

## North American Oil & Gas Exploration & Production

# ~~The Public Equity~~ My Perspective on Global Geopolitical Risk

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See Disclosure Appendix of this report for important Disclosures and Analyst Certifications

# Biography

## ■ Bob Brackett, Ph.D. (Senior Analyst)

Bob Brackett is the Senior Research Analyst covering North American Oil & Gas Exploration & Production. He is currently recognized as the #1 analyst for this sector by Institutional Investor buy-side surveys. Previously, Bob was Director of E&P Planning and also Director of Corporate Strategy for Hess Corporation. Before Hess, Bob was an Engagement Manager with McKinsey & Company's Petroleum Practice, serving the majority of the world's largest oil companies across five continents and 30 countries throughout the petroleum value chain. Bob began his career with ExxonMobil, spending eight years in positions in Exploration, Business Development, Development and Research. As a NASA Space Grant Fellow, Bob received his PhD in Earth & Planetary Sciences from Washington University – St. Louis. He received his MBA from Rice University. He also holds a BS in Geophysics and a BA in Astronomy from the University of Texas.

## ■ Oil Producing Countries in Which I've Worked

U.S., Canada, Mexico, Venezuela, Colombia, Algeria, Egypt, Saudi Arabia, U.A.E., India, Thailand, Malaysia, Indonesia, China, Russia, Denmark, Norway, U.K.

## ■ Oil Producing Countries in Which I've Been Partially Responsible for Assets

Brazil, Angola, Iraq, Peru, Equatorial Guinea, Ghana, Libya, France, Poland, Ukraine

## ■ Risks I've Taken

???

# Key Thoughts

- How to define geopolitical risk (for the E&P sector)
  - How not to define it
  - How to define it
  
- How to assess geopolitical risk
  - How not to assess it
  - How you might assess it
  
- How to avoid assessing geopolitical risk
  - E&P investors don't like geopolitical risk
  - E&P investors don't need to take geopolitical risk
  - E&P "Risk Market" exists
  - Risk Market is efficient – No free lunch but at least a buffet
  
- How you ultimately can't avoid geopolitical risk
  - Oil price drives E&P equity performance
  - Oil price forecasting requires supply / demand modeling

# How to Define Geopolitical Risk (for the E&P sector)

## ■ How not to define it:

- Geopolitical risk is the adjustment I will make to my discount rate to account for negative impacts to my base project economics (or volumes) due to **country-specific catalysts**

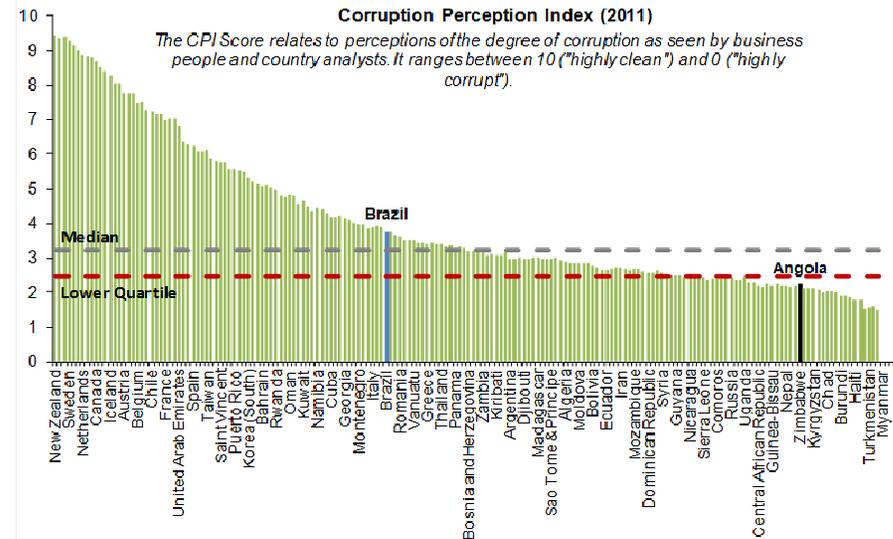
## ■ How to define it:

- Geopolitical risk represents the probability that specific scenarios will occur that have negative impacts to my base project economics (or volumes), resulting in a lower risk-weighted outcome due to **country-specific catalysts**

# How Not To Assess It: Things That Don't Really Matter for Oil & Gas Geopolitical Risk

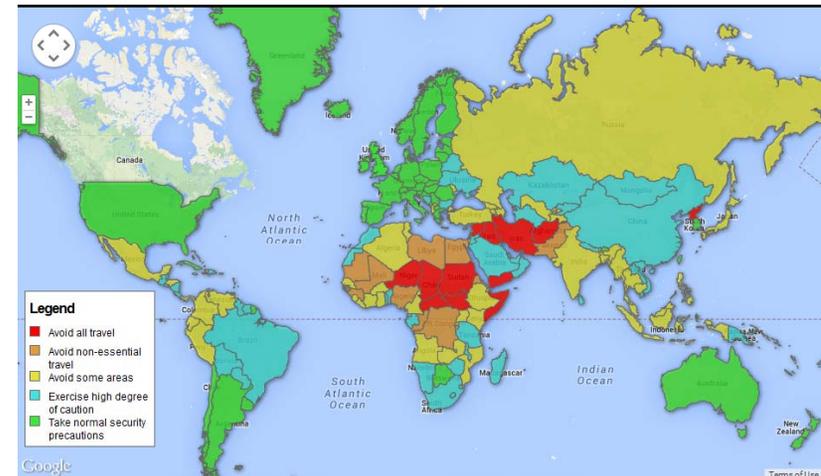
## ■ Corruption

- High Corruption Perception Index (Angola, Mozambique) has corresponded to long-term stability of fiscal terms
- Low Corruption Perception Index (France, Germany) has corresponded to severe changes to fiscal terms (banning of fracking)



## ■ Tourism

- Government travel warnings a poor guide to where oil & gas operations have been sustainable and profitable



