



Introduction to *Oil and Governance* and the NOCs Project at Stanford University

Mark Thurber

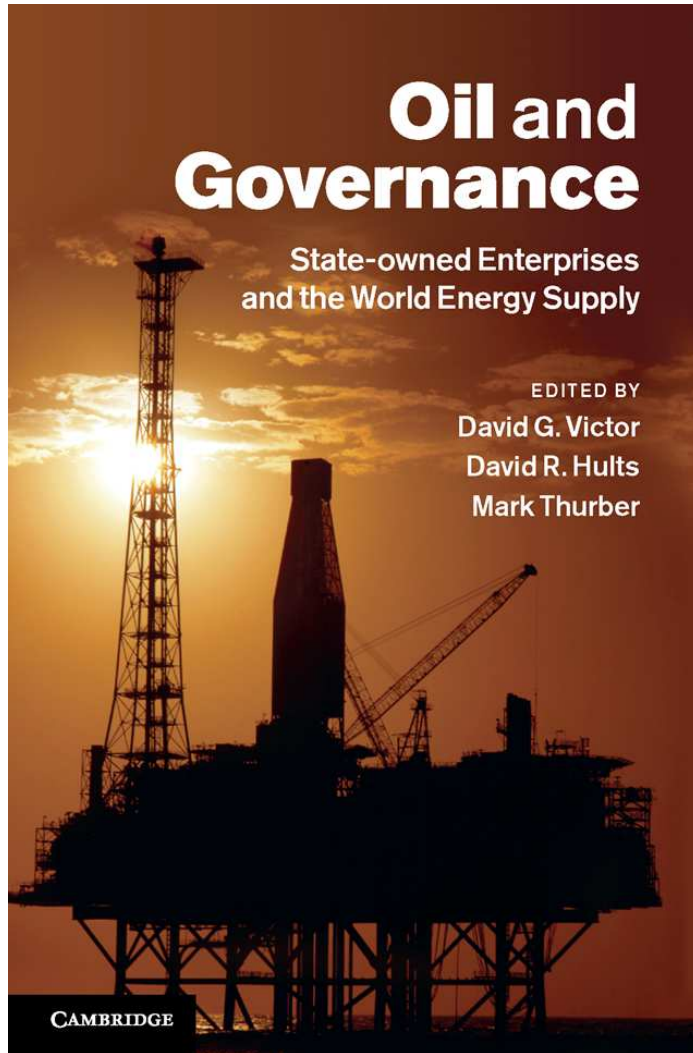
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National Oil Companies and the Future of the Oil and Gas Industry
Chatham House, 10 Saint James's Square, London
12th December 2011

Some Myths and Half-Truths About NOCs

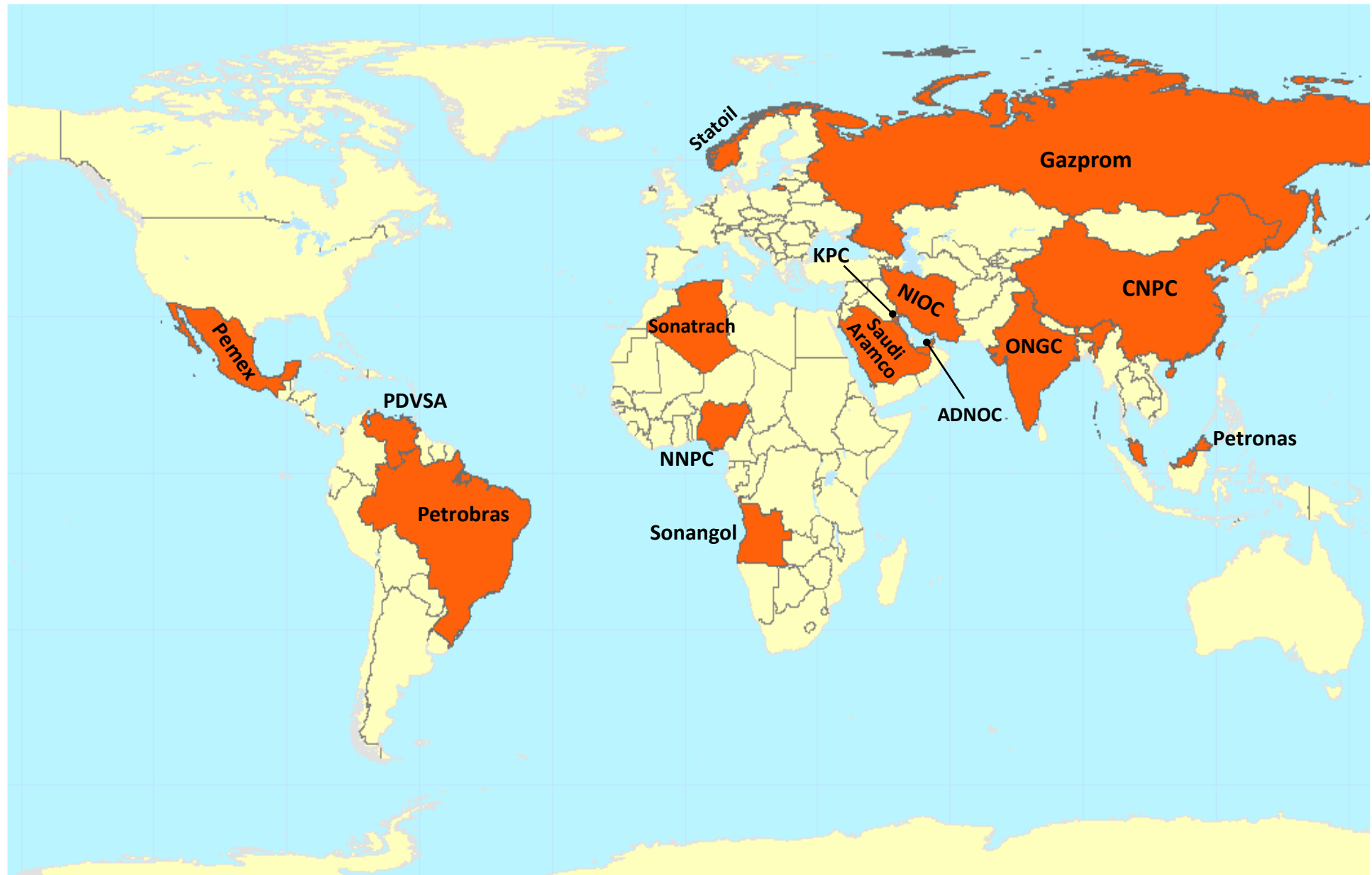
- 1) Transparency is always the best reform medicine
- 2) “Star managers” create effective NOCs
- 3) NOCs assure government control over resources
- 4) NOCs are effective geopolitical tools
- 5) NOCs compete with IOCs

