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Does Islamic Banking Favors Price Stability? An Empirical evidence from the GCC, Iran and Sudan

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This paper studies the relationship between Islamic banking growth and inflation in the Gulf Cooperation Council (GCC), Iran and Sudan using monthly time series and unbalanced monthly panel data covering the period 2001- 2015. Several econometrics models are applied including single equation model, panel ordinary least squares (OLS) and Vector error correction model (VECM). The empirical findings revealed that Islamic banking does not increase domestic prices in all the models applied. According to the single equation OLS results, Islamic banking growth dampen domestic prices in Oman, Qatar and Iran. From VECM analysis, in the short-run, Islamic banking decrease inflation in Iran and Sudan and in the long run, Islamic banking growth dampen inflation in Bahrain and Iran. The panel regression results revealed no indication that Islamic banking growth increases inflation. Five out of seven countries considered in the study revealed that Islamic banking dampened domestic price inflation. Inflation inertia, monetary growth and exchange rate depreciation are the main factors that increase inflation in these economies. The impact of an increase in international food and oil prices on domestic prices revealed mixed results. While an increase in international food and oil prices increases domestic prices in certain countries, it dampens inflationary pressure in some other countries, which could be due to government subsidies. The empirical results call for the need for economic diversification and reduce heavily dependent on oil. It also requires the need for the monetary authorities to implement tighten monetary policy. The results offer new views and insight for further empirical work on Islamic banking and macroeconomic stability.

JEL: C1, E5, E41, E51, F31

Keywords: Islamic banking growth, domestic inflation, *Sharia*, The GCC, Iran, Sudan

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1. Introduction

Islamic banking is growing rapidly in recent years in terms of both asset and loan. Islamic financial institutions spread around the world in both Muslim and non-Muslim countries. Although Islamic banks are heavily concentrated in the Middle East, the Islamic financial instruments are use in other countries such as Malaysia and Pakistan. These countries operate both Islamic and conventional banking systems.

Iran and Sudan have been experiencing high inflation. These two countries have few things in common: The banking system purely operates under *sharia* principles; Iran and Sudan are under economic sanction and both countries are oil-exporting countries. We expand our analysis to include the Gulf Cooperation Council (GCC) countries because these countries have larger presence of Islamic banking and finance[2]. Although most of the GCC countries pegged their currencies to the US dollar, Iran and Sudan are under a manage float exchange rate regime. The rules and regulations governing Islamic mode of finance and Islamic banking remain the same across the economies. However, different jurisdictions have their own *sharia* board who set the necessary guidelines for the effective functioning of Islamic banks.

Inflation in the GCC have remained relatively low in single digits. However, from 2007 to 2010 there was an uptick in inflation, which elevated to double digits for Kuwait, Oman, and Saudi Arabia. This period coincided with the global financial crisis. For Iran and Sudan, inflation continue to remain high. Although inflation rate moderated during certain period with inflation rate below ten percent, Iran and Sudan continue to register double digits inflation since September 2010. The highest inflation rate occurred in Sudan and Iran during November 2012 and July 2013 with a rate of 49 and 44 percent respectively. However, Inflation rate moderated during the global financial crisis (see figure 1).

There are lot of studies that look into the determinants of domestic prices in the GCC, Iran and Sudan applying various methods. Many of these studies investigated the linkages in money demand, money supply, exchange rate and inflation. Moriyama (2008) examined inflation dynamics in Sudan using single, vector-auto regression and Vector Error

[2] In our analysis, we exclude United Arab Emirates due to incomplete data series.

Correction Models (VECM). The empirical results revealed monetary growth and changes in the nominal exchange rate affect inflation with a lag period of 18 to 24 months.

Almounsor (2010) investigated inflation dynamics in Yemen using quarterly data from 2005- 2007 applying single, structural vector-auto regression and (VECM). The empirical findings revealed that international prices and exchange rate depreciation significantly affect domestic prices.

Osorio and Unsal (2011) presented a quantitative analysis of inflation dynamics in Asia including the GCC, Iran and Sudan using a Global VAR (GVAR) model, which incorporated the role of regional and global spillovers in driving Asia's inflation. They found the main drivers of inflation are mainly on monetary and supply shocks although the contribution of these shocks has declined. However, demand-side pressure has picked up in recent years.

Kandil amd Morsy (2009) examined the determinants of Inflation in the GCC using a model that include both domestic and external factors. They found inflation in a major trading partners with the GCC is the most important external factor. Oil revenue also reinforces inflationary pressure in the GCC. Hence, in the short run increased in government spending increases inflation. Bonato, Leo (2007) studied the determinants of inflation in Iran. The empirical findings revealed strong relationship between inflation and money supply.

McCarthy (2007) examined the pass-through of external factors such as exchange rate and import prices on domestic prices for several industrialized economies using a VAR model. According to his study, in the post-Bretton Woods era, impulse responses indicate that exchange rates have a modest effect on domestic price inflation. In addition, while import prices have a stronger effect, the pass-through is greater in countries with larger import share and more persistent exchange rates and import prices.

In the GCC countries, studies have shown that higher government spending and credit growth have successfully targeted supply side constraints, slowing down price inflation (see Kandil and Morsy (2009)). Imam and Kpodar (2016) investigated whether development of Islamic

banking is good for growth using data covering the period 1990- 2010. They found that Islamic banking is positively associated with growth after controlling other determinants of growth.

Imam and Kpodar (2013) investigated the determinants of the pattern of Islamic bank expansion worldwide using country-level data spanning from 1992 to 2006. Their study revealed that Islamic banks compliment conventional banks. Adedifar et al. (2015) reviewed recent empirical literature in Islamic banking and finance. The empirical findings revealed no major difference between Islamic and conventional banks in terms of their efficiency, competition and risk features. They found that Islamic finance enhances inclusion and financial development.

Gheeraert and Weill (2015) investigated whether Islamic banking influence macroeconomic efficiency that is total productivity by employing stochastic estimation technics with a sample of 70 countries, covering Islamic banks worldwide for the period 2000- 2005. Their results support the view that Islamic bank enhance macroeconomic efficiency to certain point. Zeitun (2012) study the impact of foreign ownership, bank-specific variables and macroeconomic indicators on the performance of Islamic and conventional banks in the GCC region employing annual data for the period 2002- 2009. They found that GDP and inflation significantly affect bank performance.

Hassan and Bashir (2003) examined the performance of Islamic bank using data for the period 1994- 2001 data. Their findings revealed that while macroeconomics variables have a positive impact on banks performance, taxes negatively impact banks performance. Similarly, Bougatef (2015) examined the impact of correction on health of Islamic banks using GMM estimation method for 69 Islamic banks with data series ranging from 2008 to 2010. Their empirical findings revealed that corruption level significantly impact financial soundness indicators. Cihak and Hesse (2010) looked into financial stability of Islamic banks covering 18 banking systems with significant presence of Islamic banks. They found that small Islamic banks tend to be financially stronger than small commercial banks. However, large commercial banks tend to be financially stronger than large Islamic banks.

However, we have not come across in any study that include Islamic finance as one of the determinants of inflation, despite the importance of

Islamic mode of finance in the demand for money in the region. We investigate whether Islamic finance through its facility in extending credit could affect domestic price inflation. To the best of our knowledge, we have not come across any empirical work to back the claim that Islamic finance is non-inflationary. This research aimed to address this empirical research gap and to provide an insight on the relationship between Islamic banking and inflation. We assess whether Islamic bank growth has been one of the contributing factors to high inflation in these countries.

The motivation for the study is the recent increased in Islamic banking growth and the high level of inflation in Iran and Sudan[3]. The two countries have double digits inflation rate. The paper is organized as follows: section 2 provides an overview of Islamic mode of finance. Section 3 discusses the model and estimation method used. Section 4 presents data and empirical results. Conclusions and recommendations are discussed in section 5.

[3] The banking systems in these countries operate under *shari'ah* principles.

2. Islamic mode of finance: Stylized facts

Sales base mode of finance is a financing mode, which include different types of *murabaha*, *salam* (forward sale), *Istisna* (manufacturing contract whereby a manafactuers promise to produce and deliver a good at an agreed price and given date), *Ijarah* (selling the service, utility generated etc.)

Murabaha is a sale transaction in which a commodity is exchange for the cost of the commodity and above some profit margin.

Salam is a sale contract where monetary transaction made in exchange for a good(s), which is delivered in advance with certain payments. Salam serves the interest of both the buyer and seller. The seller gets the desired money in advance exchange of the promise to deliver the commodity which is sold. This facility helps to cover the seller's financial needs which includes personal expenses and his productive activity.

Istisna is a sale transaction where the monetary payments are effected either in full, in parts or promised to settle in exchange for a commodity which will be delivered at an agreed-upon time.

Ijarah is a mode of leasing transaction where an agreement is undertaken between the Islamic bank and a client. The former finances the equipment or any facility on behalf of the latter with an agreed term such as agreed rental plus additional fees which is paid by the client in an account. This will allow him the latter to purchase the equipment or facility at the end of the lease period when all the payments are effected. In this leasing arrangement, Islamic banks buy and acquired the necessary asset as a result of a request from a customer who prefer to own the leased asset at the end of the lease period.

Finance based contract is a type of contract were the investor provide the capital and or expertise or management. There are five types- *Mudaraba* (partnership finance), *Muzara'a* (offer land and share proceeds of the produce), *Musakah* (agriculture), *Muharasa* and *Musarakah* (provide finance and or management)

Mudharabah is a mode of finance where Islamic banks use depositors' money in exchange of specified ratios. The banks use the money and lend it to potential investors in exchange of agreed return.

Muzara'a is a contract agreement where one party present the required resources mainly land to another party with required technical expertise and the proceeds of the produce is shared between the two parties.

Investment based contract includes mutual fund, *takaful* (solidarity, mutual support), and wealth management.

3. Model

We develop a hybrid model by borrowing from an earlier work by Valdovinos (2008) and Moriyama (2008) with few modifications. The Model is based on the following: the composition of inflation and the quantity theory of money (QTM). Firstly, an overall country's consumer price index consists of domestic price (*Pd*) and foreign (*P**) components, given by:

$$P = P_d^{\alpha}(EP_*)^{1-\alpha} \quad (1)$$

Where α is the share of the domestic component, which is assumed to be constant and E is the exchange rate. From the quantity theorem of money[4], domestic inflation follows the former given by the equation:

$$MV = P_d Y \quad (2)$$

$$P_d = MV/Y$$

Where *M* denotes the money supply, *V* is the velocity of money (the rate at which money changes hands), and *Y* is the level of output of the economy. Taking the natural logarithm of equations *(1)* and *(2)* yield equation 3 and equation 4 respectively:

$$p = \alpha p_d + (1 - \alpha)[\, e + p_* \,] \quad (3)$$

$$p_d = m - y + \mu t + \lambda \quad (4)$$

The lower-case letters represent percentage changes (growth rates) and the term $(\mu t + \lambda)$ presents the velocity component of equation n *(2)*.

The expansion of Islamic finance and banking, credit could expand which could stimulate domestic demand. In addition, the profit-risk sharing

[4] Aggregate prices and total money supply are related according to equation 2. The intuition is that a change in the rate of money growth results to an equal change in

nature of Islamic finance could further increase spending expectations and increase velocity of money which feed into domestic prices. Taking these arguments as bases, we introduction of Islamic banking variable in the augmented QTM model. Hence, from substituting equation *(4)* into equation *(3)* and the introduction of Islamic banking variable term (*Ib*), gives a linear transformation of the quantity theory of money represented in equation *5* below:

$$p = F\ (e, m, y, wcpi, ib; X) = Z\beta + X\gamma + \varepsilon \qquad (5)$$

Where $Z = F\ (e, m, y, wcpi, ib)$, X is a vector of other variables and ε is the disturbance term. The coefficients of the exchange rate and money supply capture the effects of exchange rate and monetary developments on inflation respectively. Other things equal, the depreciation of the country's currency and an increase in money supply will lead to an increase in inflation. In addition, an increase in foreign prices will be transmitted to domestic prices and subsequently lead to an increase in domestic prices. Islamic banking growth could increase output enhance demand which could translate into higher prices since Islamic banking offer more resources and capital to economic agents. The transfer of resources through Islamic mode of finance where depositors' money are offered in the form of credit on agreed terms. This arrangement increases economic agents' resources and income to some extent. The increased resources increased demand and with unchanged supply will lead to increase in prices.

In addition, an increase in international food and oil prices may positively affect domestic prices.

We investigate the impact of Islamic banking growth on inflation using equation *(5)*. We first use the single-equation model; second, we then

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inflation rate, which apparently led to the conclusion by Milton Friedman that "Inflation is always and everywhere a monetary phenomenon". The reason for such a claim is the assumption that velocity of money or its growth rate is constant. However, recent US data have claimed that velocity of money is no longer constant. Hence, money forces may not be the only factors affecting inflation.

apply the vector auto regression (VAR) and finally, we use vector error correction (VECM) to examine whether there is any long run relationship among variables. In order to solidify our findings, we apply panel regression analysis as well.

