RICE UNIVERSITY

Energy, Policy and Politics: NOCs and Latin America

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Geopolitical Risks: Myths were driving price sentiment

Key myth stories have been plaguing the oil community.

These myths created confusion.

Myth number one was that oil had moved out of its 200 year boom bust cycle and prices would remain high forever because demand was inelastic (China myth) and because supplies had finally peaked (ala Hubbert).

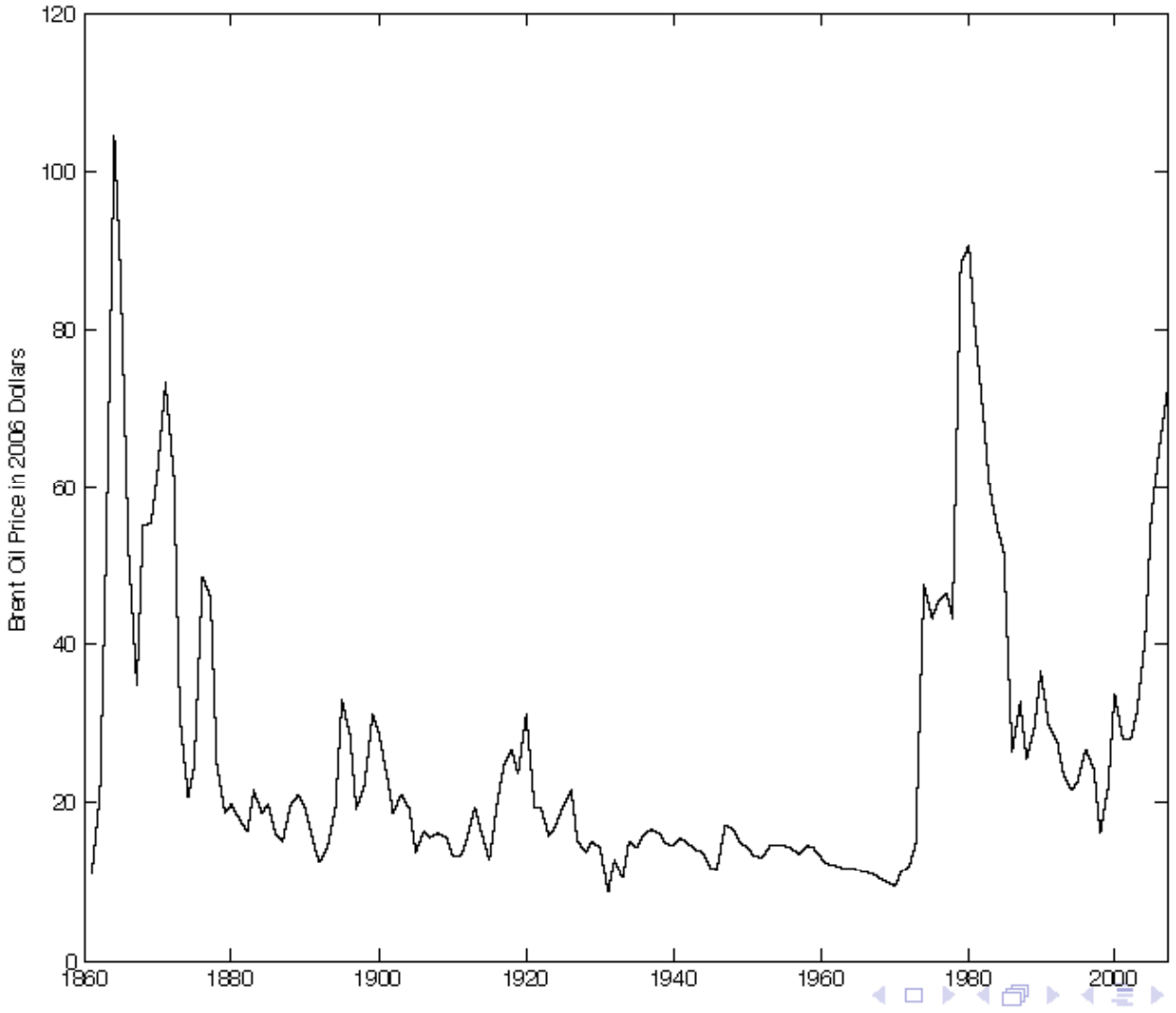
But the global oil cycle is related to the global business cycle in a manner that is more complex than just the drilling cycle.

Oil prices are likely to continue to swing.

That has implications for investment decisions.