Source: Transparency International; Government of Canada; Bernstein analysis

# How Not To Assess It: FCPA Fines Average Less than Deepwater Dry Holes

Year	Company	Oil & Gas Sector?	Settlement/ Fine (\$mln)	Summary
2014	HP		\$ 108.00	improper payments to govt officials
2014	Alcoa		\$ 384.00	bribes to govt officials
2013	ADM		\$ 36.00	illicit payments
2013	Weatherford	Yes	\$ 250.00	bribes/travel & entertainment
2013	Stryker		\$ 13.20	bribes to doctors and govt officials
2013	Diebold		\$ 48.00	bribing officials
2013	Total	Yes	\$ 398.00	bribes to intermediaries
2013	Ralph Lauren		\$ 0.70	bribes to govt officials
2013	Parker Drilling	Yes	\$ 4.00	3rd party intermediary
2013	Philips		\$ 4.50	improper payments to health care officials
2012	Eli Lilly		\$ 29.00	improper payments to govt officials
2012	Allianz		\$ 12.30	improper payments to govt officials
2012	Tyco		\$ 26.00	illicit payments
2012	Oracle		\$ 2.00	unauthorize payments
2012	Pfizer		\$ 45.00	illegal payments
2012	Orthofix		\$ 5.20	bribes to govt officials
2012	Morgan Stanley		\$ 3.65	real estate investments to official and self
2012	Biomet			bribes to doctors
2012	Noble Corporation	Yes		bribes to customs officials
2012	Smith & Nephew		\$ 22.00	bribes to doctors
2011	Magyar Telekom		\$ 95.00	bribes to govt officials
2011	Aon		\$ 16.20	violations of books & record & controls
2011	Siemens		\$ 0.28	bribery scheme
2011	Watts Water			improper payments
2011	Diageo		\$ 16.00	improper payments to govt officials

Average \$ 69.05  
Maximum \$ 398.00

Year	Company	Oil & Gas Sector?	Settlement/ Fine (\$mln)	Summary
2011	Armor Holdings		\$ 17.99	illicit payments to UN officials
2011	Tenaris	Yes	\$ 9.40	bribing govt officials
2011	Rockwell			illicit payments and leisure travel
2011	J&J		\$ 70.00	bribes to doctors
2011	Comverse			improper offshore payments to govt officials
2011	Ball			improper payments to govt employees
2011	IBM		\$ 10.00	improper cash, gifts, T&E to govt officials
2011	Tyson		\$ 5.00	illicit payments to veterinarians
2011	Maxwell		\$ 14.30	bribes to govt officials
2011	Innospec	Yes		bribes to govt officials
2010	Alcatel-Lucent		\$ 137.00	bribes to govt officials
2010	RAE	Yes		improper payments to govt officials
2010	Seven companies	Yes		widespread bribery
2010	ABB		\$ 39.30	bribe officials/pay kickbacks
2010	Alliance One & Universal		\$ 28.30	make secret payments
2010	Pride Int'l	Yes		authorizing bribes
2010	Innospec	Yes		widespread bribery to govt officials
2010	GE	Yes	\$ 23.00	illegal kickback payments
2010	ENI	Yes	\$ 365.00	decade-long bribery scheme
2010	Veraz			improper gifts & payments
2010	Technip	Yes	\$ 338.00	bribing govt officials over 10-year period
2010	Alliance One			bribes to govt officials
2010	DaimlerChrysler		\$ 185.00	bribes to govt officials
2010	Innospec		\$ 40.20	bribes to govt officials
2010	NATCO	Yes		false documents & extorted fines

Source: SEC; Bernstein analysis

# How You Might Assess It

## ■ Variety of Geopolitical Risk Services Exist

- Track record + credentials = table stakes
- Can they at least pretend that they forecast correctly

## ■ You need a “score”

- Correct metrics/framework
  - PFC Energy “Petroleum Risk Manager” example - Country Economics, Country Politics, Hydrocarbon Sector Entry, Hydrocarbon Sector Operations, Hydrocarbon Sector Shocks
- Quantitative output

## ■ You need a “consequence”

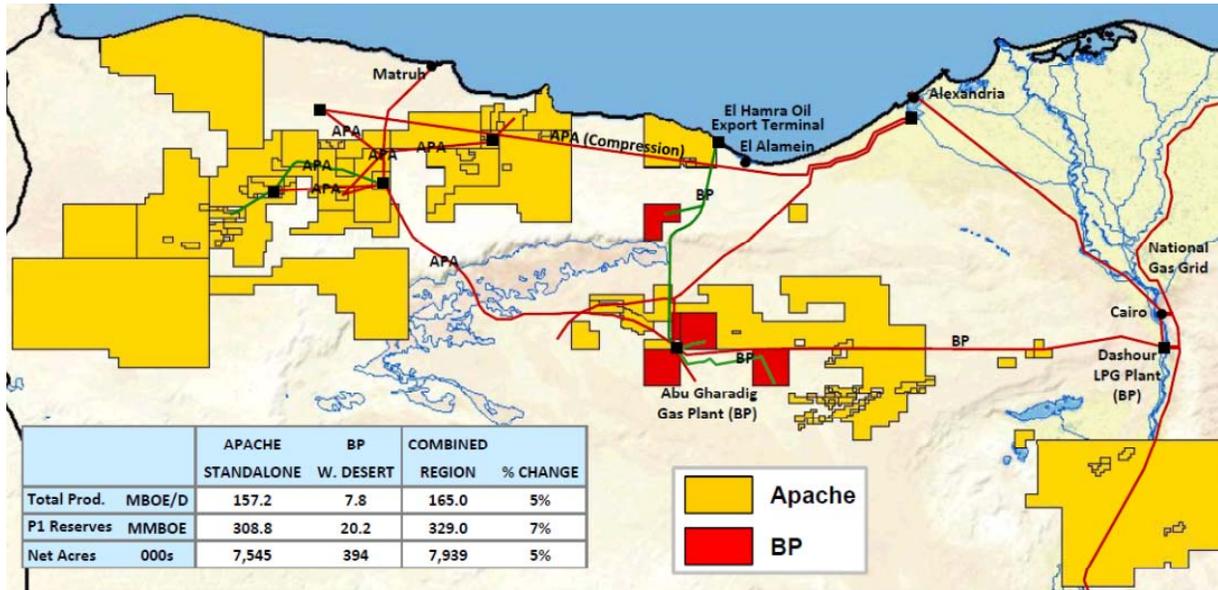
- Risk-weighting of results
- For E&Ps, the potential for a bad score to influence project decision

