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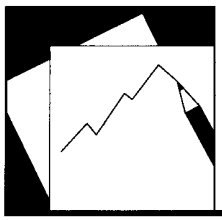

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Global and Regional Spillovers to GCC Equity Markets

Tahsin Saadi Sedik and Oral H. Williams

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Middle East and Central Asia

Global and Regional Spillovers to GCC Equity Markets

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Abstract

This paper analyzes the impact of global and regional spillovers to GCC equity markets. GCC equity markets were impacted by spillovers from U.S. equity markets despite varying degrees of foreign participation. Spillovers from regional equity markets were also important but the magnitude of the effects were on average smaller than that from mature markets. The results also illustrated episodes of contagion in particular during the recent global financial crisis. The findings suggest that given the degree of openness, and open capital accounts the financial channel is an important source through which volatility is transmitted. In this regard, GCC equity markets are not immune from global and regional financial shocks. These findings refute the notion of decoupling between the GCC equity and global equity markets.

JEL Classification Numbers: F15, F36, E44

Keywords: GCC, Stock markets, spillovers, contagion, financial integration

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I. INTRODUCTION

Gulf Cooperation Council (GCC) economies demonstrate a high degree of openness, operate open capital accounts, and have very flexible labor markets whereby expatriate workers dominate the workforce. These economies are highly integrated into the global economy through trade and financial sector channels. Oil—the main export commodity— accounts for over 75 percent of export receipts and about 85 percent of fiscal revenues. Globally, these economies are important as net creditors through the recycling of petrodollars and they play an important role in oil and gas markets. They account for 40 percent and 23 percent of proven oil and gas reserves respectively. They also possess over 70 percent of OPEC's spare crude capacity thus exercising an important role in stabilizing oil prices in the short run.[1]

At the regional level these economies are an important source of employment, remittances, exports, and growth to neighboring countries. Ilahi and Shendy (2008) illustrated that growth of real GDP in regional countries is strongly associated with that of remittance outflows from and the accumulation of financial surpluses in the GCC. Moreover, the growth nexus arises through both private consumption and investment.

These countries have pursued economic and financial integration for over three decades with a view to establishing an economic union. This has culminated in GCC countries achieving virtually unrestricted intra-regional mobility of goods, national labor, and capital. While market capitalization to GDP of GCC equity markets are comparable to that of emerging markets, they vary considerably in the degree of foreign participation. The U.A.E. has the highest degree of foreign participation and Saudi Arabia the least.

Given the increasing importance of financial and trade linkages between advanced economies and emerging markets some economists argue that emerging markets have become more vulnerable to turbulence in regional and global markets. Few studies to the authors' knowledge have explored the impact of spillovers from global and regional equity markets to GCC equity markets. Most studies have focused on market efficiency and the impact of oil volatility on mean return. Basher and Sadorsky (2006) found that changes in the oil price impacted returns in emerging markets in general while Nanda and Haff (2007) illustrated that oil prices affected equity returns at the sectoral level. Similarly, Hammoudeh et. al. (2008) examined own volatility dependency at the sectoral level for four GCC equity markets and found that the banking sector was least sensitive to past own volatility. Zarour (2006) using a VAR found that GCC markets' response to a rise in oil prices increased during the onset of the most recent oil boom. Onour (2007) using cointegration framework, found that oil price changes affect GCC market returns in the long run. At the individual country level, studies on Saudi Arabia's equity markets—the largest equity market in the Arab world—have focused on market

[1] As of December 2010 the GCCs share of OPECs excess capacity was 78 percent.

efficiency issues (Butler and Malaikah, 1992; Abraham et. al 2003), or the influence of oil (El Hedi and Rault, 2010). Suliman (2003) found that contagion from the 1987 U.S. stock market crash was transmitted from Saudi Arabia to the other Gulf economies. He also found a significant increase in cross-market linkages after the U.S. stock market crash.

This paper analyzes spillovers from mature and regional markets to individual GCC equity markets and explores whether volatility from U.S. and regional equity markets had a significant effect on the conditional volatility of stock prices in Gulf equity markets. To do so we employ a trivariate GARCH model to identify the magnitude of spillovers and their transmission mechanism. This paper finds that all GCC equity markets were impacted by spillovers from U.S. equity markets despite varying degrees of foreign participation. Spillovers from regional equity markets were also important perhaps reflecting longstanding efforts towards economic and financial integration. The findings suggest that given the high degree of openness, flexibility in labor markets, and open capital accounts the financial channel is an important source through which volatility is transmitted.

The remainder of the paper is organized as follows: Section II illustrates the main characteristics of GCC equity markets. Section III describes the data and the modeling strategy. Section IV discusses the results. Section V concludes and provides some policy implications.

II. CHARACTERISTICS OF THE GCC EQUITY MARKETS

GCC equity markets were established around the mid-1970s.[2] The first market to be established was the Kuwait Stock Exchange in 1977 followed by Tadawul All Share Index (TASI) in Saudi Arabia in 1984. The most recently established markets were the Dubai Financial Market (DFM) and Abu Dhabi Securities Market (ADSM) in 2000. The number of companies listed at the GCC level grew from 473 in 2005 to 657 by end-2009. During the same period, Kuwait recorded the largest increase in listings (64) followed by Saudi Arabia (58) (Table 1). There are few cross-listings in the GCC. At end-2009, total market capitalization stood at $647 billion of which the Saudi equity market accounted for 49 percent, followed by the U.A.E. at 17 percent, Kuwait 15 percent and Qatar 14 percent. GCC market capitalization as a share of GDP is comparable to many emerging markets. Market capitalization as a share of GDP at end-2009 amounted to 74 percent, with Qatar's being highest at 104 percent followed by Kuwat and Saudi Arabia at about 86 percent (Table 2).

All GCC markets outperformed the S&P 500 over the period under study, including after adjusting returns for risk (Table 3). Qatar had the higher returns, followed by Saudi Arabia, and Kuwait. The oil price and the returns in all GCC markets with the exception of Bahrain demonstrate high volatility relative to the S&P.

[2] However informal market exist for much longer time.

The simple correlation between GCC equity markets and the S&P 500 increased in the wake of the global financial crisis in 2008 (Table 4). However this masks changes in the correlation patterns over time as we observe that prior to the September 2001 events, Saudi Arabia's and Qatar's equity markets had the highest correlations with the S&P500. Post September 2001 and through the collapse of Lehman the simple correlation declined perhaps reflecting a home bias effect toward GCC equity markets. In the aftermath of the collapse of Lehman Brothers the correlation among GCC equity markets and the S&P 500 rose substantially.

GCC equity markets tend to be dominated by retail investors and foreign institutional participation has been minimal (Table 5). Market characteristics such as limited breadth, lack of hedging instruments, regulatory restrictions on access, and exclusion from emerging market indices have stymied the degree of participation by foreign institutions.[3] Foreign participation in listed companies is capped at 70 percent in Oman, 49 percent in the U.A.E. and Kuwait, 25 percent in Qatar, while Saudi Arabia permits foreign participation through mutual funds or swap arrangements.

Despite the relatively strong financial depth, the degree of free-float is low compared to developed markets but comparable to that in several emerging markets (Figure 1). The free float in equity markets in Europe is around 70 percent while that in the U.S. is about 90 percent. In contrast, the free float in Saudi Arabia was low at 40 percent but highest in Kuwait and the United Arab Emirates at 56 percent. Nevertheless, the degree of free float was comparable to that of India 52 percent, China 50 percent and Brazil 49 percent. The reason for the limited free-float in Saudi Arabia is related to the large amount of shares held by government-related entities and large stockholders (Mansur et. al., 2008). For example in Saudi Arabia firms tend to issue 30 percent of shares at listing and pension funds and government specialized credit institutions own over 40 percent of shareholdings which are not traded. These structural features including the lack of alternative domestic financial instruments contribute to price volatility in these markets (op cit).