Coincidence of High Oil Prices with Financial Crises

Currency & Banking Crises Severest 1850s-70s, 1970s–

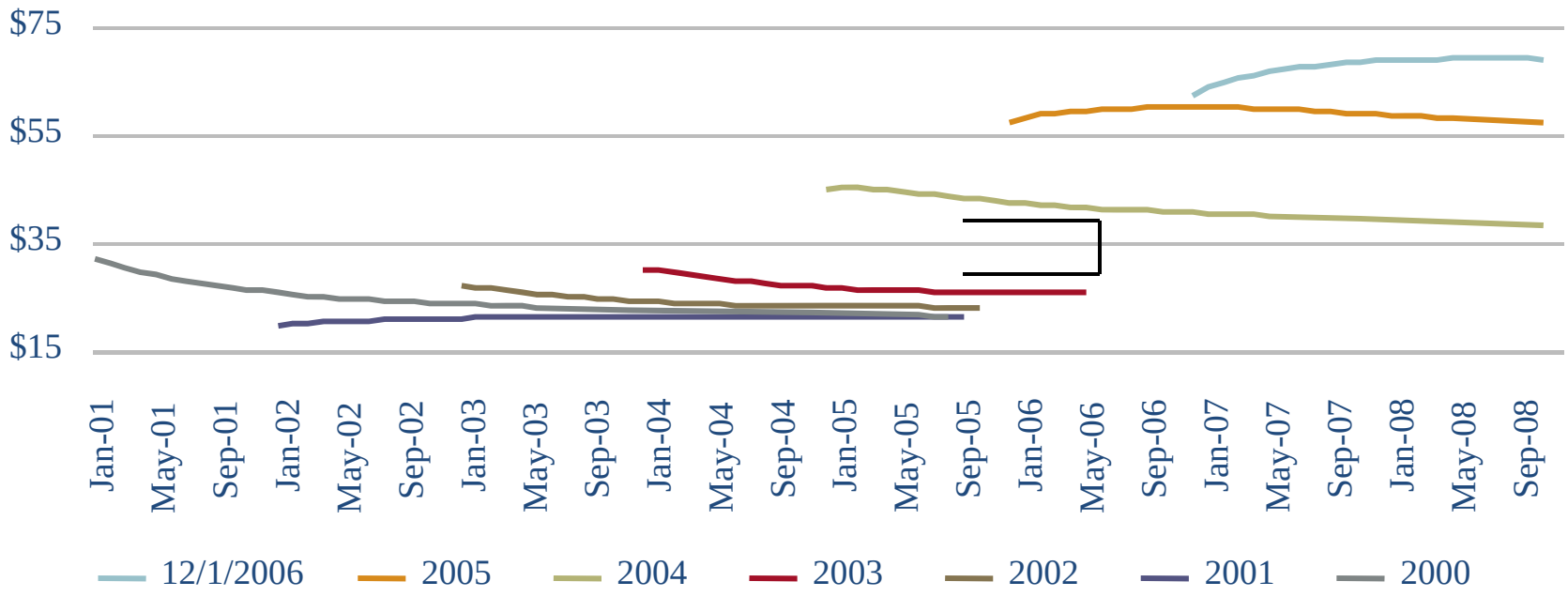


Fundamentals will be reassessed again; Long oil price is falling

Changing Perceptions about:

- Supply / demand
- Changing geopolitical risks
- F&D cost inflation/deflation

The Back of the Market Stayed Put Until 2004



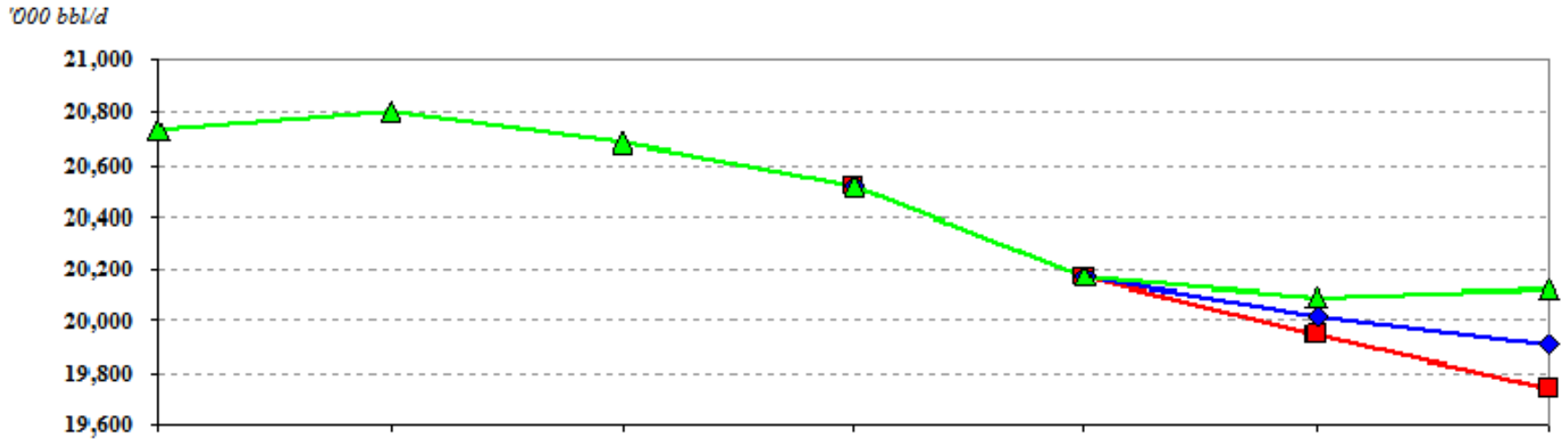
1. *Forward curve on December 1, every year.*

OPEC Per Capita Net Oil Export Revenues

Country	Nominal ($)				Real (2000$)			
	2008	2009	2010	Jan 2009	2008	2009	2010	Jan 2009
Algeria	$2,085	NA	NA	$76	$2,085	NA	NA	$61
Angola	$5,423	NA	NA	$204	$5,423	NA	NA	$163
Ecuador	$735	NA	NA	$23	$735	NA	NA	$18
Iran	$1,252	NA	NA	$44	$1,252	NA	NA	$35
Iraq	$2,119	NA	NA	$79	$2,119	NA	NA	$63
Kuwait	$31,057	NA	NA	$1,041	$31,057	NA	NA	$833
Libya	$9,161	NA	NA	$323	$9,161	NA	NA	$258
Nigeria	$506	NA	NA	$19	$506	NA	NA	$15
Qatar	$41,000	NA	NA	$1,345	$41,000	NA	NA	$1,076
Saudi Arabia	$10,221	NA	NA	$300	$10,221	NA	NA	$240
UAE	$19,303	NA	NA	$672	$19,303	NA	NA	$537
Venezuela	$2,225	NA	NA	$77	$2,225	NA	NA	$62
OPEC	$2,688	$1,090	$1,411	$1,411	$2,175	$870	$1,111	$72

US Oil Demand

- Demand is influenced by a number of factors.
  - Income, Price, Weather (heating load), Vehicle efficiency
  - Short run elasticities estimated as:
    - Price = -0.0508 ... Thus, a 1% increase in price would result in a decline in demand of 0.05%.
    - Income = 0.3518 ... Thus, a 1% decline in GDP would result in a decline in demand of 0.35%.
    - Fuel Efficiency = -0.7906 ... Thus, a 1% increase in efficiency would result in a decline in demand of 0.79%.
    - HDD = 0.1654 ... Thus, a 1% increase in HDD (colder weather) would result in an increase in demand of 0.17%.
    - Majority of adjustment occurs within a decade (lag coefficient = 0.4567)
- The last four years and what we might expect for 2008-2010...