Motivation for the Stanford NOCs Project



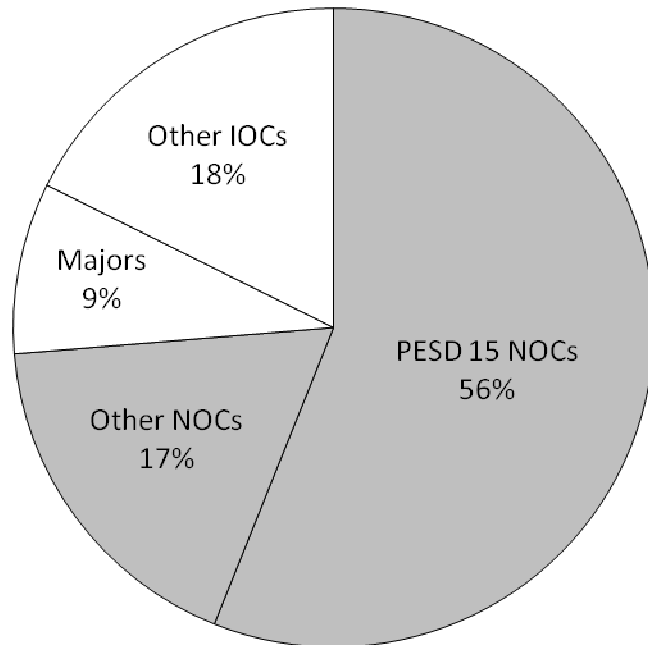
- What explains the variation in NOC performance and strategy?
- What do these findings mean for:
 - Global oil & gas markets
 - IOCs
 - Government efforts to reform NOCs

Our Sample of 15 NOCs



Role of NOCs in Oil

Oil Reserves* as of Oct 2009
(top 1460 petroleum companies)

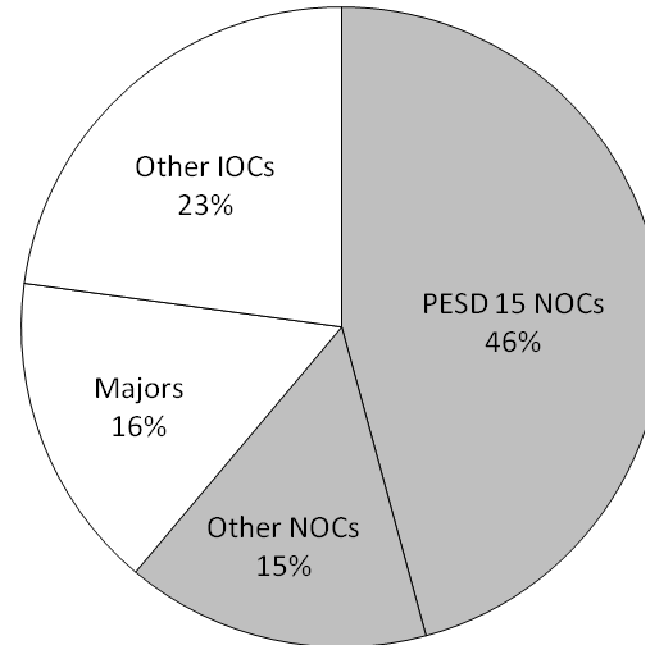


Total = 1.5 trillion barrels

*Wood Mackenzie commercial + technical reserves

(All reserves and production figures on working interest basis)

2008 Oil Production
(top 1460 petroleum companies)



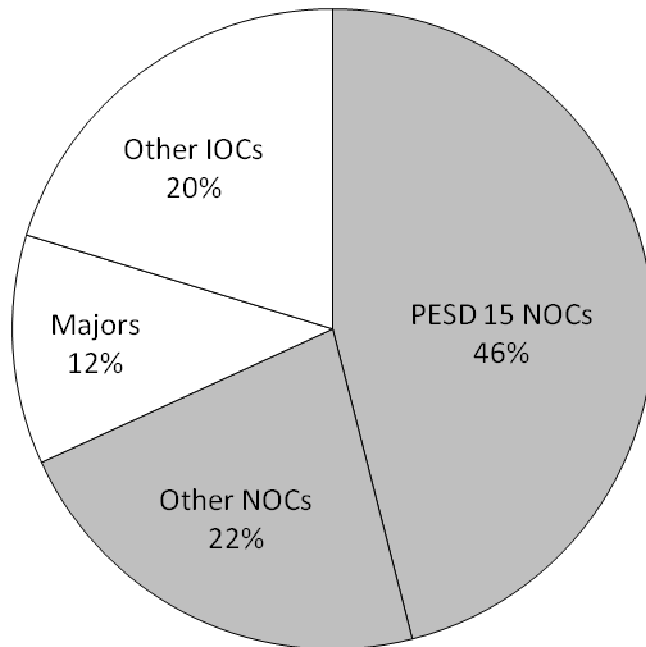
Total = 77 million barrels/day
(94% of world total)

