
Money, Inflation and the Arab Spring in Bahrain

Michael S. Miller¹, Seth Epstein²

Abstract:

This paper investigates inflation in Bahrain during the period of the Arab Spring to determine effect of unrest on general and relative prices. We find first that the GDP deflator alone measures inflation in Bahrain; the CPI measures the cost of living only. Additionally, oil prices, the U.S. dollar's trade-weighted value, and government price intervention are highly correlated with price movements. Disaggregated monthly CPI data reveal the onset of unrest is correlated with movements in several components of the CPI index, but the Arab Spring had its most direct and lasting causal effect solely on the housing.

Key Words: Bahrain, Inflation, Arab Spring

JEL Classification : E50, E02

¹ Michael S. Miller, Ph.D., Associate Professor of Economics, DePaul University, 1 East Jackson Blvd,
Chicago, IL, 60604, USA; email address: mmiller@depaul.edu; telephone: 001-312-362-8477

² Seth Epstein, Ph.D., Associate Professor of Economics, DePaul University

1. Introduction

This paper investigates money and inflation in the Kingdom of Bahrain with a focus on the period of the Arab Spring (AS), 2011-13, to determine the effects of social unrest on general and relative prices. The amount of research on the economies of the Middle East and the Arab world has expanded lately, especially in light of the AS. In addition to our own work on the effect of the AS on employment and output in Bahrain (Miller & Epstein, 2015), researchers have recently investigated the effects of unrest in the Middle East in general on stocks (*e.g.* Abdelbaki, 2013; Chau, Deesomak & Wung, 2014; Bouri, 2013), banking (*e.g.* Jackowicz & Kowalewski, 2013; Kim, 2013; Thalassinos et al., 2013), unemployment (Campante & Chor, 2012), and output (Khandelwal & Roitman, 2013). The issues of money and monetary policy in Bahrain have been addressed by Jusof, Al Wosabi & Majid (2009), Darrat and Al-Sowaidi (2009), Espinoza and Prasad (2012), Hojjat & Barnhorst (2013). Narrowing the focus to the connection between unrest and prices, Dube & Vargas (2013) is representative of analyzes that consider the unrest provoked by price movements. In this paper we reverse the analysis and consider what changes in general or relative price might have occurred *as a result of* the unrest. To do so we have organized the paper as follows. We begin by investigating the measurement and co-movement of two inflation indicators – the GDP Deflator and the Consumer Price Index (CPI) - over the period 1990-2011, followed by an analysis of the specific movements in the two indexes to determine what non-monetary factors may play a role in the movement of general prices both over time and in short periods of uncertainty in Bahrain. Third, we look at disaggregated monthly CPI data just before and then during the AS to determine the effect on prices in various consumer sectors of Bahrain, if any, of the onset of social upheaval. The last part sets out our conclusions.

2. The Nature and Movement of Inflation Indicators over Time

To understand the movement of prices during the Arab Spring we must first determine exactly what the two dominant inflation indexes are capturing. Once done we can then track the movement of the two before and during the AS to discover any causal connection between prices and social unrest. In 2007 Tahir and Samad applied Vector Autoregression to five macroeconomic variables in the Bahraini economy, including the CPI. However, since then changes have been made in the reporting of inflation figures, which provide analysts with advantages and disadvantages. The monthly reporting of disaggregated data does allow us to look more deeply into the relation of money and prices over shorter periods of time, yet we are constrained in what we can do from a sophisticated statistical standpoint because of data limitations. While Annual Consumer Price Index figures using a consistent base year (2006) go back to 1990, the database of consistent monthly

Headline Rates of consumer inflation is quite limited, covering the period since August 2007 only. Disaggregated CPI data by consumer sector is even more limited, dating back to January 2009.

Data on the GDP deflator on an annual basis go back to 1989, but the base year was changed in 2011 from 2001 to 2010. The transition to a new base year was coupled with a redefinition of nominal GDP by the Central Informatics Office (CIO), but recalculated time-series data were limited to the period since 2006 only. Thus, to create a consistent time series of deflator values for the period 1990-2013 we had to couple the actual deflator data reported under the 2001 base year for 1990-2006 with an imputed value of that deflator for the period 2007-13. We did so by applying each additional year's GDP inflation in the new 2010 series to the previous year's deflator based on 2001. The resultant time series of annual CPI and Deflator data appear in the appendix.²