	2004	2005	2006	2007	2008	2009	2010
GDP growth ...	3.64%	2.94%	2.78%	2.03%	0.5%	0.5%, -0.5%, -1.5%	2%, 0.5%, -0.5%
Price	$ 33.80	$ 44.56	$ 51.78	$ 56.77	$ 90.79	$ 45.00	$ 50.00
HDD	4290	4315	3996	4255	4463	4463	4463
Fuel Eff	17.1 mpg	17.1 mpg	17.2 mpg	17.4 mpg	17.5 mpg	18.3 mpg	18.4 mpg

NOCs have important national goals and priorities that go beyond the maximization of return on capital to shareholders.

NOC national priorities sometimes interfere with these firms' abilities to maximize the value of oil resources; replace reserves; expand production in line with market opportunity; and meet performance goals in line with best practices in international industry.

Goal	Examples
• Oil wealth redistribution to society at large	• Fuel at subsidised prices
• Wealth creation for the nation	• Contribution to national GDP • Fund for future generations
• Industrialization and economic development	• Local content programs
• Energy security, including assurance of domestic fuel supply and security of demand for producing nations	• Ensure no domestic fuel shortages
• Foreign and strategic policy and alliance building	• Oil Diplomacy and advisory role to national leaders
• Participation in national level politics	• Leadership with greater political aspirations and involvement of unions and employees in national politics

NOC Efficiency

Technical Efficiency

- On average, NOCs that are fully government-owned and sell petroleum products at subsidized prices, will be only 35 percent as technically efficient as a comparable firm which is privately held and has no obligation to sell refined products at discounted prices.
- Most of the NOCs in OPEC countries offer subsidized fuel prices. While individual firms may vary in efficiency, on average government held firms in general exhibit only 60 to 65 percent of the efficiency of the privately-held international oil majors

Revenue Efficiency

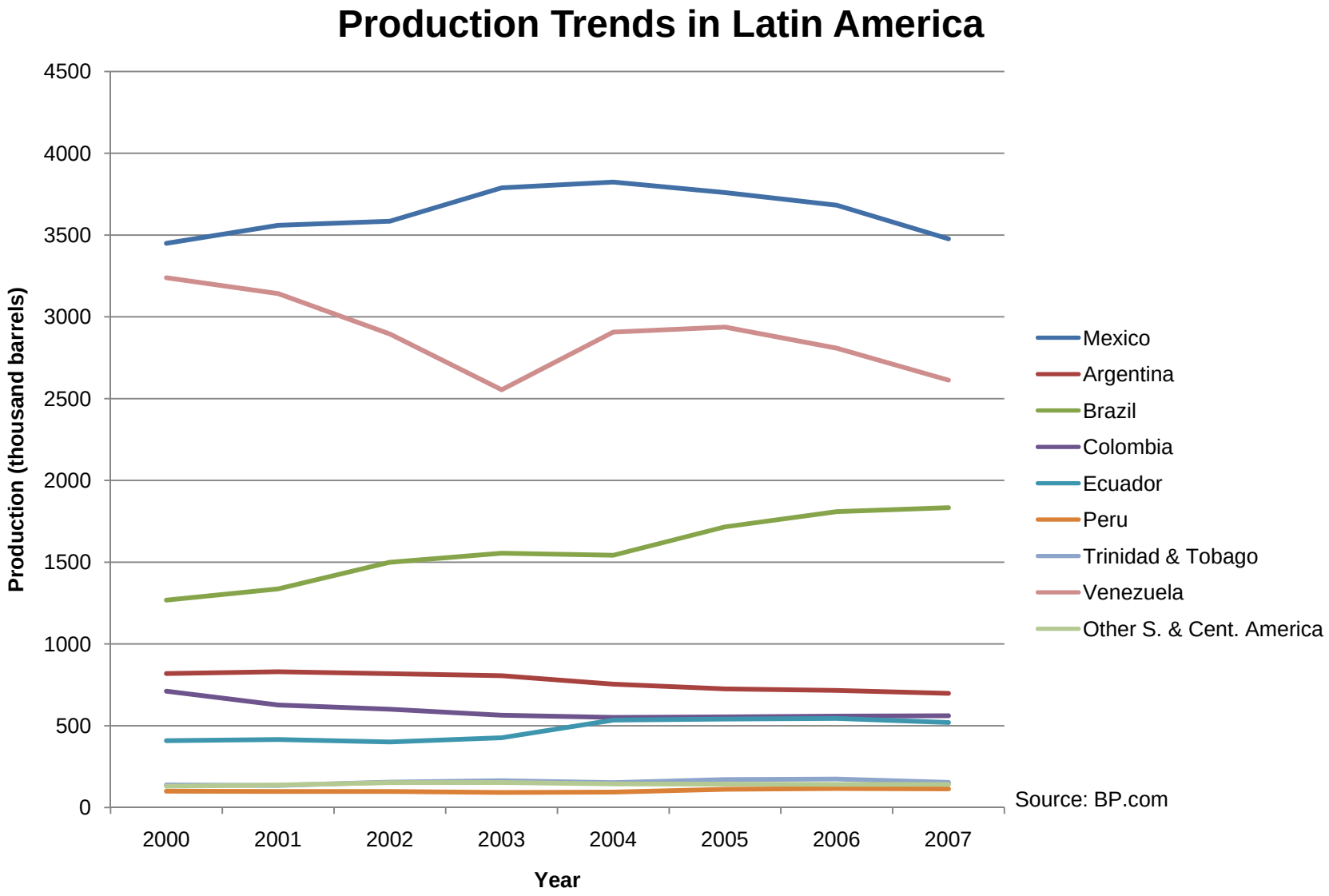
- Our analysis shows that there is a large difference in the revenue efficiency growth which could be achieved through process improvement and better integration:
  - IOCs: In the range of 10-20% growth
  - NOCs: In the range of 30-90% growth

