



Explaining the Performance & Strategy of National Oil Companies (NOCs)

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NOC Study Research Team Leads: **David Victor (Ph.D.), David Hults (JD), and Mark Thurber (Ph.D.)**

1) How We Analyze NOCs

- Motivation
- Universe of case studies
- Research design

2) What We've Found on

- NOC governance
- NOC reform
- Future of supply and prices
- Structure of petroleum industry

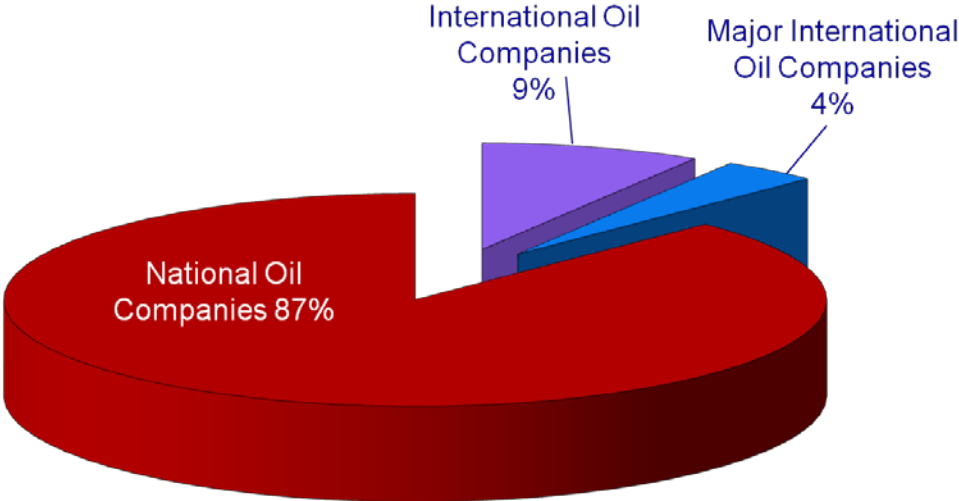
3) Where We're Headed

- Next steps

1) How We Analyze NOCs

Motivations for NOC project

- NOCs are dominant players in the petroleum industry



Booked Oil Reserves: 1.09 trillion barrels oil equivalent

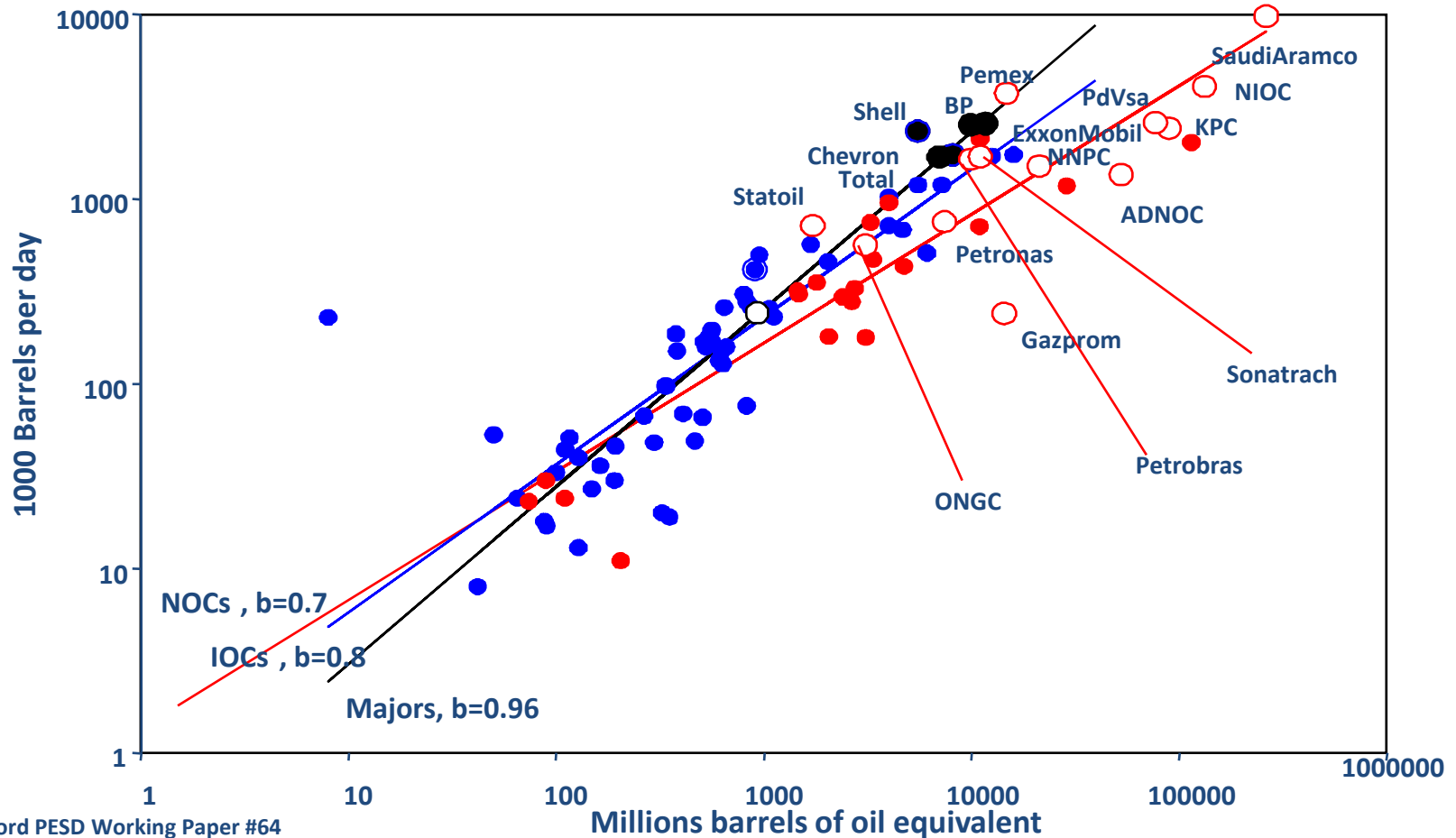
Source: 2008 Energy Intelligence Report. Note: 2006 liquid reserves.