A cursory analysis of the time series data of the two inflation measures raises several issues immediately. Not only do the two series have values that are quite different in various years, the signs of the two indicators are dissimilar in a surprising number of cases. It is also clear that average rates of inflation of the two indicators are inconsistent, 1.0% for the CPI and 3.5% for the deflator, with differing variances of 0.07% and 0.4% respectively. A correlation analysis of the two for the period 1991-2013 results in a coefficient that is surprising: -0.13. This value is not statistically significantly different from zero so we can conclude that the two inflation measures are essentially uncorrelated. Some variation is expected considering the breadth of the deflator compared to the market basket for the consumer sector, but the complete lack of correlation is surprising.³ Taking U.S. time-series data as reported in FRED of the St. Louis Federal Reserve as a benchmark, the correlation coefficient between the CPI and Implicit Deflator in the period 1989-2013 is 0.875; since 1948 it is an even higher 0.95.

Given these two descriptions we must determine which indicator, if either, truly measures inflation over this 22-year period. Then we can speculate on why the other does not and why it might better be thought of as capturing the cost of living. To make this determination we will use the quantity theory of money relationship between changes in general prices, P , the levels of real GDP (y), nominal GDP (Py), and the velocity of money, V .

$$MV = Py$$

$$\ln(MV) = \ln(Py)$$

² For an analysis of the reliability of data issued in Bahrain, see Miller & Epstein, 2011.

³ The components of the deflator and the CPI market basket appear in the Appendix II.

$$\ln M + \ln V = \ln P + \ln y$$

$$\frac{d}{dt} \ln M_t + \frac{d}{dt} \ln V_t = \frac{d}{dt} \ln P_t + \frac{d}{dt} \ln y_t, \text{ or}$$

$$\% \Delta M + \% \Delta V = \% \Delta P + \% \Delta y, \text{ thus}$$

$$\% \Delta P = \% \Delta M + \% \Delta V - \% \Delta y$$

Each of the components of the analysis can have growth rates whose values are positive, negative, or zero. For this analysis we use the values on an annual basis of real GDP, money stock M1 and M2, velocity, CPI, and the GDP deflator starting in 1990 and ending in 2011, the year of the onset of social unrest. In addition to using GDP figures from the CIO website we accessed money stock figures from the *Statistical Bulletin* of the Central Bank of Bahrain (CBB). We then calculated the continuously compounded annual growth rate (CCAGR) for each component, the results of which appear in Table 1.

The results are clear for both money stock indicators. The rate of inflation implied by the behaviour of money, velocity and output much more closely tracks the deflator than it does the CPI, and the difference from the CPI is substantial. While both the deflator and the CPI are computed using standard price index methods the amount of price movement reported over time in the CPI is so small relative to the behaviour of money that we suspect that retail prices may not be permitted to move. This divergence leads us to conclude that we must make an important distinction between these two indexes – only one is capturing the level of inflation while the other is capturing instead the cost of living. Insights on this distinction in terms of U.S. data appear in a series of blog posts on the Federal Reserve Bank of Atlanta website (Bryan, 2014). The notion of inflation is one of a sustained upward movement in the general price level, shared by most components of the index, and related to growth of money *vis-à-vis* the growth of real GDP over time. In short, inflation over time is a monetary phenomenon. The cost of living to Bryan “is a description of how difficult it is to buy a particular level of well-being” (Bryan, 2014, Part 2). The movement in prices is consistent with Bryan’s dichotomy, thus we conclude that the deflator is a valid representation of inflation in Bahrain and the CPI must be capturing instead the cost of living.

To further solidify this dichotomy we looked for any practice of price setting and subsidization by the government. While the practices are not readily available on the CIO website we were able to communicate with a staff member at the CIO to get the following list of commodities that either have their price set by the government or the government subsidizes the commodities in whole or in part:

-
- Consumer petrol
 - One brand each, set price per kilogram, of chicken, fresh/chilled beef, and fresh/chilled goat meat (other brands not controlled)
 - Electricity, water and gas
 - Medicinal drugs, with prices revised every six months
 - Wheat flour
 - Health and education services provided to citizens at no charge

These items are components of four of the divisions of the CPI consumer market basket, dampening the inflationary effects on 53.75% of the total market basket. In every case the government attempts to keep prices stable, reducing the swings in the cost of living that could occur due to inflationary or deflationary pressures. The swings in prices can be aggravated not only by monetary developments within Bahrain but also by the changing value of the US dollar to which the Bahraini dinar is pegged. Considering how little the CPI is rising over time the government has been successful in shielding consumers from the price shocks that can come from changes in the trade-weighted value of the dinar/dollar and in oil prices. To establish the role played by the dollar, energy prices and the various consumer sectors in price movements we can further analyze the deflator and the CPI before and during the social unrest.

