyad Bank	Banking/Saudi Arabia	5.7
Al Bank Al Saudi Al Fransi	Banking/Saudi Arabia	5.2
UAE Telecommunications Corporation	**Telecom/UAE**	**5.0**
Saudi Basic Industries Corporation	Industrial/Saudi	4.7
National Bank of Dubai	**Banking/UAE**	**2.7**
Gulf Bank of Kuwait	Banking/Kuwait	2.6
Saudi Electricity Company	Utilities/Saudi	2.5

Table 2: Major Companies in the Bahrain stock market 2000-2003

Company	Sector	% Weight in the GIC Bahrain Index
Bahrain Telecommunications Company	Telecom	24.3
Ahli United Bank	Banking	20.7
Investcorp	Investment	20.1
Bank of Bahrain and Kuwait	Banking	12.8
National Bank of Bahrain	Banking	9.8

Table 3: Major Companies in the UAE stock market 2000-2003

Company	Sector	% Weight in the GIC Index
UAE Telecommunication Corporation	Telecommunications	34.7
National Bank of Dubai	Banking	18.9
Emaar Properties Company	Real Estate	10.0
Abu Dhabi Commercial Bank	Banking	6.0
Abu Dhabi National Hotels Company	Tourism	5.7
Union National Bank	Banking	5.1
Dubai Islamic Bank	Equity Financing	4.4

Table 4: Major Companies in the Kuwait stock market 2000-2003

Company	Sector	% Weight in The GIC Index
National Bank of Kuwait	Banking	28.0
Gulf Bank of Kuwait	Banking	10.7
Commercial Bank of Kuwait	Banking	9.1
Kuwait Finance House	Equity Finance/Banking	9.0
Mobile Telecommunications Company	Telecommunications	8.7
National Mobile Telecommunications Company	Telecommunications	6.5
Commercial Facilities Company	Consumer Finance	5.3
Ahli Bank of Kuwait	Banking	4.4
Burgan Bank	Banking	4.3
Kuwait Real Estate Bank	Banking	2.8

Table 5: Major Companies in the Oman stock market 2000-2003

Company	Sector	% Weight in GIC Index
Bank Muscat	Banking	32.8
Oman International Bank	Banking	23.1
National Bank of Oman	Banking	12.6
Oman International Development and Investment Company	Investment	7.5
Dhofar International Development and Investment Company	Investment	7.0

Table 6: Major Companies in the Qatar stock market 2000-2003

Company	Sector	% Weight in the GIC Index
Qatar Telecom	Telecommunications	35.1
Qatar National Bank	Banking	27.7
Qatar Electricity and Water Company	Utilities	9.8
Qatar National Navigation and Transportation Company	Shipping	6.1
Commercial Bank of Qatar	Banking	5.9

Table 7: Major Companies in the Saudi Arabian stock market 2000-2003

Company	Sector	% Weight in GIC Index
Saudi American Bank	Banking	20.3
Al Rajhi Banking and Investment Corporation	Banking	18.9
Riyad Bank	Banking	11.2
Al Bank Al Saudi Al Fransi	Banking	10.2
Saudi Basic Industries Corporation	Industrial	9.3
Saudi Electricity Company	Utilities	5.0
Saudi Cement Company	Building materials	3.8
Southern Province Cement Company	Building materials	3.0
Makkah Construction and Development Company	Construction	2.8
Yanbu Cement Company	Building materials	2.4

Table 8: Diagnostics of Statistical Tests of Independence 2000-2003

Country Stock Market Prices		Q Statistic (lag order ranges from 1 to 36) on level series prices
Bahrain		**1,397.0 to 38,206.0**
UAE		**1,405.9 to 46,652.0**
Kuwait		1,405.1 to 46,101.0
Qatar		1,405.2 to 46,597.0
Oman		1,403.8 to 44,317.0
Saudi Arabia		1,403.8 to 45,331.0
GIC Composite		1,405.1 to 46,161.0

NOTE: The Q Statistics for level series prices are highly significant (with probabilities in each case of 0.0000). The Q Statistics summarise the significant existence of autocorrelation and partial correlation in level series.

Table 9: Component GCC Level Series Correlations 2000-2003

	Bahrain	UAE	Kuwait	Oman	Qatar	Saudi Arabia	GIC Composite
Bahrain	1.00	**0.62**	0.48	0.79	0.56	0.50	0.53
UAE	0.62	**1.00**	0.92	0.63	0.96	0.88	0.94
Kuwait	0.48	**0.92**	1.00	0.58	0.97	0.96	0.99
Oman	0.79	**0.63**	0.58	1.00	0.66	0.58	0.62
Qatar	0.56	**0.96**	0.97	0.66	1.00	0.95	0.99
Saudi Arabia	0.50	**0.88**	0.96	0.58	0.95	1.00	0.98
GIC Composite	0.53	**0.94**	0.99	0.62	0.99	0.98	1.00

APPENDIX 2

Level and First Difference Series Tests: Stationarity and Serial Correlation 2000-2003