- NOCs are among world's leading corporations
 - Seven of top forty companies on 2009 Fortune Global 500 list are NOCs

1) How We Analyze NOCs

- Our focus is on strategy & performance
- Focus may help explain NOC-IOC differences in production/reserves relationship

Liquid output versus reserves for the PIW top 100 (2004)



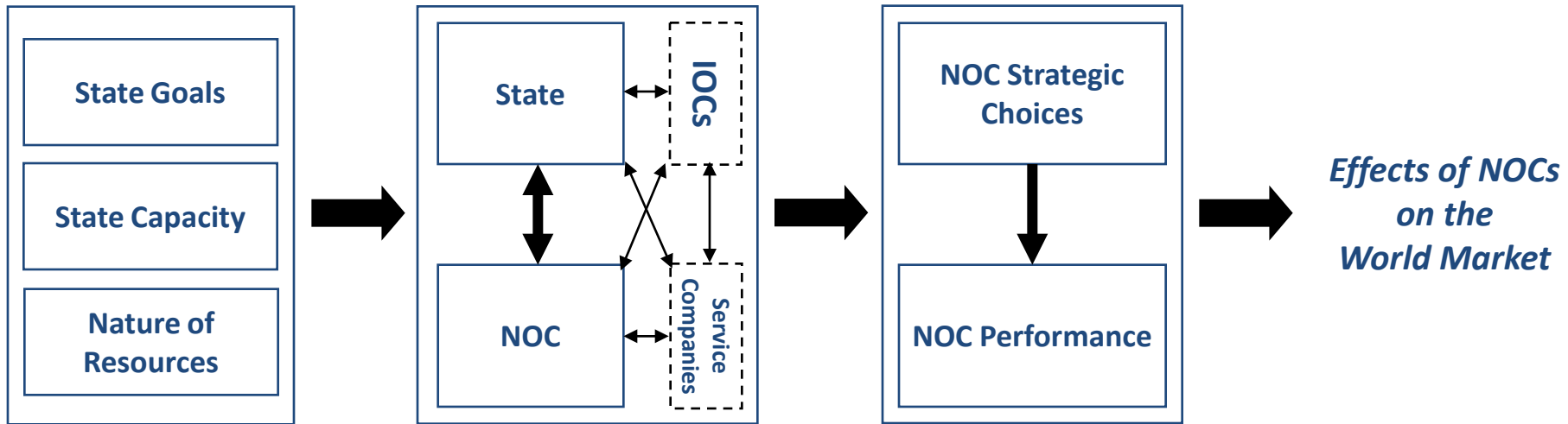
Source: Stanford PESD Working Paper #64

Note: NOCs (red), IOCs (blue) and majors (black); PESD-studied firms shown in open circles.

Data Source: The Energy Intelligence Top 100: Ranking the World's Oil Companies. Energy Intelligence, 2006.

1) How We Analyze NOCs

NOC Study Research Design



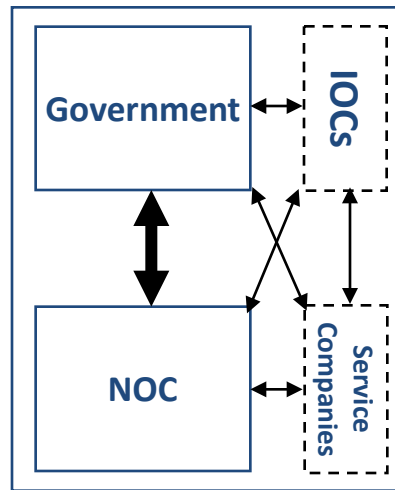
2.1) What We've Found

On the Choice of Oil Company: Risk, Management and the Frontier of the Petroleum Industry

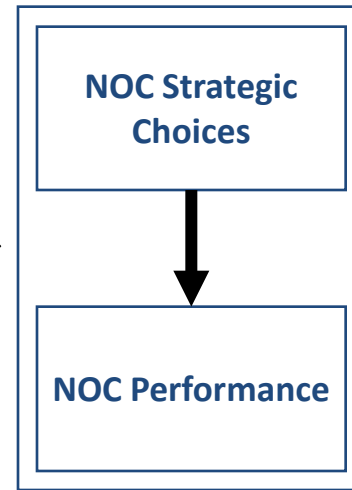
Political Economy of State Control and Investment in NOCs



Hybrid Governance: State Management of NOCs



Quantifying NOC Performance



*Effects of NOCs
on Structure of
World Market*

15 case studies

(Five cross-cutting studies are indicated in *italics*)

