

THE DRIVERS BEHIND CRUDE OIL PRODUCTION BEHAVIORS: AN INVESTIGATION ON OPEC AND NON-OPEC PRODUCERS

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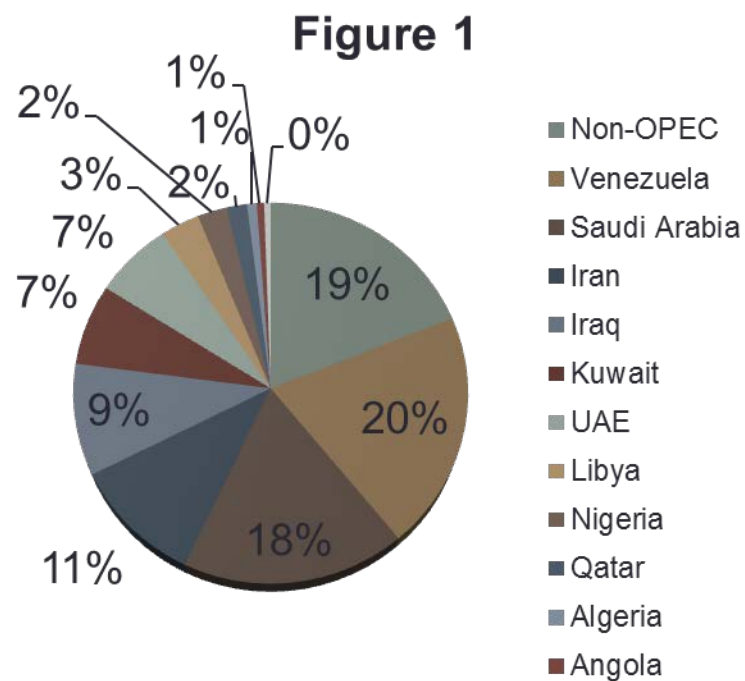
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Outline

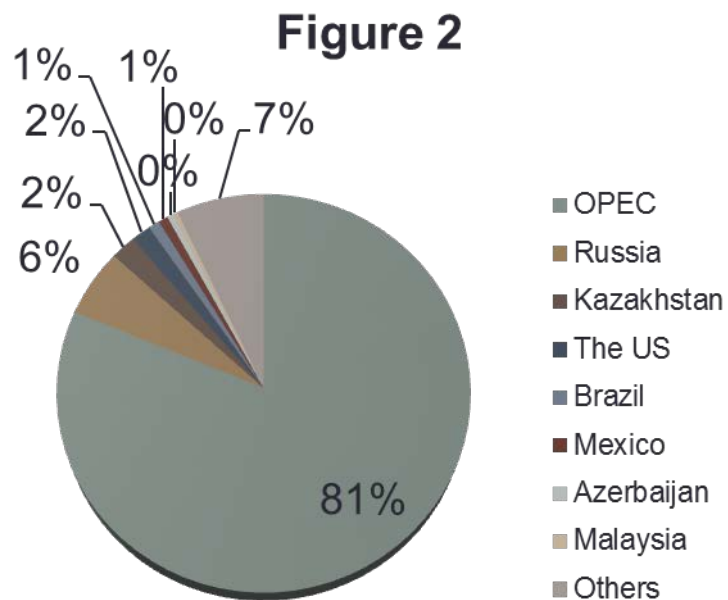
1. Introduction
2. Methodology
3. Structure of model for OPEC members crude oil production
4. Results of OPEC production
5. Structure of model for non-OPEC crude oil production
6. Results of non-OPEC production
7. Conclusion

1. Introduction

OPEC share of world oil proven reserves, 2012:

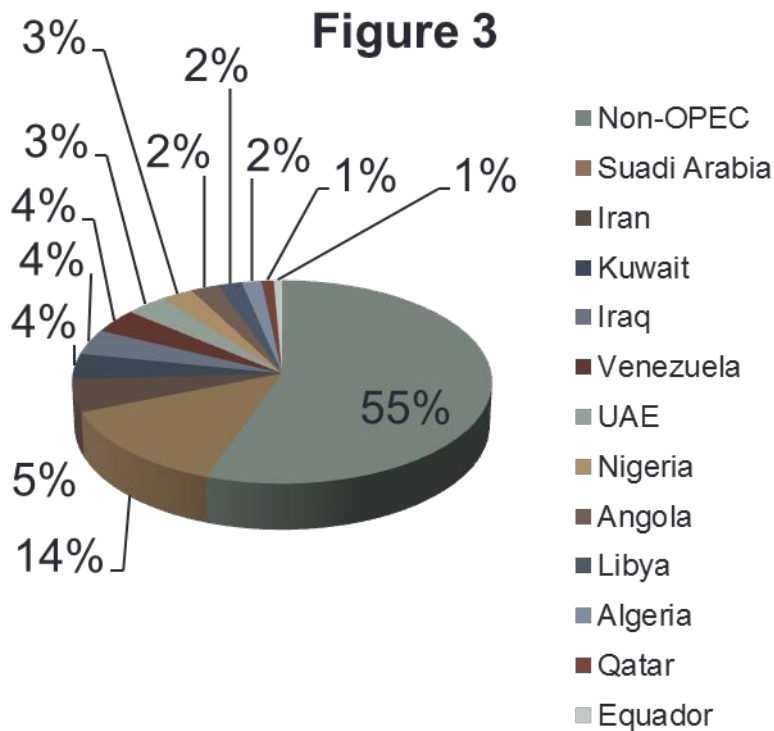


Non-OPEC share of world oil proven reserves, 2012:

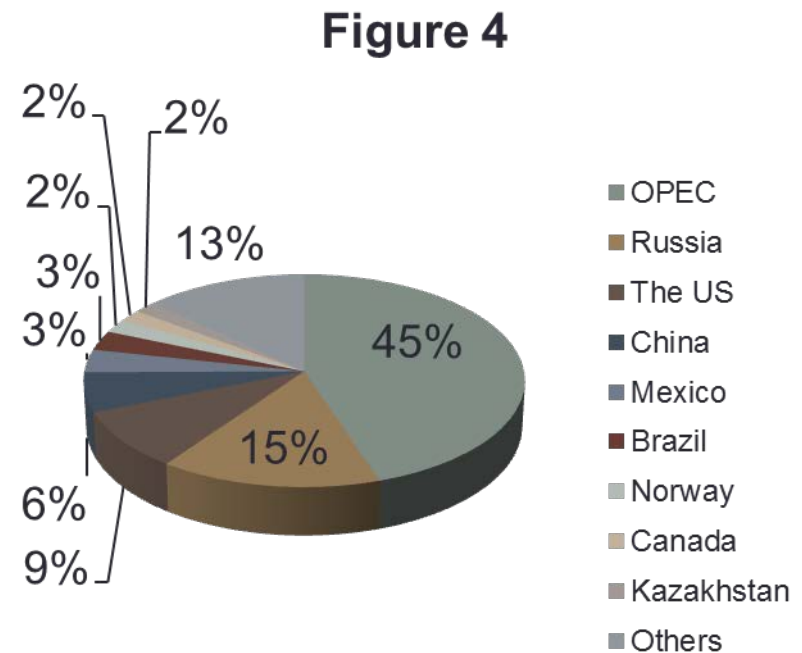


1. Introduction

OPEC share of world oil production, 2012:

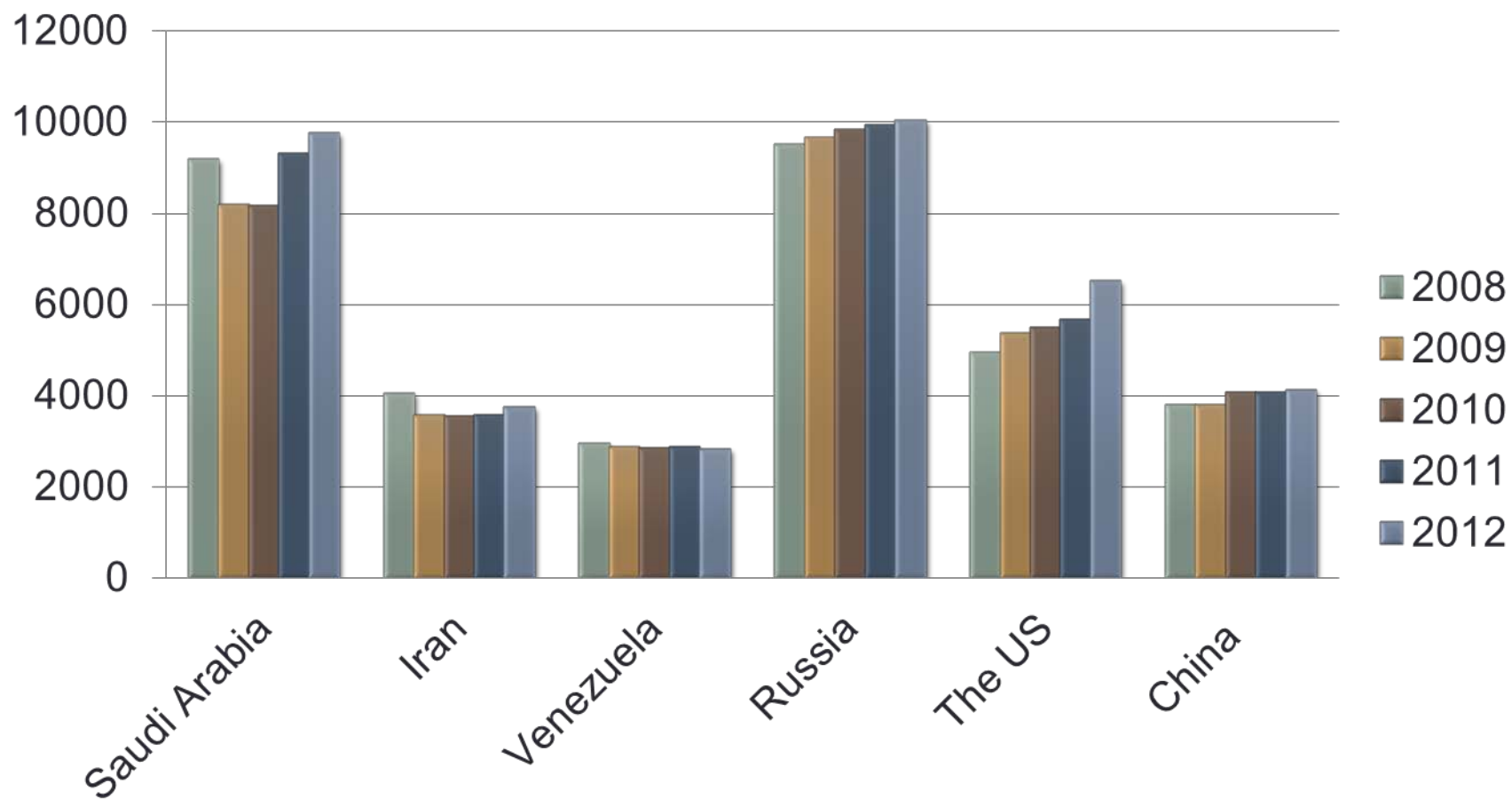


Non-OPEC share of world oil production, 2012:



1. Introduction

Graph 1



1. Introduction

- **Target price theory:**

Hammoudeh and Medan (1995) and Tang and Hammoudeh (2002).

- **Target revenue theory:**

Ezzati (1976), Adelman (1982) and Griffin (1985).

- **Changes in ownership or property right theory:**

Johany (1979) and Griffin (1985).

1. Introduction

- **Competitive theory:**

MacAvoy (1982), Verleger (1987) and Griffin (1985).

- **Cartel theory:**

Griffin (1985), Dahl and Yucel (1991) and Gulen (1996).

- **Target capacity theory:**

Suranovic (1993).

- **Political theory:**

Moran (1980-1982).

1. Introduction

- **The objectives:**

To investigate the determinant factors that impact on crude oil production of OPEC and Non-OPEC producers.

- **The choice of countries:**

OPEC: Algeria, Indonesia, Iran, Nigeria, Saudi Arabia and Venezuela (1983-2007), Libya (1990-2007) and Qatar (1994-2007).

Non-OPEC: Canada, China, Egypt, Mexico, Norway, the Russian Federation, United Kingdom, and the United States from 1980-2011.

2. Methodology

- The **Zivot and Andrews (1992)** and the **Perron (1997)** unit root tests.
- The Autoregressive Distributed Lag (**ARDL**) **bounds testing approach for cointegration** proposed by **Pesaran and Shin (1999)** and **Pesaran et al. (2001)**.
- The **Granger causality** test.

3. The structure of model for OPEC members production.

$$\ln Q_{it} = w_i + \beta_2 \ln P_t + \beta_3 \ln Q_{it}^{oo} + \beta_4 \ln Quota_{it} + \beta_5 \ln I_{it} + \theta D_{it} + \delta_{it}$$

Q_{it} : Crude oil production by country i at time t .

P_t : Real crude oil price at time t .

Q_{it}^{oo} : Crude oil production by the rest of OPEC at time t , except country i .

$Quota_{it}$: OPEC quota for country i at time t .

I_{it} : Domestic investment needs of country i at time t .