3. The Behaviour of Inflation and the Cost of Living during the Arab Spring

To determine if general prices were affected in an unusual way during the Arab Spring we must first set out the movement of the price indexes in the years before for which we have comparable data along with the movements from 2011-13. To compare the deflator to the CPI requires that we use quarterly data only given that the deflator is reported solely with the quarterly non-annualized GDP figures. We computed a quarterly CPI using monthly data which we track for percent change in the headline index from the start of one quarter to the start of the next. The finding above that the two major indexes of prices are not correlated also prompted us to determine in what ways the two are dissimilar – they are likely different in both magnitude and in the sign for quarterly values as well. Both present us with interesting macroeconomic expectations.

The movement in the absolute size of the indexes in short-run periods may be associated with exogenous events in the economy rather than monetary policy, given that the relationship between money and inflation holds over time only and not necessarily in any one short-run period. If the two indexes differ in magnitude then we know that something other than monetary factors may explain the movement. Given that the government intervenes to stabilize prices for consumers, any large swing in the deflator not accompanied by the CPI tells us, again, that an exogenous event is likely in play. The time series quarterly price data in Table 2 show us that

the behaviour of prices as measured by the two indexes varies in both sign and in magnitude.

The greatest divergence in the indexes occurs in times of uncertainty. First, 2008 and early 2009 was the period of the Great Recession of 2007-09 that affected the major trading partners of Bahrain in the Americas, Europe, and parts of Asia. This period was also one of great variability in the price of energy that is so essential to the Bahraini economy. Brent crude oil prices, measured quarterly to match the quarterly data of the deflator, rose in early 2008 to the highest nominal level ever and then fell 63% from the second quarter 2008 high of \$121.2 per barrel to \$44.52 in the first quarter of 2009.⁴ Combine this with major swings in the value of the U.S. dollar, to which the Bahraini dinar is pegged, and we have two exogenous factors that could explain the swings. We would expect that changes in oil prices should be positively correlated with the movement in the deflator, and changes in the trade weighted value of the dollar should be inversely correlated with the deflator.⁵ The expectation is borne out in the quarterly data from 2007 to 2013. One, the correlation coefficient between quarter-over-quarter (Q/Q) changes in the deflator and Q/Q changes in Brent oil prices is 0.87; the correlation between Q/Q changes in the trade-weighted value of the dollar and Q/Q changes in the deflator is -0.61. Not surprisingly, the movement in the value of the dollar and Brent oil prices is a solid -0.71. All of this, point to the role, at least in the short run, of exogenous shocks in the price of oil and the value of the US dollar in explaining the swings in inflation in Bahrain.

When we get to the Arab Spring in the first quarter of 2011 the divergence is both in magnitude and sign once again between the CPI and the deflator. Our initial expectation, given the behaviour in the 2008-09 period, would be to focus on the dollar and oil. What we actually find, however, is unlike the previous period. The importance of the unrest is revealed in the following set of observations. First, we find that the change in the trade-weighted value of the dollar was minimal. The value of the dollar between 2010Q4 (72.9440) and 2011Q2 (69.5299) dropped a relatively small 4.6%. At the same time the market price for Brent crude oil rose substantially, moving 35% higher between the fourth quarter of 2010 and the second quarter of 2011. Even West Texas Intermediate rose by 20% in the same period.

⁴ Were we to look instead at Brent oil prices on a weekly basis the drop from the first week of July to the last week of December 2008 was an astounding 74.9%.

⁵ For an analysis of the connection between oil prices and real exchange rates of oil exporters see Al-mulali & Che Sab, 2012.