## ■ You need “probabilities”

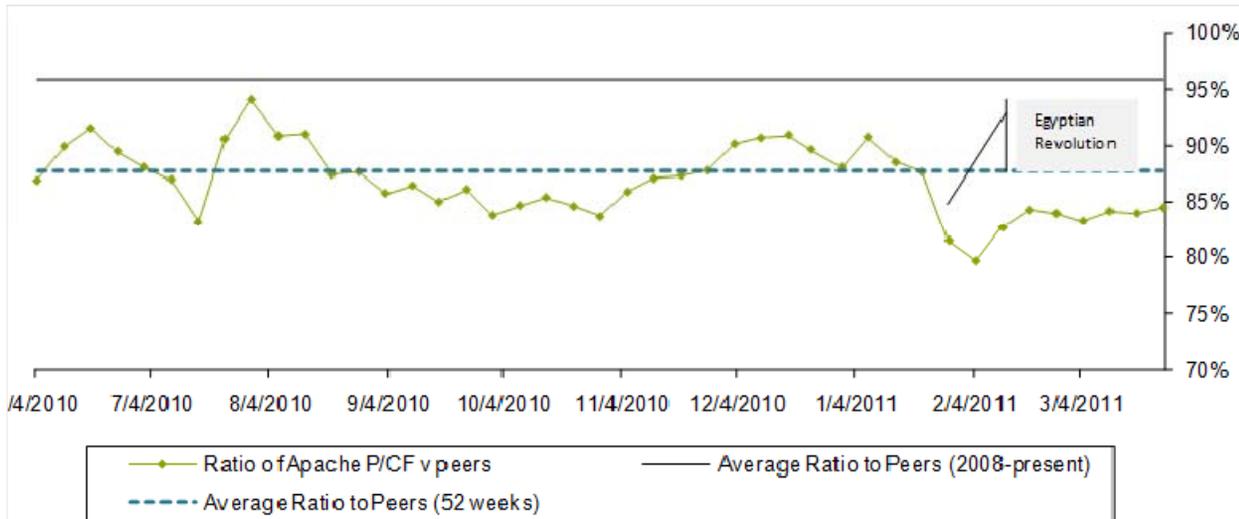
- Once you move from individual decision to portfolio, ability to model probabilistically (with correlated and uncorrelated risks) becomes paramount

Note: Not an endorsement of PFC  
Source: PFC, Bernstein analysis

# How to Avoid Assessing It: Public Equity Markets Don't Like Geopolitical Risk...



- At time, Egypt grew to be 1/4<sup>th</sup> of Apache's cash flow
- Apache operations in Western Desert
- Oil exported to Western ports
- Oil paid for by third parties
- Government payment never in arrears
- No disruption to operations



- Market was 'pricing in' nearly 50% odds of assets being seized within year
- Market was wrong (i.e., excessively punitive)
- Solution was ultimately JV with Chinese Sinopec

Source: Bloomberg L.P.; Company reports; Bernstein analysis

# How to Avoid Assessing It: E&P investors Don't Need to Take Geopolitical Risk

## Oil & Gas Risk Menu

Resource Class	Example	Key Risk:	Exploration	Develop- ment	Oper-ations	Commercial	Research	Geo-political	Sustain- ability	Investor	Stake-holder	Partner	Portfolio
		Critical Question:	Can I find hydro-carbons in new areas?	Can I avoid major project train wrecks?	Am I a lean operator?	How large a margin do I earn? How insulated am I from low prices?	Does the technology exist today or do I have to build it?	What are the odds of changes in fiscal terms or worse?	Am I depleting my inventory or growing my reserve base?	Is my portfolio what investors want?	Am I exposing myself to stake-holder risk?	How exposed am I to my operating partners?	How exposed am I to any one part of my portfolio?
North America Onshore Conventionals	Permian, Gulf Coast, California	-	-	-	☑	-	☑	☑☑☑	☑☑☑	-	-	-	-
North America Unconventionals	Eagle Ford, Marcellus, Bakken	-	-	☑	☑☑	-	☑	-	-	☑	-	-	-
Mature Onshore	Colombia, Egypt, Algeria, Russia	-	-	☑☑	☑	-	☑	☑☑	☑☑	-	-	-	-
Mature Shelf	North Sea, GOM, Malaysia	-	-	☑☑	☑☑	-	☑	☑☑	☑☑	-	-	-	-
OECD CBM	Queensland, Europe	-	-	☑☑☑	☑☑	-	☑	-	-	-	-	-	-
International Unconventionals	Poland, France, China	☑	-	☑☑	☑☑	-	☑	-	-	-	☑☑	-	-
EOR	US, China	-	☑	☑☑	☑☑	☑	☑	-	☑	-	-	-	-
Onshore Frontier Basin	Uganda, Mali, Mongolia	☑☑☑	-	☑	-	-	-	-	☑	-	-	-	-
Offshore Frontier Basin	Mozambique, Falklands, Suriname, Morocco	☑☑☑	☑	-	-	-	-	-	☑	-	-	-	-
Offshore Established Basin	DW GOM, Angola, Nigeria, Brazil	☑☑	☑☑	-	-	-	☑	☑	-	-	-	-	-
Extra Heavy Oil	Canada, Venezuela	-	☑☑	☑☑	☑☑☑	☑	☑	-	-	-	-	-	-
LNG	Australia, Nigeria	-	☑☑☑	-	-	☑	☑	-	-	-	-	-	-
Offshore Pre-Salt	Brazil, Angola, Gabon	☑☑	☑☑	-	☑	☑	☑	☑	-	-	-	☑☑	-
Offshore Heavy Oil	Brazil, Angola	☑☑	☑☑	-	☑☑	☑☑	☑	☑	-	-	-	-	-
Ultra-deep Water	GOM, Brazil, Angola	☑☑☑	☑☑	-	☑☑☑	☑☑	☑	☑	-	-	-	☑☑☑	-
HPHT DBR	North Sea, GOM	-	☑☑	☑☑	☑☑☑	☑☑☑	☑	-	-	-	-	☑☑☑	-
Sour Gas	Caspian, Indonesia, Middle East	-	☑☑☑	-	☑☑☑	☑☑	☑	-	-	-	☑	-	-
Arctic	Canada, Greenland, Russia, US, Norway	☑☑☑	☑☑	-	☑☑☑	☑☑	☑	-	-	-	-	☑☑☑	-
GTL	Various	-	☑☑	-	☑☑☑	☑☑☑	☑	-	-	-	-	☑☑☑	-
Premature Shale Oil	US	-	☑☑☑	☑☑☑	☑☑☑	☑☑☑	☑	-	☑	☑☑	☑☑	☑☑☑	-