1) How We Analyze NOCs

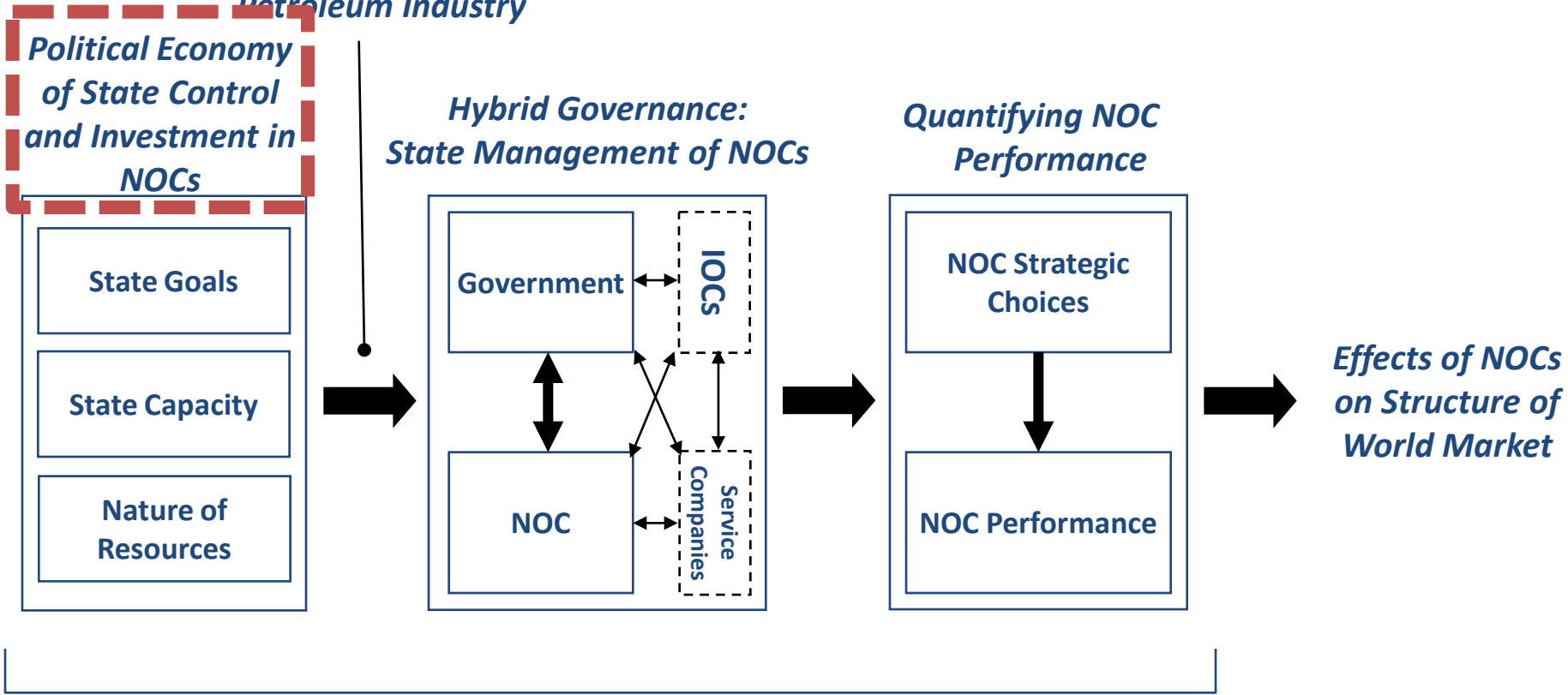
- Stanford NOC project is largest in the academic world
 - 15 case studies of NOC performance & strategy
 - 5 cross-cutting studies

Company	Country	Region	Liquid/Gas Reserves	Liquid/Gas Production	State Ownership
Saudi Aramco	Saudi Arabia	Mideast/North Africa	306.8	11,614	100%
NIOC	Iran	Mideast/North Africa	303.0	6207	100%
KPC	Kuwait	Mideast/North Africa	112.1	2795	100%
Adnoc	U.A.E.	Mideast/North Africa	72.2	2001	100%
Sonatrach	Algeria	Mideast/North Africa	36.1	3106	100%
PDVSA	Venezuela	Latin America	127.9	3030	100%
Pemex	Mexico	Latin America	14.4	4270	100%
Petrobras	Brazil	Latin America	11.7	2301	32.2%
Gazprom	Russia	Asia/Europe	116.8	9753	50.01%
CNPC	China	Asia	36.1	3696	100%
Petronas	Malaysia	Asia	26.4	1773	100%
ONGC	India	Asia	6.1	1134	74.14%
NNPC	Nigeria	Sub-Saharan Africa	40.4	1753	100%
Sonangol	Angola	Sub-Saharan Africa	3.0	533	100%
StatoilHydro	Norway	Europe	5.8	1724	62.5%

Source: 2009 Energy Intelligence Top 100. Reserves are in million boe, production is in 1000 boe/d. Note voting shares may differ from ownership shares.

2.1) What We've Found

On the Choice of Oil Company: Risk, Management and the Frontier of the Petroleum Industry



15 case studies

(Five cross-cutting studies are indicated in *italics*)

2.1) State Goals Determine NOC Functions

- NOCs are political creations with the main objective to control the sector for fulfilling state goals
- Functions of NOCs are the result of choices about the political organization and goals of their host countries

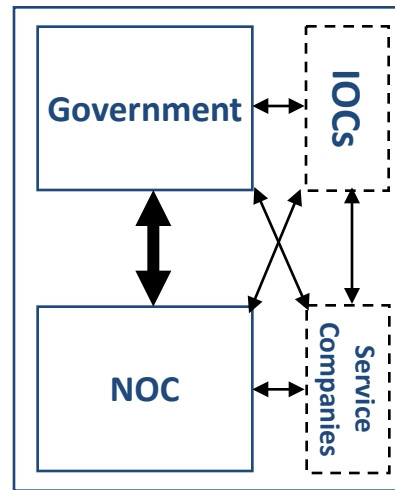
2.2) On the Choice of Oil Company : NOCs or IOCs?

On the Choice of Oil Company: Risk, Management and the Frontier of the Petroleum Industry

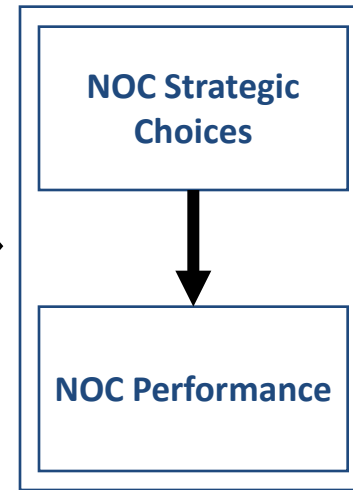
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Quantifying NOC Performance



Effects of NOCs on Structure of World Market

15 case studies

(Five cross-cutting studies are indicated in *italics*)

2.2) How to Explain Structure of Petroleum Industry?

- Many governments have state goals for oil industry

- Developmental; political

- But industry risk limits ability to control...