NOCs control 73% of world oil reserves and 61% of world oil production

Data Source: Wood Mackenzie Corporate Analysis Tool

Role of NOCs in Natural Gas

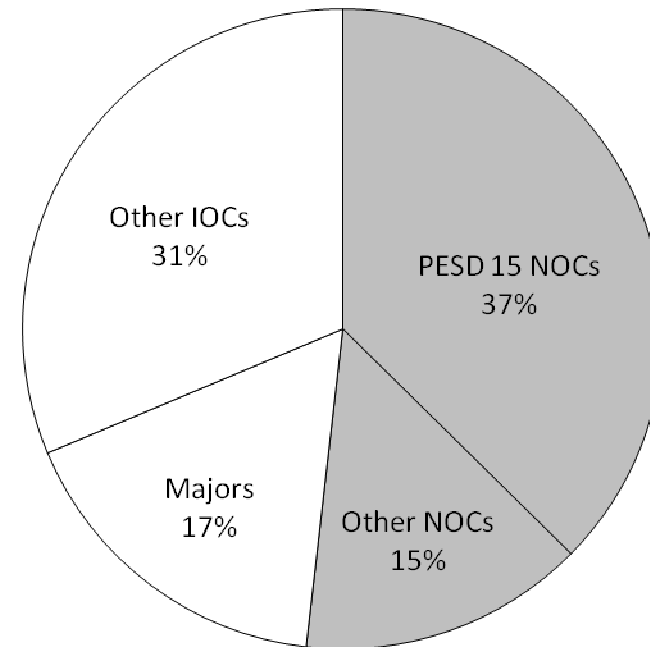
Gas Reserves* as of Oct 2009
(top 1460 petroleum companies)



Total = 1.2 trillion barrels oil equivalent

*Wood Mackenzie commercial + technical reserves

2008 Gas Production
(top 1460 petroleum companies)



Total = 48 million barrels oil eq/day
(93% of world total)

(All reserves and production figures on working interest basis)

NOCs control 68% of world gas reserves and 52% of world gas production

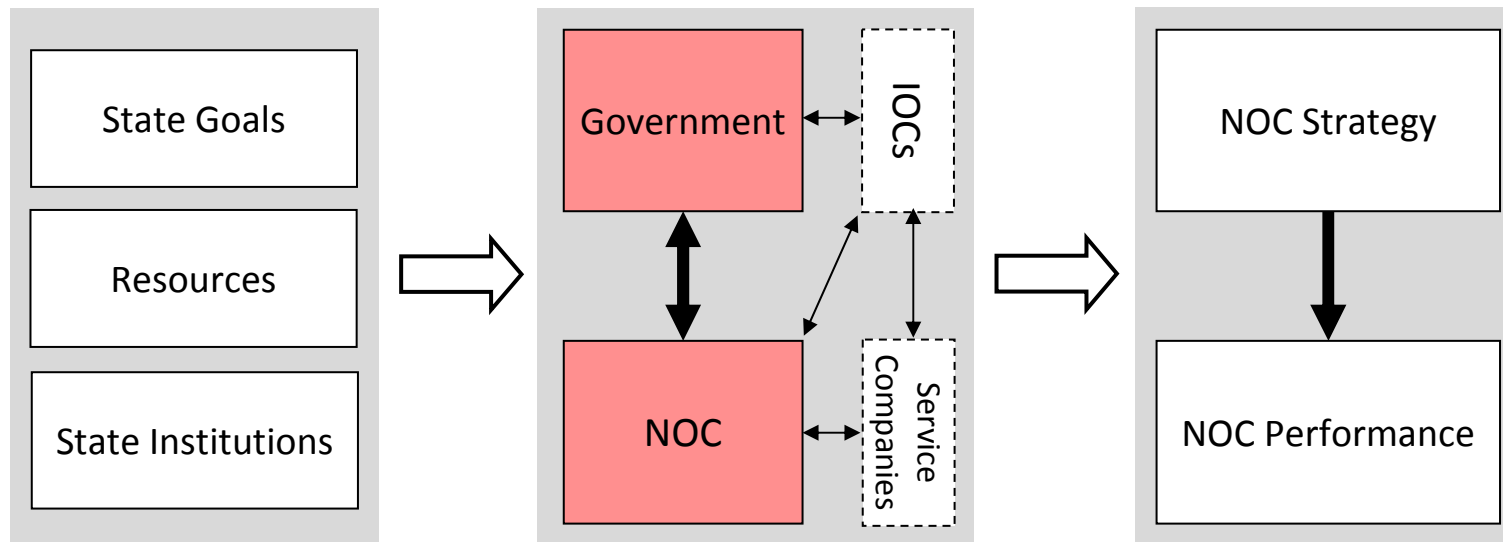
Data Source: Wood Mackenzie Corporate Analysis Tool