In order to derive a single equation from equation (5), we need its linear transformation and use the first difference of the variables[5], which is given as[6]:

$$P_t = \alpha_0 + \alpha_1 MS_t + \alpha_2 ER_t + \alpha_3 WCPI_t + \alpha_4 Y_t + \alpha_5 IB_t + \alpha_6 Woil_t + \alpha_7 Wfood_t + \varepsilon_t \quad (6)$$

Where,

P_t is the monthly inflation rate at time *t;*

MS_t is the monthly money and quasi growth rate at time *t;*

ER_t the dalasi per US dollar exchange rate at time t;

$WCPI_t$ is the monthly world consumer price index at time *t;*

Y_t is the monthly growth in imports (proxy to real economic activity) at time *t*[7]*;*

IB_t is the Islamic banking growth rate at time *t;*

$Woil_t$ is the World oil price growth rate at time *t;*

$Wfood_t$ is the World food price growth rate at time *t;*

And ε_t *is the disturbance term.*

Inflation depends on money supply growth, real GDP growth, nominal exchange rate, world consumer price index, world food prices, world oil prices, and Islamic banking growth. All the variables are transformed into growth rate. Equation 6 comprises different models of inflation within which different hypothesis can be tested. Since macroeconomic variables

[5] The Unit root test indicated that all the variables are non-stationary at level but stationary at first difference. See table 1 for unit root results.
[6] Note that M and MS denote the same variable (money supply growth); e and ER (exchange rate) and Y and IMP (output proxy by imports).
[7] Real economic activity was approximated by the monthly volume of imports.

do adjust instantaneously, we rewrite the above equation in autoregressive lag form:

$$P_t = \alpha_0 + \sum_{i=1}^{k} \alpha_{1i} P_{t-1} + \sum_{i=0}^{k} \alpha_{2i} ER_{t-i} + \sum_{i=0}^{k} \alpha_{3i} WCPI_{t-i} + \sum_{i=0}^{k} \alpha_{4i} MS_{t-i} + \sum_{i=0}^{k} \alpha_{5i} Y_{t-i} + \sum_{i=0}^{k} \alpha_{6i} IB_{t-i} + \sum_{i=0}^{k} \alpha_{7i} WOIL_{t-i} + \sum_{i=1}^{k} \alpha_{8i} WFOOD_{t-i} + \varepsilon_t \quad (7)$$

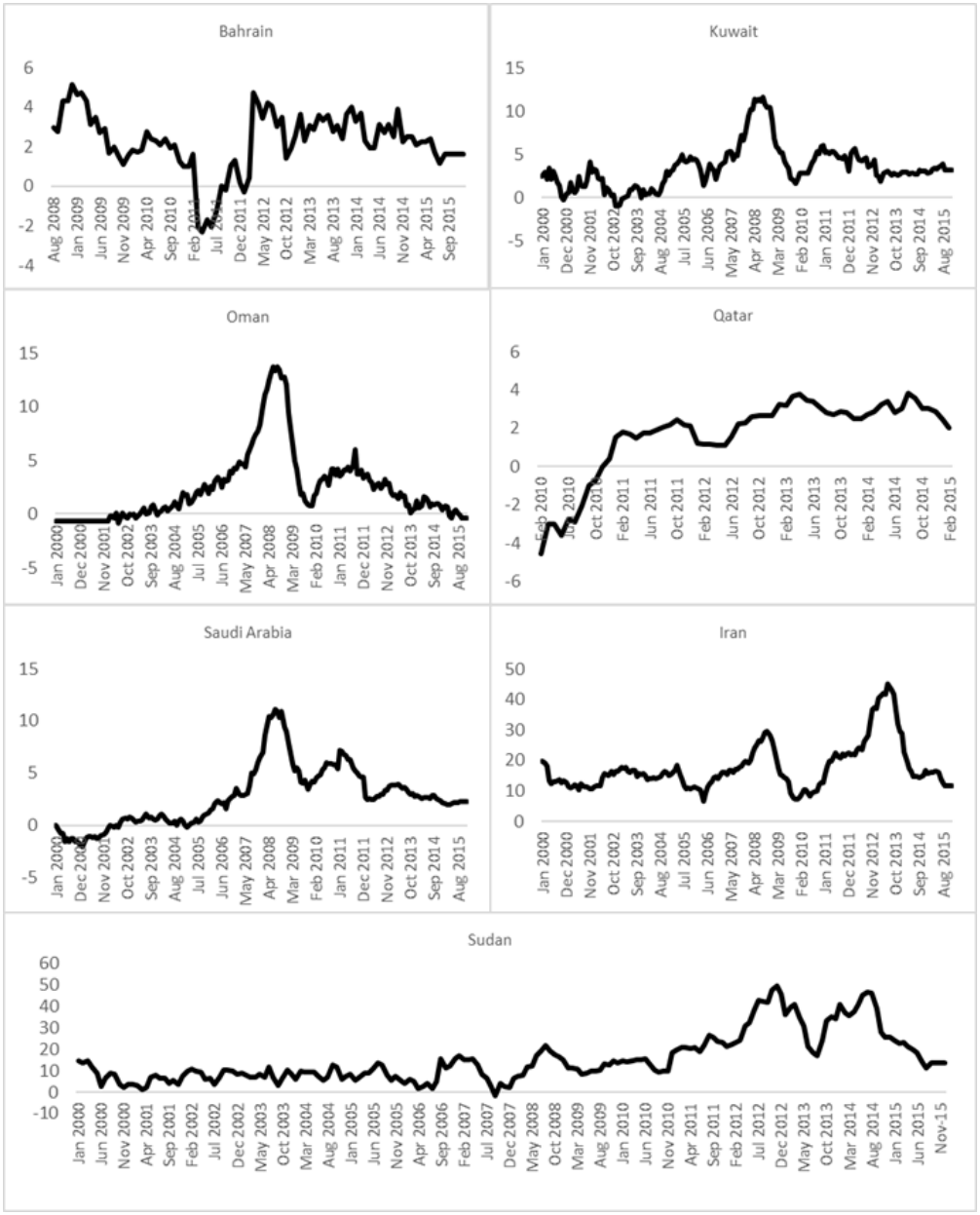
Where k is the lag length.

Since the macroeconomic variables are nonstationary and integrated of order one, we reformulate equation 7 into an error correction format as specified below:

$$\Delta P_t = \beta_0 + \sum_{i=1}^{k} \beta_{1i} P_{t-1} + \sum_{i=0}^{k} \beta_{2i} ER_{t-i} + \sum_{i=0}^{k} \beta_{3i} WCPI_{t-i} + \sum_{i=0}^{k} \beta_{4i} MS_{t-i} + \sum_{i=0}^{k} \beta_{5i} Y_{t-i} + \sum_{i=0}^{k} \beta_{6i} IB_{t-i} + \sum_{i=0}^{k} \beta_{7i} WOIL_{t-i} + \sum_{i=1}^{k} \beta_{8i} WFOOD_{t-i} + \beta_9 [P_t - \alpha_1 ER_t - \alpha_2 WCPI_t - \alpha_3 M_t - \alpha_4 Y_t - \alpha_5 IB_t] + \varepsilon_t \quad (8)$$

The term in bracket represents the error-correction term and the coefficient, β_9, is the speed at which the economy adjusts for any disequilibrium. Likewise, the parameters of the variables in the log-difference $(\beta_{1i} - \beta_{8i})$ display the short response and $\alpha_s$signify long-term responses. A substantial effect from a lagged to current prices β_{1i}would show inflation inertia which could be because of expectations.

Figure 1: Inflation



4. Data and Empirical results

4.1. Data

The empirical analysis is conducted using monthly data from 2001M1 to 2015M12[8]. While data on money supply, consumer price index, exchange rates, world oil price, world food prices, world oil prices are sourced from International Money Fund (IMF), IFS database, imported value are sourced from IMF, DOT database. Islamic banking data are sources bankscope. Since data on Islamic banking is annual and the rest of the data variables are monthly, we transform the data from low frequency to high frequency using eviews. We admit the loss of data quality due to data transformation; however, this is most possible option available data to us. All variables are in growth rates. For money supply, we used money and quasi-money. The CPI variable used is the composite consumer price index. For foreign price, we used world consumer price index (WCPI). We used nominal exchange rate of national currency per United States dollar. Since Gross Domestic Product is available only on annual frequency, we used volume of imports as proxy of the economic activity.

4.2. Unit Root Tests

We applied both standard Augmented Dickey-Fuller (ADF) unit root test and panel unit root test. Both test revealed that the series are non-stationary. The ADF unit root test for individual country series indicated non-stationary but stationary at first difference I(1). The results of the panel indicate the presence of unit root as LLC, IPS and both fisher test fail to reject the null of unit root for money supply, consumer price index, exchange rate and import. However, all the series are stationary at I (1). Appendix A, Table A1 and Table A2 contain the ADF unit root and panel unit tests results respectively.

[8] The data is sourced from International Monetary Fund's International Financial Statistics.

4.3 Empirical results and analysis

Summary Statistics

We begin our empirical analysis by presenting summary statistics of inflation, Islamic banking growth and other independent variables. Table 1 presents mean values, maximum, minimum and standard deviation of the variables use in the study. These statistics provide preliminary information regarding the distribution of the variables.

All variables have positive means ranging from 0.310 to 17.210. The mean value of Islamic banking growth is 0.31 while the standard deviation is 4.363. The maximum and the minimum values of Islamic banking growth are -52.93 and 137.818 respectively, which is fairly distributed. The minimum and the maximum values of inflation are -5.619 and 49.452 respectively. The maximum value indicates that some countries are experiencing hyperinflation. The value of the standard deviation reveals that exchange rate is more volatile compared to other variables. The mean value of money supply growth suggests that on average the monetary authorities have been implementing expansionary monetary policy.

Table 1: Descriptive Statistics

	CPI	**MS**	**ER**	**IB**	**WCPI**	**WFOOD**	**WOIL**
Mean	6.426	17.210	5.896	0.310	3.736	5.535	11.788
Median	3.217	14.955	0.000	0.135	3.618	3.564	6.294
Maximum	49.452	60.976	356.812	137.818	6.939	48.384	92.873
Minimum	-5.619	-7.110	-22.625	-52.934	1.363	-28.156	-55.455
Std. Dev.	8.899	11.157	36.322	4.363	0.862	14.616	31.502
Skewness	2.034	0.811	8.554	23.440	0.983	0.636	0.186
Kurtosis	7.954	3.343	80.197	803.769	5.743	3.544	2.774
Observations	1260	1260	1260	1260	1260	1260	1260

Single Equation results

From equation (6) inflation depends on money supply growth, real GDP growth, nominal exchange rate, world prices, oil price, Islamic banking growth. We included three dummies for period of the financial crisis, periods of oil prices hitting low and high respectively. The estimated result of equation (6) is summarized in Table 2. The coefficients represent elasticities and the standard deviation are in parenthesis. We perform regressions of inflation on a set of variables including Islamic banking growth, domestic and external factors. We checked the correlation among the explanatory variables and conclude that the hypothesis of multicollinearity can be accepted. Only the external variables, which is international food and oil prices and world consumer price index, have correlation above 0.5, which makes us comfortable introduce them simultaneously and in some instances one at time in the models (see appendix F).

The regression result from the single equation reveal the following: (i) Islamic banking growth significantly decrease inflation in Oman, Qatar and Iran, (ii) money supply significantly increases inflation in Oman, (iii) exchange depreciation tends to increase inflation in Iran and Sudan, (iv) high international food prices on the one hand raise domestic prices in Oman and Saudi Arabia[9] and on the other hand it dampen inflation in Bahrain and Qatar, (v) higher world consumer price index increase inflation in Kuwait and Iran but dampen inflation in Oman, and (vi) higher oil prices increase inflation in Qatar but decrease inflation in Bahrain, Kuwait, Saudi Arabia, Iran and Sudan. While the period of the financial crisis reflects increase inflation in Bahrain, Kuwait and Saudi Arabia, it dampen domestic prices in Oman, Qatar, Iran and Sudan. Furthermore, period of low oil prices reflects increases in inflation in Saudi Arabia and Sudan which is a reflection of subsidizes due to low oil revenues. Period of high oil prices increases in inflation in Bahrain and Oman[10] but dampen inflation in Qatar. It is also interesting to note past inflation increases inflation in Bahrain, Oman, Qatar and Sudan.