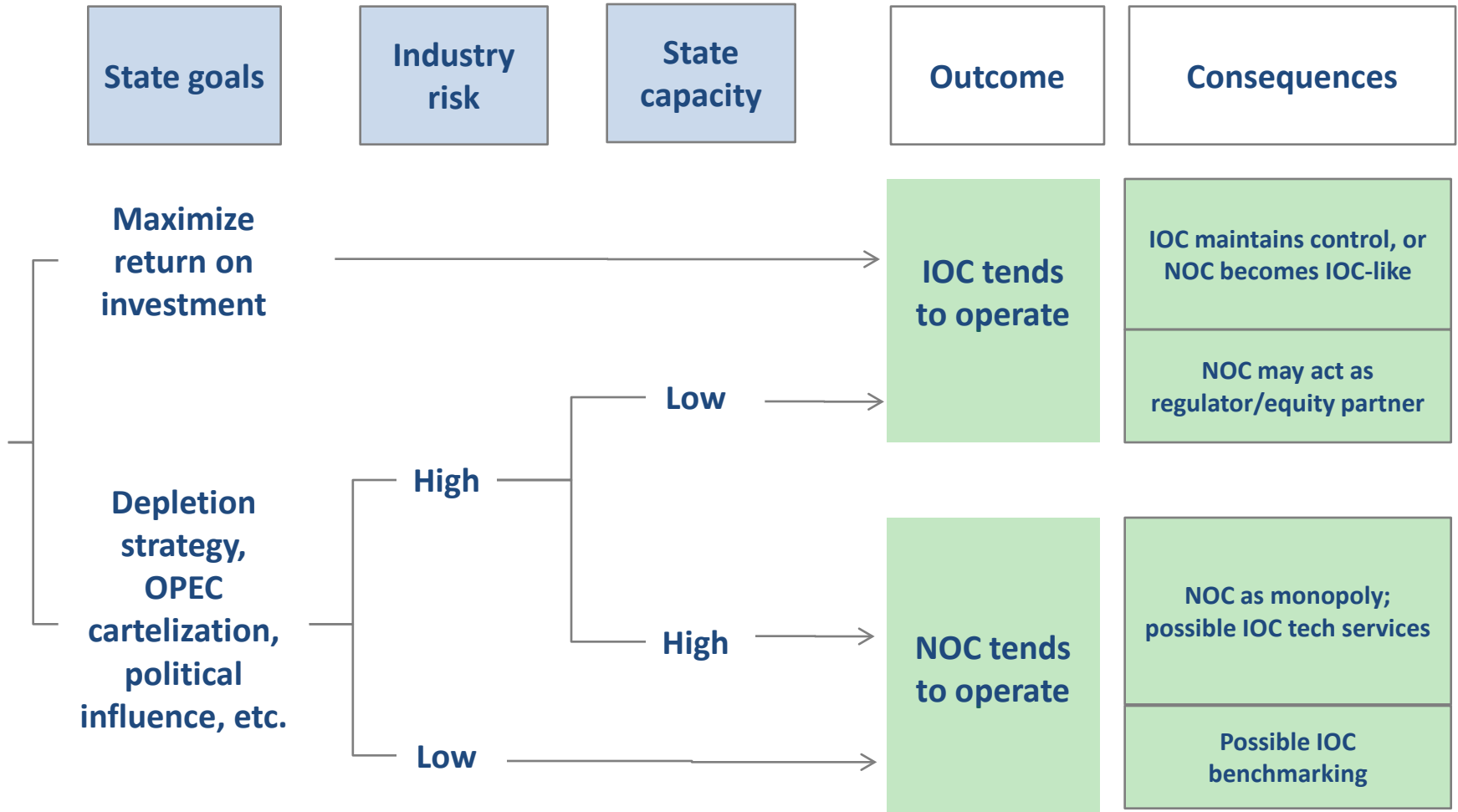
- Massive capital requirements

- ...And so does state capacity

- Huge exposure to policy errors
- Human capital endowment



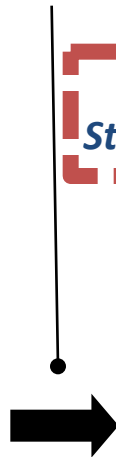
2.2) Effects of Risk & Control on NOC-IOC Operations



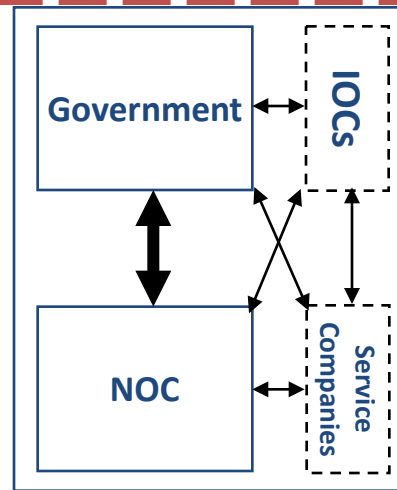
2.3) What We've Found

On the Choice of Oil Company: Risk, Management and the Frontier of the Petroleum Industry