D_{it} : Dummy variables.

4. The results of cointegration test for OPEC production

ARDL bounds F-tests for cointegration

	F-statistics	
Algeria	4.85**	
Indonesia	4.003	
Iran	5.9*	
Libya	5.87*	
Nigeria	10.87*	
Qatar	5.58**	
Saudi Arabia	1.82	
Venezuela	6.1*	
	I(0)	I(1)
F-Critical values at 1%	3.063	4.084
F-Critical values at 5%	3.539	4.667
F-Critical values at 10%	4.617	5.786

4. The Long run Estimation results for OPEC production

Determinant factors	Countries
Crude oil price	Algeria(+), Iran(+), Nigeria(+), Venezuela(-)
Rest of OPEC production	Nigeria(+), Qatar(+), Venezuela(+)
OPEC Quota	Algeria(+), Libya(+), Nigeria(+)
Investment needs	Algeria(+), Iran(-), Libya(+), Nigeria(+), Qatar(-)

5. Which factors have information to forecast future OPEC production?

Countries	Short run causation	Long run causation
Algeria	Price→production Investneeds→production Quota→production ROP→production	All factors→Production
Iran	Price→production Investneeds→production Quota≠production ROP→production	All factors→Production
Libya	Price≠production Investneeds→production Quota→production ROP→production	All factors→Production

5. Which factors have forecasting information for OPEC future production?

Countries	Short run causation	Long run causation
Nigeria	Price→production Investneeds→production Quota→production ROP→production	All factors→Production
Qatar	Price≠production Investneeds→production Quota≠production ROP→production	All factors→Production
Venezuela	Price→production Investneeds→production Quota≠production ROP≠production	All factors→Production

5. The structure of model for non-OPEC production

$$\ln Q_{it} = \alpha_i + \gamma_i \ln P_t + \delta_i \ln I_{it} + \partial_i \ln Q_t^O + \phi_i \ln RE_{it} + \theta D_{it} + \varphi_{it}$$

Q_{it} : Crude oil production by country i at time t .

P_t : Real crude oil price at time t .

I_{it} : Domestic investment needs of country i at time t .

Q_t^O : The whole production of OPEC at time t .

RE_{it} : Crude oil proven reserves of country i at time t .

D_{it} : Dummy variables of country i at time t .

φ_{it} : Error term of country i at time t .

6. The cointegration results for non-OPEC production

The ARDL bounds F-test for cointegration

	F-statistics	
Canada	7.4*	
China	5.28**	
Egypt	7.67*	
Mexico	4.74**	
Norway	7.19*	
The Russian Federation	5.42**	
UK	4.84**	
The US	5.35**	
	I(0)	I(1)
F-Critical values at 1%	3.063	4.084
F-Critical values at 5%	3.539	4.667
F-Critical values at 10%	4.617	5.786

6. The long run estimation results for non-OPEC production

Determinant factors	Countries
Crude oil price	Canada(+), China(-), Egypt(-), Norway(-), UK(-)
OPEC production	Canada(-), China(-), Egypt(-), Mexico(+), The US(-)
Investment needs	Norway(-), Russia(+), The US(-)
Proven reserves	Egypt(+), UK(+)

6. Which factors have information to forecast future non-OPEC production?

Countries	Short run causation	Long run causation
Canada	Price → production Investneeds → production OP → prodduction Reserves → production	All factors → production
China	Price → production Investneeds ≠ production OP → prodduction Reserves → production	All factors → production
Egypt	Price ≠ production Investneeds ≠ production OP → prodduction Reserves ≠ production	All factors → production

6. Which factors have forecasting ability for future non-OPEC production?

Countries	Short run causation	Long run causation
Mexico	Price \neq production Investneeds \rightarrow production OP \rightarrow production Reserves \rightarrow production	All factors \rightarrow production
Norway	Price \rightarrow production Investneeds \neq production OP \rightarrow production Reserves \neq production	All factors \rightarrow production
Russia	Price \neq production Investneeds \neq production OP \rightarrow production Reserves \neq production	All factors \rightarrow production

6. Which factors have forecasting ability for future non-OPEC production?

Countries	Short run causation	Long run causation
UK	Price → production Investneeds ≠ production OP → prodduction Reserves → production	All factors → production
The US	Price ≠ production Investneeds → production OP → prodduction Reserves ≠ production	All factors → production

7. Conclusion

There is not a general consensus regarding the OPEC and non-OPEC producers behavior.

Thank you

*Questions and suggestions are
welcome*