Douglas-Westwood

- U.K. based consultancy
- Aberdeen, Canterbury, New York, Singapore

Industry Sector Coverage

- Oil & Gas - Offshore
- Marine Renewables
- Power

Clients

- Leading global corporates
  - GE, Baker Hughes, NOV, ABB
- Investment banks & PE firms
  - GS, JPM, Citi, Barclays, BoA/ML
  - KKR, Blackstone, First Reserve
- Government agencies
  - UK & Norway offshore wind strategy
  - Economic impact studies
Explaining the Past

Looking Forward

Conclusions
From an oil perspective, how did we get here?

• Oil supply stopped responding in Q4 2004
• Global economy kept growing
• By 2008, the world economy was missing a quantity equal to the output of Saudi Arabia
• Today, compared to 2004 Q4, we’re missing a Saudi Arabia + Iraq

Observed Oil Supply; and Oil Demand anticipated based on GDP growth
Source: EIA, IMF, Douglas-Westwood analysis

* Demand growth = GDP growth − 1.2% annual efficiency gain
• The lack of oil to support economic growth lead to a prices surges in 2008…
• …and now again in 2011
• Just three years later!
• (Oil price today above oil shock levels of ’73, ‘79 in real and nominal terms)
• Without incremental supply, oil prices spiked
• Historically, when crude oil expenditure has reached 4% of GDP, the US has fallen into recession
• Equals $85-90 oil
• WTI July 22nd: $99
• Brent July 22nd: $118
• “Oil: What Price can America Afford?”

Source: EIA STEO, Monthly data, through March 2011
• Oil prices pressure are typically not resolved by efficiency or conservation…
• …not by adding capacity
• They are solved by brutal recessions
• 2008 like prior oil shocks, except in one respect
• There was no supply disruption
• First ‘peak oil’ recession?
• Oil demand is typically inelastic during times of economic growth
• Demand is hyper elastic during recession
• Demand can grow in the face of stiff price increases during an economic recovery
• So oil consumption is only ceded historically during recessions

(Suggests oil is an “enabling commodity”, like water or air—we won’t give it up easily because it reduces other activities, too)
So why a recession now?

- No supply disruption in 2008
- No peak oil—in accounting terms
- Just a slow-growing oil supply
- But…the existing oil supply is being re-allocated from the OECD countries to the non-OECD countries
- Demand—not supply—shock

Change in OECD and non-OECD Oil Consumption, from Stalling of Oil Supply in Q4 2004

Source: EIA STEO
What was the purpose of the Recession?

- Recession not merely shock and recovery
- Fundamental vehicle for re-allocation of demand from OECD to non-OECD
- All of the drop in OECD consumption occurred from the first month of the Recession, to the last month of the Recession. Not before, not after.
- OECD consumers are providing more than 90% of increased consumption in the non-OECD
- Contribution of oil producers is minimal

Change in OECD and non-OECD Oil Consumption from Beginning of Great Recession

Source: NBER, EIA
• June production at 88.5 mbpd—up 1.1% over last June
• But fundamentals analysis shows consumption should be at 90 mbpd, using last June’s prices
• So we’re 1.5 mbpd/year short to achieve price stability
• Oil supply needs to grow around 2.8% per year—it’s managing less than half that.
• The difference is worth $30 / barrel compared to last June.
Explaining the Past

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Conclusions
• GDP growth of 10%; oil demand growth of 10.5% in 2010
• 18 million light vehicle sales in 2010 vs. 13.6 m prior year (12.6 m for US in 2010)
• “S” curve – motorization in one generation
• Crude oil imports up 27% in January (imports = half of consumption)
• In 2010, China was 1/3 of total global oil demand growth
• Prospective unconstrained growth: 50 mbpd by 2030 (vs. US 19 mbpd today)
• On paper, 140 – 160 mbpd of demand by 2030, nearly 2x current demand
Long-term Supply Outlook

Range of Global Oil Supply Forecasts – 2030 – All Liquids
Source: Various

- Petroleum liquids supply forecasts from 75 – 105 mbpd for 2030
• The emerging markets will bid away the advanced countries’ oil

• It’s not ‘peak demand’, it’s unaffordable oil

• Assuming 100 mbpd supply by 2030, US consumption would be expected at 14 mbpd—down 1/3 from 21 mbpd in mid 2007

• Rate of long term decrease: 1.5% per annum, 2.3% on a per capita basis
  – Per capita, still puts US in 2030 on par with Japan, Korea today.

• It also provides us a baseline to measure stress in the system
Inelasticity, Stress, and Price Increases

- Difference between actual and predicted oil consumption (based on re-allocation of demand to non-OECD) gives us a measure of stress in the system.

- Does systemic stress equate to exponential price rise?

Source: EIA and Douglas-Westwood Analysis

US Oil Consumption, Actual and Predicted based on Demand Re-Allocation to non-OECD

Brent Crude Oil Spot Price, US Dollars

Source: Barchart.com
• China setting oil prices? Appears so.
• China tolerance limit: $110
• US tolerance limit: $90
• And the gap appears to grow over time.
• Still early days for the model.

Carrying Capacity of the US and Chinese Economies in terms of Brent Crude Prices; Brent Crude Spot Prices and Futures, Jan. 2003-Dec. 2015

Source: EIA, IMF, Barchart.com, Douglas-Westwood Analysis
• 2008 was an oil shock, not just a financial crisis
  – Shock was demand, not supply, driven
  – Result of need to re-allocate consumption from OECD to non-OECD
• Reductions in oil consumption are ordinarily achieved by recessions—that’s the corollary of inelastic demand
  – Speculation is also then a corollary of inelastic demand—price must be above sustainable price to induce traumatic reduction in consumption
• We may be able to measure the stress in the system
  – There may be quantifiable linkage between systemic stress and the oil price—ie, it’s not about rogue traders
• China’s carrying capacity appears to determine the oil price
  – China’s carrying capacity may continue to increase against the US
• We appear to be in or near an oil shock now—phase change in May
• Oil shock cycles are likely to be short: 3-4 years trough-to-trough
• The oil (petroleum liquids) supply has not peaked—but shows all the hallmarks. If it peaks, we could get shocks without needing re-allocation
• Buckle your seat belts, we’re in for a bumpy ride.
Thank You.

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