Overall

Many NOCs are 80 percent or more below the frontier of the most efficient firms in the industry

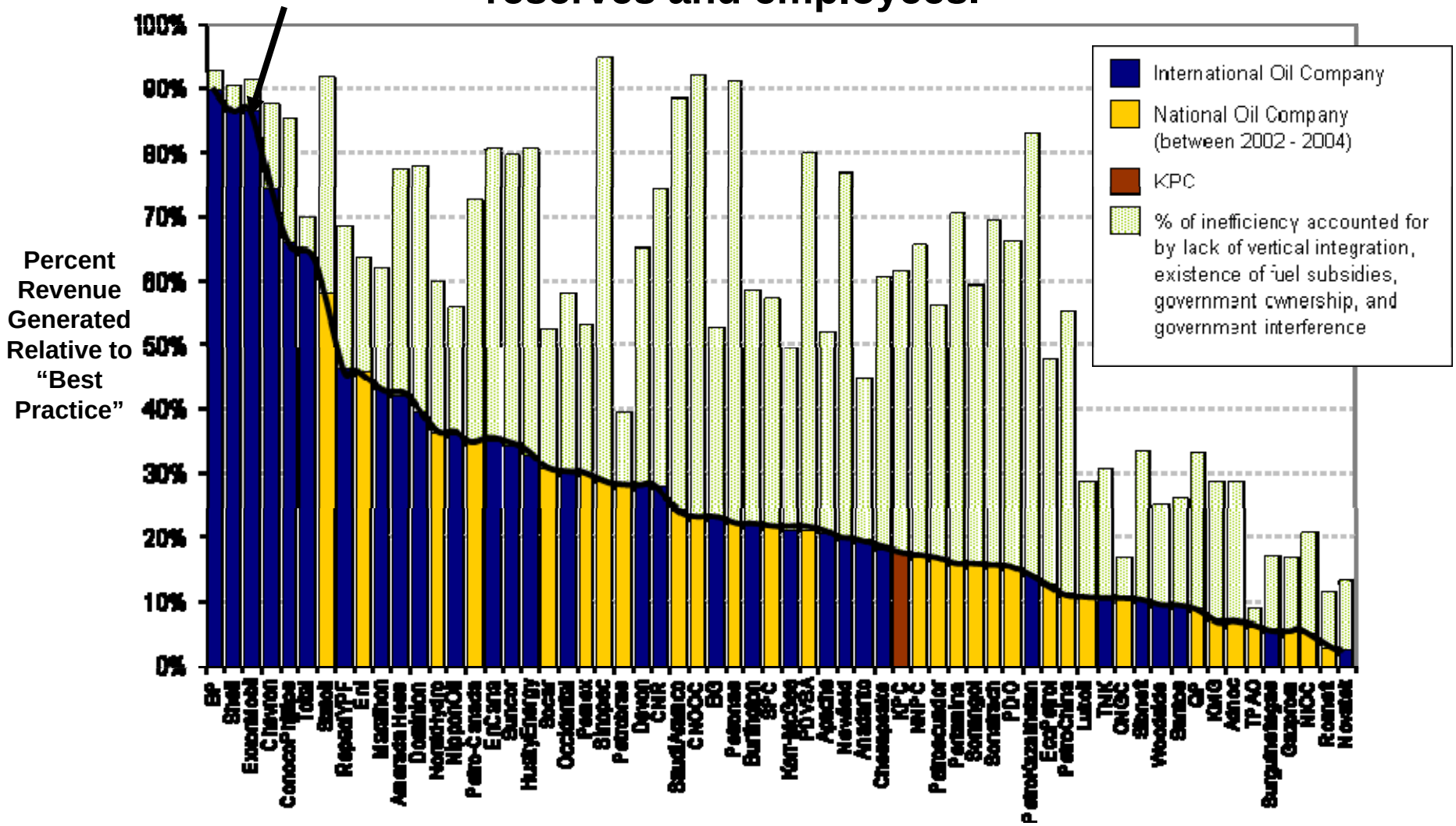
50 percent of that gap in efficiency is accounted for by:

- Their lack of vertical integration
- The inefficiencies created by having to provide facilities to meet domestic product demand that is growing inefficiently largely due to subsidized prices
- 100 percent government ownership
- Some government interference in the businesses


Production Trends in Latin America
Production (thousand barrels)
4500
4000
3500
3000
2500
2000
1500
1000
500
0
2000
2001
2002
2003
2004
2005
2006
2007
Year
Mexico
Argentina
Brazil
Colombia
Ecuador
Peru
Trinidad & Tobago
Venezuela
Other S. & Cent. America
Source: BP.com