[9] Our results agree with that of Kandil and Morsy (2009)
[10] Our findings is in line with that of Kandil and Morsy (2009)

Table 2: Single Equation Model Regressions

	Dependent Variable: DCPI						
Variable	**Bahrain**	**Kuwait**	**Oman**	**Qatar**	**Saudi Arabia**	**Iran**	**Sudan**
INTERCEPT	1.848 (0.455)	-4.033 (0.705)	0.556 (0.263)	1.183 (1.316)	-2.657*** (0.711)	5.074 (3.301)	9.837 (4.524)
D(CPI(-1))	0.258** (0.120)	0.189 (0.188)	0.165** (0.083)	0.838*** (0.247)	-0.502 (0.331)	0.301 (0.433)	0.888*** (0.264)
D(MS)	-0.002 (0.028)	0.033 (0.050)	0.065*** (0.019)	-0.001 (0.043)	-0.008 (0.061)	-0.001 (0.340)	-0.101 (0.253)
D(ER)						0.001** (0.001)	10.305** (5.006)
D(IMP)	0.233 (0.535)	0.188 (0.450)	-0.031 (0.172)	-1.149 (6.009)	0.336 (0.666)	0.467 (3.037)	0.300 (2.496)
D(IB)	-0.002 (0.005)	-4.975 (6.200)	-4.885** (2.00)	-11.267** (5.106)	-0.132 (0.600)	-7.823* (4.380)	2.213 (5.318)
D(WCPI)	-0.076 (0.124)	1.882*** (0.191)	-0.174** (0.071)	0.234 (0.356)	1.209*** (0.192)	4.050*** (0.893)	1.831 (1.225)
D(WFOOD)	-3.36*** (0.787)	0.609 (1.278)	1.398*** (0.434)	-6.600*** (2.274)	5.956*** (1.341)	-3.467 (5.868)	-4.104 (8.216)
D(OIL)	-1.048*** (0.396)	-2.082*** (0.630)	0.182 (0.239)	4.096** (1.151)	-2.606*** (0.643)	-9.879*** (2.840)	-8.472** (4.143)
DUMFC	0.836*** (0.246)	3.103*** (0.382)	-0.225* (0.134)	-6.173*** (0.711)	4.295*** (10.990)	-3.629** (1.771)	-5.690** (2.502)
DUMOILL	0.250 (0.282)	0.839 (0.654)	-0.099 (0.227)	1.342 (1.204)	1.453** (0.662)	-4.066 (2.988)	20.751*** (4.284)
DUMOILH	0.909** (0.450)	0.024 (0.693)	0.466* (0.239)	-2.857** (1.271)	0.352 (0.721)	3.594 (3.205)	6.143 (4.541)
Adjusted R^2	0.40	0.64	0.38	0.56	0.69	0.24	0.27
F- Stats	11.03	25.37	7.85	19.52	31.92	4.45	5.31
DW	0.56	0.29	2.19	0.39	0.23	0.17	0.23
SE	1.05	1.61	0.54	2.98	1.65	7.45	10.58
AIC	3.00	3.86	1.66	5.08	3.91	6.92	7.63
SC	3.19	4.08	1.90	5.29	4.13	7.15	7.85

The coefficients of the variables are listed, and standard errors are in parentheses.
*** 1% significance level, ** 5% significance level, and * 10% significance level.

The main drivers of inflation in Bahrain is past inflation representing an indication of inflation inertia, period of financial crisis and period of high oil prices. However, increase in international food prices and high oil prices tends to dampen domestic prices. This could be an indication of presence of subsidies because of oil revenue receipts. In addition, the non-pass through of international prices on domestic prices could be as a result artificial control on domestic and hence international price developments are not transmitted to domestic prices. Our findings to a larger extent agree with the work of Kandila and Morsy (2009).

In Kuwait, in the short run, higher world consumer prices is transmitted to domestic prices. In addition, period of financial crisis resulted to increase in domestic prices. However, increase in world oil prices tends to dampen inflation which is could be a reflection of subsidies. Oman domestic prices is positively influence by fast inflation, increase in money growth, increase in international food prices, and periods of high oil price. However, growth in Islamic banking, increase in world consumer prices, and periods of financial crisis decreases inflation. In Qatar, the presence of increase in Islamic banking growth, increase in international world price, periods of financial crisis and high oil prices eases inflationary pressure. This could be a reflection of subsidies and to some extent evidence of price control. However, there is evidence of inflation inertia. In addition, increase in the international price increases inflation, which could be due to demand pressure because of increase in oil revenue. In Saudi Arabia domestic prices is driven mainly by world consumer price and world food prices. Periods of the financial crisis and period of low oil prices have shown increased in domestic prices. However, increase in oil prices decreases domestic prices. This could be also be a reflection of subsidies because of increase in oil revenues as Saudi Arabia is major oil exporter.

In Iran, a pure Islamic banking country has its domestic prices dampen as result of increase in Islamic banking growth and increase in oil prices. In addition, periods of financial crisis tend to dampen inflation in Iran. This could be due to the economic sanction the country face as it disconnected financially from the rest of the world. However, the depreciation of the local currency visa-a-visa to the US dollar increases inflation. Similarly,

increases in the world consumer prices lead to increase in domestic prices as well.

Inflation in Sudan is positively influenced by past inflation, exchange rate depreciation, and period of low oil prices. However, increase in world oil prices decreases inflation in Sudan, which could be a reflection of subsidies receipts from oil revenue. Similarly, period of the recent, financial crisis tends to dampen domestic prices. This could be due to the sanction, which makes the country less connected to the world. Our empirical result shows no indication that growth in Islamic banking increases inflation. In fact, our empirical results indicated that it dampens domestic prices. In the short-run, increase in Islamic banking growth significantly decrease domestic prices in Oman, Qatar and Iran.

Given that the unit root tests revealed that the variables are nonstationary, we perform a cointegration test. The results of Johansen tests suggest the existence of cointegrating vectors. Appendix B, Table B1 and Table B2 summaries the cointegration and panel cointegration tests. Since there is existence of cointegrating vectors, we perform a vector error correction estimates to determine the short and long-run dynamics of inflation across the countries under consideration.

In Bahrain, in the long run, the main drivers of inflation are money supply and world consumer prices. However, Islamic banking growth dampen inflation in Bahrain in the long run. In the short-run, inflation is drive by inflation inertia and international food prices. From the impulse response functions, persistent inflationary effect is attributed to certain extent by world consumer prices and growth in economic activity. However, money supply growth, changes in exchange rate and Islamic banking growth show no persistent effects overtime. In Kuwait, the main drivers of inflation in the long run are money supply growth and exchange rate depreciation. The impulse response functions show persistent inflationary effect is due to the pass-through channels of changes in exchange rate and world consumer prices. The inflationary effect of money supply and Islamic banking growth appear to have the least persistent effect. In Oman, the main driver of inflation in the long-run is money supply. In the short-run, the main causes of inflation are money supply, international oil and food prices. The impulse response functions revealed persistent inflationary effects mainly due to growth in money supply. However, there is no persistent inflation overtime with the other determinants. In

Qatar, money supply and world consumer price index are the main drivers of inflation in the long run. The impulse response shows persistent inflationary effects attributed to growth in money supply and real economic growth. However, world consumer price index and Islamic banking growth do not have long pronounced effect. In Saudi Arabia, world consumer price is the main driver of inflation in the long run, in the short run, money supply, past inflation and world consumer price are the main causes of inflation. The impulse response shows persistent inflationary effects attributed to growth in Islamic banking growth and money supply growth. However, world consumer prices and real economic activity do not have long pronounced effect.

While in the long-run, inflation in Sudan is mainly determined by money supply and world consumer price index, in the short-run, however, past inflation is the main driver of inflation. The impulse response functions illustrate persistent inflationary effect due to Islamic banking growth, money supply growth and change in exchange rate to some extent. However, changes in world consumer prices appears less persistent overtime. In Iran, money supply, world consumer prices and exchange rate depreciation are the main drivers of inflation in the long-run, in the short run, past inflation and international food prices are some of the causes of inflation. The impulse response illustrates persistent inflationary effects attributed to change in exchange rate and growth in Islamic banking. The pass-through channels of money supply growth and world consumer price do not appear to last long. In Iran, Islamic banking growth significantly decreases domestic prices in the short and long run. In Sudan, to certain extent, Islamic banking growth decreases inflation in the short run.

From the Vector error correction model, we conclude that Islamic banking growth does not impose any inflationary pressure on domestic prices for the countries under study. In fact, it rather dampens domestic prices in certain countries namely Iran, Bahrain and to some extent Oman.

For robustness checks to strengthen our assessment**,** we perform a panel regression with fixed effect with different specifications. The outcome of the panel regression results reveals that the coefficient of the variable of interest, Islamic banking growth is negative and insignificant in all specifications indicating that growth in Islamic bank does not exert any inflationary pressure in the selected countries. However, the regression

results indicated that in the GCC countries, Iran and Sudan inflation is determined mainly by money supply growth and exchange rate depreciation of the individual country currency vis-à-vis the US dollar affect inflation in all specifications suggesting the existence of the pass-through on inflation. In addition, lag (previous period) inflation positively affect current inflation suggesting that inflation exhibits inflation inertia. Furthermore, world consumer price index and world food prices positively affect inflation in all specifications. While the coefficient for world food prices significantly affect prices in these economies, world consumer price index and world oil price are significant in only one specification. The possible explanation is that these countries are mainly oil exporting economies. Three dummies DUMFC, DUMOILL and DUMOILH were introduced representing periods of financial crisis, low oil prices and high oil prices respectively. While the coefficient for DUMFC remained insignificant in all specifications, the coefficients for DUMOILH is positive and significant in two out the four specifications. The intuition is that periods of high prices represent increase in oil revenue, which exerts demand pressure. Likewise, periods of low oil prices represent low oil revenue, which slow down demand.

The elasticities of inflation to money supply, exchange rate, and world food prices based on the panel regression revealed, a percent increase in money supply, depreciation of the currency against US dollar, and world food prices inflation would raise inflation by 0.024, 0.005, and 0.01 percent respectively. In addition, a percentage point increase in world consumer price and high oil price will increase inflation in by 0.11 and 0.486 percent respectively. However, a one percent decrease in the period of low oil prices will dampen inflation by 0.230 percent.

Table 3: Panel Least Squares

	Dependent Variable: D(CPI)			
Variable	**Model 1**	**Model 2**	**Model 3**	**Model 4**
INTERCEPT	-0.143 (0.330)	-0.373 (0.013)	-0.001 (0.054)	-0.028 (0.053)
D(MS)	0.024* (0.013)	0.026** (0.013)	0.022* (0.013)	0.024* (0.013)
D(ER)	0.005* (0.003)	0.005* (0.003)	0.001* (0.003)	0.005* (0.003)
D(IMP)	-0.001 (0.001)	-0.001 (0.002)	-0.001 (0.002)	-0.001 (0.002)
D(IB)	-0.001 (0.004)	-0.001 (0.001)	0.000 (0.001)	-0.000 (0.006)
WCPI	0.031 (0.062)	0.111** (0.057)		
WOIL	0.001 (0.002)		0.004** (0.002)	
WFOOD	0.010*** (0.004)			0.012*** (0.003)
DUMFC	-0.142 (0.125)	-0.186 (0.121)	-0.145 (0.125)	-0.163 (0.120)
DUMOILL	-0.137 (0.144)	-0.230* (0.139)	-0.194 (0.142)	-0.162 (0.139)
DUMOILH	0.297 (0.227)	0.486** (0.204)	0.380* (0.219)	0.369 (0.196)
Adjusted R^2	0.034	0.026	0.027	0.033
F- Stats	4.30	2.34	2.47	3.05
DW	1.63	1.61	1.62	1.63
SE	1.42	1.43	1.43	1.42
AIC	3.55	3.56	3.56	3.55
SC	3.59	3.62	3.62	3.62

The coefficients of the variables are listed, and standard errors are in parentheses. *** 1% significance level, ** 5% significance level, and * 10% significance level.

We ran panel regression with fixed effect with four specifications. The regression results are presented in Table 3. In the first model, we included all the variables together with three dummies DUMMFC, DUMOILH and DUMOILL namely periods of financial crisis, periods of low oil prices and periods of high oil prices respectively.

The outcome of the panel regression reveals that, money supply growth, exchange rate depreciation and increase in world food prices mainly determined inflation in Iran, Sudan and GCC countries. We introduce world Consumer price index, world oil price index and world food price index in the regression equation one at time. When world CPI is introduced in the regression, money supply growth, exchange rate depreciation, and increase in world CPI positively increase domestic prices in these economies. In addition, while period of high oil price positively influence inflation, low oil prices dampen inflation. This could be attributed to the fact that in periods of high oil price, these economies get over heated due to the increased in demand.

Similarly, when world oil price index is introduced, oil price, money supply and exchange rate depreciation will result to increase in domestic price. Similarly, periods of high oil price positively influence inflation. Given that these countries are oil rich countries and are major exporters of oil, increase in oil price enhances revenue and give more room for fiscal spending.

Furthermore, when world food index is introduced in the regression, its coefficient is positive and statistically significant. Since the region is a major food imported, an increased in world food price index will results to increase in domestic prices.

However, in all specifications, the coefficient of the variable of interest, Islamic banking growth remain negative and indicating Islamic banking growth in these countries does not increase domestic prices. Hence, the empirical findings offer us a conclusion that growth in Islamic does not lead to increase in domestic prices. Similarly, the coefficient for financial crisis, DUMFC is insignificant in all the specification of the model indicating that the financial crisis does have any impact on prices in these economies. Hence, the argument that Islamic banking and Islamic finance target the real sector and is noninflationary holds some ground. From the

analysis, the main drivers of inflation in these economies are money supply, exchange depreciation, surge in international oil and food prices.

The variance decomposition indicates that the variance of inflation in the GCC countries, Iran and Sudan is dominated by its own lag, followed by international food and oil prices and monetary growth. Islamic banking growth and exchange rate contributed the least in the variance of inflation in the region. The least variance by exchange rate could be due to fixed exchange rate regime in the GCC countries and economic sanction on Iran and Sudan.

The impulse response shows persistent inflationary effect attributed to international food and oil prices and growth in money supply. However, the pass-through channels of Islamic banking growth and real economic activity does not last long. This reinforces the argument that growth in Islamic banking is not inflationary.