The volume of shares traded in the GCC has soared during the boom years from about $300 billion in 2003, to a peak of $1.7 trillion in 2006 when most markets experienced a bubble associated with the oil boom but have since leveled off at $682 billion at end-2009. Banks tend to dominate equity markets ranging from 25 percent of market capitalization in Dubai to a high of 40 percent in Qatar (Table 6), thus having a strong bearing on the performance of the overall index. Despite the increasing number of listed companies, the market is concentrated and it is dominated by the banking sector. The average market value of listed companies is high compared with other emerging markets (Table 2).The top ten firms as a share of market capitalization ranged from 16 percent in Kuwait to 74 percent in Qatar and

[3] In May 2010 the FTSE include the U.A.E. exchanges in its emerging markets index which is followed by 170 different funds.

banks account for a large share of market capitalization (Table 6). Banking sector performance is also strongly correlated with oil shocks which is an important source of volatility and is transmitted via macro variables (Poghosyan and Hesse, 2009). Banks' profitability was hit when the bubble burst in 2005–06 as trading in investment portfolios where short and long term positions in local equities constituted a significant portion of their asset value

The volume of initial public offerings (IPOs) increased during the recent oil boom from about $2 billion in 2004 to a cumulative $43 billion in 2010 (Table 7). As shares were typically offered at par and undervalued, this contributed to a substantial increase in stock prices. During 2000–05 listed companies registered remarkable rates of profitability ranging from 40 percent to 70 percent (Mansur et. al, 2008. Trading income peaked at about 20 percent of pre-provision profits for some GCC banks. The number of IPOs rose from 15 in 2004 to 25 in 2008 but remained within the 20–25 range between 2005 and 2008, before falling to 13 in 2009 owing to the global financial crisis. Saudi Arabia accounted for 50 percent of the value of new offerings followed by the U.A.E. with 28 percent. Saudi and U.A.E. IPOs covered a broad range of sectors but these tended to be dominated by oil and gas, financial, and real estate. The Saudi market experienced a surge of issuance in the financial sector related to the regulatory requirement that insurance companies be listed on the TASI.

GCC equity markets in light of the rapid increase in per capita income have expanded to encompass the asset management industry estimated between $60–70 billion at end-2009. This also reflects the dominance of individual versus institutional investors. With respect to mutual funds for which data is more readily available, aggregate assets under management amounted about $30 billion of which $24 billion is managed in Saudi Arabia (Figure 2). The number of funds in Saudi Arabia reached 266 at end-2009 and these specialized in local equity (21 percent), international equity funds (28 percent), and money market funds (23 percent).

III. DATA AND MODELING STRATEGY

The data used in this study are monthly covering April 2000 through September 2010.[4] It employs close of stock market indices in GCC's country j equity market, the United States and the GCC index excluding country j. For the U.S. the Standard and Poor 500 (S&P 500) index was used while for the GCC weighted average indexes excluding country j were constructed. Accordingly, six regional indexes were constructed.[5] Price returns (R_t) were calculated as changes in the log of stock market prices expressed in percent:

$$R_t = (\ln P_t - \ln P_{t-1}) * 100 \qquad (1)$$

[4] The sample is dictated by the data availability for some GCC markets. UAE index is available from June 2002 onward. Dubai index is used as a proxy for the UAE index from April 2000 to May 2002.

[5] We use nominal GDP as weights because time series for market capitalization are not available for some GCC stock markets. Annual GDP data were converted into monthly data and weights were calculated as 24-months moving averages.

In order to test the own-volatility spillover effects as well as the cross-volatility spilloever effects (spillover from global and regional markets to each GCC equity markets) we employed the trivariate generalized autoregressive conditional heteroscedasticity (trivariate GARCH) framework in modeling the volatility of returns as well to understand the conditional correlations across the markets. The GARCH corrects for heteroscedasticity and provides additional information on the determinants of volatility. Applications of the GARCH methodology to financial data have been widely used for example Bollerslev (1990), Tse and Tsui (2002) and Sun and Zhang (2009). Theoretically the specification of a trivariate GARCH model should be parsimonious, because the log likelihood estimation is nonlinear and computationally difficult with more parameters and thus for practical reasons we apply the simplest GARCH(1,1) model.

A. Trivariate GARCH(1,1): Mean Equation

For the trivariate GARCH(1,1), the mean equation could be specified as follows:

$$R_t = \alpha + \beta R_{t-1} + \lambda X_t + \varepsilon_t \tag{2}$$

where R_t = (country j of GCC market returns at time *t*, Standard and Poor 500 returns, and GCC excluding country j market returns; R_{t-1} is a corresponding vector of lagged returns, X_t is the exogenous variable (the average petroleum spot price), and $\varepsilon_t = (\varepsilon_{1,t}, \varepsilon_{2,t}, \varepsilon_{3,t})$ is a residual vector. The parameters of the mean return equations comprise the constant terms $\alpha = (\alpha_1, \alpha_2, \alpha_3)$, the parameters of the autoregressive terms $\beta = (\beta_1, \beta_2, \beta_3)$, which allow for cross markets mean return spillovers (for example from Standard and Poor 500 and GCC markets to country j market of GCC), and the coefficients for oil prices $\lambda = (\lambda_1, \lambda_2, \lambda_3)$.

B. Trivariate GARCH(1,1): VEC Representation

In the multivariate GARCH(1,1)-VEC representation proposed by Engle and Kroner (1995), the residual ε_t is normally distributed $\varepsilon_t \mid \xi_{t-1} \square N(0, H_t)$. The parameterization for H, as a function of the information set ξ_{t-1} chosen here allows each element of H, to depend on q (q=1 in our model) lagged values of the squares and cross-products of ε_t, as well a p (p=1) lagged values of the elements of H. So the elements of the covariance matrix follow a vector ARMA process in squares and cross-products of the residuals. The most widely used GARCH specification asserts that the best predictor of the variance in the next period is a weighted average of the long-run average variance, the new information in this period that is captured by the most recent squared residual, and the variance predicted for this period. Such an updating rule is a simple description of adaptive or learning behavior and can be thought of as Bayesian (Engle, 2001). Defining

$h_t = vecH_t$

$\eta_t = vec(\varepsilon_t \varepsilon_t^{'})$

where vec(.) is the vector operator that stacks the columns of the matrix, a parameterization GARCH(1,1) can be written :

$$h_t = C_0 + A\eta_{t-1} + Gh_{t-1}, \qquad (3)^{6}$$

where C_0 is a n^2 x 1 parameter vector, and A, and G, are n^2x n^2 parameter matrices. In the vec model, a diagonal representation is obtained if the matrices A and G are assumed to be diagonal. To illustrate in the trivariate case, omitting all redundant elements of the matrix, for example $h_{21,t}$, the diagonal representation is simply:

$$\begin{aligned} h_t &= \begin{pmatrix} h_{11,t} \\ h_{12,t} \\ h_{13,t} \\ h_{22,t} \\ h_{23,t} \\ h_{33,t} \end{pmatrix} \\ &= \begin{pmatrix} c_{01} \\ c_{02} \\ c_{03} \\ c_{04} \\ c_{05} \\ c_{06} \end{pmatrix} + \begin{pmatrix} a_{11} & 0 & 0 & 0 & 0 & 0 \\ 0 & a_{22} & 0 & 0 & 0 & 0 \\ 0 & 0 & a_{33} & 0 & 0 & 0 \\ 0 & 0 & 0 & a_{44} & 0 & 0 \\ 0 & 0 & 0 & 0 & a_{55} & 0 \\ 0 & 0 & 0 & 0 & 0 & a_{66} \end{pmatrix} \begin{pmatrix} \varepsilon_{1,t-1}^2 \\ \varepsilon_{1,t-1}\varepsilon_{2,t-1} \\ \varepsilon_{1,t-1}\varepsilon_{3,t-1} \\ \varepsilon_{2,t-1}^2 \\ \varepsilon_{2,t-1}\varepsilon_{3,t-1} \\ \varepsilon_{3,t-1}^2 \end{pmatrix} + \begin{pmatrix} g_{11} & 0 & 0 & 0 & 0 & 0 \\ 0 & g_{22} & 0 & 0 & 0 & 0 \\ 0 & 0 & g_{33} & 0 & 0 & 0 \\ 0 & 0 & 0 & g_{44} & 0 & 0 \\ 0 & 0 & 0 & 0 & g_{55} & 0 \\ 0 & 0 & 0 & 0 & 0 & g_{66} \end{pmatrix} \begin{pmatrix} h_{11,t-1} \\ h_{12,t-1} \\ h_{13,t-1} \\ h_{22,t-1} \\ h_{23,t-1} \\ h_{33,t-1} \end{pmatrix} \end{aligned} \qquad (4)$$