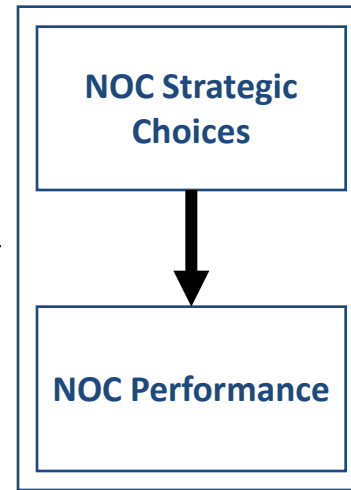
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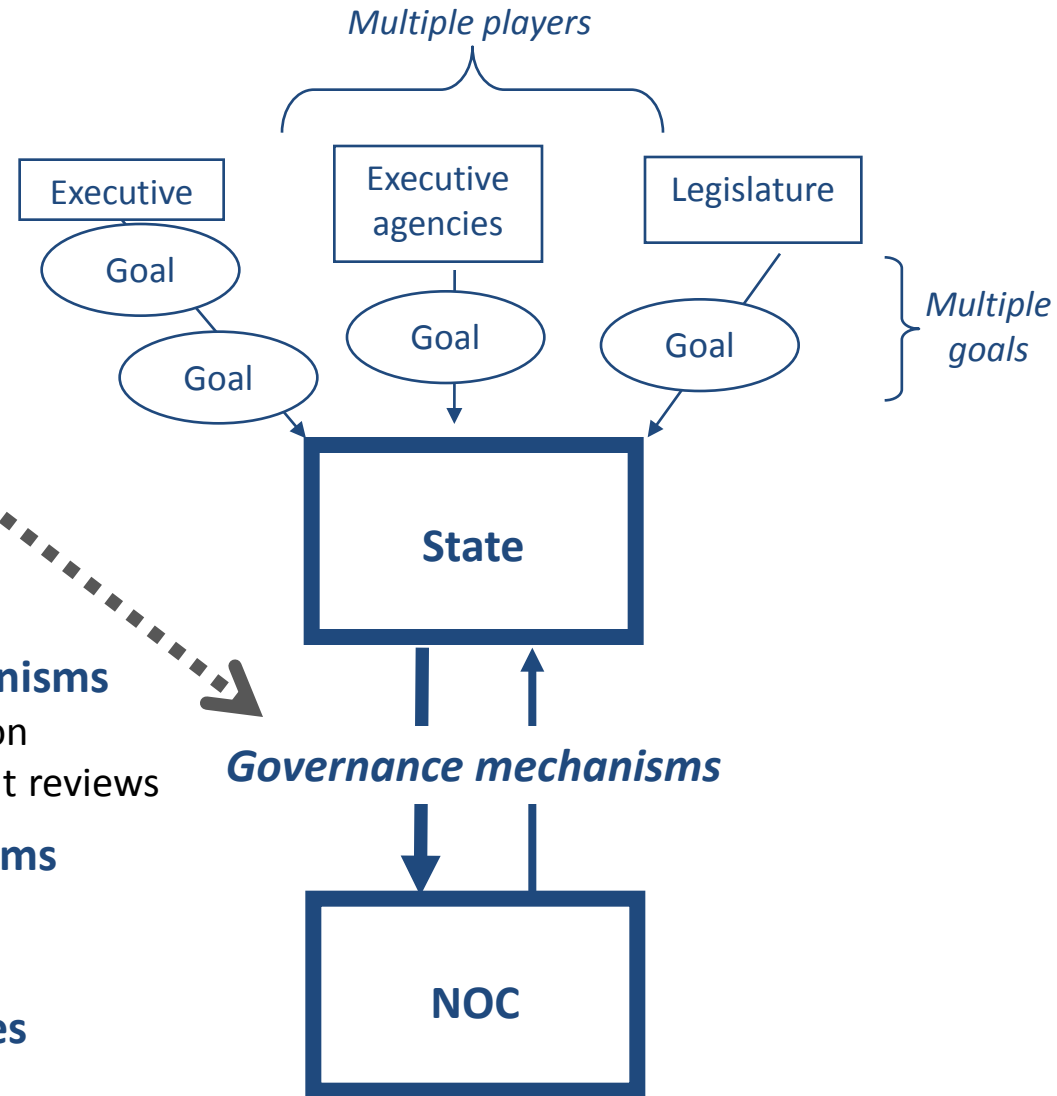
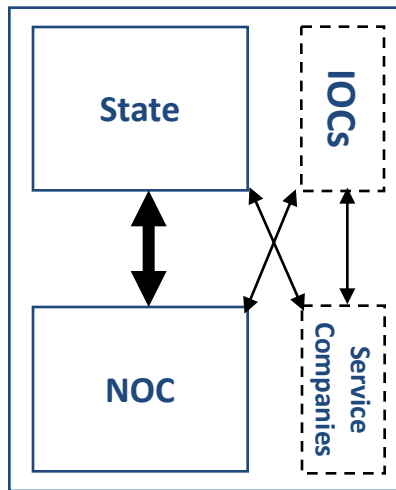


*Effects of NOCs
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15 case studies

(Five cross-cutting studies are indicated in *italics*)