5. Conclusions

We examined the impact of Islamic banking growth on inflation dynamics in the GCC, Iran and Sudan using monthly time series and panel data from 2001 to 2015. These countries are among countries with larger presence of Islamic banking. Our empirical analysis revealed that Islamic banking growth does not have any inflationary pressure in the GCC, Iran and Sudan. In fact, the results show Islamic banking growth dampen inflation in the short run and long run. From the single regression results, Islamic banking growth significantly decreases domestic prices in Oman, Qatar and Iran. From the error correction model, Islamic banking dampen inflation in Bahrain, Iran and Sudan. The findings revealed Islamic banking growth dampen domestic prices in five out of seven countries under consideration. The results of panel regression with fixed effect revealed no indication that Islamic banking growth increases domestic prices. Our findings support the hypothesis that Islamic banking and finance enhances price stability.

There is strong impact of inflation inertia on inflation. Similarly, money supply and exchange rate depreciation do have significant impact on domestic prices. The variance decomposition revealed that inflation is dominated by its own lag, international food and oil prices and monetary growth. Furthermore, the findings revealed that persistent inflationary

effect attributed to international food and oil prices and monetary growth. However, Islamic banking growth is the least dominant to inflation. Given the above phenomena, it is recommended that central banks reiterate their assurance to maintain low and stable inflation. Hence, the monetary authorities should continue with tight monetary policies couple with proper fiscal management in order to have a conductive macroeconomic environment. Although most of the GCC countries under pegged their currencies to US dollar, for Iran and Sudan, the depreciation of the local currency against the US dollar is passed on to domestic prices. The results revealed that revenues generated during periods of high oil prices need to be use wisely rather than engaging in extra-spending activities. Hence, there is a need to accumulate foreign exchange reserves in order to minimize external shock particularly during the period of low oil prices. The foreign exchange buffer could help some countries when confronted with economic sanction; a case in point is Iran and Sudan. The empirical results call for certain policy measures. Given that most of these countries are food importers, increase in international food prices are transmitted to domestic prices. Hence, there is a need for these countries to diversify their economies and not to solely depend on oil. One possible option is to scale up financing in the non-oil sectors particularly in agriculture sector which minimize food imports particularly in the GCC countries. While our results is in line with notion that Islamic finance is directed more towards supporting the real sector and non-inflationary, more work is needed to investigate the extent to which our estimates are robust. For instance, it would be of interest to disaggregate Islamic finance into different Islamic mode of finance rather than using Islamic banking growth as a proxy for Islamic finance. However, the empirical research in this area is subject to the availability of data. These findings is first empirical work to sight light on the impact of Islamic banking on domestic prices.

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APPENDIX A: TABLES

Table A1: Augmented Dicky-Fuller Unit Root Test 1/2/3/4/

Bahrain Dependent Variable: DCPI			
Variable	**Level**	**1st difference**	**2nd difference**
CPI	0.009	0.000	Not needed
MS	0.430	0.000	Not needed
ER	0.992	0.98	0.000
LIMP	0.081	0.000	Not needed
IB	0.000	Not needed	Not needed
WCPI	0.006	0.000	Not needed
WFOOD	0.003	0.000	Not needed
WOIL	0.003	0.000	Not needed

Kuwait Dependent Variable: DCPI			
Variable	**Level**	**1st difference**	**2nd difference**
CPI	0.322	0.000	Not needed
MS	0.474	0.000	Not needed
ER	0.289	0.000	Not needed
LIMP	0.047	0.000	Not needed
IB	0.639	0.024	0.000

Oman Dependent Variable: DCPI			
Variable	**Level**	**1st difference**	**2nd difference**
CPI	0.603	0.000	Not needed
MS	0.212	0.004	Not needed
ER			
LIMP	0.052	0.000	Not needed
IB	0.159	0.000	Not needed

Qatar Dependent Variable: DCPI			
Variable	**Level**	**1st difference**	**2nd difference**
CPI	0.501	0.000	Not needed
MS	0.139	0.000	Not needed
ER			
LIMP			
IB	0.717	0.000	Not needed

APPENDIX A: Cont.

Table A1: Augmented Dicky-Fuller Unit Root Test

Saudi Arabia Dependent Variable: DCPI			
Variable	**Level**	**1st difference**	**2nd difference**
CPI	0.745	0.000	Not needed
MS	0.135	0.000	Not needed
ER	0.091	0.000	Not needed
LIMP	0.000	Not needed	Not needed
IB	0.086	0.000	Not needed

Iran Dependent Variable: DCPI			
Variable	**Level**	**1st difference**	**2nd difference**
CPI	0.195	0.001	Not needed
MS	0.145	0.000	Not needed
ER	0.038	0.000	Not needed
LIMP	0.340	0.000	Not needed
IB	0.003	0.015	Not needed

Sudan Dependent Variable: DCPI			
Variable	**Level**	**1st difference**	**2nd difference**
CPI	0.745	0.000	Not needed
MS	0.023	0.000	Not needed
ER	0.624	0.000	Not needed
LIMP	0.009	0.000	Not needed
IB	0.086	0.000	Not needed

1/ P- values are reported for null hypothesis: Ho: series have unit root.
2/All tests include intercept and number of lags is based on Schwartz Information Criterion.
3/ Statistically significant levels of 1%, 5% and 10% is used.
4/ All variables are almost stationary I (1); Bahrain exchange rate is stationary I(2).

Table A2: Panel Unit Root Test 1/2/3/4/

Panel Unit root test				
Variable	**Level**	**(Prob)**	**I(1)**	**(Prob)**
MS	Levin, Lin & Chu t*LC Im, Peasaran and Shin W-stat ADF- Fisher Chi-square PP – Fisher Chi-square	0.5895 0.013 0.0269 0.0078		0.000
CPI	Levin, Lin & Chu t*LC Im, Peasaran and Shin W-stat ADF- Fisher Chi-square PP – Fisher Chi-square	0.9238 0.091 0.099 0.0167		0.000
ER	Levin, Lin & Chu t*LC Im, Peasaran and Shin W-stat ADF- Fisher Chi-square PP – Fisher Chi-square	0.999 0.336 0.141 0.003		0.000
IB	Levin, Lin & Chu t*LC Im, Peasaran and Shin W-stat ADF- Fisher Chi-square PP – Fisher Chi-square	0.927 0.000 0.000 0.000		0.000
WCPI	Levin, Lin & Chu t*LC Im, Peasaran and Shin W-stat ADF- Fisher Chi-square PP – Fisher Chi-square	0.1273 0.000 0.000 0.000		0.000
WOIL	Levin, Lin & Chu t*LC Im, Peasaran and Shin W-stat ADF- Fisher Chi-square PP – Fisher Chi-square	0.2066 0.000 0.000 0.000		0.000
WFOOD	Levin, Lin & Chu t*LC Im, Peasaran and Shin W-stat ADF- Fisher Chi-square PP – Fisher Chi-square	0.0725 0.000 0.000 0.000		0.000
IMP	Levin, Lin & Chu t*LC Im, Peasaran and Shin W-stat ADF- Fisher Chi-square PP – Fisher Chi-square ……	0.4701 0.000 0.000 ….0.000		0.000

1/ P- values are reported for null hypothesis: Ho: series have unit root.
2/All tests include intercept and number of lags is based on Schwartz Information Criterion.
3/ Statistically significant levels of 1%, 5% and 10% is used.
4/ All variables are stationary at I(1).

APPENDIX B: TABLES

Table B1: Cointegration Test for Inflation equation 1/2/

	Null Hypothesis					
	r=0		r≤1		r≤2	
	Trace Stat. (95% C.V.)	Max Stat. (95% C.V.)	Trace Stat. (95% C.V.)	Max Stat. (95% C.V.)	Trace Stat. (95% C.V.)	Max Stat. (95% C.V.)
Bahrain	190.06* (125.61)	53.50* (46.23)	136.55* (95.75)	47.23* (40.08)	89.32* (69.82)	32.59 (33.89)
Kuwait	208.33* (125.62)	59.90* (46.23)	148.44* (95.75)	46.18* (40.08)	102.26* (69.82)	41.36* (33.88)
Oman	194.83* (125.62)	51.20* (46.23)	143.63* (95.75)	46.54* (40.08)	97.08* (69.82)	40.98* (33.88)
Qatar	178.14* (125.62)	69.31* (46.23)	108.83* (95.75)	46.79* (40.08)	62.04* (69.82)	22.68* (33.88)
Saudi Arabia	185.81* (125.62)	54.42* (46.23)	108.83* (95.75)	46.79* (40.08)	62.04* (69.82)	22.68 (33.88)
Iran	169.38* (125.62)	55.24* (46.23)	114.15* (95.75)	43.12* (40.08)	71.03* (69.82)	32.03 (33.88)
Sudan	168.48* (125.62)	60.36* (46.23)	108.11* (95.75)	47.47* (40.08)	60.64 (69.82)	25.74 (33.88)

1/r is the number of cointegrating vectors

2/ Asterisks *indicate rejection of the hypothesis at 95% C.V. Critical values in ().

Table B2: Panel Co-integration Test 1/

Pedroni Residual Cointegration Test

Null Hypothesis: No cointegration

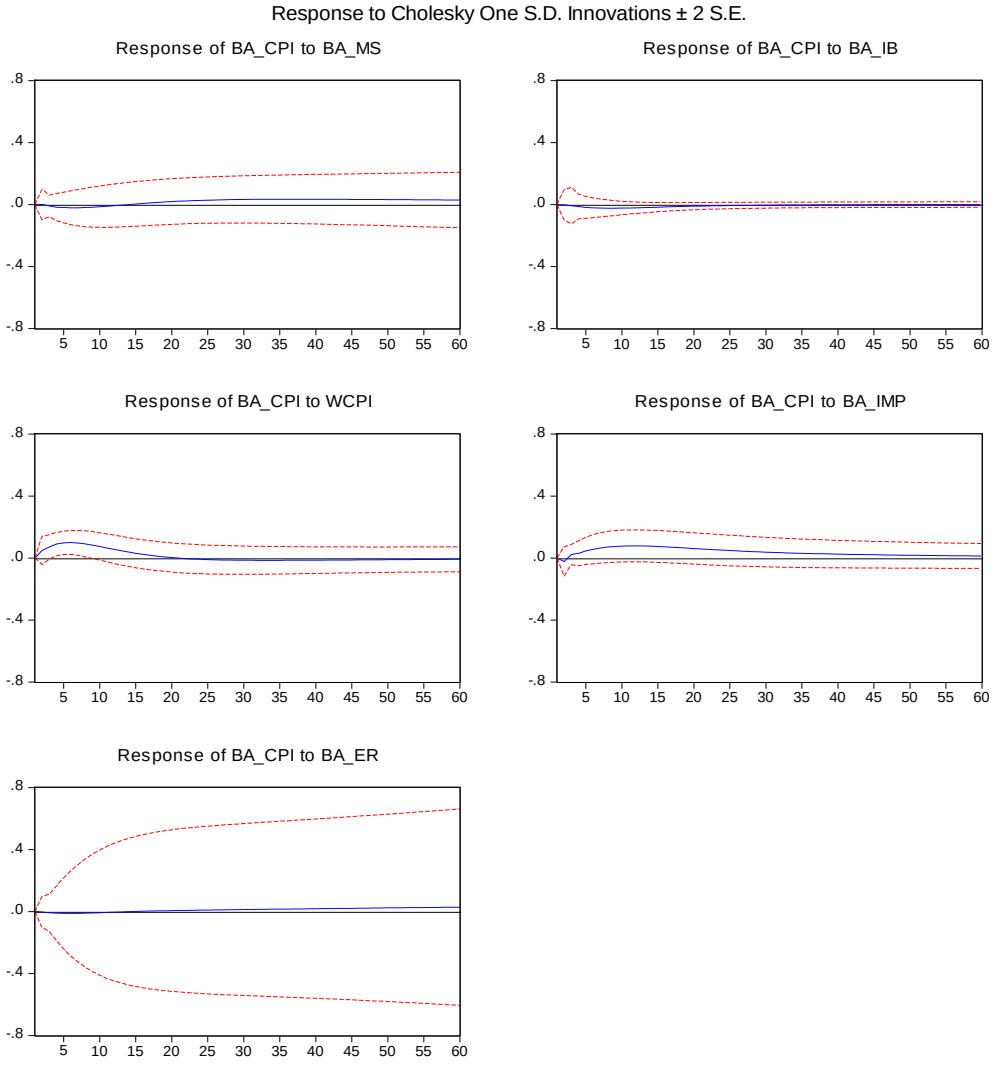
Variables CPI, MS, ER, IB, WCPI and WOIL				
Alternative hypothesis: common AR coefs. (within-dimension)				
	Statistic	**Prob**	**Weighted Statistic**	**Prob**
Panel v-Statistic	0.564806	0.2861	-0.517246	0.6975
Panel rho-Statistic	0.425277	0.6647	1.306111	0.9042
Panel PP-Statistic	0.003645	0.5015	0.646971	0.7412
Panel ADF-Statistic	0.263121	0.6038	0.553739	0.7101
Alternative hypothesis: common AR coefs. (between-dimension)				
	Statistic	**Prob**		
Panel rho-Statistic	1.486293	0.9314		
Panel PP-Statistic	0.789255	0.7850		
Panel ADF-Statistic	0.743135	0.7713		