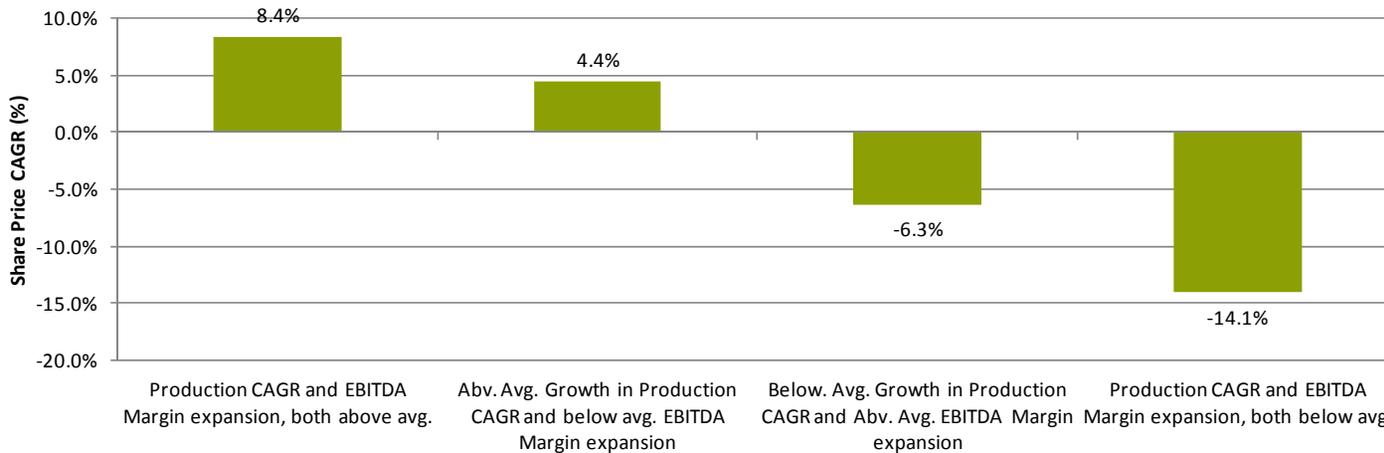
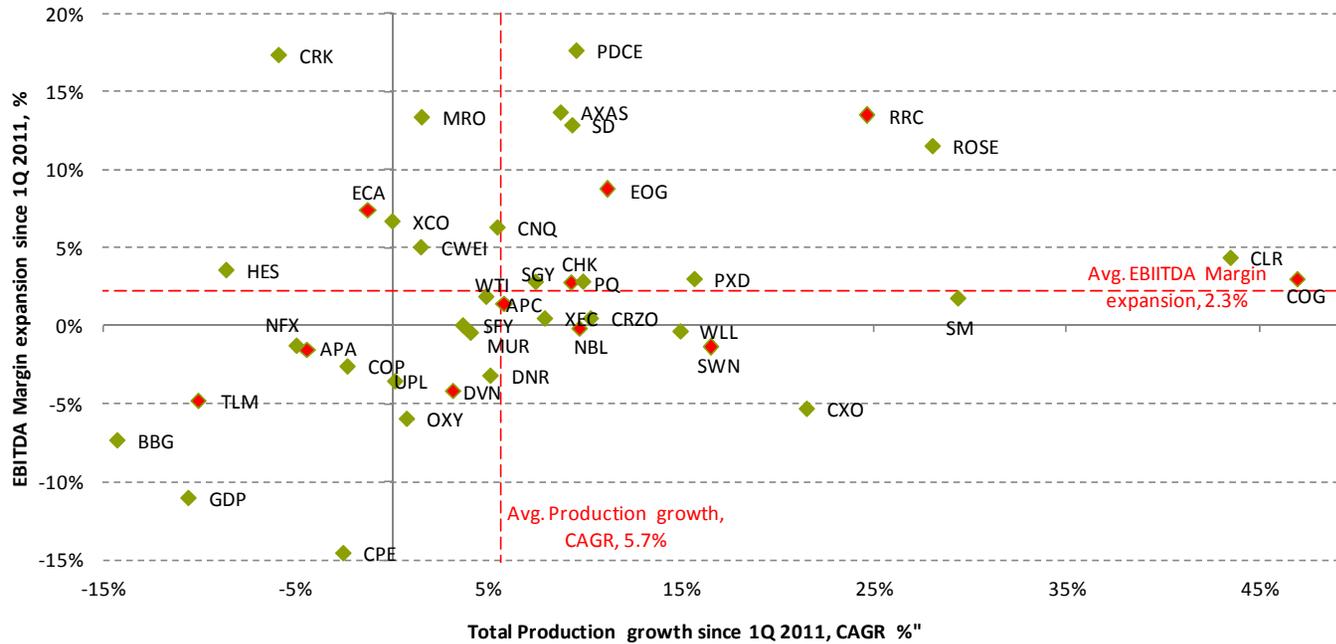
Source: Bernstein analysis

# How to Avoid Assessing It: Unconventionals Overcome Growth Risk

Resource Class	Example	Key Risk:	Develop- ment	Oper-ations	Commercial	Research	Geo-political	Sustain- ability	Investor	Stake-holder	Partner	Portfolio
		Critical Question:	Can I find hydro- carbons in new areas?	Can I avoid major project train wrecks?	Am I a lean operator?	How large a margin do I earn? How insulated am I from low prices?	Does the technology exist today or do I have to build it?	What are the odds of changes in fiscal terms or worse?	Am I depleting my inventory or growing my reserve base?	Is my portfolio what investors want?	Am I exposing myself to stake-holder risk?	How exposed am I to my operating partners?
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North America Unconventionals	Eagle Ford, Marcellus, Bakken	-	-	☑	☑☑	-	☑	-	-	☑	-	
Mature Onshore	Colombia, Egypt, Algeria, Russia	-	-	☑☑	☑	-	☑	☑☑	☑☑	-	-	
Mature Shelf	North Sea, GOM, Malaysia	-	-	☑☑	☑☑	-	☑	☑☑	☑☑	-	-	
OECD CBM	Queensland, Europe	-	-	☑☑☑	☑☑	-	☑	-	-	-	-	
International Unconventionals	Poland, France, China	☑	-	☑☑	☑☑	-	☑	-	-	☑☑	-	
EOR	US, China	-	☑	☑☑	☑☑	☑	☑	-	☑	-	-	
Onshore Frontier Basin	Uganda, Mali, Mongolia	☑☑☑	-	☑	-	-	-	☑	-	-	-	
Offshore Frontier Basin	Mozambique, Falklands, Suriname, Morocco	☑☑☑	☑	-	-	-	-	☑	-	-	-	
Offshore Established Basin	DW GOM, Angola, Nigeria, Brazil	☑☑	☑☑	-	-	-	☑	☑	-	-	-	
Extra Heavy Oil	Canada, Venezuela	-	☑☑	☑☑	☑☑☑	☑	☑	-	-	-	-	
LNG	Australia, Nigeria	-	☑☑☑	-	-	☑	☑	-	-	-	-	
Offshore Pre-Salt	Brazil, Angola, Gabon	☑☑	☑☑	-	☑	☑	☑	☑	-	-	☑☑	
Offshore Heavy Oil	Brazil, Angola	☑☑	☑☑	-	☑☑	☑☑	☑	☑	-	-	-	
Ultra-deep Water	GOM, Brazil, Angola	☑☑☑	☑☑	-	☑☑☑	☑☑	☑	☑	-	-	☑☑☑	
HPHT DBR	North Sea, GOM	-	☑☑	☑☑	☑☑☑	☑☑☑	☑	-	-	-	☑☑☑	
Sour Gas	Caspian, Indonesia, Middle East	-	☑☑☑	-	☑☑☑	☑☑	☑	-	-	☑	-	
Arctic	Canada, Greenland, Russia, US, Norway	☑☑☑	☑☑	-	☑☑☑	☑☑	☑	-	-	-	☑☑☑	
GTL	Various	-	☑☑	-	☑☑☑	☑☑☑	☑	-	-	-	☑☑☑	
Premature Shale Oil	US	-	☑☑☑	☑☑☑	☑☑☑	☑☑☑	☑	-	☑	☑☑	☑☑☑	