Writing the equations as a system and renaming some coefficients to make them more intuitive, we obtain:

$$h_{11,t} = c_{11} + a_{11}\varepsilon_{1,t-1}^2 + g_{11}h_{11,t-1} \qquad (5)$$

$$h_{12,t} = c_{12} + a_{12}\varepsilon_{1,t-1}\varepsilon_{2,t-1} + g_{12}h_{12,t-1} \qquad (6)$$

$$h_{13,t} = c_{13} + a_{13}\varepsilon_{1,t-1}\varepsilon_{3,t-1} + g_{13}h_{13,t-1} \qquad (7)$$

$$h_{22,t} = c_{22} + a_{22}\varepsilon_{1,t-1}^2 + g_{22}h_{22,t-1} \qquad (8)$$

$$h_{23,t} = c_{23} + a_{23}\varepsilon_{2,t-1}\varepsilon_{3,t-1} + g_{23}h_{23,t-1} \qquad (9)$$

$$h_{33,t} = c_{33} + a_{33}\varepsilon_{1,t-1}^2 + g_{33}h_{33,t-1} \qquad (10)$$

[6] The second term is the short run persistence (or the ARCH effects of past shocks), and the third term is the contribution to the long run persistence (or the GARCH effects of past volatilities).

In the trivariate model illustrated here, there are six free parameters in each of the C_0, A, and G, matrices, and in the general n-variate diagonal model there are ((n (n + 1))/2) free parameters in each matrix. In the diagonal representation each element of the covariance matrix ($h_{jk,t}$) depends only on past values of $\varepsilon_{jt}\varepsilon_{kt}$ and past values of itself. Further restrictions are imposed to insure that H is positive semidefinite. Namely, matrices are restricted to be rank one. There are two important features of this specification: (i) it guarantees that the conditional covariance matrix is positive semidefinite; and (ii) the Diagonal VECH model is identical to the Diagonal BEKK model.

IV. RESULTS AND DISCUSSION

Table 8 illustrates the individual country mean return equations. The S&P 500 lagged returns, own lagged returns, GCC lagged returns, and the oil price were the main variables of the mean returns. By including oil in the mean equation we control for the effect of oil when investigating the spillover effects in the variance equations.

Table 9 presents the estimated coefficients for the variance covariance matrix of equations 5 to 7 for each GCC country.[7] These quantify the effects of the lagged own and cross innovations and lagged own and cross volatility persistence on the present own and cross volatility of the three markets (GCC, country *j* of the GCC and the S &P 500). The results show that both past own shocks (ARCH term) and past own volatilities (GARCH term) have statistically significant effects on the volatility, the effect of own past volatility is stronger.

Local spillovers

The effect of past own shocks were significant in Oman, Qatar, Saudi Arabia and the U.A.E. equity markets pointing to a strong ARCH effect. The size of Saudi Arabia's ARCH coefficient was 0.08 and considerably smaller than that of Qatar (0.34), the U.A.E. (0.33) and Oman (0.17). The GARCH estimated coefficients were all significant except in the case of Kuwait, suggesting persistence in volatility in most GCC countries. The size of the coefficients that represented the persistence of own lagged volatility ranged from 0.37 in Qatar to 0.98 in Bahrain. In the case of Saudi Arabia, the larger and more developed of the GCC equity markets, the coefficient of own volatility persistency was 0.89. Saudi equity markets which have a higher turnover than the other GCC markets tended to have higher volatility, perhaps reflecting the dominance of retail investors.

[7] The results for equations 8 to 10 are simultaneously computed and they are available upon request. The conditional distribution of the error term was assumed to be normal (Gaussian) distribution. As an alternative, a residual vector (ε_t) following the t-student distribution has also been considered. Results are broadly similar and therefore not reported. The complete set of results is available from the authors upon request.

Regional spillovers

Individual GCC markets demonstrated strong cross effects of past regional shocks. The average size of the coefficient on regional cross effects of past shocks was 0.17. The magnitude of the coefficient regional cross-past shocks was smallest in Kuwait (0.11) and largest in the U.A.E. and Oman (0.23). The results suggests that cross effects of past shocks in regional markets do have important spillover effects in local equity markets and underscore the need to strengthen cross-border regulatory frameworks. The persistence of cross volatilities from GCC equity markets was significant in all markets. Coefficients range from 0.53 in Oman to 0.88 in Bahrain. This finding suggests that adverse events in GCC economies do have regional spillover effects.

Global spillovers

The impact of cross effects from past shocks origination from mature markets were highly significant in all markets except Bahrain. The average size of the S&P 500 cross past shocks coefficient was 0.20. The coefficient of past shocks between the S&P 500 and Saudi equity markets was smallest (0.13), while the coefficient with the U.A.E. was among the largest (0.23). This may reflect the degree of foreign participation which is very low in Saudi Arabia and highest in the U.A.E. among all GCC markets. Furthermore, the coefficients on cross volatility persistence from mature and regional markets were all significant. The impact of persistence in past volatility from the S&P500 ranged from 0.59 in Oman to 0.91 in Bahrain. The size of the coefficients were comparable to those of Sun and Zhang (2009) who explored spillovers from the U.S. subprime to China and Hong Kong stock markets.[8]

Contagion

In exploring the effects of contagion from mature and regional markets, we adopt the taxonomy of Masson (1999) that views contagion as the unanticipated transmission of shocks. Figure 3 illustrates that turbulence in mature markets produced shifts in the conditional covariance of GCC equity markets or contagion during the recent global financial crisis. In particular, the conditional covariances peaked during the recent global crisis suggesting the comovement of these markets especially during periods of market turbulence. Similarly turbulence in regional equity markets (Figure 4 and 5) also produced shifts in all GCC markets during the stock market bubble in 2006 and in 2008 as a result of the global financial crisis.

[8] However, these coefficients are not strictly comparable owing to difference in sample size and specification of the mean equations.

Robustness checks

As a robustness check, we use weekly stock indices over the ten-year period from Tuesday, June 12, 2001 to Tuesday, November 9, 2010 representing 492 observations.[9] We use weekly indices instead of daily indices to avoid biases that could result from non-trading days, non-synchronous trading hours and days, and to avoid the noise commonly associated with daily data. In addition, we use Tuesday indices to avoid day-of-the-week effects for stock returns—mainly Friday and Monday.[10] In addition, in the Middle East most stock markets are closed Friday and Saturday as opposed to Saturday and Sunday in most other countries. Thus, using Tuesday data appears to be best for comparability and to avoid any day-of-the-week effect. The results obtained with weekly data are comparable to those for monthly data (Tables 10 and Figures 6–8).

V. CONCLUSIONS

The main finding of the paper is that GCC equity markets were impacted by spillovers from U.S. and regional markets. These spillover effects were significant regardless of the degree of foreign participation. These findings refute the notion of decoupling between the largest GCC equity markets and global equity markets. The conditional covariance between these markets and the S&P 500 illustrate contagion i.e. turbulence peaked by producing shifts in the transmission of volatility during the recent global financial crisis around the time of the collapse of Lehman Brothers in fall 2008. The findings underscore that these equity markets are not immune from global financial shocks such as that unleashed by the subprime financial crisis and refute the notion of decoupling between the GCC equity and global equity markets

The impact of regional spillovers to local equity markets were also significant and point to the need for cross-border coordination and supervision to minimize adverse spillover effects. Macroeconomic management will need to take into account for the transmission channels through which global shocks impact the domestic economy. In particular, diversifying the sources of financing the real economic would increase the resilience of banks balance sheets by limiting their exposure to the various types of risks. In addition further deepening of asset markets would give firms alternative means of financing investment.