Our NOC Sample

Company	Country	Liquids Prod (000 bpd)	Gas Prod (mmcf/d)	Total Reserves (bboe)
Saudi Aramco	Saudi Arabia	10,669	6,677	280
National Iranian Oil Company	Iran	3,694	7,840	237
Pemex	Mexico	3,257	3,953	27
Kuwait Petroleum Corporation	Kuwait	2,832	1,166	47
CNPC (includes PetroChina)	China	2,694	5,354	33
PDVSA	Venezuela	2,275	876	268
ADNOC	United Arab Emirates	1,993	3,523	83
Petrobras	Brazil	1,921	1,713	30
Sonatrach	Algeria	1,201	6,658	21
Statoil	Norway	1,199	4,647	21
Gazprom	Russia	1,124	51,818	270
NNPC	Nigeria	862	1,842	26
ONGC	India	696	2,231	11
Petronas	Malaysia	534	4,076	12
Sonangol	Sonangol	270	0	3
		<i>Working interest, 2008</i>	<i>Working interest, 2008</i>	<i>Working interest, as of October 2009</i>

Data Source: Wood Mackenzie Corporate Analysis Tool

15 Cases, 1 Research Protocol...



...with Government-NOC relations at its center

Understanding NOCs

1) State Goals

2) Resources

3) State Institutions

Understanding NOCs

1) State Goals

NOCs are “commercial and...” enterprises

2) Resources

3) State Institutions

Level of Burden	Social Goods	Private Goods
High	Gazprom (<i>subsidized domestic gas</i>) NIOC (<i>fuel subsidies; social programs</i>) NNPC (<i>fuel subsidies</i>) PDVSA (post-strikes) (<i>fuel subsidies; social programs</i>) Pemex (<i>high taxes, spent by government for broad public purposes</i>)	NIOC (<i>rents to security and police groups that back ruling elites</i>) NNPC (<i>political patronage; contracts and “lifting licenses” to associates; senior posts as political plums</i>) PDVSA (post-strikes) (<i>political patronage</i>)
Upper middle	CNPC (<i>employment</i>) KPC (<i>employment of Kuwaitis in general</i>) Sonatrach (<i>high taxes, which government uses to pursue macroeconomic stability goals</i>)	Gazprom (<i>investments benefiting elites</i>) KPC (<i>elite employment</i>) ONGC (<i>nepotism; contract corruption</i>) Pemex (<i>patronage through unions</i>) Sonatrach (<i>political patronage</i>)
Lower middle	ADNOC (<i>training/employment</i>) ONGC (<i>employment; some CSR</i>) PDVSA (pre-strikes) (<i>fuel subsidies</i>) Petrobras (<i>tool for energy self-sufficiency and to supply domestic markets</i>) Petronas (<i>fuel subsidies; high taxes in Malaysia, spent by government for public purposes</i>) Saudi Aramco (<i>support diversification of economy and Saudi employment</i>) Sonangol (<i>fuel subsidies</i>)	CNPC (<i>senior posts as political plums</i>) Petronas (<i>private banker and political tool for prime minister</i>) Sonangol (<i>education and employment for elites</i>)
Low	Statoil	ADNOC PDVSA (pre-strikes) Petrobras Saudi Aramco Statoil

“Backward Linkages”: Building an Oil Service Industry in Norway



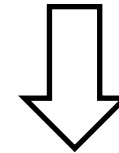
Photo: Norwegian Ministry of Petroleum and Energy

With partial privatization in 2001,
Statoil's R&D became more
commercially-oriented

Statoil



Norsk Hydro



Oil Service Companies:

- Exploration, geology, seismic
- Field development
- Floating platforms, drilling rigs
- Tankers
- Lifting equipment, winches, cranes
- Pumps, valves, flowmeters
- Chemicals
- Subsea remote-operated vehicles
- Control systems
- Safety equipment
- Staffing and training



Level of Burden	Social Goods	Private Goods
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The Impact of State Goals

	Non-hydrocarbon burden			
	High	Upper middle	Lower middle	Low

The Impact of State Goals

Performance in hydrocarbon functions	Non-hydrocarbon burden			
	High	Upper middle	Lower middle	Low
High				
Upper middle				
Lower middle				
Low				

The Impact of State Goals

Performance in hydrocarbon functions	Non-hydrocarbon burden			
	High	Upper middle	Lower middle	Low
High			PDVSA (pre-strikes) Petrobras	Statoil
Upper middle			CNPC Petronas Saudi Aramco Sonangol	ADNOC
Lower middle	Gazprom PDVSA (post-strikes) Pemex	Sonatrach	ONGC	
Low	NIOC NNPC	KPC		

Large Non-Hydrocarbon Burden → Low Hydrocarbon Performance

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NOCs are “commercial and...” enterprises