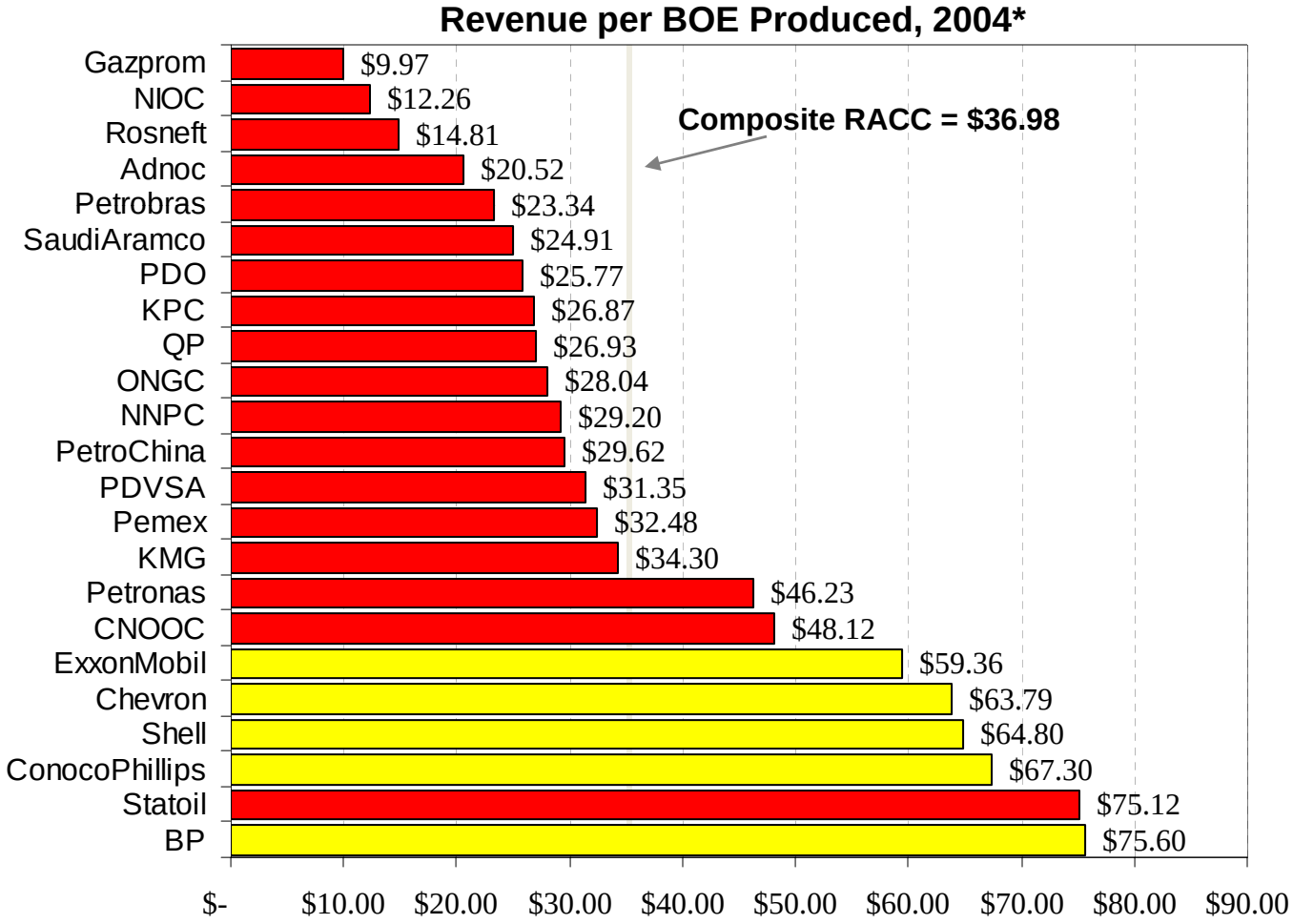
Revenue Efficiency

Revenue efficiency is measured as the percent of revenue a company achieves relative to "best practice" for a given level of reserves and employees.



Performance in Revenue Per Barrel