Source: Bernstein analysis

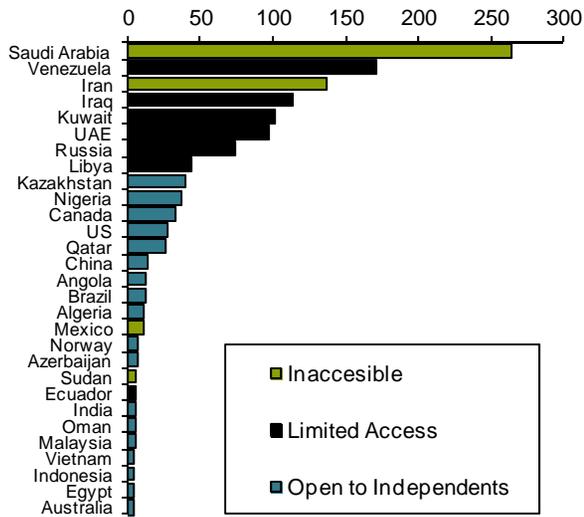
# How to Avoid Assessing It: Growth Drives Valuation, Followed by Margin



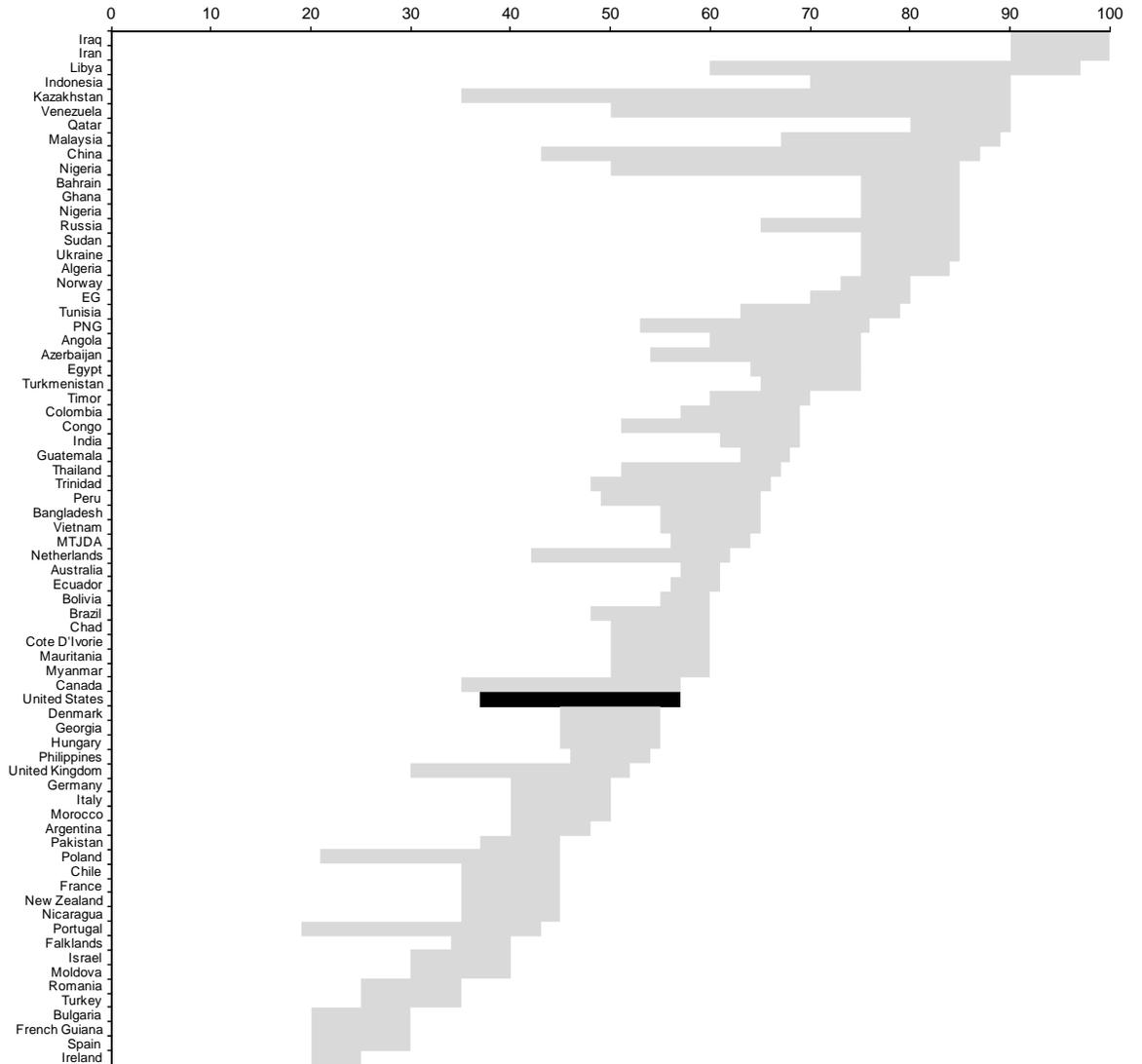
Source: Company reports; Bloomberg LPI; Bernstein analysis

# How to Avoid Assessing It: Access is Difficult but the Market is Efficient

Access to Oily Countries is Gone...  
Ranked by proved reserves (bln BO)