Given the small movement in the dollar's value plus the normally high correlation between oil and the dollar we would expect little change in Brent crude. As a result there should be little change in the deflator in Bahrain. But oil rose while the dollar remained stable. We conclude that a random shock is likely behind this odd movement in oil prices, one unrelated to the value of the dollar. That shock is likely the Arab Spring: the unrest unsettled Middle East energy markets, and energy prices in general, so highly correlated with the inflation index in Bahrain, rose as a result of a price premium for political uncertainty. What is also interesting in this period is the movement in cost of living as measured by the CPI, which was so tame in the period leading up to the unrest. The total change in consumer prices from January 2009 through December 2010 was 2.5%, yet consumer prices *fell* in the first quarter of 2011 by 2.7%, the largest swing positive or negative in any one quarter for which we have monthly data. Yet, overall price increases for consumers totalled 5.6% from January 2011 to December 2013. Again, the unusual movement must be tied to some exogenous shock, which we would argue was the Arab Spring. But where in the economy was this effect most felt by the citizens?

To establish exactly how the unrest affected the cost of living we can look at the movement of the components of the consumer basket of goods. In August 2007 the CIO began to publish monthly figures on CPI. Initially only headline rates were reported but starting in January 2009 the reports were expanded to include details on a consistent set of categories from the market basket (see Appendix III for the categories). While the time series is not as long as we would need to carry out a sophisticated analysis of unusual behaviour during the Arab Spring, we can consider the movement of the headline rate and of the components to establish the primary side effects of the unrest. An analysis of the components over time allow us to track a change in the relative price of the components as well as pinpoint which components were most affected, if any, by the start of unrest.

To isolate the possible causes of the movement in the cost of living around the time of the AS we first find which components of the market basket moved the most, both up and down. We do this two ways. In columns one and two of Table 3 we list the largest overall price changes in absolute terms regardless of the weight of the sector in the market basket for the period of unrest (February 2011 to December 2013). In columns three and four we list the largest movers adjusted for weight in the market basket as a percent of the total rise in prices over the period of 5.6%.

Looking at both methods we see that those sectors showing the biggest absolute or relative changes in prices have movements that are consistent with the prices being influenced by policy makers as much or more than by scarcity or market conditions, save one (housing). Let us focus on recreation, communication, furnishings and food. Recreation prices show the biggest spike in absolute price, but 27.2 percentage points of the 31.4 percentage point rise, or 87% of the rise, occurred in one month between September and October 2011. The same is true of

communication, where 5.8 percentage points of the 5.9 point drop (98%) occurred over one month, August to September 2011. Not as pronounced but still unusual, 6.7 percentage points of the 15.6% rise in the price of furnishings occurred between July and August 2011.

To further establish that pricing policy is behind these movements rather than scarcity and market conditions let us analyze the food sector a little more closely. To do this we will compare the movement in food prices in Bahrain to the movement in world food prices on an annual basis as reported by the Food and Agricultural Organization (FAO) of the United Nations. We would expect food prices in Bahrain to be highly correlated with world prices given how little food Bahrain itself produces; only 1.79% of the land in Bahrain is arable. The country is at the mercy of import prices. Yet, food price movements appear to be uneven and unrelated to world prices. The rise in food prices between January and February 2012 was 8.2%, explaining 95% of the rise over the two-year period of the AS. Over the entire period for which we have data, 2009-13, we see that the movement in food prices in Bahrain is not related to movement in world prices, as shown in Table 4. This unusual behavior, both within Bahrain and relative to world prices, leads us to conclude that movements in food and other major components of the cost of living must be tied to pricing policy rather than relative scarcity.

There is one sector, however, where this is not the case, and that is housing. Four facts will point to the importance of the onset of unrest in influencing housing prices in Bahrain. One, the change in the housing price index from January 2009 to December 2013 was -7.5%. Two, in the two years prior to the AS the change in the price index was only -1.5%. Three, the change in the housing index between February 2011 and December 2013 was -6.1%. And three, the change in the housing index from February 2011, the exact start of the unrest, to March 2011 was -14.2%, from an index of 107.9 to 92.6. These price movements lead us to conclude that the most important price effect of the Arab Spring on the Bahraini economy was in housing. The price of housing fell due to the onset of unrest and more than three years later (October 2014) prices had not yet recovered.

