

The Impact of Oil Price Fluctuations on the GDP Growth of Bahrain

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here

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Presentation Outline

- **Introduction**
- **Background**
- **Research Aims and Objective**
- **Methodology:**
 - **Data**
 - **Model**
- **Empirical work and results**
- **Conclusion**

- Fluctuations in oil price recently
 - Hikes in 2008 crisis
 - Drops since 2014
- GDP depends highly on oil export
 - Oil accounts for 60% of Bahrain's export receipts
 - Oil accounts for 70% of government revenue
- Oil Price changes may affect GDP growth

- Worldwide:
 - Darby (1982), Amano and Norden (1998), Rasche and Tatom (1977), Bruno and Sachs (1982), Bernanke (1997)
- GCC region:
 - MN Eltony, M Al-Awadi (2001), Al-Mutawa (1991, 1992), Taher (1987), Almulali (2010), Ahmed and Masan (2015)

- Bahrain's economy:
 - DI Al-Ezzee (2011) studied the real influences of real exchange rate and oil price changes on the growth of real GDP of Bahrain using yearly data
- Our study on the Kingdom of Bahrain uses quarterly data which include both the hikes in oil prices of 2008, and the recent drops in oil prices since 2014

- Aim:
 - Investigate the impact of oil price changes on the economic growth of Bahrain
- Objectives:
 - Examining the short run relationship between oil price returns and Bahrain GDP growth
 - Testing the long run relationship between oil price returns and Bahrain GDP growth

- Data:
 - Quarterly data from 1995 Q1 to 2016 Q2
 - GDP of Bahrain at constant prices (Bloomberg)
 - Monthly West Texas Intermediate (WTI) oil prices (Bloomberg)
 - Consumer price index CPI. (Bloomberg)
- Transformation of Data:
 - Real Oil Prices: converted oil price to real oil prices by dividing it over CPI (got rid of inflation factor)
 - Obtaining Stationary Series: took logarithmic form and the first difference for both Real Oil Prices and GDP

- Stationarity Test:
 - Augmented Dickey-Fuller (ADF) unit root test & Phillip Peron (PP) Test
 - Results: Stationary at level $I(1)$ series
- Lag Selection:
 - Var estimation: took initial 12 lags, and we decided to apply a structure lag of 3 following AIC criterion recommendation.
- Johansen Cointegration Test:
 - Results show one cointegrating vector

- Model: VECM equations

$$\Delta \text{GDP}_t = \sum_{i=1}^p \beta_{1i} \Delta \text{GDP}_{t-1} + \sum_{i=1}^p \beta_{2i} \Delta \text{OP}_{t-1} + \gamma_1 \text{ECT}_{t-1} + \varepsilon_t$$

1

$$\Delta \text{OP}_t = \sum_{i=1}^p \alpha_{1i} \Delta \text{GDP}_{t-1} + \sum_{i=1}^p \alpha_{2i} \Delta \text{OP}_{t-1} + \gamma_2 \text{ECT}_{t-1} + \mu_t$$

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- GDP = The natural logarithm of gross domestic product of Bahrain
- OP = The real natural logarithm of WTI oil price
- ECT = The error correction term
- β_{1i} , β_{2i} , α_{1i} and α_{2i} = The coefficients of the lags of the first differenced GDP and oil price in equations 1 and 2
- γ_1 and γ_2 are the coefficients of the first lag of the error correction terms
- ε_t and μ_t = The error terms

- Stationarity test (ADF and PP tests):

	At level test	First-difference	At level test	First-difference
Variables	ADF test		PP test	
GDP	-0.751	-10.664***	-0.615	-11.256***
Oil price	-1.414	-6.794***	-1.532	-6.697***

*** denotes 1% significance level.

- Lag selection for the model (VAR estimation and AIC criteria)

lag	LL	LR	df	p	FPE	AIC	HQIC	SBIC
0	-75.8528				.028932	2.13295	2.15796	2.1957
1	123.531	398.77	4	0.000	.000137	-3.22004	-3.14501*	-3.03178*
2	128.763	10.464	4	0.033	.000132	-3.25379	-3.12875	-2.94003
3	134.773	12.019*	4	0.017	.000125*	-3.30884*	-3.13379	-2.86958

- Johansen cointegration test (One cointegrating vector)

Maximum					5%
Rank	parms	LL	eigenvalue	Trace statistic	critical
0	8	142.10749	.	17.7366	12.53
1	11	149.67897	0.16862	2.5937*	3.84
2	12	150.9758	0.03114		

- Results of the long-run dynamics of the VEC model

Cointegration Equations		
GDP (-1)	1	
OP (-1)	1.471**	
Constant	10.293***	
Vector Error Correction	Δ GDP	Δ OP
Δ GDP (-1)	-0.419*** (0.128)	-0.291 (0.233)
Δ GDP (-2)	-0.399*** (0.128)	-0.392 (0.233))
Δ OP (-1)	0.200*** (0.076)	0.374*** (0.138)
Δ OP (-2)	0.033 (0.076)	-0.012 (0.139)
ECT_{t-1}	-0.018*** (0.005)	-0.007 (0.009)

Standard errors in the brackets. **, *** indicate that the coefficients are significant at 5% and 1% level, respectively.

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- Key findings:
 - Short Run Effects: Oil price returns affects GDP, whilst GDP has no effect on oil price returns.
 - Long Run Effects: For every 1% increase in oil price, GDP is affected positively by 1.47%.

- Recommendations:
 - More diversified Economic portfolio.
 - Implement a mixed measure of Fiscal Austerity through:
 1. cutting government spending in areas where consumers aren't hurt.
 2. implementation of VAT taxes to increase non-hydrocarbon state revenues.
 3. Taxation on “luxury sin products” such as Cigarettes and Alcohol to prevent tax burden from falling on the lower income class.
 - Subsidies Reduction.

Thank You