[9] While the number of observations increased with higher frequency data, the period is shorter because some GCC countries published weekly data from mid-2001 onward.

[10] For example, French (1980) observed that Friday returns were greater on average while Monday returns were less than the average.

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Table 1. GCC: Listed Companies, 2005–09

	2005	2006	2007	2008	2009
Bahrain	47	49	43	45	45
Kuwait	143	163	181	202	207
Oman	96	124	125	127	125
Qatar	31	36	40	42	44
Saudi Arabia	77	86	111	127	135
UAE	79	81	90	96	101
GCC	473	539	590	639	657

Source: World Bank Development Indicators.

Table 2. Equity Markets in Selected Emerging Economies, 2009

Market	*Number of companies*	*Market capitalization (billions of US$)*	*Market capitalization (percent of GDP)*	*Value traded (billions of US$)*	*Turnover ratio*	*Average company's market value (millions of US$)*
Bahrain	45	17	83.8	0.9	4.50	376.3
Brazil	425	1,338	85.0	649.2	67.37	3,147.6
Chile	232	231	142.6	37.6	20.69	994.5
China	1700	5,011	102.1	8956.2	229.52	2,947.4
Egypt	306	91	48.5	52.8	59.68	297.7
India	4946	1,227	99.2	1088.9	116.32	248.0
Israel	622	189	96.9	88.3	54.63	303.4
Jordan	272	32	139.1	13.6	40.29	117.2
Korea	1798	836	100.5	1581.5	238.22	465.2
Kuwait	207	96	86.5	69.9	72.61	465.3
Morocco	78	64	71.0	17.8	11.97	826.7
Nigeria	216	33	19.2	4.6	26.92	154.5
Oman	125	17	32.4	5.8	33.70	138.4
Qatar	44	88	104.7	25.5	29.04	1,996.4
Russia	333	861	70.1	682.5	154.89	2,586.9
Saudi Arabia	135	319	86.2	337.0	105.70	2,361.0
South Africa	411	805	280.3	342.5	83.85	1,959.0
Turkey	315	234	38.0	243.5	138.39	742.9
U.A.E.	101	110	47.7	65.7	59.95	1,085.3

Sources: World Bank World Development Indicators (WDI); World Economic Outlook (WEO) and Fund staff estimates.

Table 3. Data Descriptive Statistics [1]

	Bahrain	Kuwait	Oil Price	Oman	Qatar	Saudi Arabia	S&P 500	UAE
Mean	0.1	1.1	1.4	0.7	1.2	1.1	(0.1)	0.6
Median	0.4	1.4	3.5	0.8	1.6	1.7	0.7	0.2
Maximum	9.6	18.4	34.9	18.5	26.0	17.9	9.2	32.9
Minimum	(13.0)	(27.1)	(43.3)	(31.3)	(29.6)	(29.8)	(18.6)	(30.4)
Std. Dev.	4.0	5.9	10.4	6.3	8.8	8.1	4.8	8.6
Skewness	(0.5)	(0.7)	(0.6)	(0.7)	(0.5)	(0.9)	(0.7)	0.1
Kurtosis	3.7	6.6	5.3	7.2	4.4	4.8	3.9	6.2
Jarque-Bera	8.2	87.1	41.8	115.1	16.7	38.2	15.7	61.1
Probability	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sum	12.3	147.7	191.7	96.1	171.2	150.7	(11.4)	82.6
Sum Sq. Dev.	2,185.7	4,788.0	15,096.2	5,508.1	10,734.8	9,039.9	3,139.6	10,165.3
Observations	140.0	140.0	140.0	140.0	140.0	140.0	140.0	140.0

Source: Authors calculations.

[1] Variables are in log differences.

Table 4. GCC: Simple Correlations

	Bahrain	Kuwait	Oman	Qatar	Saudi Arabia	UAE
			2000:M5-2010:M9			
S&P 500	0.36	0.37	0.31	0.40	0.32	0.17
	(4.34)	(4.43)	(3.64)	(4.65)	(3.71)	(1.96)
			2000:M5-2001:M9			
S&P 500	0.16	-0.01	-0.45	0.18	0.43	-0.55
	(0.61)	(-0.04)	(-2.22)	(0.69)	(1.89)	(-2.59)
			2001:M9-2008:M9			
S&P 500	0.30	0.22	0.19	0.14	0.09	0.07
	(2.89)	(2.06)	(1.81)	(1.26)	(0.78)	(0.63)
			2008:M9-2010:M9			
S&P 500	0.66	0.77	0.69	0.84	0.84	0.44
	(4.20)	(5.79)	(4.66)	(7.44)	(7.47)	(2.33)

[1] T-statistics in parenthesis.

Table 5. Selected GCC Market Participation by Nationality [1]

(Percent)

Nationality	Saudi Arabia	Kuwait	Dubai
Nationals	95	92	55
GCC Citizens	2	3	6
Non-GCC	3	5	38

Sources: Country Stock Exchanges, NCB Capital.

[1] April 2010.

Table 6. GCC: Sectoral Market Capitalization, 2009

(Percent)

	Bahrain	Kuwait	Dubai	Abu dhabi	Qatar	Saudi Arabia
Banking	33	34	25	37	40	28
Investment	42	12	13	…	…	3
Insurance	3	2	5	4	1	2
Services [1]	19	30	38	44	50	18
Real Estate	…	8	18	4	…	4
Industrial	…	10	…	…	9	34
Other	3	4	1	12	…	11
Total	100	100	100	100	100	100

Source: Country stock exchanges.

[1] For Saudi Arabia includes telecoms, electricity, and energy services.

For Dubai includes materials, transportation, and telecoms.

For Abu Dhabi includes telecoms and energy services.

Table 7. GCC: IPOs, 2004–10 [1]

(In U.S. dollars millions)

	2004	2005	2006	2007	2008	2009	2010
Bahrain	…	103.1	1036.4	69.5	…	…	…
Kuwait	708.0	747.0	123.5	111.7	98.0	…	…
Oman	67.3	784.6	54.0	156.4	69.8	608.5	…
Qatar	…	1,112.4	1,355.2	388.9	511.1	952.1	144.2
UAE	513.2	1,757.9	2,150.7	6,559.0	1,288.4	…	…
Saudi Arabia	729.3	1,674.5	2,785.4	4,770.0	9,704.8	1,124.1	1,144.6
Total	2,017.8	6,179.4	7,505.1	12,055.6	11,672.1	2,684.7	1,288.8
No. of IPOs	15	23	23	20	25	13	9

Source: Zawya

[1] Through July 2010.

Table 8. GCC: Selected Results from Conditional Mean Equations

	j=Bahrain	j=Kuwait	j=Oman	j=Qatar	j=Saudi Arabia	j=U.A.E.
Mean equation						
Intercept	0.17	1.02	1.14	1.23	1.43	0.94
	(0.35)	(0.50)	(0.48)	(0.76)	(0.60)**	(0.52)*
Country j returns (lagged)	0.13	0.35	0.07	-0.002	0.1	0.08
	(0.10)	(0.09)***	(0.09)	(0.11)	(0.10)	(0.09)
S&P500 returns (lagged)	0.13	0.12	0.15	-0.04	0.17	0.13
	(0.11)	(0.08)	(0.09)*	(0.14)	(0.10)*	(0.11)
GCC excluding country j returns	0.11	0.06	0.15	0.14	0.13	0.12
	(0.06)	(0.07)	(0.08)*	(0.12)	(0.11)	(0.09)
Oil price	0.11	0.04	0.03	0.2	0.11	-0.02
	(0.03)***	(0.06)	(0.05)	(0.06)***	(0.05)**	(0.05)

Sources: Data stream and authors' calculations.

Regressions are a GARCH (1,1) and estimated using maximum likelihood.

Standard errors are in parentheses. *** denotes significance at the 1 percent level.