Conclusion

The effects of the Arab Spring on the economies of the Middle East had the potential to be both varied and widespread. While earlier research has shown that the unrest did in fact drive down GDP and employment growth in Bahrain we analyzed what effect the upheaval had on general and relative prices. We began by investigating the measurement and co-movement of two inflation indicators – the GDP Deflator and the Consumer Price Index (CPI) - over the period 1990-2011. This analysis makes clear that the deflator alone measures inflation in Bahrain; the CPI appears to be instead a measure of the cost of living where prices are influenced

by government intervention. The next step was to look at the specific movements in the two indexes to determine what non-monetary factors may play a role in the movement of general prices both over time and in short periods of uncertainty in Bahrain. The evidence points to the important roles played by the price of oil and the trade-weighted value of the U.S. dollar. Third, to establish what effects the unrest might have had we looked at disaggregated monthly CPI data just before and then during the AS to determine the effect on prices in various consumer sectors of Bahrain, if any, of the onset of social upheaval. While the onset of unrest is correlated with movements in several components of the CPI index, the AS had its most direct and lasting causal effect solely on the housing portion of the consumer basket. Other prices in Bahrain at the consumer level appear to be greatly influenced by government policy as much or more by market conditions or growth rates in money, consistent with the observation that the CPI is a measure of the cost of living only, not a measure of inflation.

APPENDIX

Time Series Data on Inflation, by CPI and Deflator, Annual
 CPI Base year = 2006; Deflator Base Year 2001/2010

Year	GDP Deflator	Inflation	CPI	Inflation	Deflator	Deflator	Current	Real
					Inflation	Using	Dinar	GDP
					2010 Base	2010 Base	GDP	
1989	86.18							
1990	89.04	3.3%	95.90					
1991	87.22	-2.0%	96.00	0.1%				
1992	85.93	-1.5%	96.50	0.5%				
1993	86.62	0.8%	99.00	2.6%				
1994	92.49	6.8%	99.40	0.4%				
1995	94.73	2.4%	102.50	3.1%				
1996	95.10	0.4%	102.30	-0.2%				
1997	96.68	1.7%	104.60	2.2%				
1998	89.52	-7.4%	104.20	-0.4%				
1999	91.86	2.6%	102.80	-1.3%				
2000	105.03	14.3%	93.40	-9.1%				
2001	100.00	-4.8%	92.30	-1.2%				
2002	101.26	1.3%	91.90	-0.4%				
2003	108.39	7.0%	93.40	1.6%				
2004	118.26	9.1%	95.50	2.2%				
2005	131.36	11.1%	98.00	2.6%				
2006	145.10	10.5%	100.00	2.0%		88.58	6,957.90	7,854.50
2007	157.29	8.4%	103.30	3.3%	8.4%	96.06	8,170.48	8,505.83
2008	175.22	11.4%	106.90	3.5%	11.4%	106.98	9,667.29	9,036.30
2009	152.44	-13.0%	109.90	2.8%	-13.0%	93.07	8,624.77	9,266.80
2010	163.72	7.4%	112.10	2.0%	7.4%	100.00	9,668.20	9,668.20
2011	181.24	10.7%	112.40	0.3%	10.7%	110.63	10,920.60	9,871.20
2012	185.05	2.1%	115.30	2.6%	2.1%	113.01	11,530.50	10,203.20
2013	187.82	1.5%	119.90	4.0%	1.5%	114.72	12,328.20	10,746.40
Avg. Rate	1991-2013	3.5%		1.0%				

Components of the GDP Deflator

Agriculture: Output is deflated using volume index and Intermediate consumption at constant prices is calculated using fixed coefficient to the output.

Fishing: Single deflation is used. Output is deflated using volume index and Intermediate consumption at constant prices is calculated using fixed coefficient to the output.

Mining: The estimates at constant prices are obtained through double deflation using volume indicators of production to deflate output at current prices, and a multi index of input prices to deflate intermediate consumption.

Quarrying: The estimates at constant prices are obtained through double deflation using volume indicators of production to deflate output, and an index of construction input materials to deflate the intermediate consumption.

Manufacturing:: The estimates at constant prices are obtained through double and single deflation using appropriate volume and price indices (International price indices for industry for world wild) for different manufacturing activities.

Electricity: Single deflation is used, gross output is extrapolated using a volume index of production and intermediate consumption is taken as a fixed ratio to the output.

Water supply: Single deflation is used, gross output is extrapolated using a volume index of production and intermediate consumption is taken as a fixed ratio to the output.

Construction: The constant price estimates are obtained through double deflation using the construction cost index (which is a combination of the construction material index and the labor cost index). The intermediate consumption is deflated using the construction material index.

Wholesale and Retail Trade: To obtain the estimates at constant prices the gross output in the various activities is deflated using appropriate price indices, and intermediate consumption is deflated using the overall CPI

Hotels: The constant price estimates are obtained through double deflation using a room charges index (from the tourism statistics) for deflating gross output, and a CPI to deflate intermediate consumption.