NOC execs must satisfy their government masters

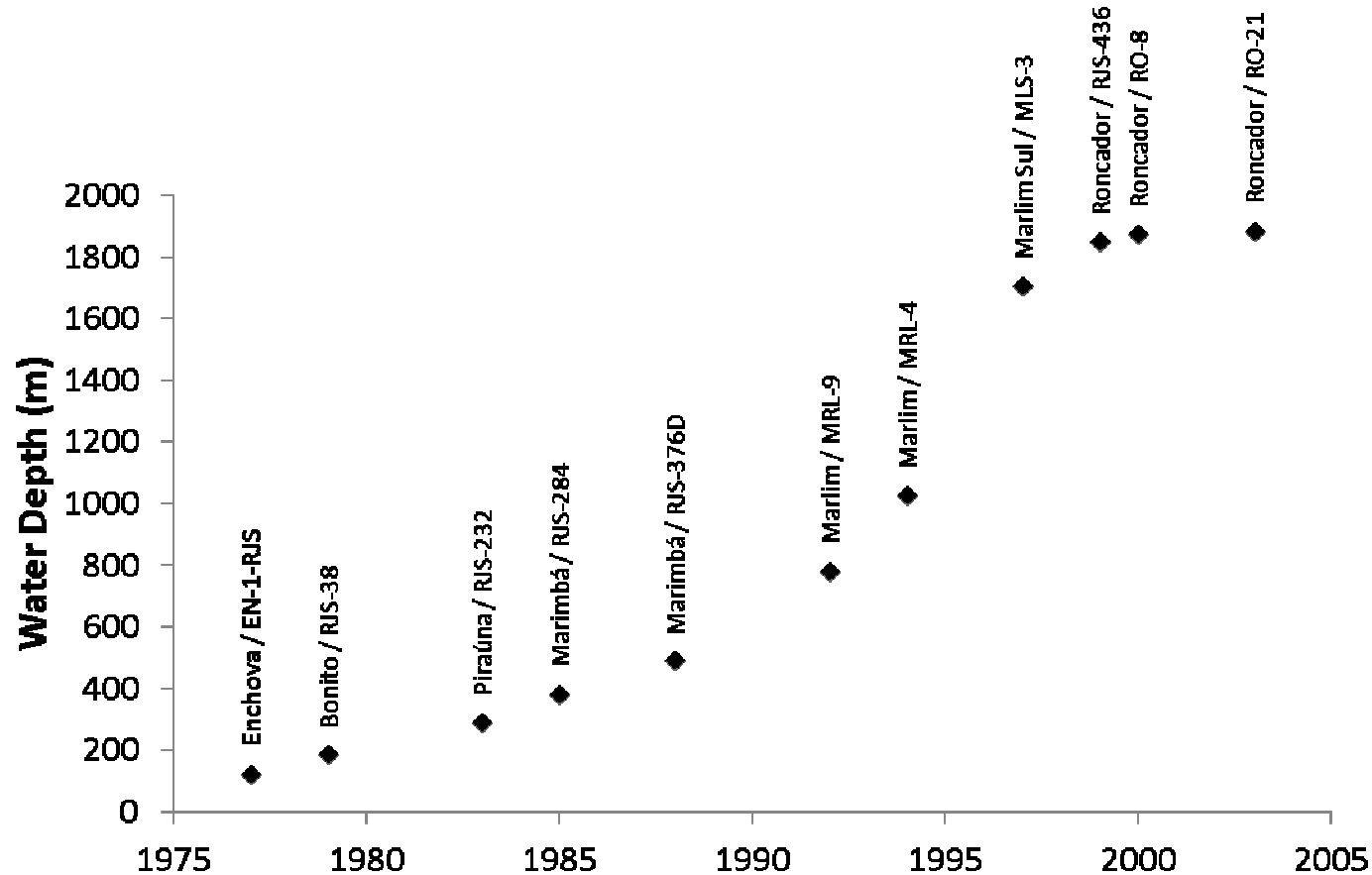
2) Resources

Evolution of NOCs often driven by geology

3) State Institutions

Resources: Brazil's Gentle Continental Shelf

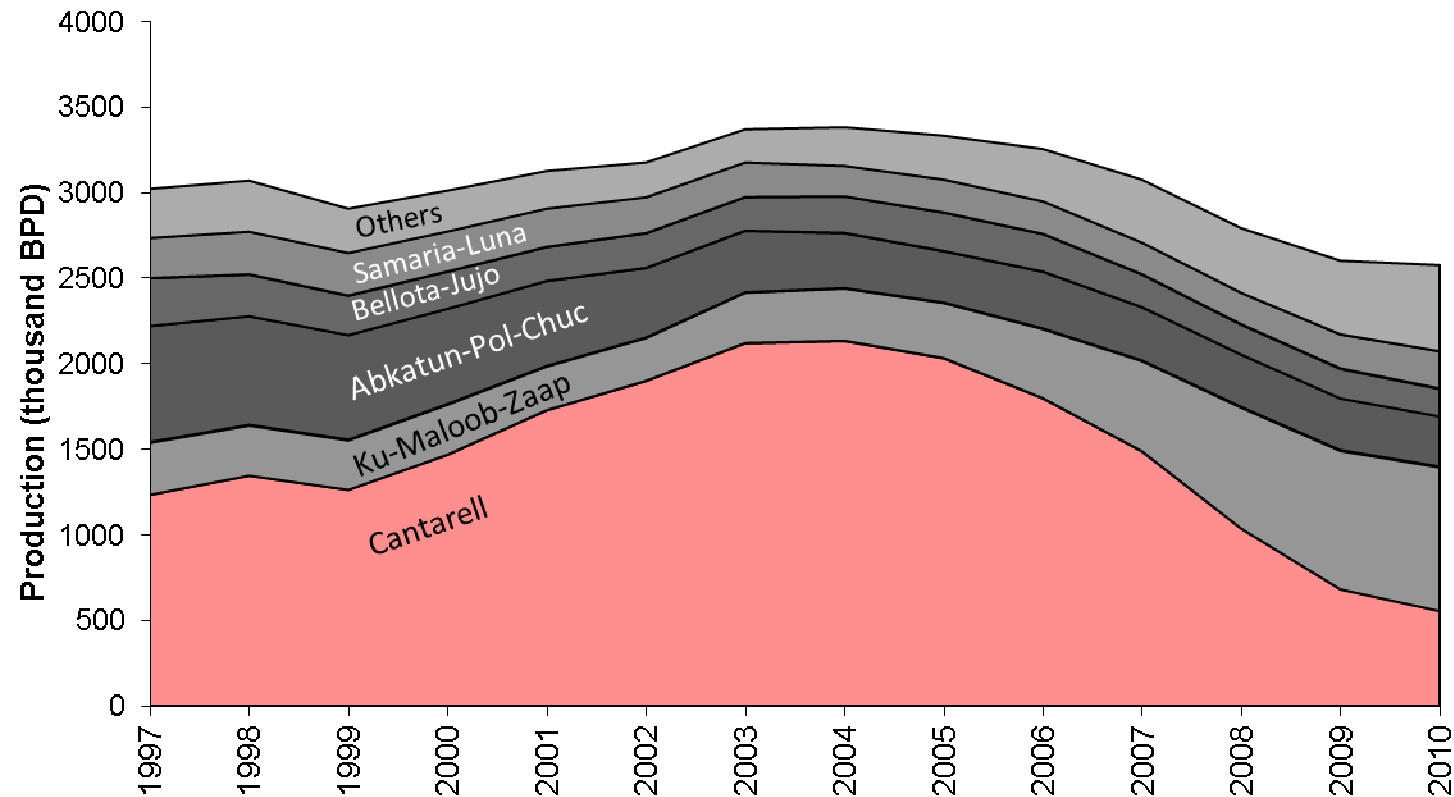
Petrobras was able to develop leading deepwater capabilities