** denotes significance at the 5 percent level and * at the 10 percent level.

Table 9. GCC: Selected Results from Conditional Variance

	(2= S&P500 ; 3= GCC excluding country j)					
	j=Bahrain	j=Kuwait	j=Oman	j=Qatar	j=Saudi Arabia	j=U.A.E.
Constant						
Cjj	0.23	12.20	0.90	24.33	2.27	0.02
	(0.20)	(5.32)***	(0.65)	(8.03)***	(0.97)**	(0.11)
Cj2	0.13	0.45	0.19	1.10	0.33	0.04
	(0.14)*	(0.79)	(0.721	(0.94)	(0.32)	(0.11)
Cj3	0.73	3.10	3.50	6.63	3.85	0.25
	(0.38)**	(1.94)	(1.67)**	(1.90)***	(1.25)***	(0.59)
ARCH Effects						
Ajj	0.002	0.15	0.17	0.34	0.08	0.33
	(0.005)	(0.13)	(0.05)***	(0.09)***	(0.04)*	(0.09)***
Aj2	0.02	0.16	0.23	0.25	0.13	0.23
	(0.24)	(0.08)*	(0.05)***	(0.05)***	(0.04)***	(0.05)***
Aj3	0.02	0.11	0.23	0.14	0.16	0.23
	(0.02)	(0.06)*	(0.07)***	(0.05)**	(0.05)***	(0.06)***
GARCH Effects						
Gjj	0.98	0.41	0.83	0.37	0.89	0.77
	(0.01)***	(0.24)	(0.04)***	(0.10)***	(0.04)***	(0.05)***
Gj2	0.91	0.59	0.80	0.56	0.86	0.82
	(0.03)***	(0.17)***	(0.03)***	(0.08)***	(0.03)***	(0.03)***
Gj3	0.88	0.60	0.53	0.58	0.62	0.78
	(0.04)***	(0.18)***	(0.15)***	(0.09)***	(0.08)***	(0.04)***

Sources: Data stream and authors' calculations.

2= S&P500 ; 3= GCC excluding country j

Regressions are a GARCH (1,1) and estimated using maximum likelihood.

Standard errors are in parentheses. *** denotes significance at the 1 percent level.

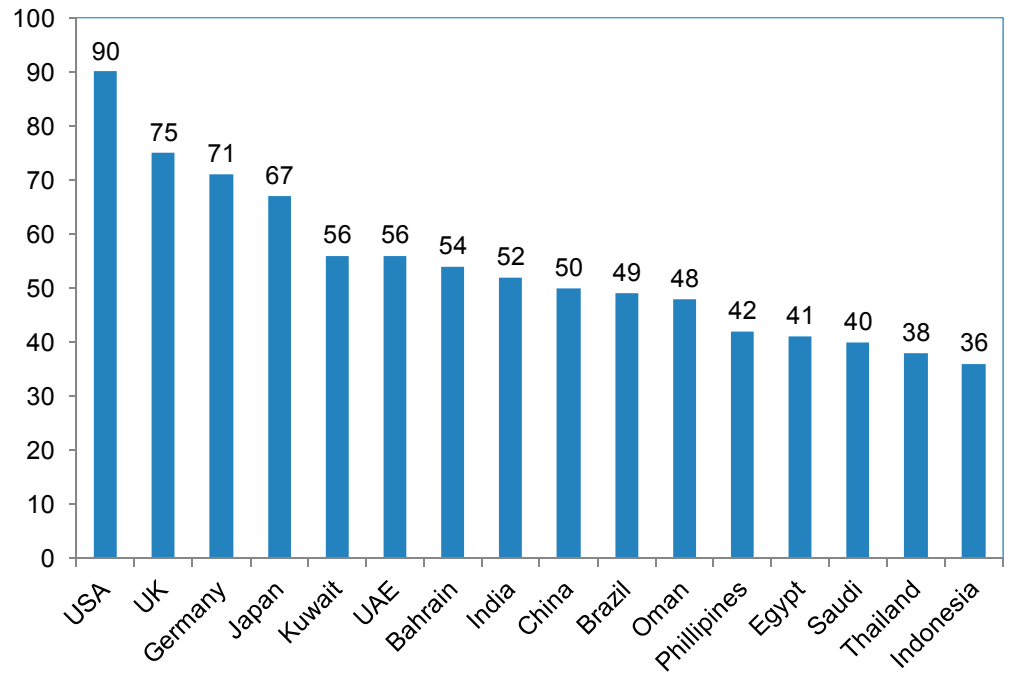
** denotes significance at the 5 percent level and * at the 10 percent level.

Table 10. GCC: Selected Results From Conditional Mean Equations (Weekly Data)

	j=Bahrain	j=Kuwait	j=Oman	j=Qatar	j=Saudi arabia	j=U.A.E
Mean equation						
Intercept	0.15	0.04	0.41	0.67	0.04	0.31
	(0.07)**	(0.11)***	(0.10)***	(0.13)***	(0.16)***	(0.12)**
Country j returns (lagged)	0.14	0.16	-0.03	0.05	0.06	0.08
	(0.06)**	(0.05)***	(0.05)	(0.06)	(0.05)	(0.05)
S&P500 returns (lagged)	0.06	0.08	0.07	0.03	0.06	0.07
	(0.11)**	(0.04)*	(0.03)**	(0.04)	(0.04)	(0.03)**
GCC excluding country j returns	0.06	0.06	0.12	0.17	0.12	0.09
	(0.03)**	(0.03)*	(0.04)***	(0.05)***	(0.07)*	(0.05)*
Oil price	0.04	0.02	0.05	0.09	0.07	-0.01
	(0.02)**	(0.02)	(0.02)**	(0.06)***	(0.03)**	(0.02)

Sources: Data stream and authors' calculations.
Regressions are a GARCH (1,1) and estimated using maximum likelihood.
Standard errors are in parentheses. *** denotes significance at the 1 percent level.
** denotes significance at the 5 percent level and * at the 10 percent level.

Figure 1. Equity Markets Free Float (Percent of Market Capitalization)