2.3) State Governance of NOCs

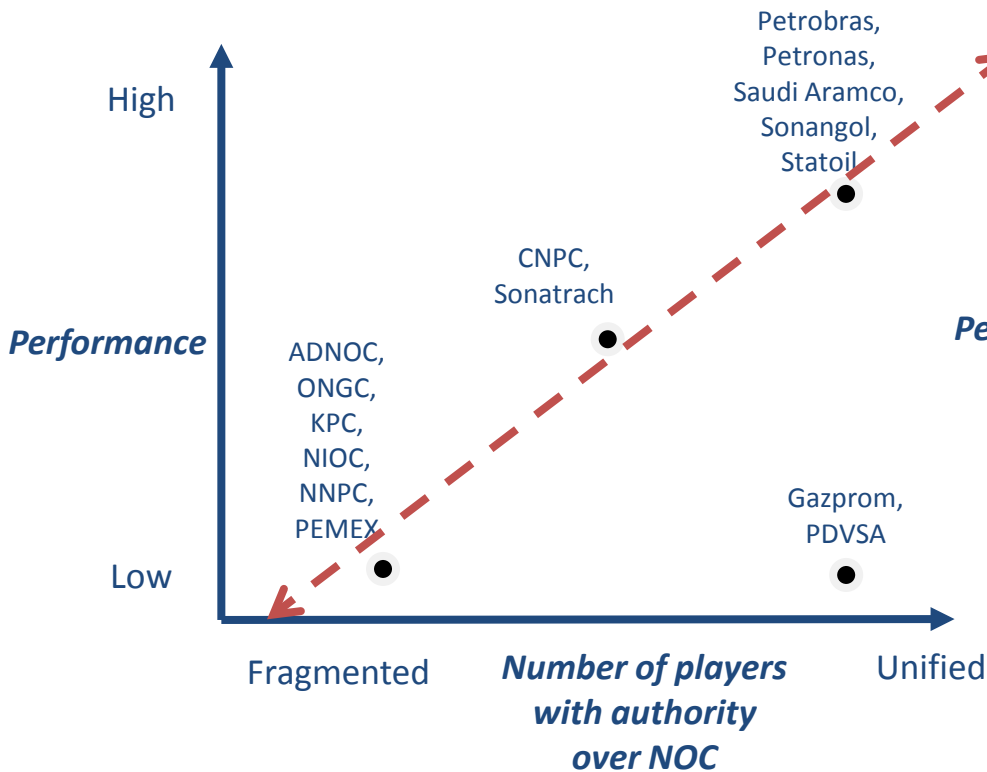


• Types of governance tools

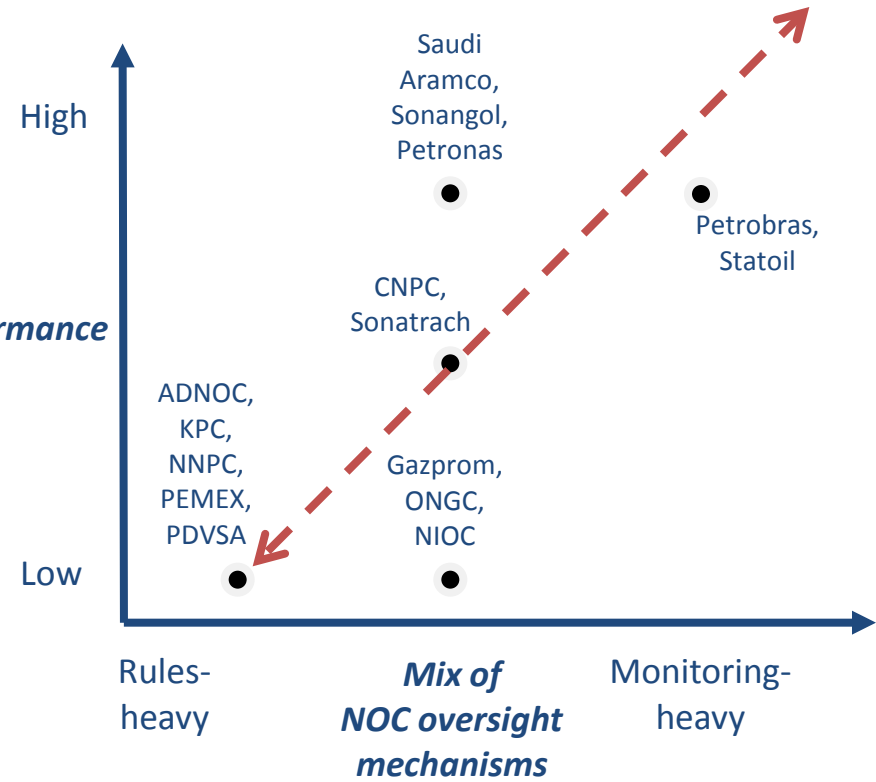
- **Law-based state oversight mechanisms**
 - Audits, investigations, competition
 - Budget, investment, procurement reviews
- **Informal state oversight mechanisms**
 - Personal ties
 - Political pressure
- **NOC counter-governance strategies**
 - Lobbying
 - Wall-building

2.3) Successful NOC Governance Systems Share Common Features

- Centralized, rather than fragmented



- Monitoring-heavy, rather than rules-heavy



2.3) *Implications for Reforming NOCs*

- More difficult than normally thought
- Transparency alone doesn't make much difference
- For performance what really matters:
 - How shareholders and other stakeholders use information and their control
 - The organization of government

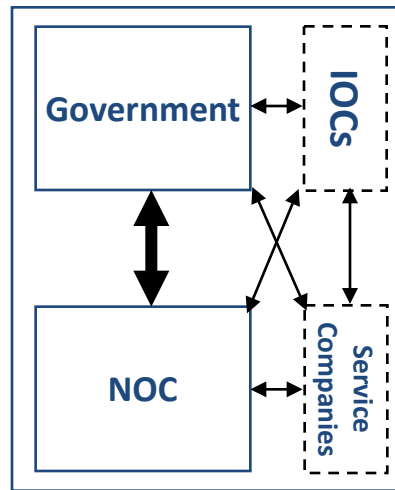
2.4) What We've Found

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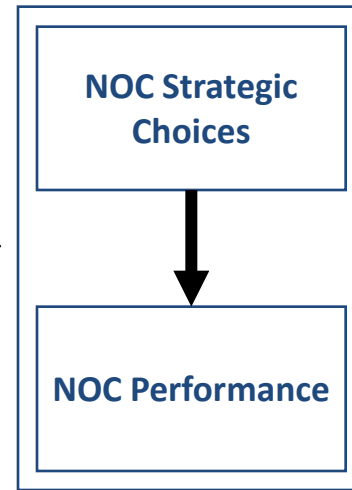
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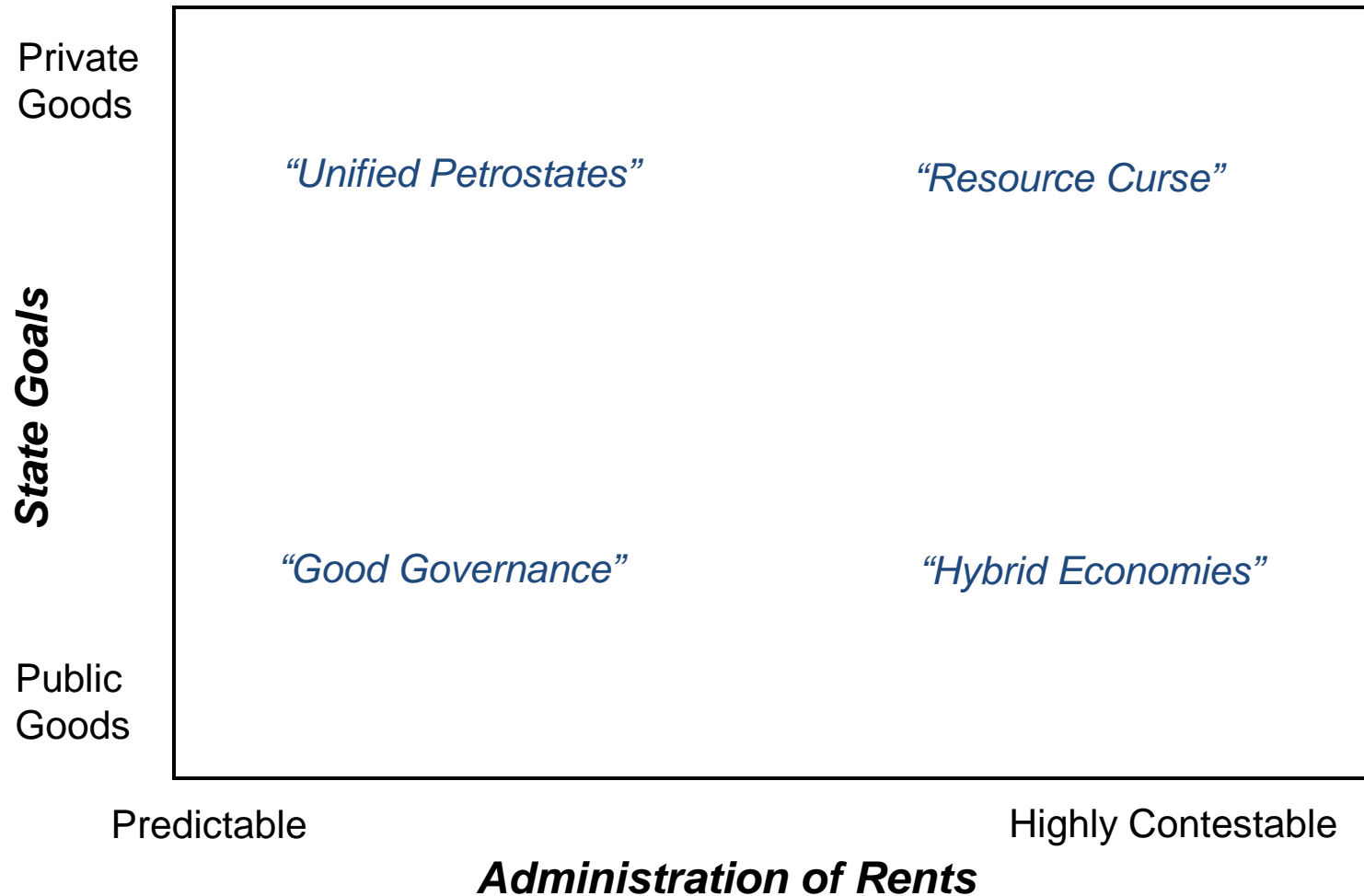