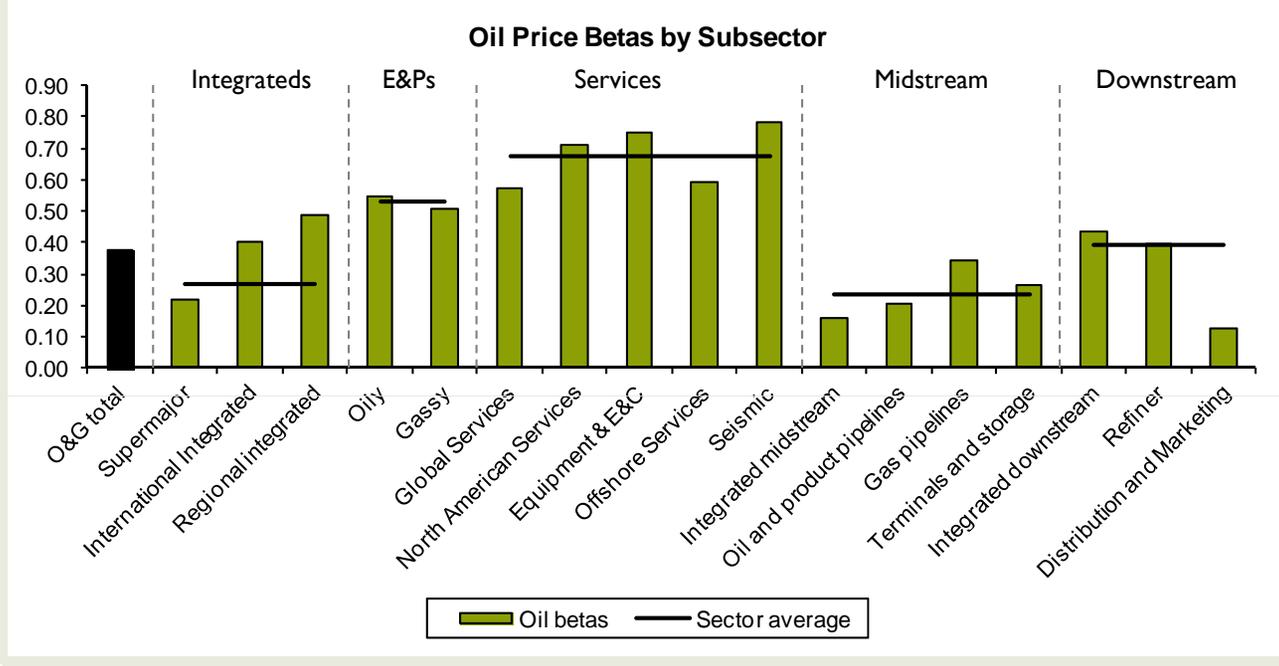
Fiscal Terms (% Govt Take) Reflect Subsurface Risk



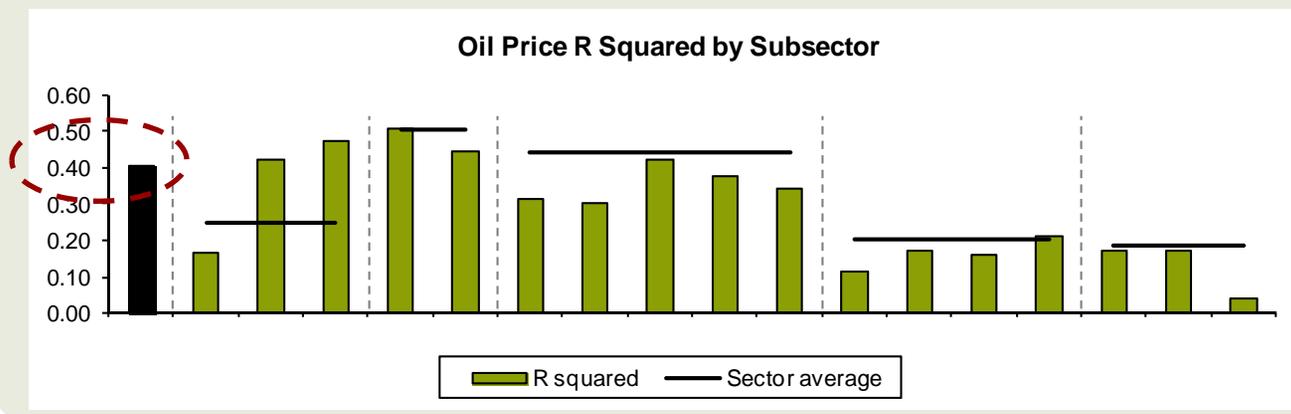
Source: Company filings, BP, IHS, Total, WoodMac, GAO, MMS, Daniel Johnston & Co., Van Meurs, World Bank, Bernstein Analysis

# Oil Price Drives E&P Equity Performance: Oil Price Accounts for Half of Share Price Movement

(1) Beta to Oil Highest for E&Ps and Services (Lowest for Supermajors and Midstream/Downstream)



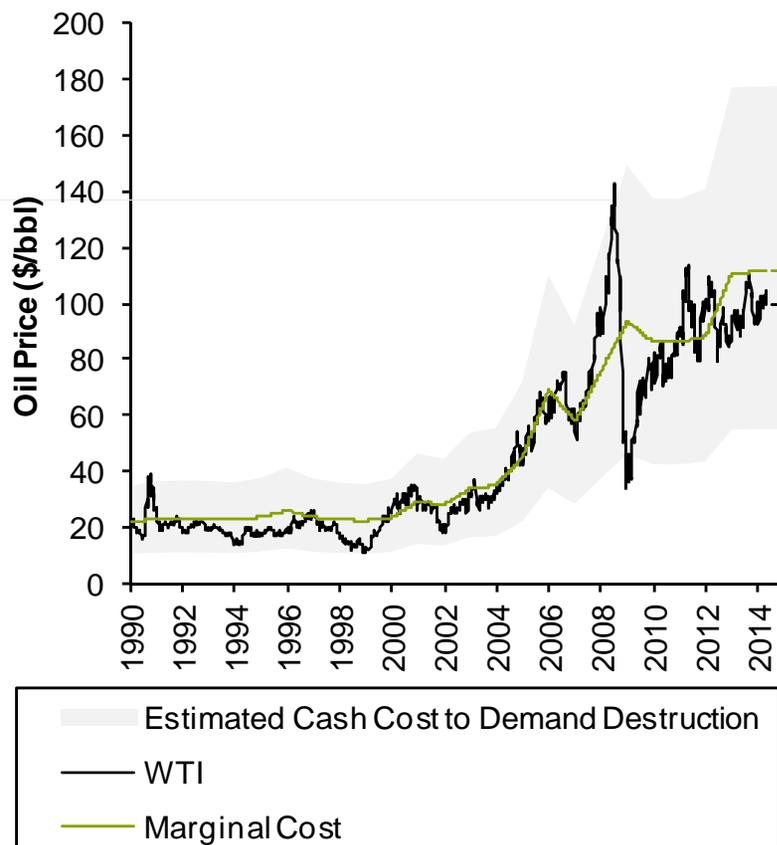
(2) But Oil Price only explains 40% of stock price movement on average (and still less than half of E&P movement)