Transport and communication: The constant price estimates are obtained through double deflation using CPI and volume index for deflating gross output Appropriate price indices are used to construct deflator for intermediate consumption such as CPI and services price.

Financial intermediation: Gross output is deflated using net interest rate index and a CPI to deflate the intermediate consumption. While Constant price estimates of the

insurance are compiled by deflating the current price data using single deflator (CPI).

Real estate, renting and business activities: The output at the constant price estimates are obtained through deflation using average rent index by type dwelling and an appropriate sub-indices of the CPI. For intermediate consumption appropriate sub-indices of the CPI is used.

Producers of Government Services: The constant price estimates are obtained through deflation using wage index and appropriate sub-indices of the CPI to deflate the intermediate consumption.

Education: The constant price estimate for the private sector is obtained through double deflation using the volume index for output and a appropriate CPI for intermediate consumption. For the government estimates are obtained through deflation using wage index and appropriate sub-indices of the CPI to deflate the intermediate consumption.

Health: The constant price estimate for the private sector is obtained through double deflation using the volume index for output and an appropriate CPI for intermediate consumption. For the government estimates are obtained through deflation using wage index and appropriate sub-indices of the CPI to deflate the intermediate consumption.

Other services: The constant price estimates are obtained through deflation using an appropriate CPI.

Components and their Weights of the CPI Market Basket

Based on Classification of Individual Consumption according to Purpose (COICOP)

Division	Base Period Expenditure Weight, in percent
Food and non-alcoholic beverages	23.22
Alcoholic beverages, tobacco, and narcotics	1.35
Restaurants and hotels	1.88
Clothing and footwear	7.74

Housing, water, electricity, gas, other fuel	23.96
Furnishings, household equipment, routine maintenance	8.38
Transport	12.31
Communication	2.56
Education	2.19
Health	2.19
Recreation and culture	5.18
Miscellaneous goods and services	6.09

Table 1 – Inflation, Implied and Actual

Component, 1990-2011	For M2	For M1
CCAGR – Money Stock	10.20%	11.06%
CCAGR – Velocity	-1.97%	-2.76%
CCAGR – Real GDP	4.75%	4.75%
Implied inflation ($\% \Delta M + \% \Delta V - \% \Delta y$)	3.47%	3.55%
Actual inflation, CPI, using CCAGR	0.76%	0.76%
Actual inflation, Deflator, using CCAGR	3.67%	3.67%

Table 2: The Movement of General Prices, Quarter over Quarter

Year and Quarter	CPI Headline Inflation, %	Deflator Inflation, %
2008Q1	0.6	4.1%
2008Q2	0.3	13.7%
2008Q3	2.0	2.1%
2008Q4	0.5	-15.3%
2009Q1	0.3	-13.6%
2009Q2	-0.1	7.1%
2009Q3	1	3.2%
2009Q4	0.5	5.2%
2010Q1	0.3	0.2%
2010Q2	-0.5	0.0%
2010Q3	0.9	0.0%
2010Q4	-0.5	0.0%
2011Q1	-2.7	7.8%

2011Q2	-0.3	4.3%
2011Q3	1.8	-1.4%
2011Q4	-1.2	0.4%
2012Q1	2.1	1.8%
2012Q2	-0.3	-1.5%
2012Q3	1.4	1.0%
2012Q4	-0.3	1.6%
2013Q1	1.7	-0.1%
2013Q2	0.2	-1.2%
2013Q3	0.9	2.0%
2013Q4	-0.1	1.0

Table 3: Major Price Movers in the Cost of Living, Feb. 2011 – Dec. 2013

Consumer Sector	Percent Rise or Fall in Prices in a Sector, Independent of Weight in Market Basket	Consumer Sector	Percent Contribution to the 5.6% Rise in Cost of Living, Adjusted by Weight in Market Basket
Recreation	+31.4%	Food	+37%
Alcohol	+24.3%	Recreation	+30%
Furnishings	+15.6%	Furnishings	+24%
Misc. Goods/Services	+13.7%	Misc. Goods/Services	+15%
Education	+10.1%	Education	+8%
Food	+8.6%	Alcohol	+6%
Restaurants	+4.5%	Clothing	+4%

Clothing	+3.1%	Transportation	+2%
Healthcare	+2.5%	Restaurants	+2%
Transportation	+1.0%	Healthcare	+1%
Communication	-5.9%	Communication	-3%
Housing	-6.1%	Housing	-27%