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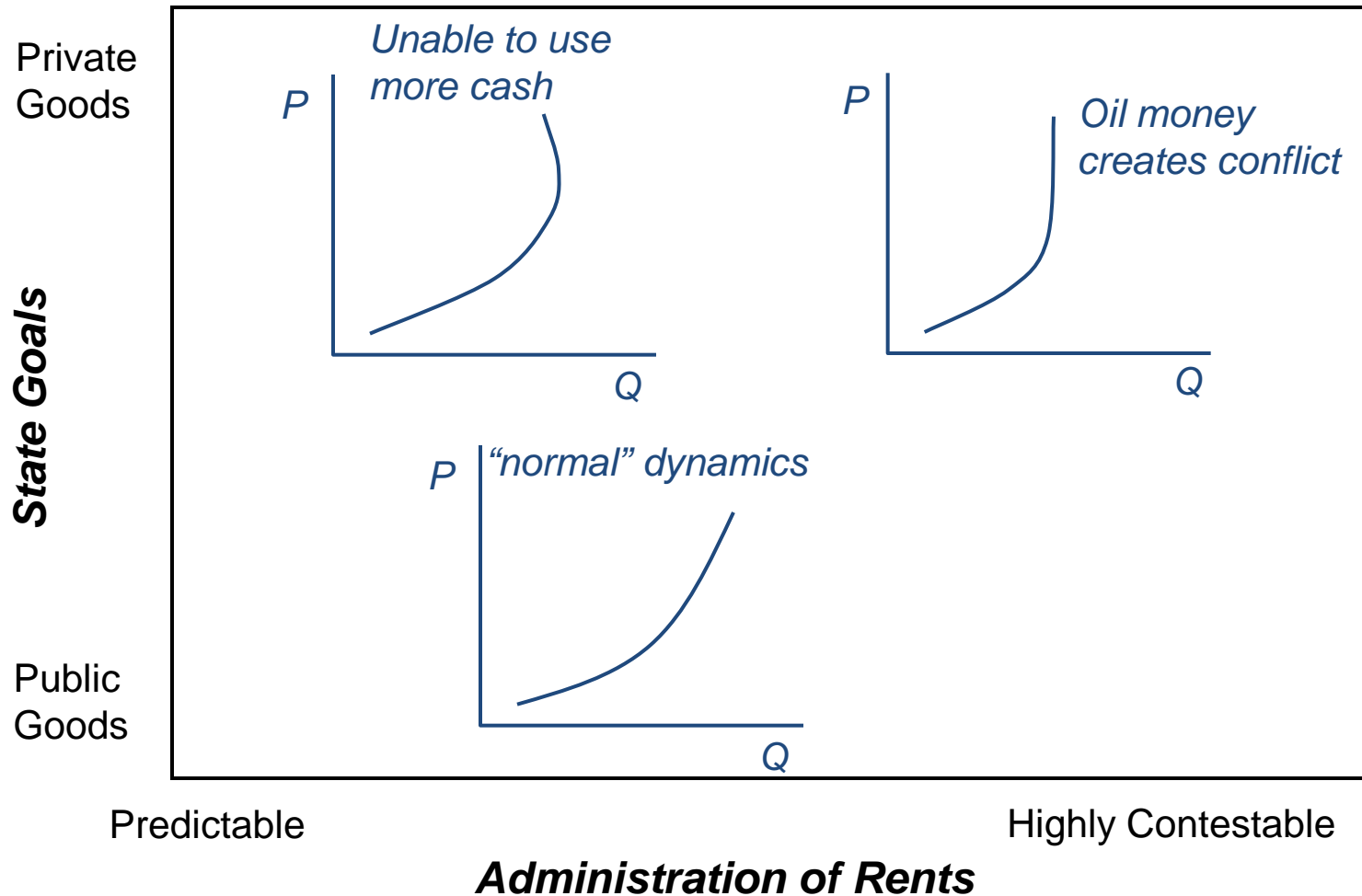
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2.4) State Goals and Administrative Capacity