Variable	ADF t statistic	Series	DW statistic
BAHTRI (Bahrain)	0.5165	Level	1.9966
EMTRI (The UAE)	2.1800	"	2.0038
KUTRI (Kuwait)	1.9488	"	2.0002
OMTRI (Oman)	0.6636	"	1.9996
QATAR (Qatar)	2.2583	"	1.9940
SAUTRI (Saudi Arabia)	0.9899	"	1.9921
Regression Residual Level Series	1.2651	"	1.9904
D(BAHTRI) Bahrain	-14.9964	First differences	1.9982
D(EMTRI) The UAE	-13.9633	"	1.9972
D(KUTRI) Kuwait	-17.0817	"	1.9972
D(OMTRI) Oman	-14.7341	"	2.0001
D(QATAR) Qatar	-14.0003	"	2.0027
D(SAUTRI) Saudi Arabia	-16.7395	"	2.0195
Regression Residual First Difference Series	-15.6877	"	2.0282

Note: All results are significant to the 1% level. The 1% MacKinnon critical value (MacKinnon, 1991) for the ADF is –3.4379. With regard to the level series, as ADF t statistic lies to the right of the 1% critical values in each case and the series are nonstationary. In the case of the first difference series and the error term of the first difference regression the ADF t statistic lies to the left and the series are thus deemed stationary. In each case the DW statistic is approximately two indicating that serial correlation is not problematic in the series or in the in the error terms of the regressions of those series.

APPENDIX 3

VAR Lag Order Selection 2000-2003

VAR Lag Order Selection Criteria
Endogenous variables: D(BAHTRI) D(SAUTRI) D(KUTRI) D(EMTRI) D(OMTRI) D(QATRI)
Exogenous variables: C
Sample: 1/01/2000 11/10/2003
Included observations: 1389

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-30014.66	NA	2.39E+11	43.22629	43.24891	43.23475
1	-29851.49	324.6851	1.99E+11	43.04319	43.20152*	43.10240*
2	-29802.84	96.39382	1.95E+11	43.02497	43.31902	43.13493
3	-29775.23	54.45928	1.98E+11	43.03705	43.46682	43.19777
4	-29747.66	54.15220	2.00E+11	43.04919	43.61467	43.26066
5	-29714.88	64.09613	2.01E+11	43.05382	43.75502	43.31605
6	-29665.81	95.53471	1.97E+11	43.03500	43.87191	43.34798
7	-29613.82	100.7456*	1.93E+11*	43.01199*	43.98461	43.37572
8	-29585.59	54.47758	1.95E+11	43.02317	44.13151	43.43765
9	-29556.04	56.75155	1.97E+11	43.03246	44.27651	43.49770
10	-29519.81	69.28450	1.97E+11	43.03212	44.41189	43.54812
11	-29504.90	28.37394	2.03E+11	43.06250	44.57798	43.62924
12	-29481.39	44.55951	2.07E+11	43.08047	44.73167	43.69797
13	-29441.91	74.45955	2.06E+11	43.07547	44.86238	43.74372
14	-29418.38	44.19495	2.09E+11	43.09341	45.01604	43.81242
15	-29380.41	70.95197	2.09E+11	43.09059	45.14893	43.86034
16	-29334.38	85.63285	2.06E+11	43.07614	45.27020	43.89665
17	-29279.84	100.9909	2.00E+11	43.04945	45.37922	43.92071
18	-29262.54	31.88281	2.06E+11	43.07638	45.54187	43.99839
19	-29221.76	74.80796*	2.05E+11	43.06949	45.67070	44.04226
20	-29195.66	47.66499	2.08E+11	43.08374	45.82066	44.10726

* Indicates lag order selected by the criterion
LR: sequential modified LR test statistic (each test at 5% level)
**FPE**: Final prediction error
AIC: Akaike information criterion
SC: Schwarz information criterion
HQ: Hannan-Quinn information criterion

Note: The optimal lag at 7 is selected on the basis of the maximum value of the likelihood ratio (LR)
and the minimum values of the final prediction error (FPE) and the Akaike (AIK) information criteria
(Eviews4, 2001).