The level of vertical integration and extent of fuel subsidies affects the ability to generate revenue



* Includes liquids production, natural gas production, and refined product sales

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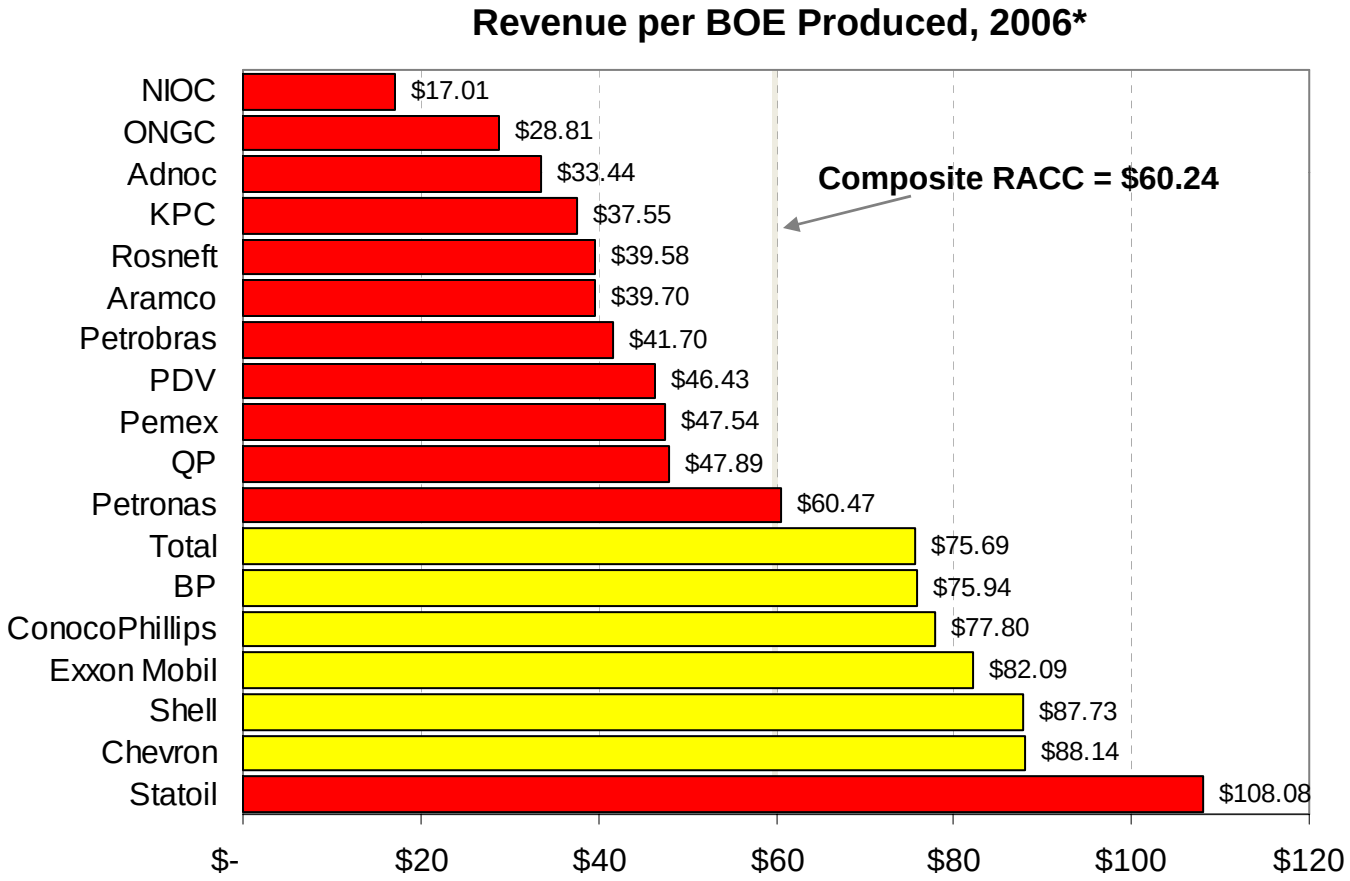