Data Source: Petrobras

Resources: Easy Oil in Mexico

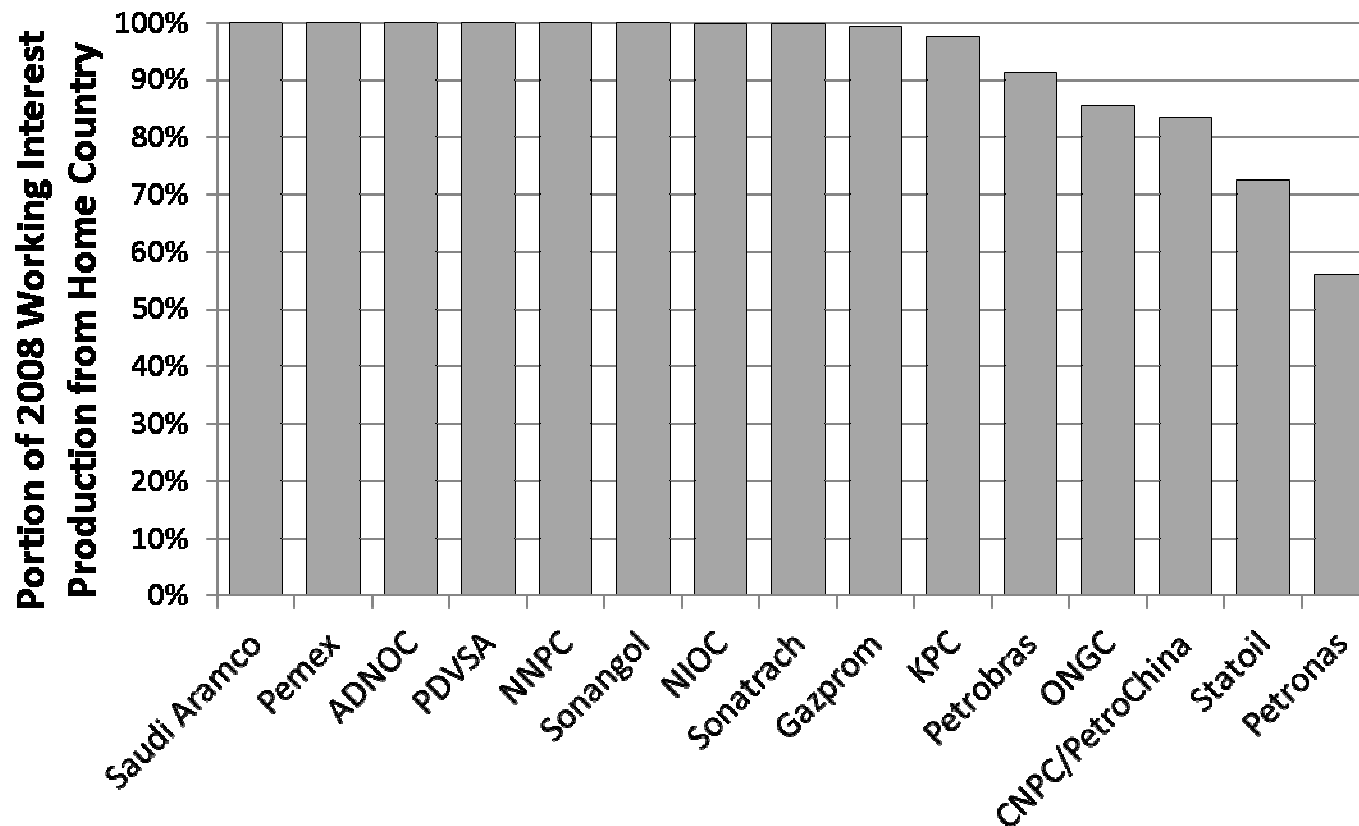
Pemex's capabilities gradually atrophied following 1976 discovery of Cantarell



