The Growing Importance of Inventories Outside OECD Countries and Implications for the Oil Market

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Overview

• Given the lack of non-OECD stocks data how can these be estimated?
• Will an increase in oil demand in developing countries lead to a stock level comparable to that in OECD countries?
• How is the expansion of the refining sector affecting stock levels?
US/OECD data provide means to estimate stocks

• Stocks data for non-OECD countries are limited
• But we do have data on 3 key parameters for each country:
  – Crude oil production
  – Refinery throughputs (directly or capacity * utilization)
  – Product consumption
• Do US/OECD data provide a means to develop “rules of thumb” to estimate non-OECD stocks from these 3 parameters?
  – Used US (EIA) data to investigate
First pass - USA as starting point

- **EIA data**
  - Breakdown by sub-sector in the supply chain
  - Detailed by region (PADD)
Crude stocks as a function of production

CRUDE STOCKS: LEASES, TANK FARMS & PIPELINES
as DAYS of CRUDE PRODUCTION

Source EIA: data exclude refinery stocks
Product stocks as function of consumption

**PRODUCT STOCKS BULK TERMINALS, PIPELINES & NATURAL GAS PLANTS / PRODUCT SUPPLIED**

- **US TOTAL PRODUCT DELIVERIES**
- **PRODUCT STOCKS** as DAYS of PRODUCT SUPPLIED (Excl refinery stocks)

Source EIA: data exclude refinery stocks
Product stocks as function of consumption + exports

PRODUCT STOCKS BULK TERMINALS, PIPELINES & NATURAL GAS PLANTS / PRODUCT DELIVERIES plus EXPORTS

US TOTAL PRODUCT DELIVERIES + EXPORTS

PRODUCT STOCKS as DAYS of PRODUCT SUPPLIED plus EXPORTS (Excl refinery stocks)

Source EIA: data exclude refinery stocks
Refinery crude stocks as function of refinery throughput

Crude Oil End of Month Stocks at Refineries as Days of Refinery Gross Input

High – coastal/marine fed
~ 10 days inventory

Low – inland/pipeline fed
~ 4 days inventory

Source EIA: refinery data only
Refinery product stocks as function of refinery throughput

Total Product End of Month Stocks at Refineries as Days of Refinery Gross Input

Source EIA: refinery data only
Refining changes lead to major shift in scale and location of inventories.
Applying “rules of thumb” to non-OECD regions provides a means to make a (first) estimate of regional and global stocks

- **US analysis suggests a (very rough) stocks “model”**
  - Crude $= 30-35 \times$ daily production + 4-10 \times$ refinery t/p
  - Product $= 20-27 \times$ consumption (+ exports) + 15-25 \times$ refinery t/p

- **Can tune / calibrate based on industry norms, known data and/or country specific characteristics, e.g.**
  - OECD and JODI data
  - Pipeline:
    - Line fill from diameter & length
    - Associated crude terminal inventory (front end) $\sim 10 \text{ days} \times$ line bpd capacity
    - Associated product terminal inventory (back end) $\sim 6-10 \text{ days} \times$ line bpd capacity
Applying “rules of thumb” to non-OECD regions provides a means to make a (first) estimate of regional and global stocks

- Would need to include
  - Speculative / financial / congestion
  - Oil at sea
  - Independent/transit
  - SPR’s
  - Seasonality

- Could add in to existing models to generate projections global and by region
  - IEA, EIA, WORLD Model
  - Aid in gauging future inventory levels and shifts
Thank you!

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