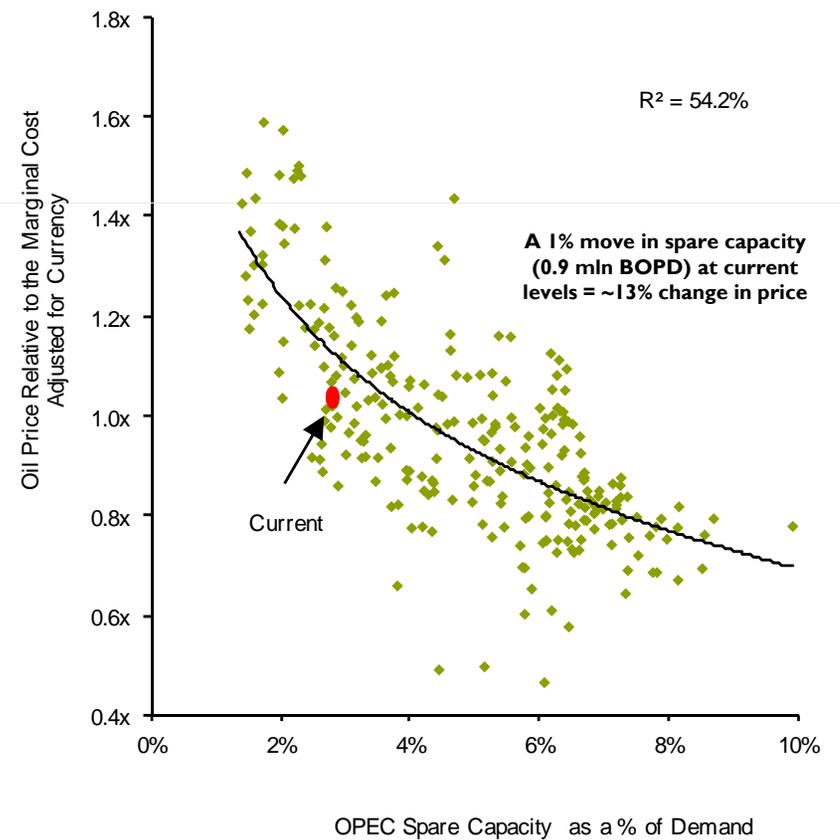
Source: Factset, Bernstein analysis

# Oil Price Strives Towards Long-Term Marginal Cost...

(1) WTI cycles around marginal cost (bound by demand destruction and cash cost floor)



(2) OPEC spare capacity determines half of the variability around marginal cost



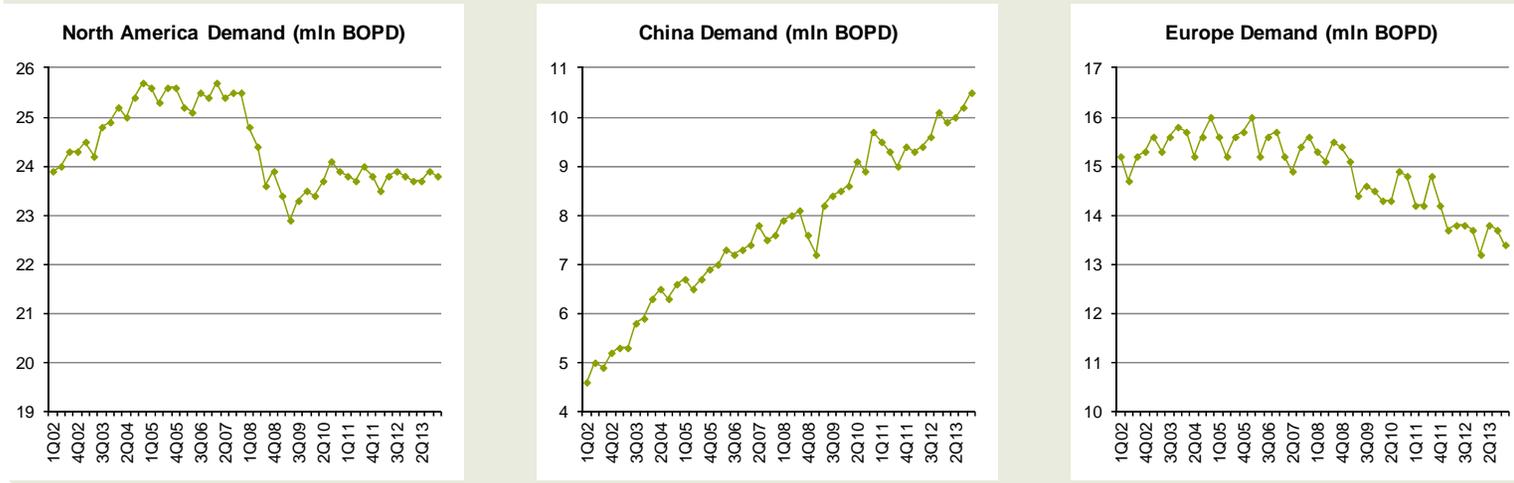
Source: Bloomberg LP, IEA, Corporate reports, and Bernstein analysis

# Global Demand Grows 1.5% (Driven by Non OECD)

(1) Global demand a story of OECD slow erosion and Non-OECD expansion

OECD	2010	2011	2012	2013E	2014E	2015E	2016E	2017E	2018E	2019E	2020E	11-16 CAGR
North America	23.8	23.7	23.7	23.8	23.9	24.1	24.3	24.3	24.3	24.4	24.4	0.5%
Europe	14.2	14.3	13.7	13.4	13.2	13.1	13.0	12.9	12.8	12.7	12.6	-1.2%
Asia/Oceania	7.8	7.9	8.6	8.6	8.4	8.4	8.3	8.3	8.3	8.2	8.1	-0.7%
<b>Total OECD</b>	<b>45.8</b>	<b>45.8</b>	<b>46.0</b>	<b>45.7</b>	<b>45.6</b>	<b>45.6</b>	<b>45.6</b>	<b>45.5</b>	<b>45.4</b>	<b>45.3</b>	<b>45.1</b>	<b>-0.2%</b>
Non-OECD												
Africa	3.4	3.4	3.5	3.7	3.8	4.0	4.2	4.3	4.5	4.6	4.7	4.2%
Latin America	6.3	6.5	6.5	6.7	6.8	7.0	7.2	7.3	7.5	7.6	7.7	2.3%
China	8.9	9.2	9.6	10.1	10.6	11.1	11.6	12.1	12.6	13.7	14.2	4.8%
Other Asia	10.6	11.0	11.4	11.7	12.0	12.3	12.7	13.1	13.5	13.8	14.1	2.9%
Non-OECD Europ	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	-0.7%
FSU	4.4	4.4	4.5	4.5	4.6	4.7	4.7	4.8	4.8	4.9	4.9	1.3%
Middle East	7.8	7.7	7.6	7.8	8.1	8.3	8.7	9.0	9.3	9.6	9.9	3.3%
<b>Total non-OECD</b>	<b>41.9</b>	<b>43.0</b>	<b>43.8</b>	<b>45.1</b>	<b>46.6</b>	<b>48.2</b>	<b>49.7</b>	<b>51.3</b>	<b>52.8</b>	<b>54.8</b>	<b>56.2</b>	<b>3.2%</b>
<b>World</b>	<b>87.7</b>	<b>88.8</b>	<b>89.9</b>	<b>90.9</b>	<b>92.2</b>	<b>93.7</b>	<b>95.4</b>	<b>96.8</b>	<b>98.2</b>	<b>100.1</b>	<b>101.3</b>	<b>1.5%</b>