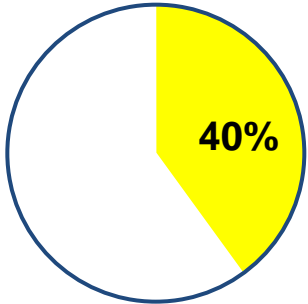
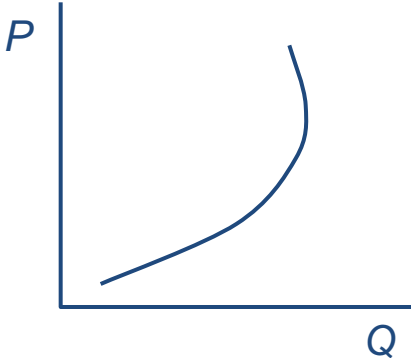
2.4) NOC Strategy and Performance Drive Global Supply Dynamics



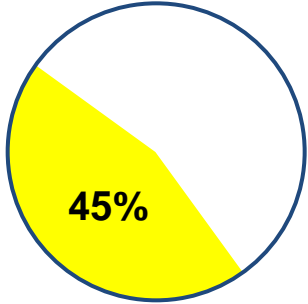
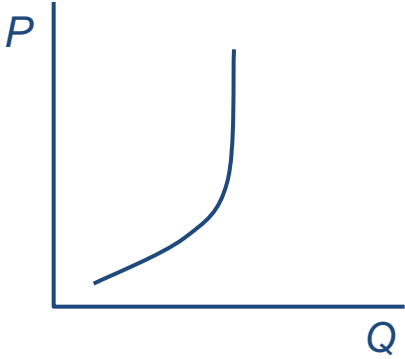
2.4) Approximate Distribution of Supplier Types

% of Global Oil & Gas Reserves

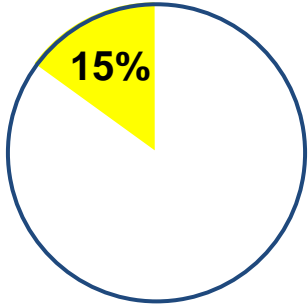
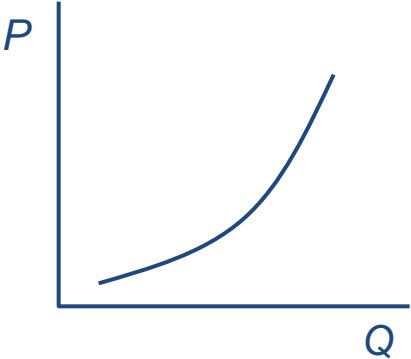
Petrostates
Unable to Use Cash



“Resource Curse”

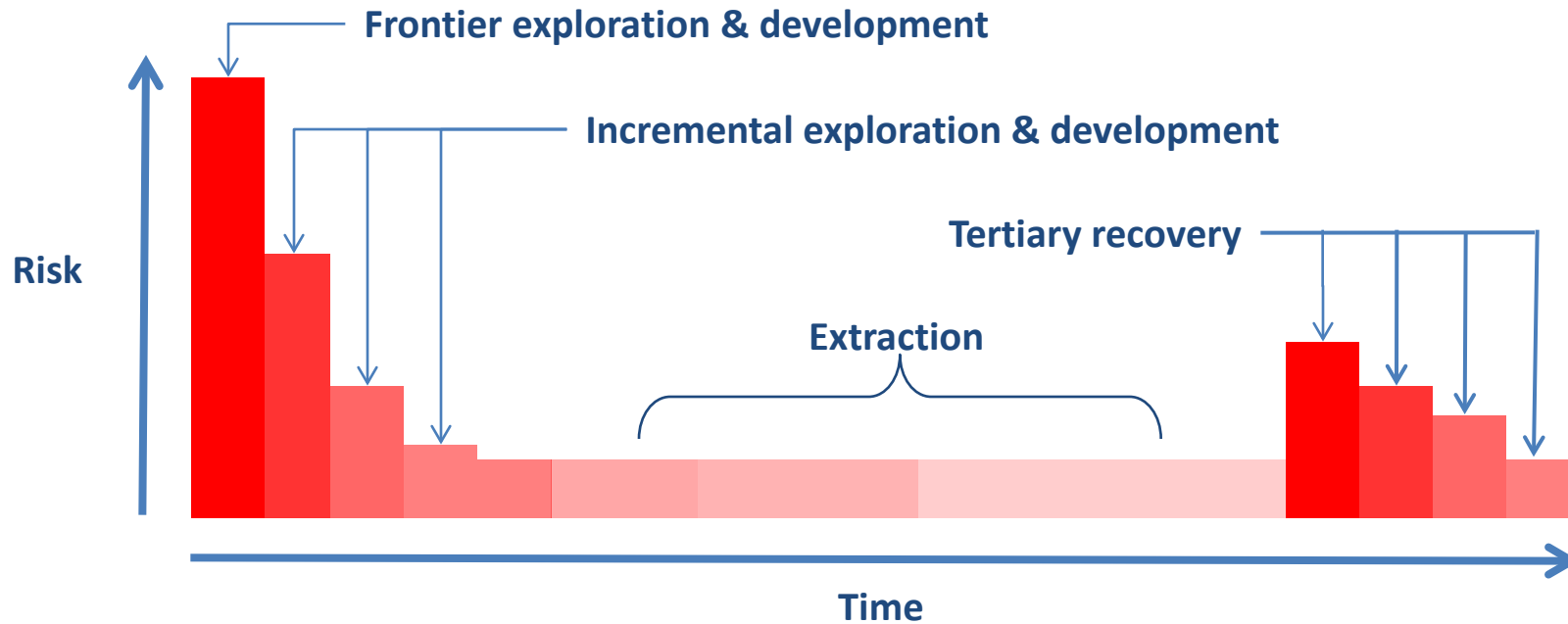


IOCs, Globalized NOCs



2.4) Industry Risk Shifts Over Time

Industry
risk



2.4) *Implications for World Oil Markets*

- Oil supply in coming decades to be short and erratic
- Relief from demand side
 - Efficiency
 - Electrification
- Frontier investments by IOCs, outside NOCs control
 - Sub-optimal investment in world oil resources

3) *Where We're Going*

Next steps

- Finish all studies by end of 2009
 - Undergoing extensive review
 - Working papers published on PESD website
- Release findings during mid-2010
- Questions? Comments?
 - Please email Varun Rai at varun@stanford.edu

Thank You