Source: NCB Capital

Figure 2. Saudi Arabia: Mutual Funds and Subscribers

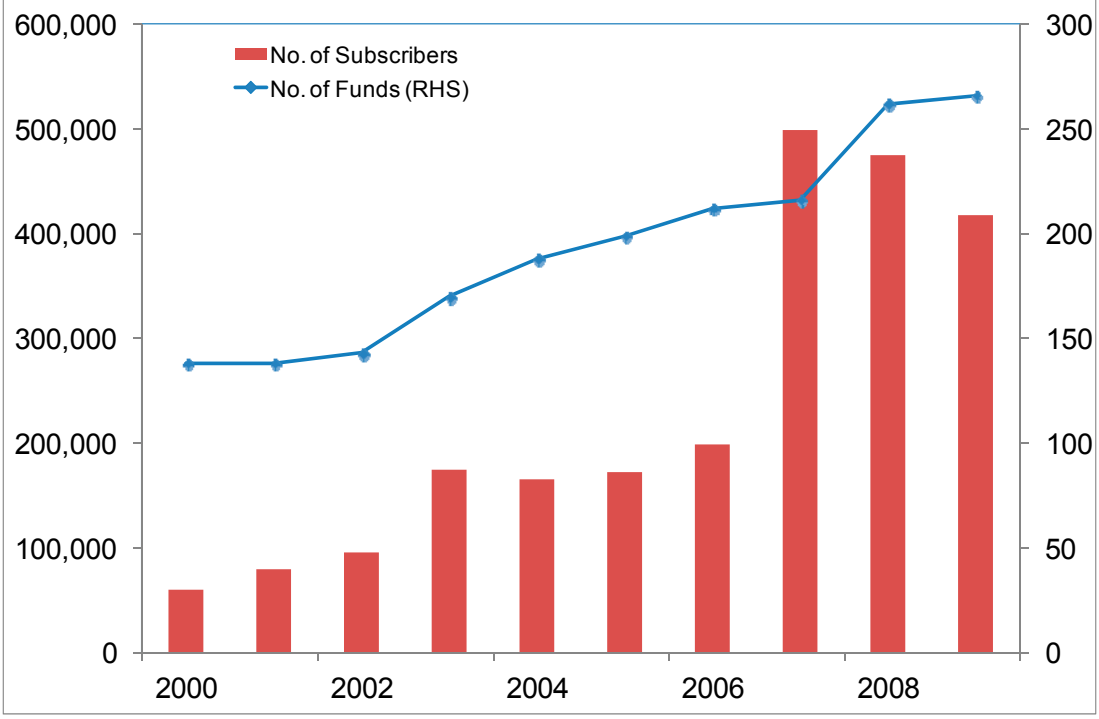
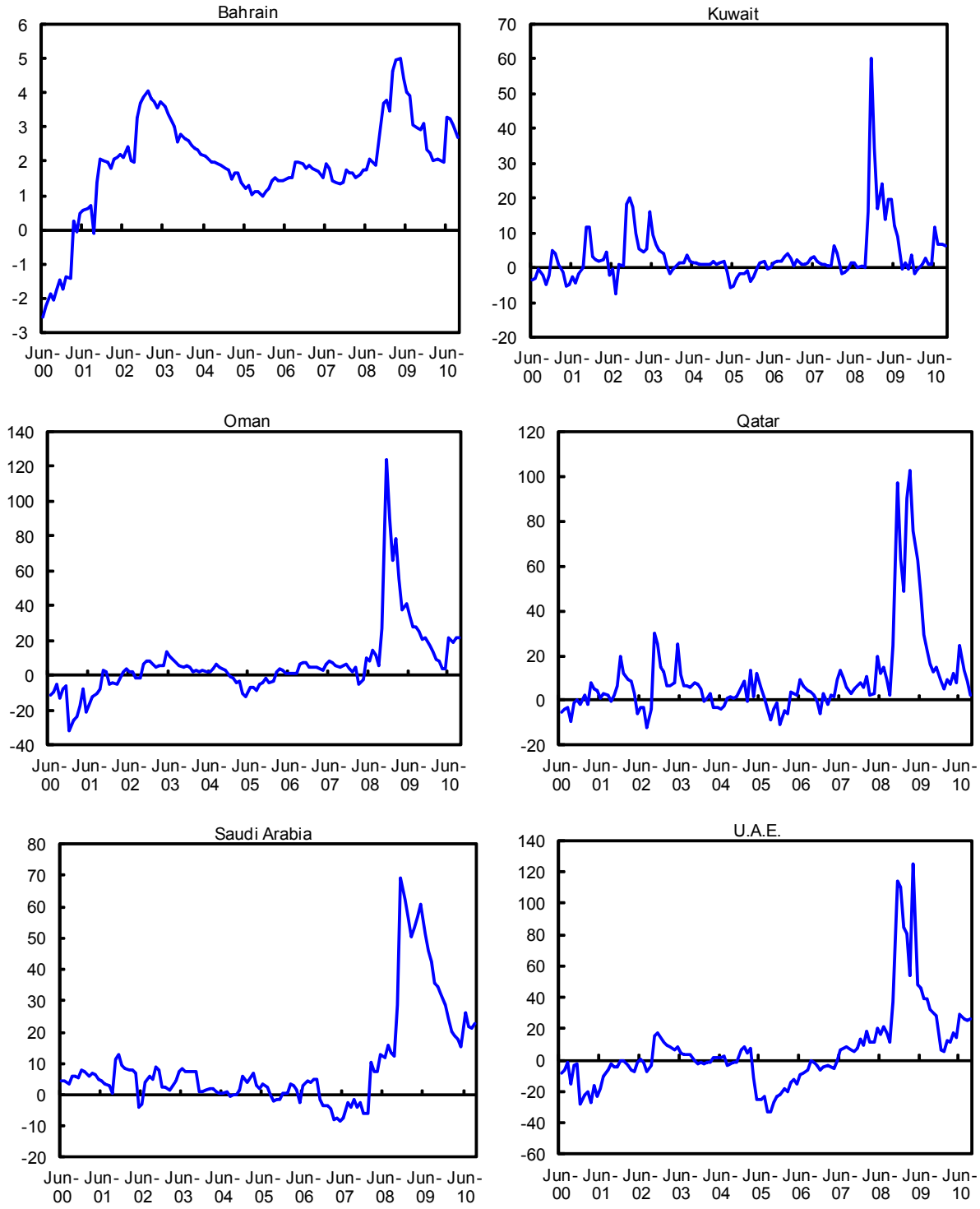
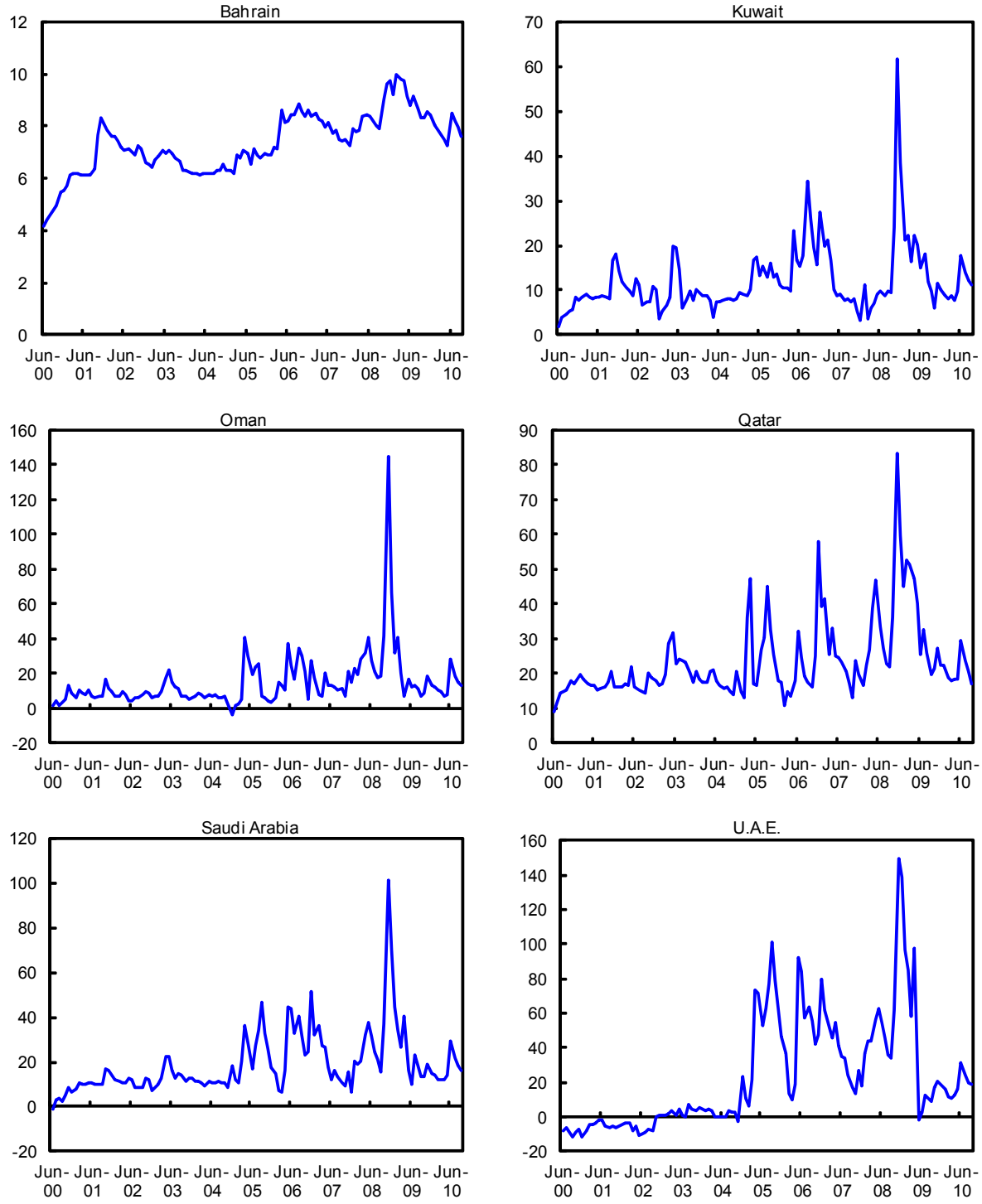