Data Source: Pemex Statistical Yearbook

Resources: Going Abroad

NOC moves abroad spurred by perceived resource insufficiency at home



Data Source: Wood Mackenzie Corporate Analysis Tool

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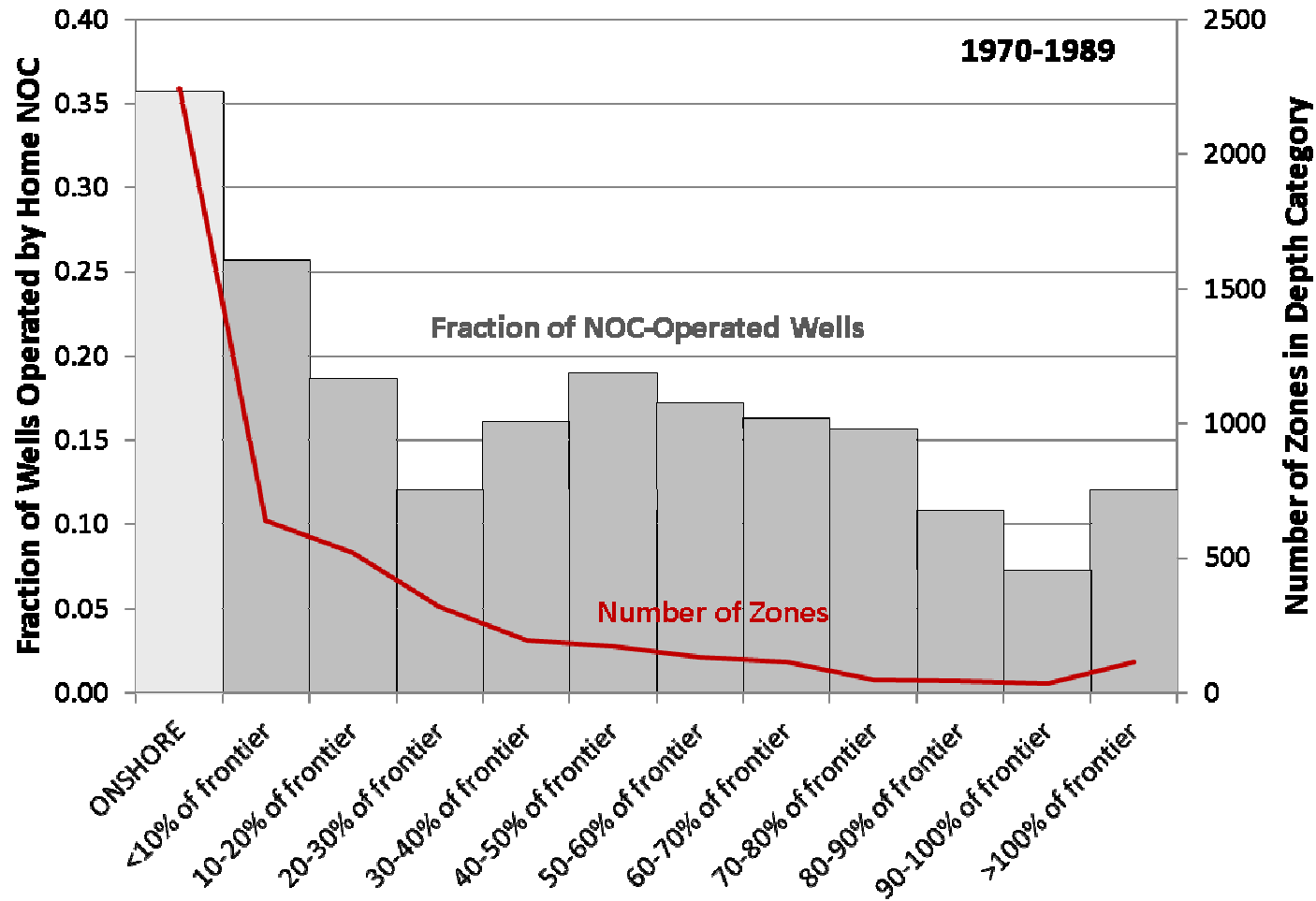
2) Resources