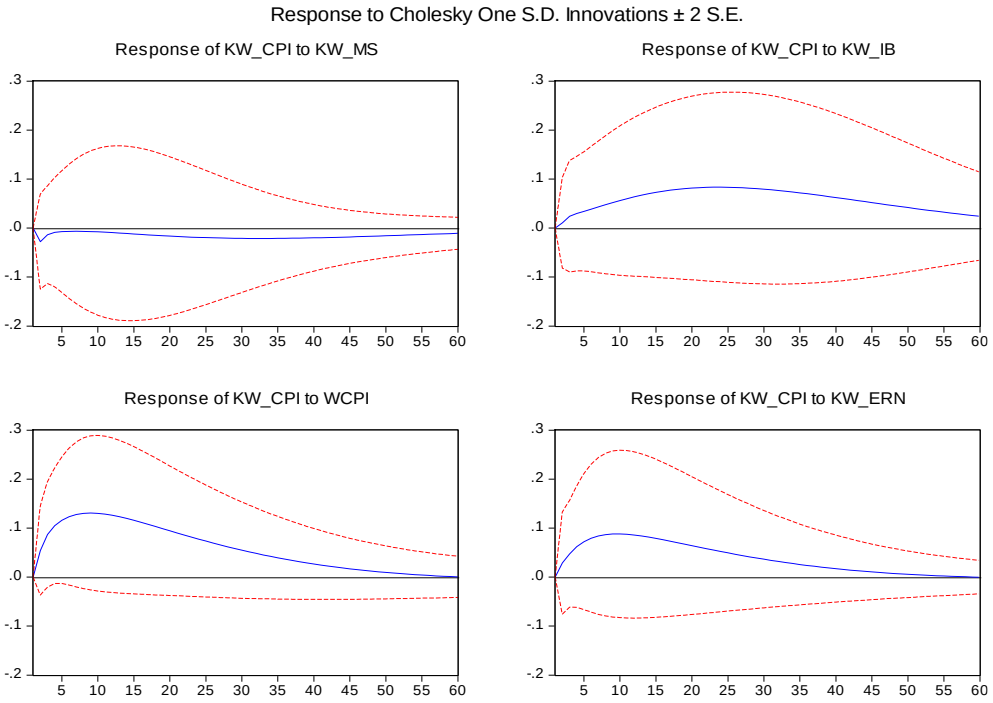
1/* The panel cointegration test, all the eleven statistics do not reject the null hypothesis of no cointegration at the conventional level of 0.05.

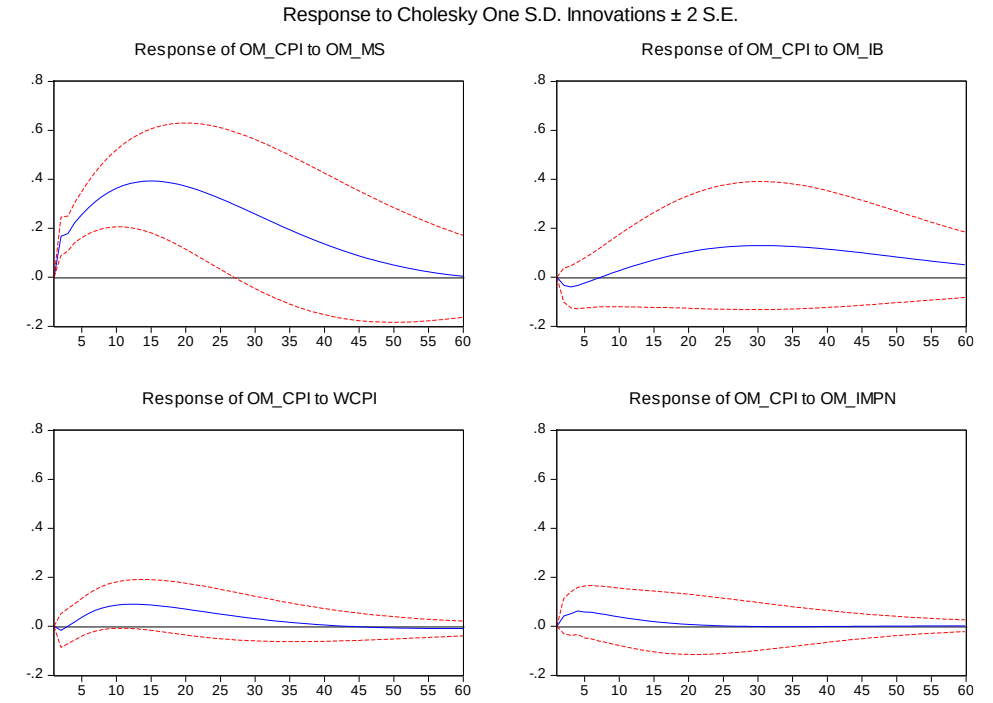
APPENDIX C

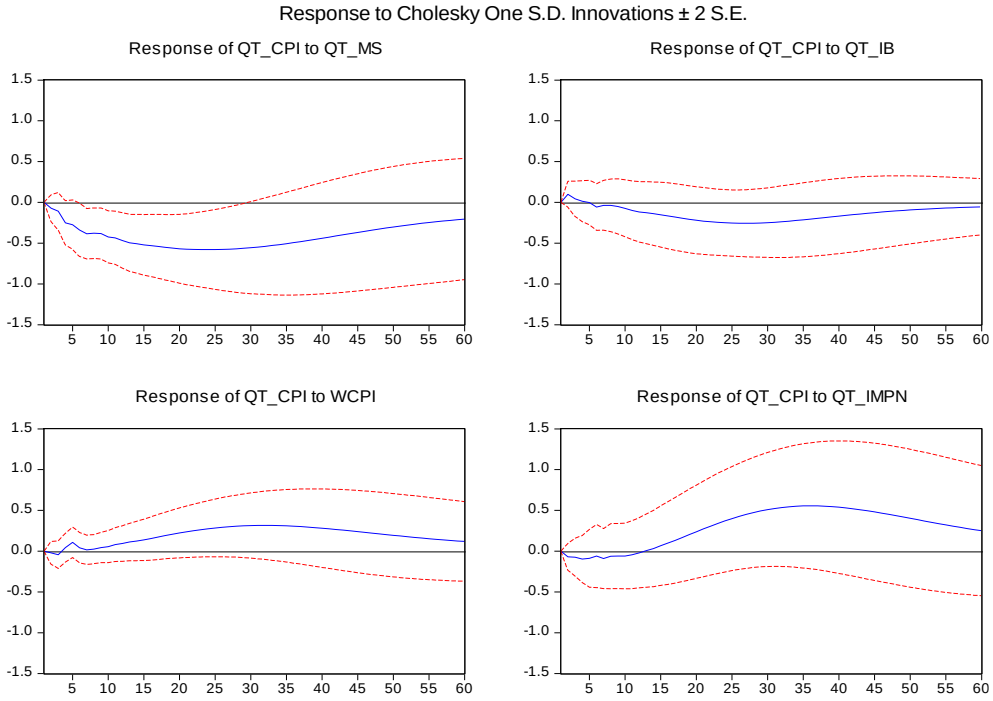
Figure C1. Impulse Response of Inflation

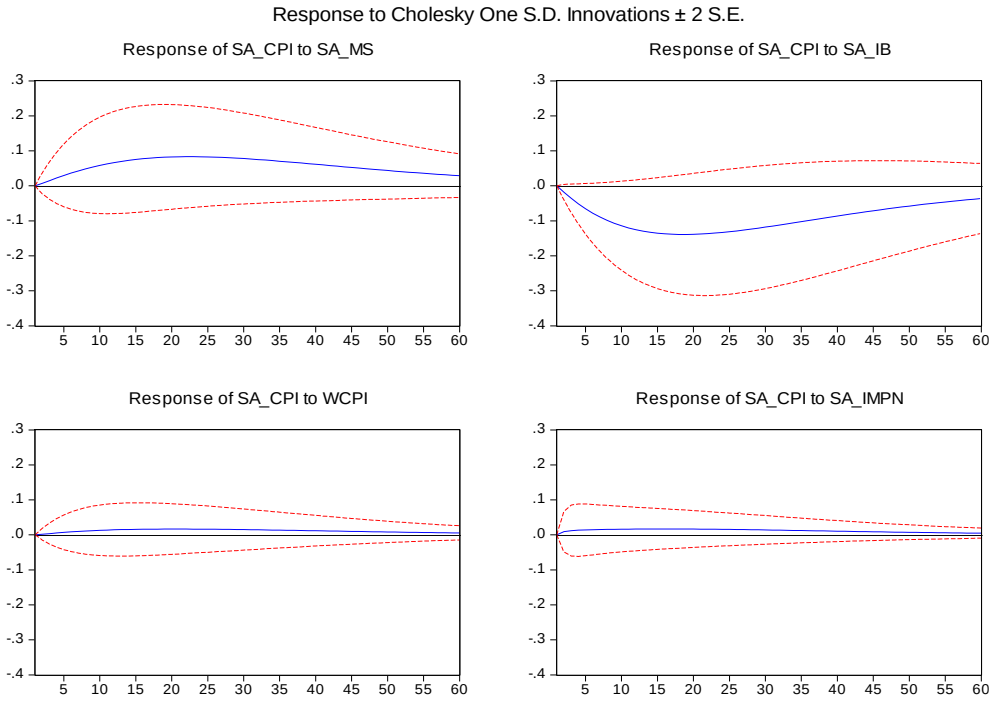
Appendix Figure 1: Impulse Response

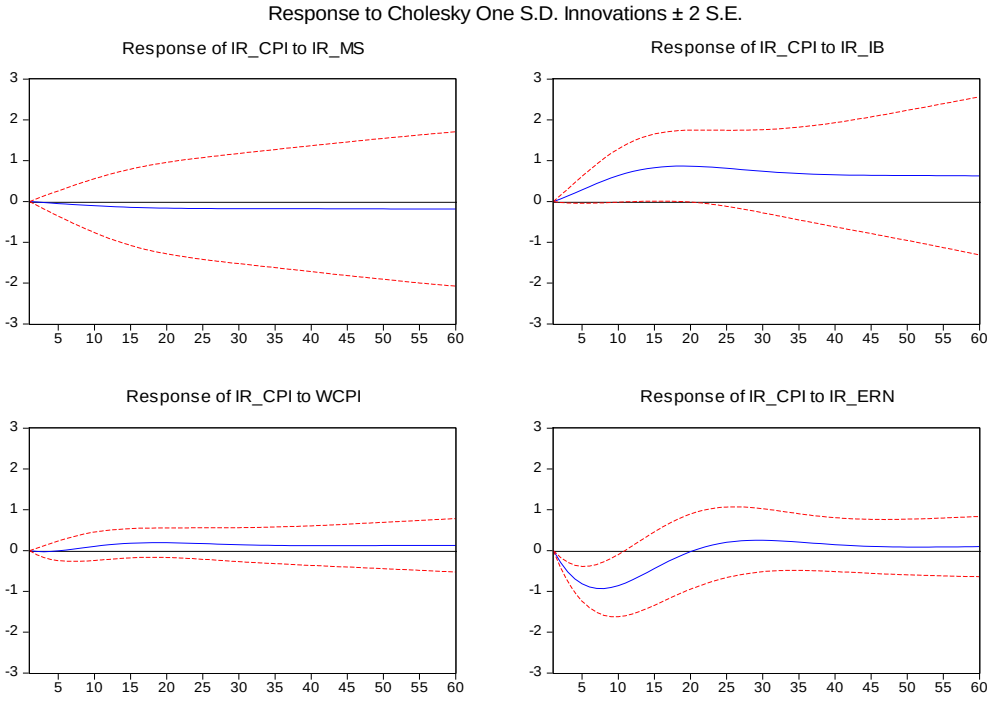


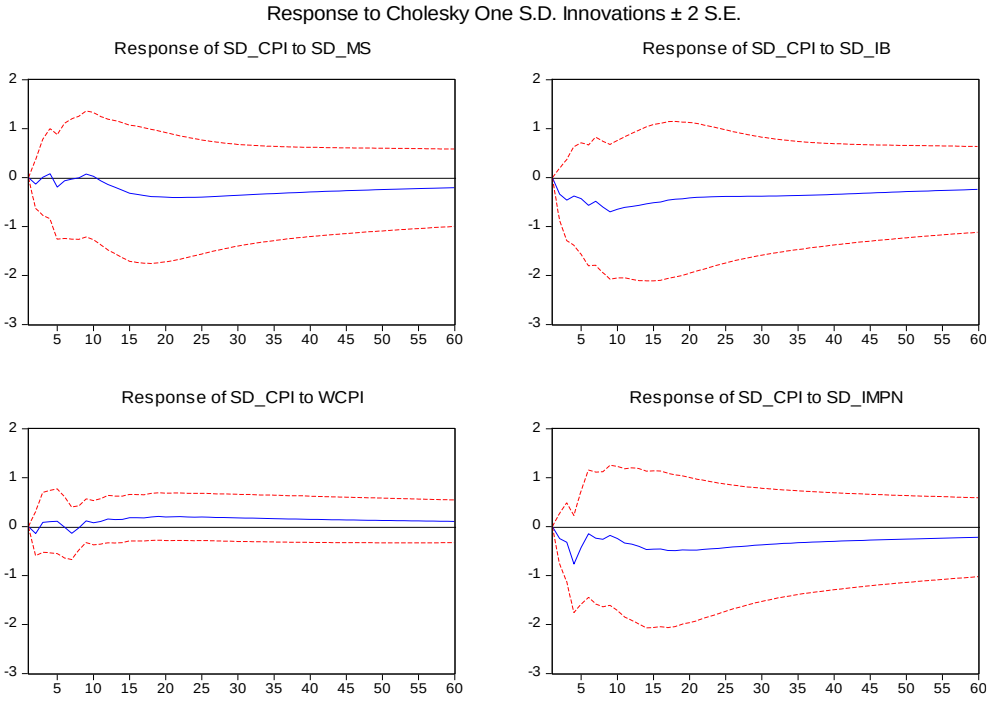

Response to Cholesky One S.D. Innovations ± 2 S.E.
Response of KW_CPI to KW_MS
Response of KW_CPI to KW_IB
Response of KW_CPI to WCPI
Response of KW_CPI to KW_ERN