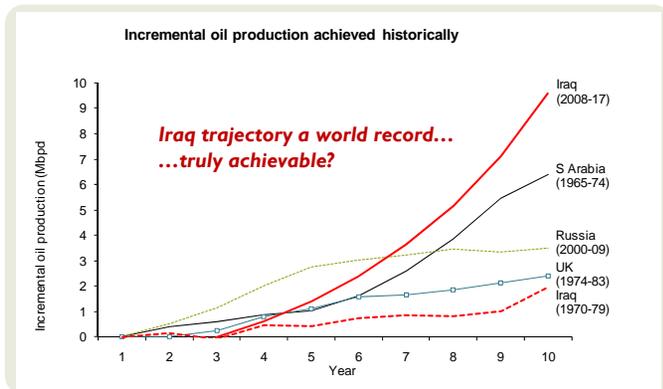
(2) A story of three regions (all same scale) – flat, rising, declining



Source: IEA; Bernstein estimates and analysis

# Global Supply Grows Slower than Demand out to 2020

Global Supply	2009	2011	2013E	2015E	2017E	2019E	13-19 CAGR
USA	7.4	8.1	10.1	10.7	11.0	11.0	1.5%
Mexico	3.0	2.9	2.8	2.5	2.3	2.0	-5.2%
Canada	3.2	3.5	3.9	4.2	4.6	5.0	4.3%
UK	1.5	1.1	0.9	0.9	1.0	0.9	1.1%
Norway	2.4	2.0	1.8	1.7	1.5	1.3	-5.7%
Australia	0.6	0.5	0.5	0.5	0.4	0.6	3.7%
Other OECD	0.8	0.7	0.7	0.6	0.6	0.5	-4.1%
<b>Total OECD</b>	<b>18.8</b>	<b>18.9</b>	<b>20.6</b>	<b>21.1</b>	<b>21.4</b>	<b>21.4</b>	<b>0.6%</b>
Asia	7.5	7.7	7.7	7.6	7.4	7.2	-1.1%
Latin America	3.9	4.2	4.2	4.6	4.6	5.2	3.4%
Eastern Europe	0.1	0.1	0.1	0.1	0.1	0.1	0.0%
Middle East	1.7	1.7	1.4	1.6	1.5	1.5	0.3%
Africa	2.6	2.6	2.3	2.3	2.1	2.0	-1.7%
FSU	13.3	13.6	13.7	13.6	13.5	13.1	-0.8%
<b>Total Other Non-OPEC</b>	<b>29.1</b>	<b>29.9</b>	<b>29.5</b>	<b>29.8</b>	<b>29.3</b>	<b>29.4</b>	<b>0.0%</b>
Angola	1.8	1.6	1.8	2.2	2.5	2.4	5.3%
Iran	3.7	3.6	2.7	2.5	2.2	2.0	-4.7%
Iraq	2.4	2.7	3.5	4.4	4.9	5.5	7.8%
Nigeria	1.8	2.2	1.9	1.9	2.0	2.1	1.6%
Saudi Arabia	7.9	9.0	9.5	9.3	11.0	12.9	5.3%
OPEC NGL & Condensates	4.8	5.8	6.6	7.1	7.5	7.8	2.8%
Other OPEC production (inc. Ecuador)	11.0	10.8	11.2	11.4	11.8	11.8	0.9%
<b>Total OPEC</b>	<b>33.5</b>	<b>35.7</b>	<b>37.2</b>	<b>38.8</b>	<b>41.9</b>	<b>44.6</b>	<b>3.1%</b>
Refinery Process Gains	2.3	2.2	2.1	2.1	2.1	2.2	0.5%
Other biofuels	1.6	1.9	1.9	2.2	2.5	2.8	6.5%
<b>Total Global Supply</b>	<b>85.2</b>	<b>88.5</b>	<b>91.3</b>	<b>94.0</b>	<b>97.1</b>	<b>100.4</b>	<b>1.6%</b>
Global Spare Capacity	6.9	4.3	4.1	3.9	3.2	1.9	-12.2%



**Ultimately, supply must be “found” somewhere...  
...balancing demand requires growth with U.S., Iraq, Saudi Arabia  
leading candidates...  
....second tier candidates for growth include Canada, Iran, Latin America**

Source: IEA; Bernstein estimates and analysis

# What to Use Geopolitical Risking For?

- E&P Project Decisions
- Portfolio Decisions
- Strategic Landscape
- Global Supply Outlook
- Continually Updated Global Supply Outlook



# Disclosure Appendix

## Disclosure Appendix

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### Ticker Rating Changes

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APA	O (IC) 05/13/11
APC	O (RC) 06/28/12
CHK	M (RC) 06/13/12
COG	M (RC) 05/02/14 O (RC) 11/20/13 M (RC) 07/30/13 O (IC) 09/11/12
DVN	M (IC) 05/13/11
ECA	M (IC) 05/13/11
ECA.CN	M (IC) 05/13/11
EOG	O (RC) 11/02/11
NBL	M (RC) 01/08/13
RRC	O (RC) 02/26/14 M (RC) 02/20/14 O (IC) 09/11/12
SWN	O (IC) 09/11/12
TLM	O (RC) 06/28/12
TLM.CN	O (RC) 06/28/12

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Rating Guide: O - Outperform, M - Market-Perform, U - Underperform, N - Not Rated

Rating Actions: IC - Initiated Coverage, DC - Dropped Coverage, RC - Rating Change

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