Evolution of NOCs often driven by geology

Characteristic NOC/IOC difference: managing risk

3) State Institutions

Risk: NOCs, IOCs, and the Deepwater Frontier



Data Source: Wood Mackenzie PathFinder database

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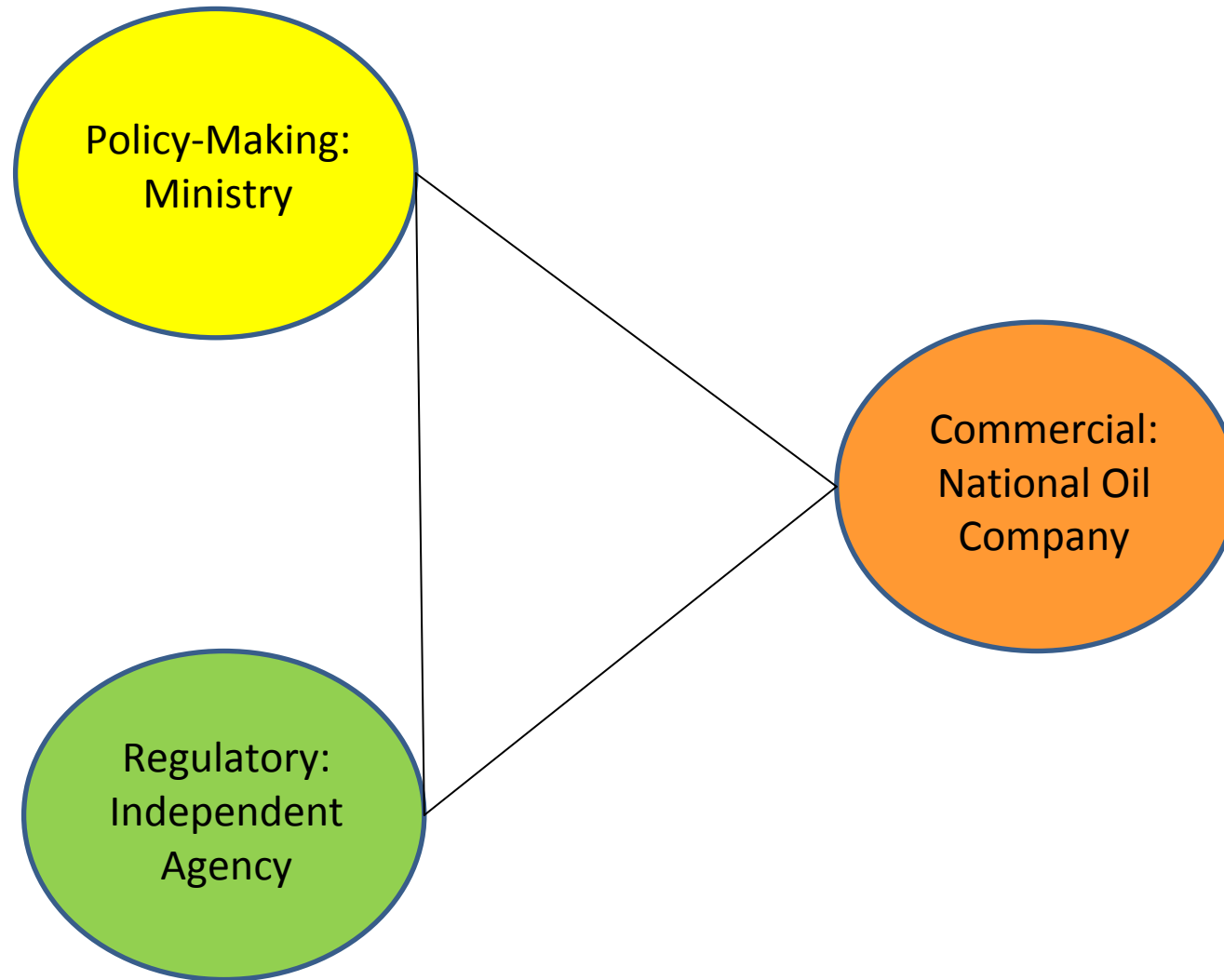
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An Application of *Oil and Governance*: When Does the “Norwegian Model” Work?



Case Data from *Oil and Governance*

Country	Tried Separating Functions?	Effective Separation of Functions Currently?	Good Performance Currently?
Norway	✓	✓	✓
Brazil	✓	✓	✓
Mexico	✓	?	
Nigeria	✓		
Algeria	✓		
Malaysia			✓
Saudi Arabia			✓
Angola			✓
Russia			
Venezuela			

Source: Thurber, Hults, and Heller (2011)

Detailed Observations

1. Ability to implement separation of functions depends on human capital and institutional development (*e.g., Norway vs. Nigeria*)
2. Countries lacking deep human and institutional capacity may benefit from *not* establishing separation of functions at first (*e.g., Angola/Brazil vs. Nigeria*)
3. Checks and balances from separation of functions may offer resilience against political or economic shocks (*e.g., consider Venezuela, Malaysia, Angola*)
4. Attempts to implement separation of functions in countries lacking institutional prerequisites can be harmful (*e.g., Nigeria*)
 - a. Crowd out incremental reform efforts
 - b. Can diffuse already-scarce financial/human resources
 - c. Increase points of engagement and corruption
 - d. Exacerbate cynicism

Reform Recommendations

	Low Political Competition	High Political Competition
High Institutional Capacity		
Low Institutional Capacity		

Source: Thurber, Hults, and Heller (2011)

Reform Recommendations

	Low Political Competition	High Political Competition
High Institutional Capacity		<u>Suggest:</u> •Separate functions <u>Examples:</u> NORWAY, BRAZIL, MEXICO
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Reform Recommendations

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Low Institutional Capacity	<u>Suggest:</u> •Consolidate functions <u>Example:</u> ANGOLA	

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Reform Recommendations

	Low Political Competition	High Political Competition
High Institutional Capacity	<p><u>Suggest:</u></p> <ul style="list-style-type: none"> •Consolidate functions •Separate functions as politics becomes more pluralistic <p><u>Example:</u> MALAYSIA (under Mahathir)</p>	<p><u>Suggest:</u></p> <ul style="list-style-type: none"> •Separate functions <p><u>Examples:</u> NORWAY, BRAZIL, MEXICO</p>
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Low Institutional Capacity	<p><u>Suggest:</u></p> <ul style="list-style-type: none"> •Consolidate functions <p><u>Example:</u> ANGOLA</p>	<p><u>Suggest:</u></p> <ul style="list-style-type: none"> •Develop technical and institutional capacity <p><u>Example:</u> NIGERIA</p>

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Institutions shape reform possibilities

Reforms that focus on NOC in isolation likely to fail

Some Myths and Half-Truths About NOCs

- 1) Transparency is always the best reform medicine
- 2) “Star managers” create effective NOCs
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