Response to Cholesky One S.D. Innovations ± 2 S.E.
Response of OM_CPI to OM_MS
Response of OM_CPI to OM_IB
Response of OM_CPI to WCPI
Response of OM_CPI to OM_IMPN


Response to Cholesky One S.D. Innovations ± 2 S.E.
Response of QT_CPI to QT_MS
Response of QT_CPI to QT_IB
Response of QT_CPI to WCPI
Response of QT_CPI to QT_IMPN

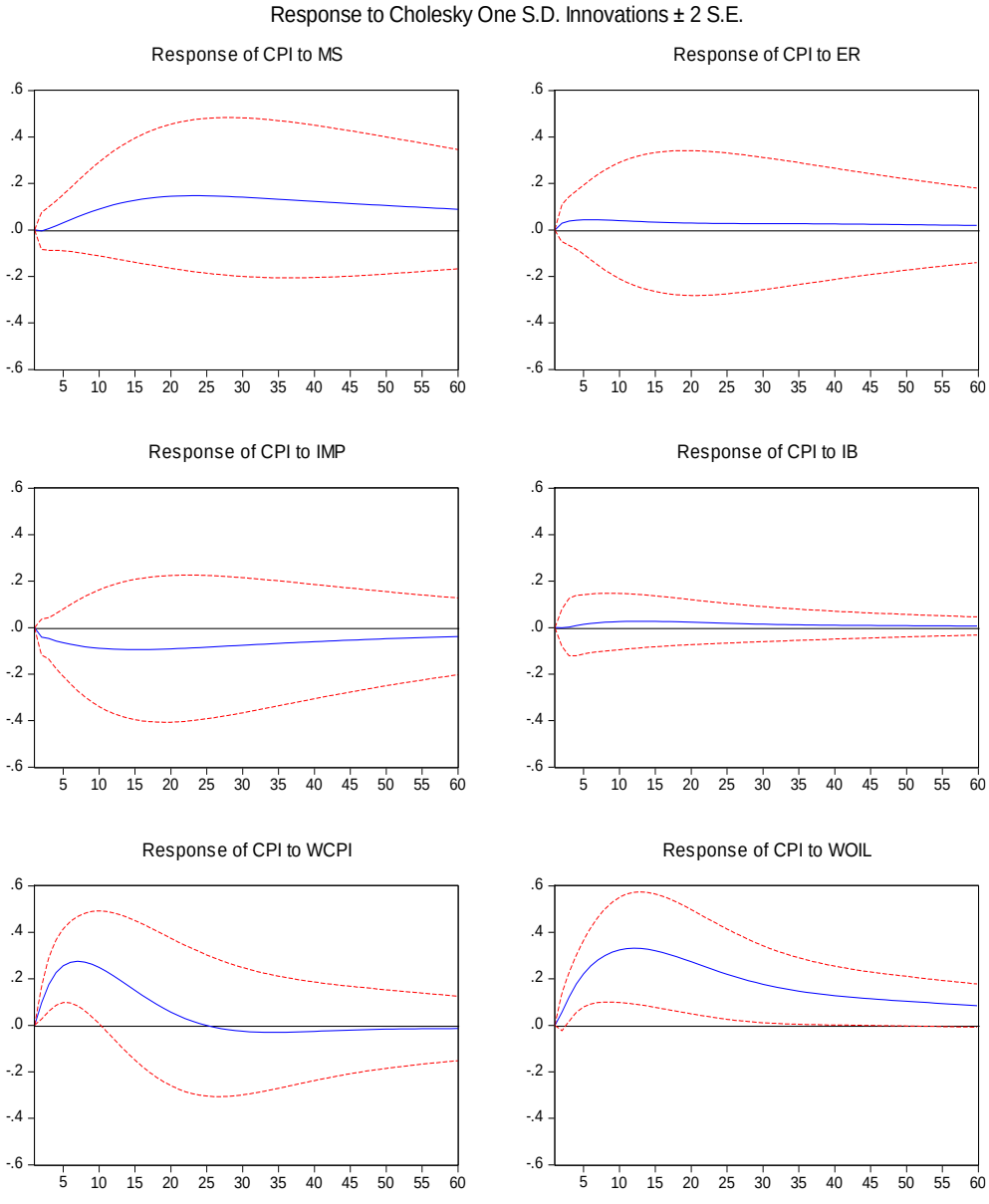

Response to Cholesky One S.D. Innovations ± 2 S.E.
Response of SA_CPI to SA_MS
Response of SA_CPI to SA_IB
Response of SA_CPI to WCPI
Response of SA_CPI to SA_IMPN


Response to Cholesky One S.D. Innovations ± 2 S.E.
Response of IR_CPI to IR_MS
Response of IR_CPI to IR_IB
Response of IR_CPI to WCPI
Response of IR_CPI to IR_ERN


Response to Cholesky One S.D. Innovations ± 2 S.E.
Response of SD_CPI to SD_MS
Response of SD_CPI to SD_IB
Response of SD_CPI to WCPI
Response of SD_CPI to SD_IMPN

APPENDIX C

Panel- Impulse Response of Inflation



Appendix C. Detailed ECM Results

Table 1. Bahrain: Vector Error Correction Estimates 1/

Long Run Dynamics				
CPI(-1)	1			
MS(-1)	-0.152534			
	(0.06523)			
	[-2.33835]			
IB(-1)	8.225035			
	(3.79897)			
	[2.16507]			
WCPI(-1)	-3.352971			
	(0.54766)			
	[-6.12240]			
C	2.972139			
	D(CPI)	D(MS)	D(IB)	D(WCPI)
Adjusted Coefficient	-0.093458	0.239931	-2.34E-05	0.035623
	(0.02232)	(0.08240)	(0.00086)	(0.00506)
	[-4.18660]	[2.91183]	[-0.02730]	[7.04524]
Short run Dynamics	D(BA_CPI)	D(BA_MS)	D(BA_IB)	D(WCPI)
D(CPI(-1))	-0.241269	0.098955	0.001474	0.000756
	(0.09163)	(0.33823)	(0.00351)	(0.02075)
	[-2.63304]	[0.29257]	[0.41960]	[0.03641]
D(CPI(-2))	-0.101511	0.867495	-0.001184	-0.031686
	(0.09235)	(0.34089)	(0.00354)	(0.02092)
	[-1.09918]	[2.54482]	[-0.33448]	[-1.51477]
D(MS(-1))	0.007692	-0.262687	-0.001737	0.002206
	(0.02317)	(0.08552)	(0.00089)	(0.00525)
	[0.33203]	[-3.07173]	[-1.95523]	[0.42038]
D(MS(-2))	-0.000924	-0.385072	-0.001032	-0.000179
	(0.02318)	(0.08557)	(0.00089)	(0.00525)
	[-0.03987]	[-4.49986]	[-1.16147]	[-0.03415]
D(IB(-1))	1.158560	-12.36815	0.191049	1.142943
	(2.55083)	(9.41551)	(0.09779)	(0.57777)
	[0.45419]	[-1.31359]	[1.95364]	[1.97819]
D(IB(-2))	2.814484	2.679509	0.123602	-0.295218
	(2.47187)	(9.12407)	(0.09476)	(0.55989)
	[1.13860]	[0.29367]	[1.30431]	[-0.52728]
D(WCPI(-1))	0.223034	2.492921	0.033339	0.240759
	(0.36142)	(1.33406)	(0.01386)	(0.08186)
	[0.61710]	[1.86867]	[2.40615]	[2.94099]
D(WCPI(-2))	-0.124611	1.620586	0.025014	-0.298645
	(0.35016)	(1.29248)	(0.01342)	(0.07931)
	[-0.35587]	[1.25385]	[1.86341]	[-3.76545]
C	0.119348	-0.329053	0.002720	-0.098156
	(0.08283)	(0.30573)	(0.00318)	(0.01876)
	[1.44093]	[-1.07629]	[0.85652]	[-5.23198]
WOILN	0.375454	2.462708	-0.042357	0.458543
	(0.41664)	(1.53787)	(0.01597)	(0.09437)
	[0.90116]	[1.60138]	[-2.65186]	[4.85901]
WFOODN	-2.251224	-1.580029	0.000157	0.851099
	(0.76607)	(2.82767)	(0.02937)	(0.17352)
	[-2.93868]	[-0.55877]	[0.00536]	[4.90499]
R-squared	0.197962	0.307043	0.243373	0.666231
Adj. R-squared	0.116272	0.236464	0.166309	0.632236
Sum sq. resids	63.14112	860.2761	0.092801	3.239402
S.E. equation	0.764618	2.822325	0.029313	0.173189
F-statistic	2.423354	4.350340	3.158066	19.59792
Log likelihood	-131.7454	-288.4583	259.6146	46.45356
Akaike AIC	2.395757	5.007639	-4.12691	-0.574226
Schwarz SC	2.674507	5.286388	-3.848161	-0.295477
Mean dependent	0.005364	-0.138489	-0.002174	-0.005768
S.D. dependent	0.813364	3.229923	0.032104	0.285585

1/ Standard errors in ( ) and t-statistics in [ ]

Table 2. Kuwait: Vector Error Correction Estimates 1/					
Long Run Equation					
KW_CPI(-1)	1				
KW_MS(-1)	-0.804456				
	(0.35083)				
	[-2.29302]				
KW_IB(-1)	18.49681				
	(14.9320)				
	[1.23874]				
WCPI(-1)	14.37683				
	(3.18961)				
	[4.50739]				
KW_ERN(-1)	-393.8492				
	(105.827)				
	[-3.72162]				
C	-70.82386				
Adjusted Coefficient	-7.89E-05	0.012519	-2.01E-05	-0.005284	0.000233
	(0.00272)	(0.00995)	(7.7E-05)	(0.00073)	(3.3E-05)
	[-0.02895]	[1.25777]	[-0.26180]	[-7.25878]	[6.98346]
Short Run Dynamics	D(CPI)	D(MS)	D(IB)	D(WCPI)	D(ER)
D(CPI(-1))	-0.033976	0.276867	-0.002754	0.005690	-0.000969
	(0.07676)	(0.28044)	(0.00216)	(0.02051)	(0.00094)
	[-0.44265]	[0.98727]	[-1.27463]	[0.27741]	[-1.03101]
D(MS(-1))	-0.005666	-0.21418	0.002936	-0.004216	-0.000532
	(0.02034)	(0.07431)	(0.00057)	(0.00543)	(0.00025)
	[-0.27858]	[-2.88242]	[5.12844]	[-0.77578]	[-2.13325]
D(IB(-1))	2.466169	-16.01951	0.377636	0.892717	-0.041701
	(2.57854)	(9.42091)	(0.07259)	(0.68900)	(0.03159)
	[0.95642]	[-1.70042]	[5.20262]	[1.29568]	[-1.32011]
D(WCPI(-1))	0.293764	-1.425441	0.015107	0.159961	-0.006235
	(0.25246)	(0.92240)	(0.00711)	(0.06746)	(0.00309)
	[1.16359]	[-1.54536]	[2.12576]	[2.37121]	[-2.01581]
D(ERN(-1))	0.767391	10.23958	0.044863	-0.429418	-0.038653
	(5.98775)	(21.8768)	(0.16855)	(1.59995)	(0.07335)
	[0.12816]	[0.46806]	[0.26616]	[-0.26839]	[-0.52694]
C	-0.044672	0.080773	0.000675	-0.089413	0.002455
	(0.06152)	(0.22478)	(0.00173)	(0.01644)	(0.00075)
	[-0.72610]	[0.35934]	[0.38967]	[-5.43901]	[3.25737]
WOIL	0.226590	-0.834127	0.007570	0.304601	-0.006227
	(0.24803)	(0.90620)	(0.00698)	(0.06627)	(0.00304)
	[0.91356]	[-0.92047]	[1.08423]	[4.59604]	[-2.04919]
WFOOD	0.508343	-0.550273	-0.027825	0.836462	-0.027649
	(0.56219)	(2.05400)	(0.01583)	(0.15022)	(0.00689)
	[0.90423]	[-0.26790]	[-1.75825]	[5.56830]	[-4.01457]
R-squared	0.076509	0.098018	0.262444	0.545741	0.348520
Adj. R-squared	0.032793	0.055321	0.227530	0.524237	0.317681
Sum sq. resids	73.19100	977.0041	0.057998	5.225699	0.010985
S.E. equation	0.658090	2.404390	0.018525	0.175845	0.008062
F-statistic	1.750147	2.295652	7.516901	25.37929	11.30119
Log likelihood	-173.4758	-404.112	462.0216	61.43829	610.1101
Akaike AIC	2.050290	4.641708	-5.09013	-0.589194	-6.754046
Schwarz SC	2.211166	4.802585	-4.929253	-0.428318	-6.593169
Mean dependent	0.007497	-0.027356	-0.000231	-0.007676	0.000198
S.D. dependent	0.669154	2.473789	0.021078	0.254937	0.009760
1/ Standard errors in ( ) and t-statistics in [ ]					