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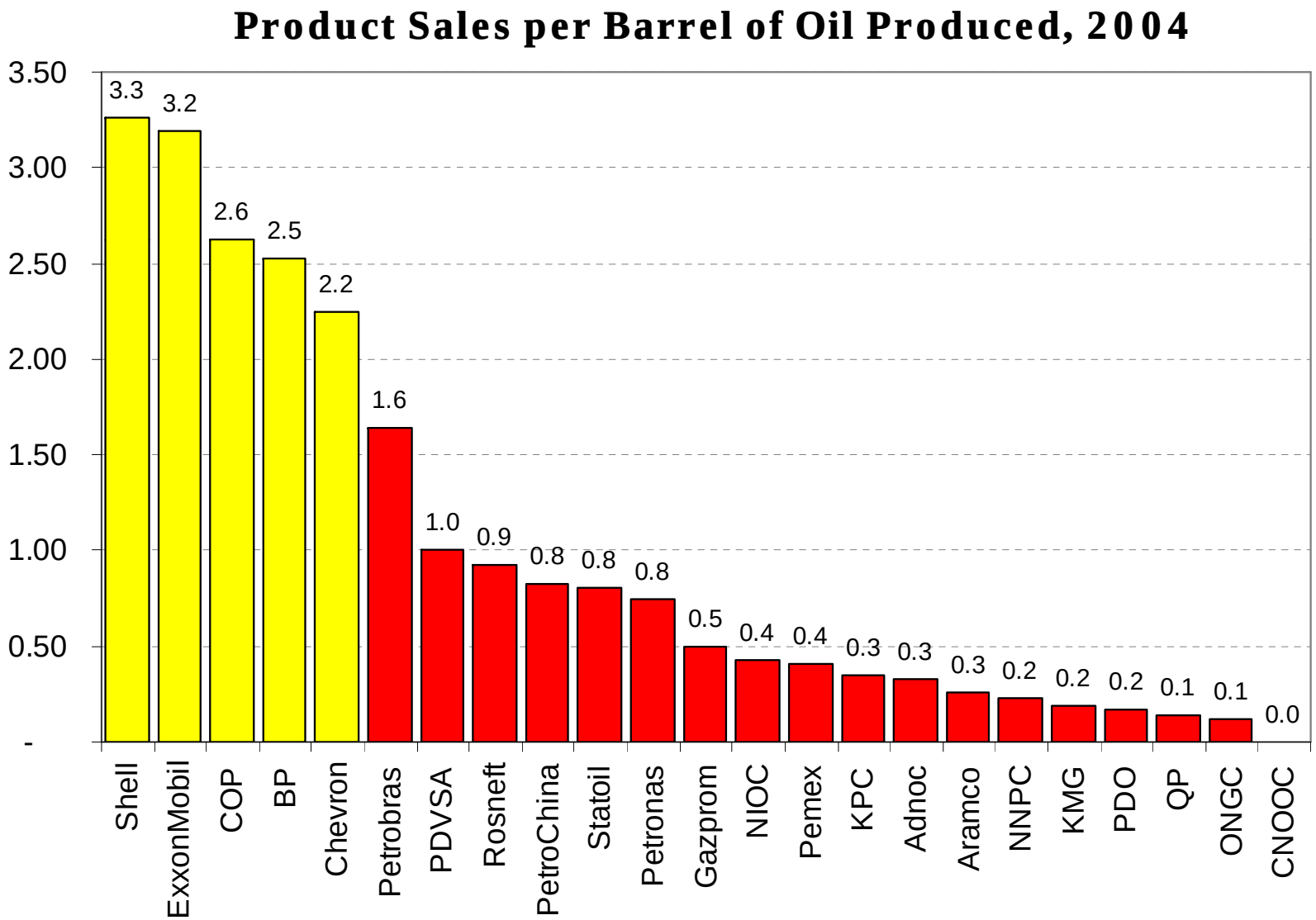
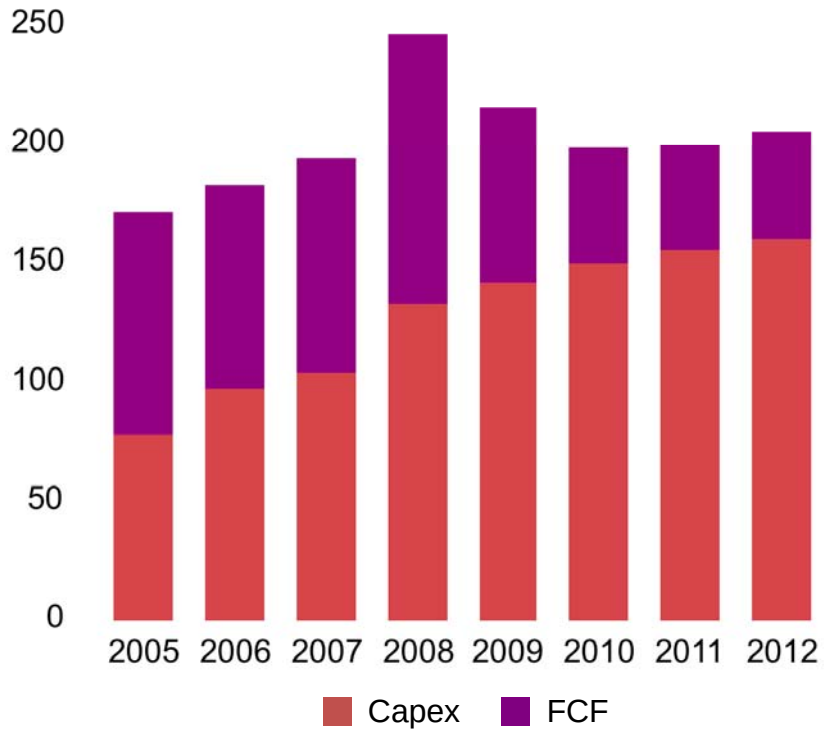
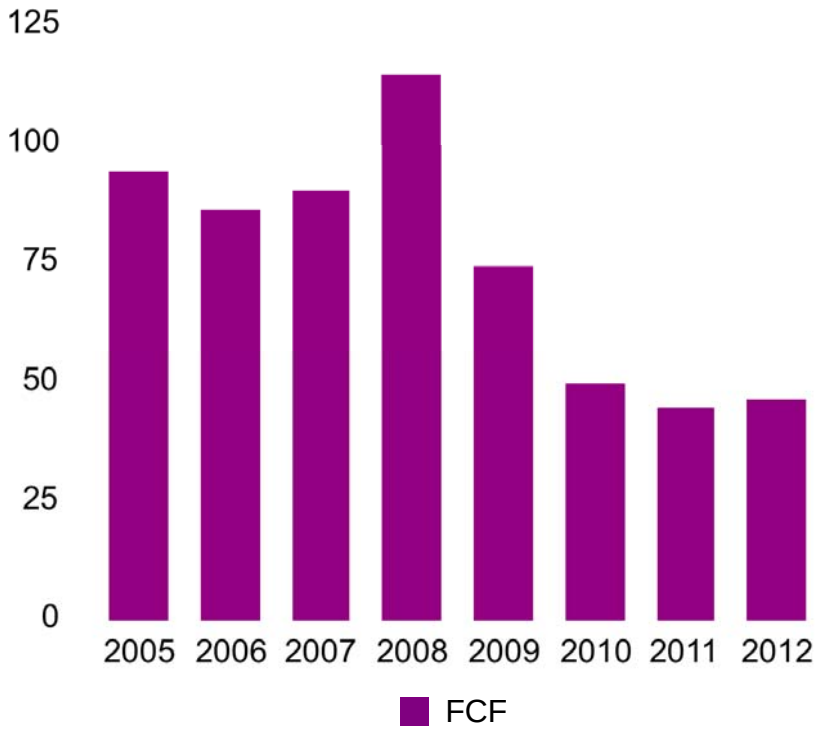