APPENDIX 4

Level Series Graphs of Share Price Indices 2000-2003
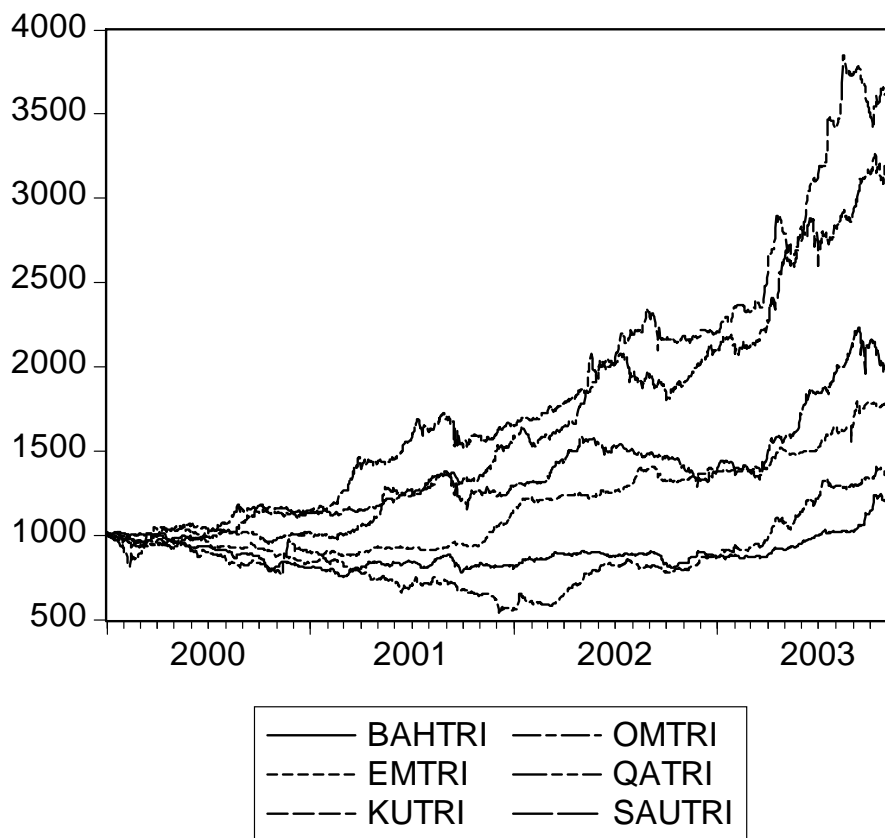
Note: All markets are seen to move more or less together over the period of the study.

APPENDIX 5

Pairwise Granger Causality Tests 2000-2003

Sample: 1/01/2000 11/10/2003
Lags: 7

Null Hypothesis:	Obs	F-Statistic	Probability
D(SAUTRI) does not Granger Cause D(BAHTRI)	1402	3.27922	0.00184*
D(BAHTRI) does not Granger Cause D(SAUTRI)		2.11689	0.03912**
D(QATRI) does not Granger Cause D(BAHTRI)	1402	1.45212	0.18045
D(BAHTRI) does not Granger Cause D(QATRI)		1.57114	0.13974
D(EMTRI) does not Granger Cause D(BAHTRI)	**1402**	**0.91219**	**0.49590**
D(BAHTRI) does not Granger Cause D(EMTRI)		**0.65654**	**0.70908**
D(OMTRI) does not Granger Cause D(BAHTRI)	1402	0.59110	0.76363
D(BAHTRI) does not Granger Cause D(OMTRI)		4.45886	6.4E-05*
D(KUTRI) does not Granger Cause D(BAHTRI)	1402	4.63928	3.8E-05*
D(BAHTRI) does not Granger Cause D(KUTRI)		1.07950	0.37398
D(QATRI) does not Granger Cause D(SAUTRI)	1402	1.83712	0.07652***
D(SAUTRI) does not Granger Cause D(QATRI)		2.48089	0.01562**
D(EMTRI) does not Granger Cause D(SAUTRI)	**1402**	**4.47586**	**6.1E-05***
D(SAUTRI) does not Granger Cause D(EMTRI)		**1.78317**	**0.08673***
D(OMTRI) does not Granger Cause D(SAUTRI)	1402	2.09370	0.04141**
D(SAUTRI) does not Granger Cause D(OMTRI)		0.33368	0.93880
D(KUTRI) does not Granger Cause D(SAUTRI)	1402	1.45540	0.17921
D(SAUTRI) does not Granger Cause D(KUTRI)		1.83100	0.07763***
D(EMTRI) does not Granger Cause D(QATRI)	**1402**	**1.15684**	**0.32482**
D(QATRI) does not Granger Cause D(EMTRI)		**2.05634**	**0.04536**
D(OMTRI) does not Granger Cause D(QATRI)	1402	2.12709	0.03815
D(QATRI) does not Granger Cause D(OMTRI)		1.76085	0.09131***
D(KUTRI) does not Granger Cause D(QATRI)	1402	0.59985	0.75646
D(QATRI) does not Granger Cause D(KUTRI)		1.34890	0.22342
D(OMTRI) does not Granger Cause D(EMTRI)	**1402**	**0.91392**	**0.49454**
D(EMTRI) does not Granger Cause D(OMTRI)		**0.91139**	**0.49653**
D(KUTRI) does not Granger Cause D(EMTRI)	**1402**	**1.79964**	**0.08349***
D(EMTRI) does not Granger Cause D(KUTRI)		**0.86577**	**0.53299**
D(KUTRI) does not Granger Cause D(OMTRI)	1402	2.24606	0.02839**
D(OMTRI) does not Granger Cause D(KUTRI)		2.34906	0.02189**

Note: Significance is indicated by *, **, and *** at the 1, 5 and 10% levels.