Table 3. Oman: Vector Error Correction Estimates 1/				
Long Run Equation				
OM_CPI(-1)	1			
OM_MS(-1)	-0.338861			
	(0.06341)			
	[-5.34365]			
OM_IB(-1)	-2.980255			
	(4.79603)			
	[-0.62140]			
WCPI(-1)	4.696839			
	(0.71673)			
	[6.55313]			
C	-12.53945			
Adjusted Coefficient	-0.025939	-0.014845	0.000213	-0.022832
	(0.00843)	(0.03963)	(0.00035)	(0.00291)
	[-3.07697]	[-0.37457]	[0.61324]	[-7.85207]
Short Run Dynamics	D(CPI)	D(MS)	D(IB)	D(WCPI)
D(CPI(-1))	-0.105455	0.289920	0.003457	-0.032424
	(0.07415)	(0.34862)	(0.00305)	(0.02558)
	[-1.42213]	[0.83163]	[1.13370]	[-1.26770]
D(MS(-1))	0.060207	-0.073813	0.000138	-0.004778
	(0.01681)	(0.07902)	(0.00069)	(0.00580)
	[3.58208]	[-0.93411]	[0.19968]	[-0.82422]
D(IB(-1))	-2.507402	-8.211463	0.412045	0.395242
	(1.73848)	(8.17318)	(0.07148)	(0.59964)
	[-1.44230]	[-1.00468]	[5.76430]	[0.65913]
D(WCPI(-1))	-0.032367	0.771704	0.011298	0.156307
	(0.19202)	(0.90274)	(0.00790)	(0.06623)
	[-0.16856]	[0.85485]	[1.43100]	[2.36001]
C	-0.137662	-0.021057	0.000822	-0.081254
	(0.04613)	(0.21689)	(0.00190)	(0.01591)
	[-2.98396]	[-0.09709]	[0.43341]	[-5.10621]
WOIL	0.405827	0.827796	-0.012388	0.328262
	(0.18679)	(0.87817)	(0.00768)	(0.06443)
	[2.17262]	[0.94264]	[-1.61294]	[5.09494]
WFOOD	1.578461	-0.916333	0.007237	0.642968
	(0.40169)	(1.88847)	(0.01652)	(0.13855)
	[3.92958]	[-0.48523]	[0.43814]	[4.64063]
R-squared	0.310865	0.037512	0.185783	0.544887
Adj. R-squared	0.282489	-0.00212	0.152257	0.526147
Sum sq. resids	44.00578	972.6431	0.074399	5.235519
S.E. equation	0.508780	2.391951	0.020920	0.175491
F-statistic	10.95514	0.946501	5.541376	29.07626
Log likelihood	-128.1969	-403.7139	439.8573	61.27121
Akaike AIC	1.530302	4.625998	-4.852329	-0.598553
Schwarz SC	1.673304	4.769000	-4.709328	-0.455551
Mean dependent	0.001756	0.021594	-0.000505	-0.007676
S.D. dependent	0.600642	2.389419	0.022721	0.254937
1/ Standard errors in ( ) and t-statistics in [ ]				

Table 4. Qatar: Vector Error Correction Estimates 1/				
Long Run Equation				
QT_CPI(-1)	1			
QT_MS(-1)	-1.347996			
	(0.44400)			
	[-3.03601]			
QT_IB(-1)	10.14228			
	(14.4200)			
	[0.70335]			
WCPI(-1)	-43.75795			
	(5.84915)			
	[-7.48108]			
C	184.1224			
Adjusted Coefficient	0.002504	0.047900	-0.000181	0.003139
	(0.00229)	(0.01101)	(0.00011)	(0.00037)
	[1.09104]	[4.34918]	[-1.66444]	[8.44219]
Short Run Dynamics	D(CPI)	D(MS)	D(IB)	D(WCPI)
D(QT_CPI(-1))	0.007751	0.646557	-0.002528	-0.000779
	(0.09030)	(0.43337)	(0.00427)	(0.01463)
	[0.08583]	[1.49193]	[-0.59238]	[-0.05327]
D(QT_MS(-1))	-0.008824	-0.141403	-0.000705	0.002067
	(0.01736)	(0.08330)	(0.00082)	(0.00281)
	[-0.50833]	[-1.69742]	[-0.85924]	[0.73503]
D(QT_IB(-1))	0.012350	-15.84453	0.234114	-0.096723
	(1.83963)	(8.82886)	(0.08695)	(0.29806)
	[0.00671]	[-1.79463]	[2.69263]	[-0.32451]
D(WCPI(-1))	-0.373076	-0.801975	0.020695	0.087229
	(0.45066)	(2.16285)	(0.02130)	(0.07302)
	[-0.82784]	[-0.37080]	[0.97163]	[1.19464]
C	-0.096385	-1.272598	0.003097	-0.100641
	(0.11411)	(0.54763)	(0.00539)	(0.01849)
	[-0.84469]	[-2.32384]	[0.57420]	[-5.44368]
WOILN	-0.114991	5.566911	-0.052526	0.348774
	(0.46571)	(2.23505)	(0.02201)	(0.07545)
	[-0.24692]	[2.49073]	[-2.38639]	[4.62231]
WFOODN	1.430513	7.433177	0.017006	0.963691
	(0.95796)	(4.59748)	(0.04528)	(0.15521)
	[1.49330]	[1.61680]	[0.37561]	[6.20898]
R-squared	0.022870	0.218323	0.140242	0.619641
Adj. R-squared	-0.03229	0.174196	0.091707	0.598169
Sum sq. resids	146.3373	3370.561	0.326885	3.841476
S.E. equation	1.086342	5.213631	0.051344	0.176010
F-statistic	0.414612	4.947625	2.889523	28.85823
Log likelihood	-194.1053	-401.142	208.7627	46.13849
Akaike AIC	3.062201	6.199122	-3.041859	-0.577856
Schwarz SC	3.236917	6.373837	-2.867144	-0.403141
Mean dependent	-0.029547	-0.138007	-0.003189	-0.00593
S.D. dependent	1.069217	5.737225	0.053873	0.277662
1/ Standard errors in ( ) and t-statistics in [ ]				

Table 5.Saudi Arabia: Vector Error Correction Estimates 1/				
Long Run Equation				
CPI(-1)	1			
MS(-1)	0.380307			
	(1.50189)			
	[0.25322]			
IB(-1)	5.038977			
	(10.5439)			
	[0.47791]			
WCPI(-1)	62.88321			
	(9.18523)			
	[6.84612]			
C	-249.5293			
Adjusted Coefficient	-0.000411	7.48E-05	-4.45E-05	-0.001971
	(0.00059)	(0.00319)	(0.00035)	(0.00027)
	[-0.69245]	[0.02342]	[-0.12842]	[-7.20183]
Short Run Dynamics	D(CPI)	D(MS)	D(IB)	D(WCPI)
D(CPI(-1))	0.126765	-0.26031	0.028864	0.016478
	(0.07393)	(0.39752)	(0.04315)	(0.03409)
	[1.71456]	[-0.65484]	[0.66893]	[0.48335]
D(MS(-1))	0.024131	-0.210884	0.002555	-0.006112
	(0.01394)	(0.07495)	(0.00814)	(0.00643)
	[1.73103]	[-2.81361]	[0.31407]	[-0.95082]
D(IB(-1))	0.136017	0.280136	0.162992	-0.044168
	(0.13105)	(0.70460)	(0.07648)	(0.06043)
	[1.03790]	[0.39758]	[2.13106]	[-0.73096]
D(WCPI(-1))	0.466268	1.092900	0.058927	0.245009
	(0.14383)	(0.77330)	(0.08394)	(0.06632)
	[3.24187]	[1.41330]	[0.70201]	[3.69456]
C	0.100073	0.224072	0.026133	-0.209524
	(0.11936)	(0.64175)	(0.06966)	(0.05504)
	[0.83841]	[0.34916]	[0.37515]	[-3.80709]
WOILN	0.138591	-0.04378	-0.097668	0.448863
	(0.12830)	(0.68981)	(0.07488)	(0.05916)
	[1.08023]	[-0.06347]	[-1.30437]	[7.58775]
WFOOD	-0.001062	-0.002291	-0.000164	0.001690
	(0.00126)	(0.00679)	(0.00074)	(0.00058)
	[-0.84111]	[-0.33757]	[-0.22303]	[2.90307]
R-squared	0.182510	0.059995	0.048905	0.512053
Adj. R-squared	0.148849	0.021289	0.009742	0.491961
Sum sq. resids	26.40292	763.2478	8.993229	5.613233
S.E. equation	0.394096	2.118889	0.230003	0.181711
F-statistic	5.421942	1.550023	1.248759	25.48554
Log likelihood	-82.73157	-382.1372	13.12167	55.07140
Akaike AIC	1.019456	4.383564	-0.057547	-0.528892
Schwarz SC	1.162457	4.526565	0.085455	-0.385891
Mean dependent	0.021345	-0.002373	0.000139	-0.007676
S.D. dependent	0.427167	2.141811	0.231132	0.254937
1/ Standard errors in ( ) and t-statistics in [ ]				

Table 6. Iran: Vector Error Correction Estimates 1/					
Long Run Equation					
CPI(-1)	1				
MS(-1)	-0.482766				
	(0.23585)				
	[-2.04690]				
IB(-1)	9.225710				
	(2.01575)				
	[4.57682]				
WCPI(-1)	-19.40955				
	(1.83424)				
	[-10.5818]				
ER(-1)	-23.95112				
	(5.87677)				
	[-4.07556]				
C	57.33508				
Adjusted Coefficient	0.009172	0.026026	-0.003629	0.010061	0.000315
	(0.00900)	(0.00959)	(0.00118)	(0.00110)	(0.00087)
	[1.01957]	[2.71322]	[-3.06746]	[9.11940]	[0.36287]
Short Run Dynamics	D(CPI)	D(MS)	D(IB)	D(WCPI)	D(ER)
D(CPI(-1))	0.329547	0.016199	-0.028133	-0.040395	0.014788
	(0.07763)	(0.08278)	(0.01021)	(0.00952)	(0.00749)
	[4.24487]	[0.19568]	[-2.75525]	[-4.24257]	[1.97570]
D(MS(-1))	0.005956	-0.142077	0.005824	0.015095	-0.00153
	(0.08320)	(0.08871)	(0.01094)	(0.01020)	(0.00802)
	[0.07159]	[-1.60150]	[0.53229]	[1.47940]	[-0.19076]
D(IB(-1))	-1.933211	0.333254	0.317716	-0.061619	-0.063769
	(0.60331)	(0.64332)	(0.07935)	(0.07399)	(0.05817)
	[-3.20432]	[0.51802]	[4.00407]	[-0.83278]	[-1.09629]
D(WCPI(-1))	-0.179158	-0.075448	0.068975	0.130007	0.033409
	(0.54578)	(0.58197)	(0.07178)	(0.06694)	(0.05262)
	[-0.32826]	[-0.12964]	[0.96091]	[1.94225]	[0.63490]
D(ER(-1))	-0.530632	0.219447	-0.149643	0.071306	-0.01065
	(0.93482)	(0.99681)	(0.12295)	(0.11465)	(0.09013)
	[-0.56763]	[0.22015]	[-1.21711]	[0.62195]	[-0.11816]
C	-0.247514	0.000624	0.013988	-0.11428	0.003509
	(0.14083)	(0.15017)	(0.01852)	(0.01727)	(0.01358)
	[-1.75754]	[0.00416]	[0.75521]	[-6.61657]	[0.25844]
WOIL	0.319608	0.331812	-0.037653	0.465840	0.033024
	(0.60490)	(0.64501)	(0.07956)	(0.07419)	(0.05832)
	[0.52836]	[0.51443]	[-0.47328]	[6.27925]	[0.56625]
WFOOD	3.579362	-2.17576	-0.166592	0.952761	-0.121674
	(1.18814)	(1.26693)	(0.15627)	(0.14572)	(0.11455)
	[3.01257]	[-1.71736]	[-1.06609]	[6.53842]	[-1.06215]
R-squared	0.395808	0.166096	0.279709	0.671310	0.056402
Adj. R-squared	0.356511	0.111858	0.232861	0.649932	-0.00497
Sum sq. resids	220.7013	250.9399	3.817630	3.319635	2.051575
S.E. equation	1.339522	1.428342	0.176175	0.164283	0.129149
F-statistic	10.07219	3.062371	5.970544	31.40165	0.919017
Log likelihood	-221.2244	-229.699	46.54948	55.77463	87.53694
Akaike AIC	3.488249	3.616652	-0.568932	-0.708707	-1.189954
Schwarz SC	3.684804	3.813207	-0.372377	-0.512152	-0.993399
Mean dependent	-0.024396	-0.068071	0.000442	-0.00593	0.000279
S.D. dependent	1.669857	1.515623	0.201144	0.277662	0.128829
1/ Standard errors in ( ) and t-statistics in [ ]					