Product Sales per Barrel of Oil Produced, 2004
3.50
3.00
2.50
2.00
1.50
1.00
0.50
-
3.3
3.2
2.6
2.5
2.2
1.6
1.0
0.9
0.8
0.8
0.8
0.5
0.4
0.4
0.3
0.3
0.3
0.2
0.2
0.2
0.1
0.1
0.0
Shell
ExxonMobil
COP
BP
Chevron
Petrobras
PDVSA
Rosneft
PetroChina
Statoil
Petronas
Gazprom
NIOC
Pemex
KPC
Adnoc
Aramco
NNPC
KMG
PDO
QP
ONGC
CNOOC

IOCs may have less cash available but share buy backs, not exploration, likely to be cut: Still shopping for attractive assets

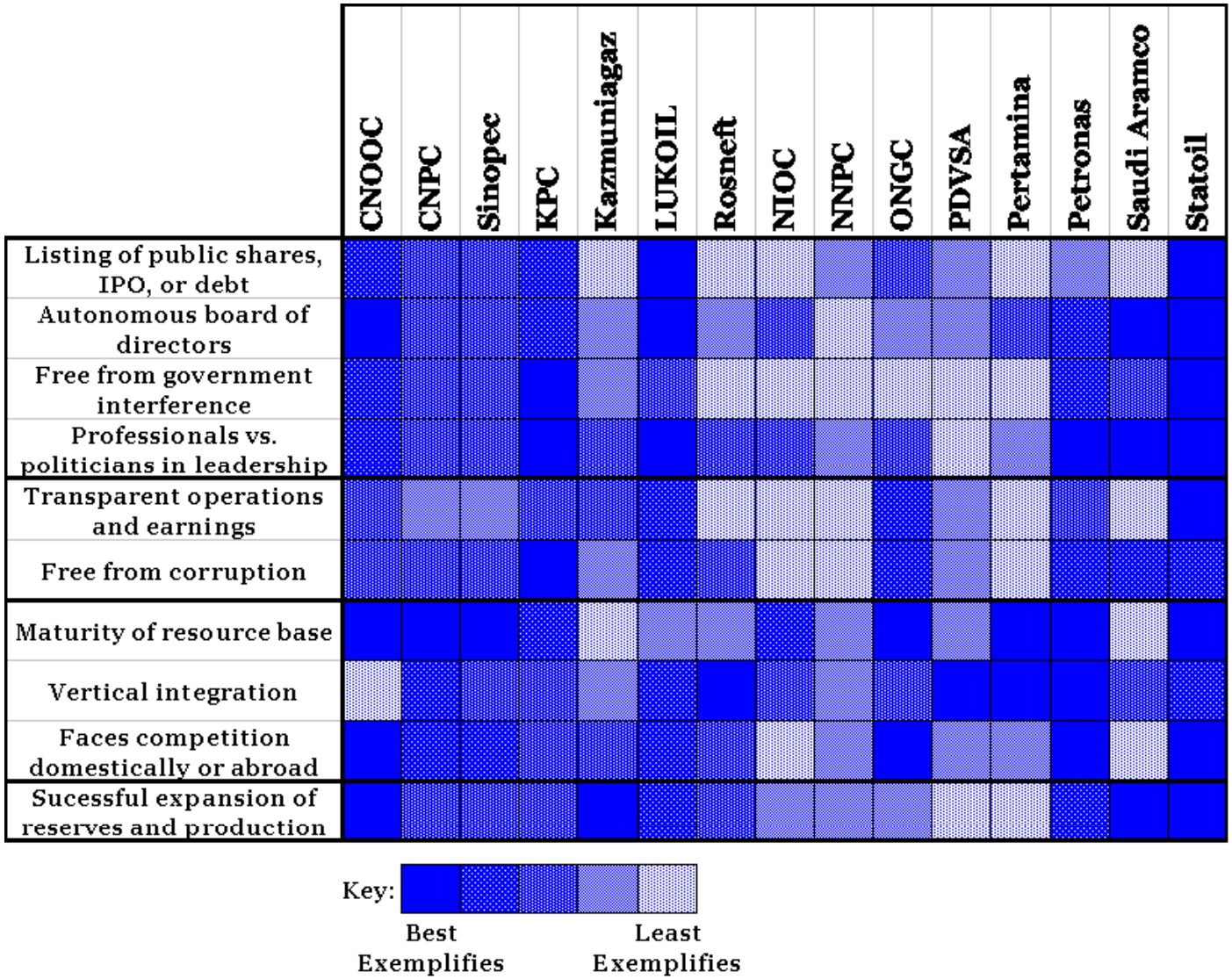
Spending Capacity of IOCs (2005 – 2012)
Source: Morgan Stanley



Free Cash Flow of IOCs (2005 – 2012)
Source: Morgan Stanley



Structural Factors Improving NOC Performance



Summary of Key Findings and Conclusions: Factors that Influence NOC Performance

- **An new trend among NOCs is to balance the needs of social welfare and revenue maximization by adopting some institutional elements of private sector firms to enhance the NOC's performance**
  - Certain institutional structures promote the achievement of higher value and wealth creation from the existing resource base.
  - These institutional structures include:
    - Competition in the home industry
    - Competition in international exploration and refining
    - Strict monitoring of accounting and financial reporting practices
    - Offering publicly traded shares, IPO shares or commercial bonds in major international markets
    - Autonomous board of directors and professional management
  - These optimal institutional structures encourage NOC managers to
    - Minimize the commercial impact of pursuit of non-commercial social welfare/economic development objectives,
    - Focus on core business activities, and
    - Reduce corruption and wasteful spending.
- **The case studies show an increasing number of NOCs are accessing international capital markets.**
  - This improves NOC compliance with international standards of corporate responsibility.
  - It also encourages the NOC to abide by international institutional structures and accounting standards.
- **The strategy of vertical integration has multiple benefits for a NOC.**
  - By entering into the downstream market, a NOC is able to capture the value added from production and sale of finished products.
  - It enhances security of demand by providing market access, especially if it is able to invest in downstream assets in key consuming regions.
  - It helps NOC diversify and mitigate risk.

  Upstream/downstream asset swaps are a promising avenue for IOC/NOC partnering and collaboration.

Obama on energy policy

	Cap-and-Trade	Higher CAFE	Renewable Energy Standard	Drill Offshore?	Tax on Big Oil	Tax Credits
	•Yes: reduce emissions 80% from 1990 levels by 2050 •100% permit auction •Supports Low Carbon Fuel Standard	•Increase fuel economy beyond 35mpg •52 mpg by 2025 •1 million plug-in car target	25% by 2025	•Supports limited offshore drilling (1Aug2008) •Prioritize the Construction of the Alaska Natural Gas Pipeline	•Proposes giving working families $1,000 energy rebate; paid from oil companies' profits •Proposes selling 70million barrels of oil from reserves to lower current gasoline prices (4Aug2008) •(Proposes eliminating need for oil from Middle East & Venezuela in 10 years)	•Proposes $7,000 tax credit on the purchase of fuel-efficient cars •Proposes that new vehicles sold in US are flex-fuel by the end of his first term: $4 billion in loans/ tax credits to U.S. auto plants •Supports extending tax credit for renewable energy production

New U.S. Efficiency Standards Will Reduce U.S. Oil Demand

- Green advocates will focus first and foremost on fuel efficiency improvements
- Similar trends hold in many countries. Obama Administration may push auto efficiency as part of global climate agreement
- Policy can be multi-pronged in its approach
  - A technological breakthrough, such as with plug-in hybrid vehicles, could push demand lower into the future. Once these alternatives are adopted, the market is forever changed
  - Biofuels can induce even further reductions in demand