Figure 3. GCC: Conditional Covariance with S&P 500, 2000–10



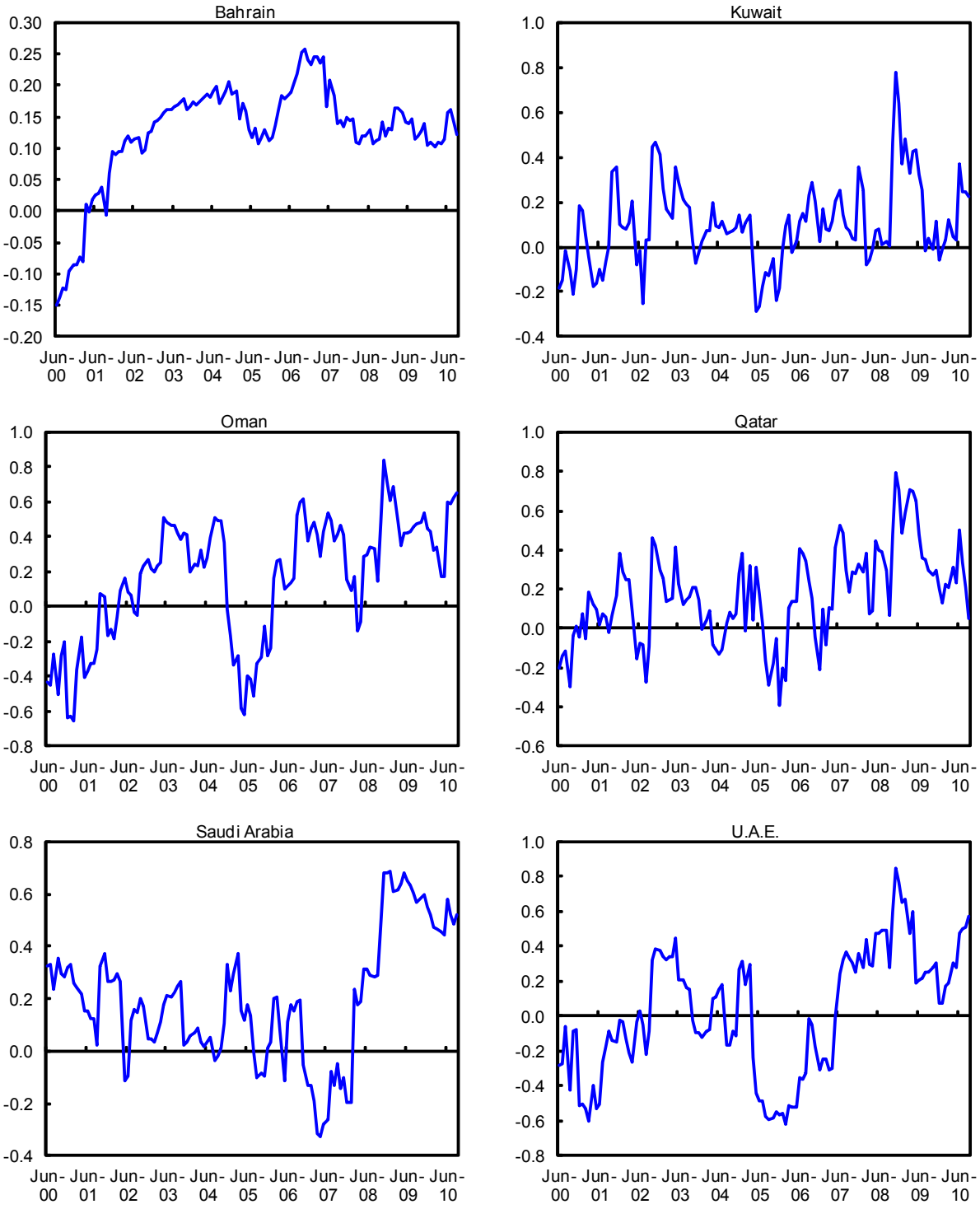
Source: Fund staff calculations.

Figure 4. GCC: Conditional Covariance with GCC Index, 2000–10



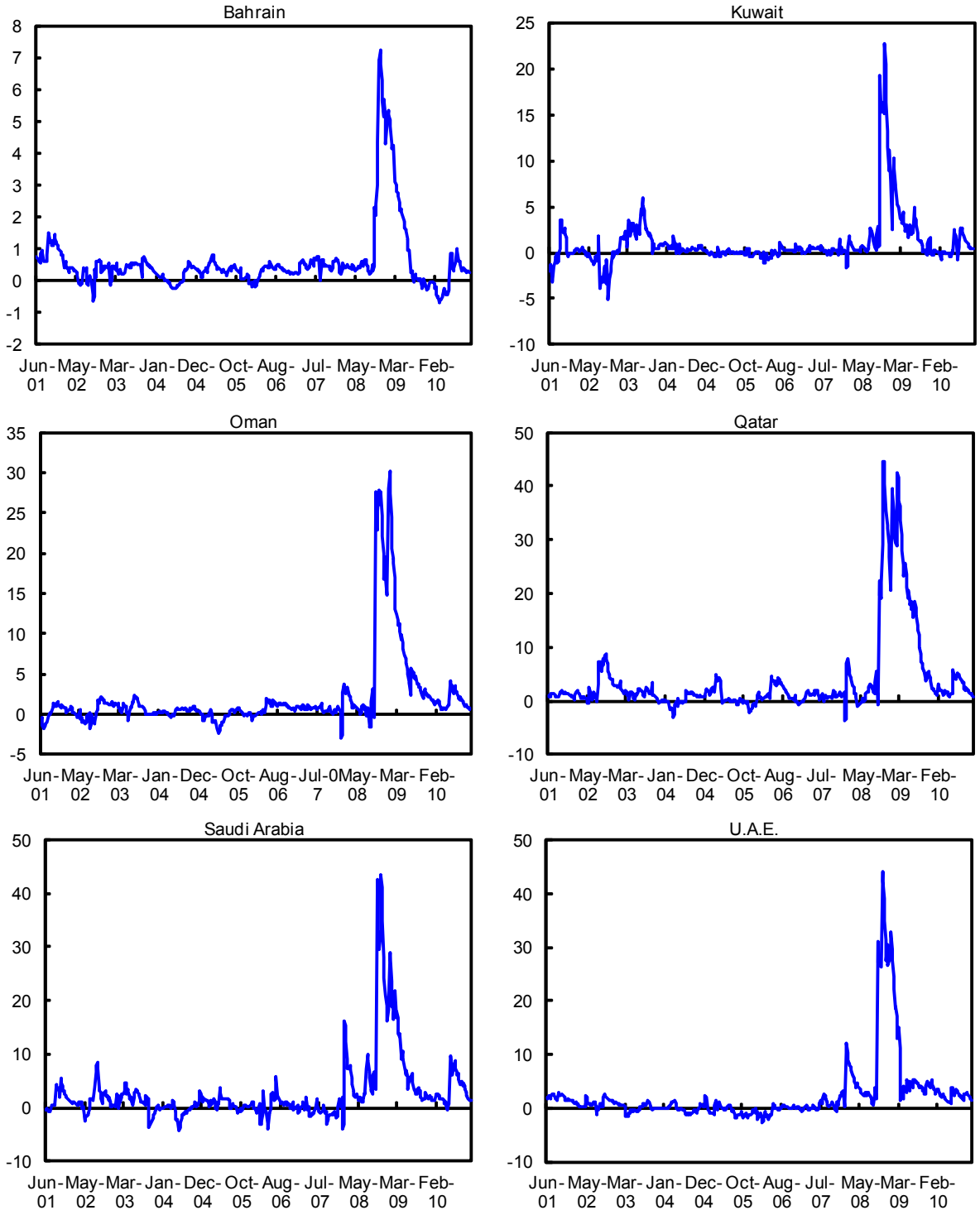
Source: Fund Staff calculations.