Table 7. Sudan: Vector Error Correction Estimates 1/				
Long Run Equation				
CPI(-1)	1			
MS(-1)	-1.654545			
	(0.75369)			
	[-2.19527]			
IB(-1)	-12.9262			
	(14.3895)			
	[-0.89831]			
WCPI(-1)	-84.30856			
	(9.49291)			
	[-8.88122]			
C	356.6207			
Adjusted Coefficient	-0.003133	0.002546	9.60E-06	0.001748
	(0.00361)	(0.00389)	(0.00017)	(0.00020)
	[-0.86684]	[0.65499]	[0.05546]	[8.95168]
Short Run Dynamics	D(CPI)	D(MS)	D(IB)	D(WCPI)
D(CPI(-1))	0.199017	0.150087	0.000489	-0.007247
	(0.07570)	(0.08140)	(0.00363)	(0.00409)
	[2.62912]	[1.84381]	[0.13495]	[-1.77225]
D(MS(-1))	-0.011603	0.043585	-0.005488	-0.001188
	(0.07115)	(0.07651)	(0.00341)	(0.00384)
	[-0.16309]	[0.56968]	[-1.61064]	[-0.30924]
D(IB(-1))	-2.323328	-0.338142	0.249106	0.160609
	(1.55864)	(1.67607)	(0.07464)	(0.08419)
	[-1.49062]	[-0.20175]	[3.33728]	[1.90758]
D(WCPI(-1))	0.689523	-0.037077	-0.011313	0.160376
	(1.15452)	(1.24150)	(0.05529)	(0.06237)
	[0.59724]	[-0.02986]	[-0.20462]	[2.57157]
C	0.021008	-0.127661	0.002517	-0.085009
	(0.27458)	(0.29526)	(0.01315)	(0.01483)
	[0.07651]	[-0.43236]	[0.19138]	[-5.73144]
WOIL	0.930234	2.602848	0.113528	0.320073
	(1.15279)	(1.23965)	(0.05521)	(0.06227)
	[0.80694]	[2.09966]	[2.05638]	[5.13992]
WFOOD	-1.239237	-4.638968	-0.244516	0.717455
	(2.38221)	(2.56170)	(0.11408)	(0.12868)
	[-0.52021]	[-1.81090]	[-2.14328]	[5.57537]
R-squared	0.074194	0.060490	0.121609	0.584787
Adj. R-squared	0.036072	0.021804	0.085440	0.567690
Sum sq. resids	1636.926	1892.890	3.754256	4.776519
S.E. equation	3.103059	3.336862	0.148606	0.167622
F-statistic	1.946242	1.563617	3.362253	34.20407
Log likelihood	-450.0435	-462.9739	90.87045	69.43730
Akaike AIC	5.146557	5.291841	-0.931129	-0.690307
Schwarz SC	5.289558	5.434843	-0.788127	-0.547305
Mean dependent	0.059193	-0.074588	0.003660	-0.007676
S.D. dependent	3.160588	3.373847	0.155393	0.254937
1/ Standard errors in ( ) and t-statistics in [ ]				

APPENDIX D: TABLES

Table D1: Variance Decomposition of CPI/

Panel								
Period	**CPI**	**MS**	**ER**	**IMP**	**IB**	**WCPI**	**WOIL**	**WFOOD**
Panel								
1	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
6	96.48	0.04	0.05	0.10	0.00	0.53	0.46	2.34
12	93.12	0.20	0.06	0.17	0.01	0.50	1.06	4.88
18	91.89	0.39	0.08	0.21	0.01	0.38	1.39	5.65
24	91.80	0.53	0.10	0.23	0.01	0.39	1.53	5.40
30	92.00	0.63	0.11	0.25	0.01	0.42	1.59	4.99
36	92.19	0.69	0.12	0.27	0.01	0.41	1.62	4.69
42	92.30	0.74	0.13	0.28	0.01	0.40	1.65	4.50
48	92.34	0.78	0.13	0.29	0.01	0.38	1.67	4.39
54	92.36	0.81	0.13	0.30	0.01	0.38	1.69	4.32
60	92.37	0.84	0.13	0.31	0.00	0.37	1.71	4.26

APPENDIX D: TABLES

TABLE D2: Variance Decomposition

Variance Decomposition of CPI						
Period	CPI	MS	ER	IMP	WCPI	IB
Bahrain						
1	100.00	0.00	0.00	0.00	0.00	0.00
6	97.97	0.07	0.01	0.17	1.35	0.42
12	88.90	0.09	0.04	0.24	8.55	2.19
18	84.77	0.28	0.06	0.68	10.31	3.90
24	83.18	0.51	0.07	1.26	10.25	4.74
30	81.56	0.62	0.07	1.68	11.00	5.07
36	80.66	0.65	0.07	1.91	11.45	5.27
Kuwait						
1	100.00	0.00	0.00	0.00	0.00	0.00
6	74.25	5.10	4.14	1.08	12.21	3.21
12	51.49	10.28	8.79	0.82	19.70	8.92
18	43.23	11.75	12.86	1.05	19.45	11.66
24	39.94	12.29	15.25	1.47	18.18	12.87
30	38.47	12.63	16.13	1.88	17.39	13.50
36	37.73	12.90	16.27	2.21	17.02	13.88
Oman						
1	100.00	0.00		0.00	0.00	0.00
6	70.78	14.77		0.28	14.11	0.06
12	54.43	27.29		0.30	17.92	0.06
18	44.98	37.36		0.24	17.38	0.05
24	38.94	44.48		0.20	16.25	0.13
30	35.19	49.04		0.18	15.21	0.37
36	32.98	51.67		0.17	14.41	0.77
Qatar						
1	100.00	0.00		0.00	0.00	0.00
6	71.27	6.22		0.07	0.64	21.80
12	60.66	14.63		0.30	1.76	22.64
18	54.31	20.17		0.54	3.67	21.31
24	50.43	23.09		0.76	5.69	20.03
30	48.12	24.47		0.96	7.31	19.15
36	46.77	25.05		1.16	8.42	18.61
Saudi Arabia						
1	100.00	0.00	0.00	0.00	0.00	0.00
6	86.93	1.10	1.29	0.60	9.62	0.46
12	87.72	2.61	1.56	0.36	6.92	0.83
18	88.21	3.79	1.33	0.36	5.18	1.13
24	88.35	4.59	1.12	0.38	4.32	1.23
30	88.39	5.17	1.01	0.38	3.83	1.23
36	88.35	5.59	0.97	0.36	3.53	1.20
Iran						
1	100.00	0.00	0.00	0.00	0.00	0.00
6	90.62	1.38	0.57	2.28	2.27	2.88
12	87.54	1.94	0.63	5.20	1.40	3.29
18	74.86	2.07	2.82	5.43	0.98	13.84
24	62.27	2.27	6.94	4.61	0.88	23.03
30	58.75	2.23	8.09	4.74	1.45	24.73
36	57.90	2.15	7.84	5.39	2.97	23.74
Sudan						
1	100.00	0.00	0.00	0.00	0.00	0.00
6	92.43	0.01	3.62	0.09	2.80	1.06
12	89.06	0.03	4.31	0.87	4.81	0.92
18	86.15	0.09	4.71	2.13	5.23	1.69
24	83.30	0.19	5.02	3.45	5.17	2.87
30	80.64	0.30	5.31	4.63	5.01	4.11
36	78.28	0.42	5.61	5.61	4.84	5.25

APPENDIX F: Correlation Matrix

			Correlation Matrix					
			Bahrain					
	WOIL	WFOOD	IB	ER	IMP	WCPI	MS	CPI
WOIL	1.00	0.69	-0.07	0.03	0.52	0.55	0.31	-0.41
WFOOD	0.69	1.00	0.02	0.05	0.34	0.57	0.47	-0.46
IB	-0.07	0.02	1.00	0.01	-0.06	-0.03	-0.04	-0.03
ER	0.03	0.05	0.01	1.00	0.05	0.13	0.10	-0.01
IMP	0.52	0.34	-0.06	0.05	1.00	0.14	0.18	-0.37
WCPI	0.55	0.57	-0.03	0.13	0.14	1.00	0.50	-0.27
MS	0.31	0.47	-0.04	0.10	0.18	0.50	1.00	-0.04
CPI	-0.41	-0.46	-0.03	-0.01	-0.37	-0.27	-0.04	1.00
			Kuwait					
	WOIL	WFOOD	IB	ER	IMP	WCPI	MS	CPI
WOIL	1.00	0.69	0.28	-0.69	0.35	0.55	0.03	0.16
WFOOD	0.69	1.00	0.15	-0.77	0.08	0.57	0.10	0.30
IB	0.28	0.15	1.00	-0.33	0.58	0.09	0.45	0.06
ER	-0.69	-0.77	-0.33	1.00	-0.22	-0.72	-0.13	-0.26
IMP	0.35	0.08	0.58	-0.22	1.00	0.17	0.25	0.17
WCPI	0.55	0.57	0.09	-0.72	0.17	1.00	0.10	0.57
MS	0.03	0.10	0.45	-0.13	0.25	0.10	1.00	0.42
CPI	0.16	0.30	0.06	-0.26	0.17	0.57	0.42	1.00
			Oman					
	WOIL	WFOOD	IB	ER	IMP	WCPI	MS	CPI
WOIL	1.00	0.69	-0.07		0.25	0.55	0.10	0.25
WFOOD	0.69	1.00	-0.05		0.48	0.57	0.28	0.41
IB	-0.07	-0.05	1.00		-0.29	-0.17	-0.16	-0.20
ER								
IMP	0.25	0.48	-0.29		1.00	0.49	0.43	0.43
WCPI	0.55	0.57	-0.17		0.49	1.00	0.43	0.61
MS	0.10	0.28	-0.16		0.43	0.43	1.00	0.75
CPI	0.25	0.41	-0.20		0.43	0.61	0.75	1.00
			Qatar					
	WOIL	WFOOD	IB	ER	IMP	WCPI	MS	CPI
WOIL	1.00	0.69	0.10		-0.32	0.55	0.56	0.01
WFOOD	0.69	1.00	0.28		-0.30	0.57	0.57	-0.16
IB	0.10	0.28	1.00		-0.31	0.08	0.43	-0.75
ER								
IMP	-0.32	-0.30	-0.31		1.00	-0.26	-0.25	0.14
WCPI	0.55	0.57	0.08		-0.26	1.00	0.52	-0.09
MS	0.56	0.57	0.43		-0.25	0.52	1.00	-0.39
CPI	0.01	-0.16	-0.75		0.14	-0.09	-0.39	1.00
			Saudi Arabia					
	WOIL	WFOOD	IB	ER	IMP	WCPI	MS	CPI
WOIL	1.00	0.69	0.18	0.06	0.26	0.55	0.28	0.17
WFOOD	0.69	1.00	0.23	0.32	0.34	0.57	0.24	0.37
IB	0.18	0.23	1.00	0.03	0.28	0.00	0.03	-0.16
ER	0.06	0.32	0.03	1.00	0.06	0.28	0.23	0.40
IMP	0.26	0.34	0.28	0.06	1.00	0.37	0.26	0.10
WCPI	0.55	0.57	0.00	0.28	0.37	1.00	0.32	0.44
MS	0.28	0.24	0.03	0.23	0.26	0.32	1.00	0.40
CPI	0.17	0.37	-0.16	0.40	0.10	0.44	0.40	1.00
			Iran					
	WOIL	WFOOD	IB	ER	IMP	WCPI	MS	CPI
WOIL	1.00	0.69	-0.06	0.04	-0.10	0.55	0.29	-0.07
WFOOD	0.69	1.00	-0.09	-0.07	0.00	0.57	0.32	0.03
IB	-0.06	-0.09	1.00	0.24	0.01	-0.26	-0.07	-0.35
ER	0.04	-0.07	0.24	1.00	0.21	-0.15	0.02	0.02
IMP	-0.10	0.00	0.01	0.21	1.00	-0.06	0.14	-0.16
WCPI	0.55	0.57	-0.26	-0.15	-0.06	1.00	-0.01	0.29
MS	0.29	0.32	-0.07	0.02	0.14	-0.01	1.00	-0.48
CPI	-0.07	0.03	-0.35	0.02	-0.16	0.29	-0.48	1.00
			Sudan					
	WOIL	WFOOD	IB	ER	IMP	WCPI	MS	CPI
WOIL	1.00	0.69	0.08	-0.23	0.05	0.55	0.15	-0.18
WFOOD	0.69	1.00	-0.03	-0.10	-0.02	0.57	0.04	-0.15
IB	0.08	-0.03	1.00	-0.33	0.08	-0.09	0.28	-0.25
ER	-0.23	-0.10	-0.33	1.00	-0.07	-0.04	0.03	0.78
IMP	0.05	-0.02	0.08	-0.07	1.00	-0.14	0.01	-0.16
WCPI	0.55	0.57	-0.09	-0.04	-0.14	1.00	-0.04	-0.02
MS	0.15	0.04	0.28	0.03	0.01	-0.04	1.00	-0.11
CPI	-0.18	-0.15	-0.25	0.78	-0.16	-0.02	-0.11	1.00