Table 4: Movement in Food Prices, World versus Bahrain

Year	Change in FAO Food Price Index, from the year before	Change in Bahraini Food Price Index from the year before
2010	+17.2%	+4.8%
2011	+22.3%	+2.0%
2012	-7.3%	+4.1%
2013	-1.6%	+2.3%

References

- Al-Mulali, U. and Che Sab, C., (2012), "Oil Prices and the Real Exchange Rate in Oil-Exporting Countries", *OPEC Energy Review*, 36(4), 375-82.
- Bouri, E. I., (2013) "Correlation and Volatility of the MENA Equity Markets in Turbulent Periods, and Portfolio Implications", *Economics Bulletin*, 33(2), 1575-93.
- Bryan, M., (2014), "Torturing the CPI Data until They Confess: Observations on Alternative Measures of Inflation" (in three parts), *Macroblog*, Federal Reserve Bank of Atlanta
- Central Bank of Bahrain, "Statistical Bulletin", *various editions containing data files. Retrieved from <http://www.cbb.gov.bh>*
- Central Informatics Organization, Kingdom of Bahrain, "National Account", *various publications containing data files. Retrieved from http://www.cio.gov.bh/cio_eng/SubDetailed.aspx?subcatid=233*
- Central Informatics Organization, Kingdom of Bahrain. "Bulletin of Quarterly", *National Accounts*, various editions from 2008-14.
- Central Informatics Organization, Kingdom of Bahrain. "Statistical Abstract", *various yearly editions containing data files. Retrieved from <http://www.cio.gov.bh>*
- Central Informatics Organization, Kingdom of Bahrain. "Bahrain in Figures", *various editions containing data files. Retrieved from <http://www.cio.gov.bh>*
- Darrat, Ali F. and Al-Sowaidi S. (2009), "Financial Progress and the Stability of Long-Run Money Demand: Implications for the Conduct of Monetary Policy in Emerging Economies", *Review of Financial Economics*, Vol. 18, Issue 3, 124-131.
- Double Inflation Allowance Call. (2008), "*Gulf Daily News*", *on line at gulf-daily-news.com*.
- Dube, O. and Vargas, J. F. (2013), "Commodity Price Shocks and Civil Conflict: Evidence from Colombia", *The Review of Economic Studies*, 80(4), 1384-1421.
- Espinosa, R. A., and Prasad A. (2012), "Monetary Policy Transmission in the GCC Countries", *IMF Working Papers: 12/132*.
- Hojjat, T. A., and Barnhorst, B. C., (2013), "Inflation Persistence and Growth in Seven Emerging Islamic Economies", *International Journal of Business and Emerging Markets*, 5(2), 148-64.
- Miller, M. S. and Epstein, S. (2015), "Bahraini Macroeconomic Performance and Policy during the Arab Spring", *International Journal of Applied Economics and Econometrics*, 10(4),1-26.
- Miller, M. S. and Epstein, S. (2011), "The Challenges of Assessing the Output of Emergent Economies: the Case of Bahrain", *Chinese Business Review*,10(12), 1138-47.
- St. Louis Federal Reserve Bank. "Federal Reserve Economic Data (FRED)", *data may be retrieved from <http://research.stlouisfed.org/fred2/>*
- Tahir, R., and Samad A., (2007), "Modelling of Bahrain's Economy: A Vector Autoregressive Approach", *The Middle East Business and Economic Review*, Vol. 19, no. 1, 23-38.
- Thalassinos, I.E., Venediktova, B., Staneva-Petkova, D., Zampeta, V., (2013), "Way of Banking Development Abroad: Branches or Subsidiaries", *International Journal of Economics and Business Administration*, 1(3), 69-78.
- United Nations Food and Agricultural Organization, "World Food Situation and FAO Food Price Index", *available at <http://www.fao.org/worldfoodsituation/foodpricesindex/en/>*

United States Department of Commerce, Bureau of Economic Analysis, "Gross Domestic Product", *Data may be retrieved from <http://www.bea.gov/national/index.htm#gdp>*

Yusof, R. M., Al Wosabi, M., and Majid, M. A., (2009), "Monetary Policy Shocks and Islamic Banks' Deposits in a Dual Banking System: Empirical Evidence From Malaysia and Bahrain", *Journal of Economic Cooperation and Development*, 30(2), 1-26.