Figure 5. GCC: Conditional Correlation with S&P 500, 2000–10



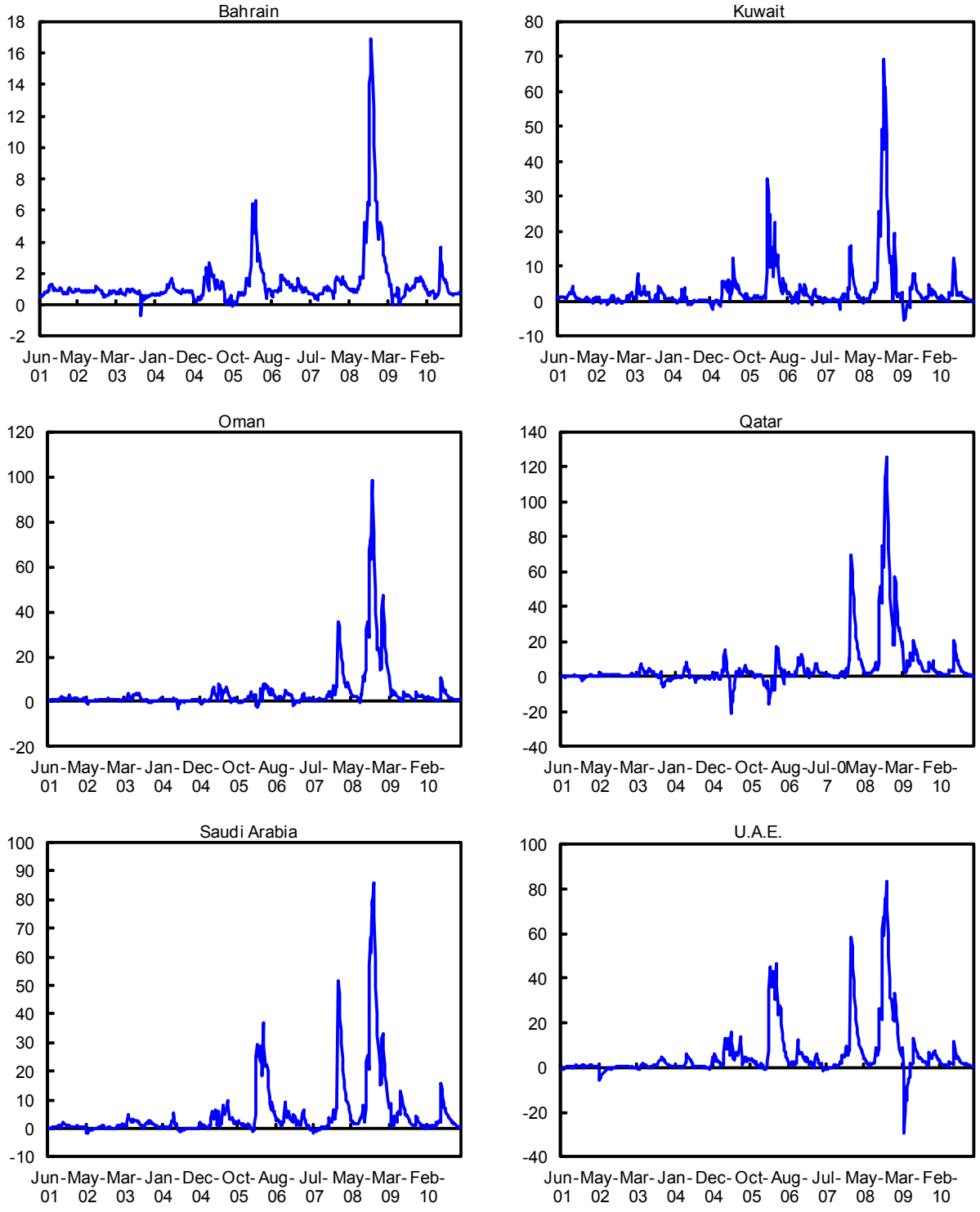
Source: Fund staff calculations.

Figure 6. GCC: Conditional Covariance with S&P 500, 2001–10
(Weekly data)



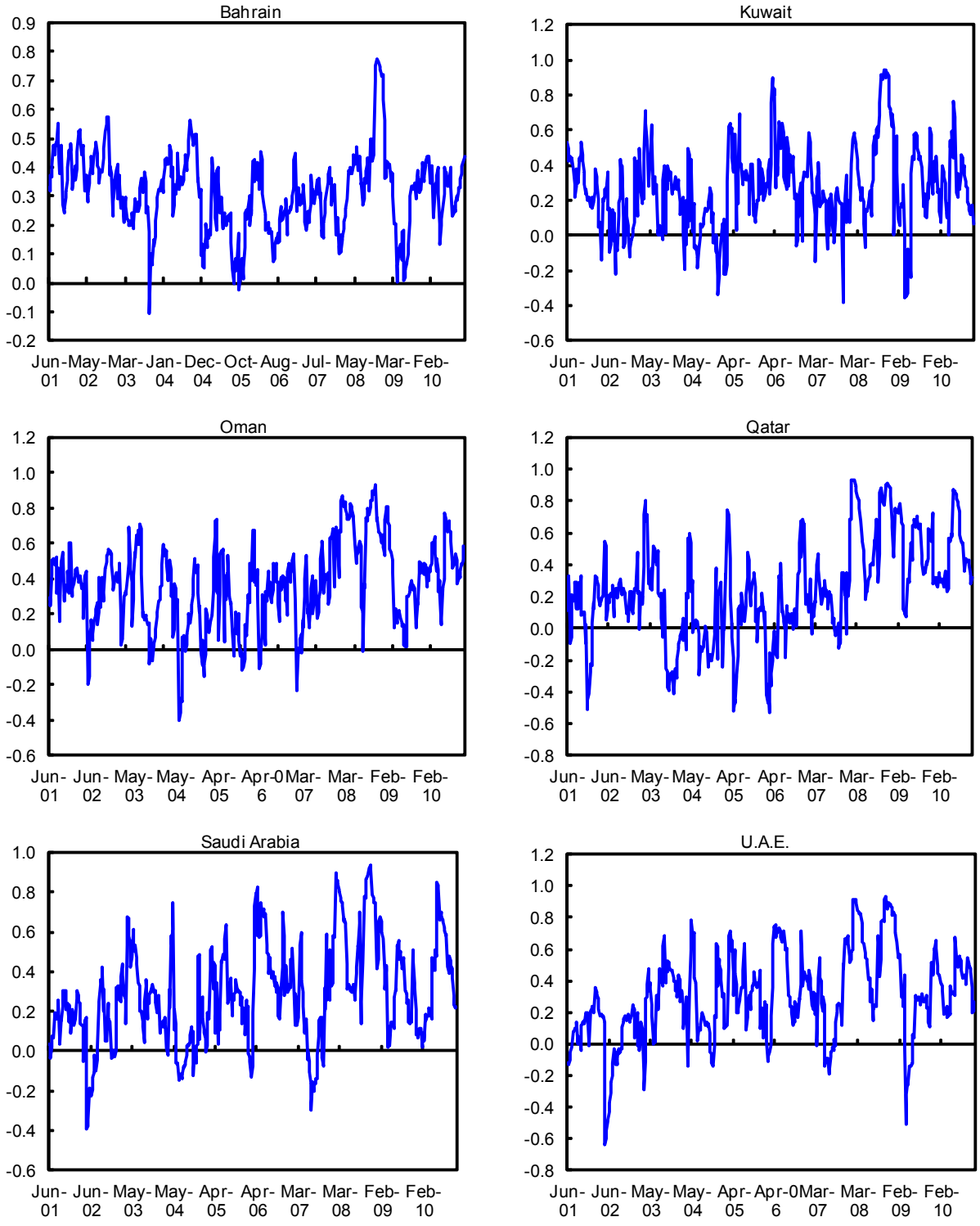
Source: Fund staff calculations.

Figure 7. GCC: Conditional Covariance with GCC Index, 2001–10
(Weekly data)



Source: Fund Staff calculations.

Figure 8. GCC: Conditional Correlation with GCC Index, 2001–10
(Weekly data)



Source: Fund staff calculations.