

# One great pool, but with varying depth: Dynamic efficiency of crude oil markets

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One great pool, varying depth

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## This paper: oil market integration

- Integration of world oil markets: The world oil market, like the world ocean, is one great pool (Adelman, 1984)
- Plante and Strickler (2021): differentials between different crude oil price series
- Plante and Strickler (2021): fewer structural breaks in oil price differentials, smaller variation
- Bravo Caro et al. (2020): fractional cointegration approach
- Bravo Caro et al. (2020): WTI-Brent market is strongly globalised

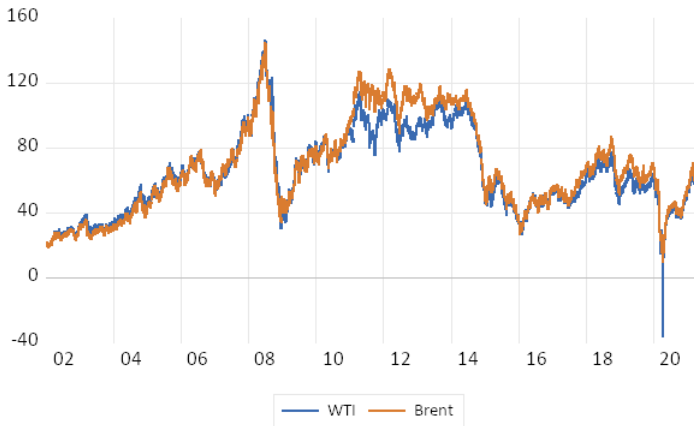
## This paper: oil market efficiency

- Measuring informational efficiency: quantitative vs qualitative approaches
- Lo and MacKinlay (1988), Kim and Shamsuddin (2008): Variance-ratio test
- Duan et al. (2021), Sattarhoff and Gronwald (2022): distance from random walk as measure of informational efficiency

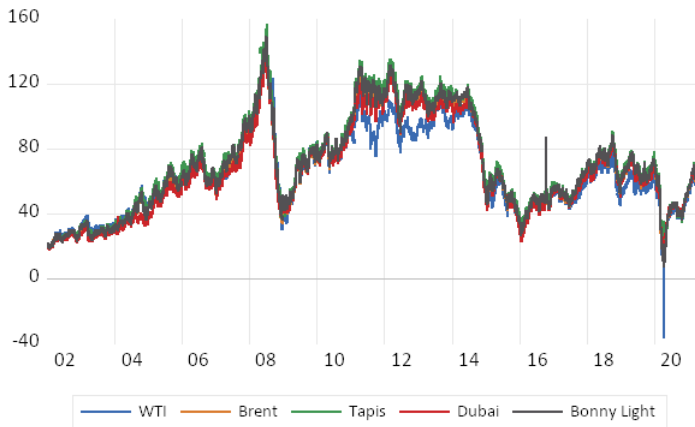
## This paper: degree of efficiency of global/regional oil markets

- WTI (North America), Brent (North Sea), Bonny Light (West Africa), Dubai (Persian Gulf), Tapis (Asia Pacific)
- Daily data, 02/01/2002 - 29/03/2021
- Application of Duan et al.'s (2021) dynamic efficiency

## Let's take a look at the data



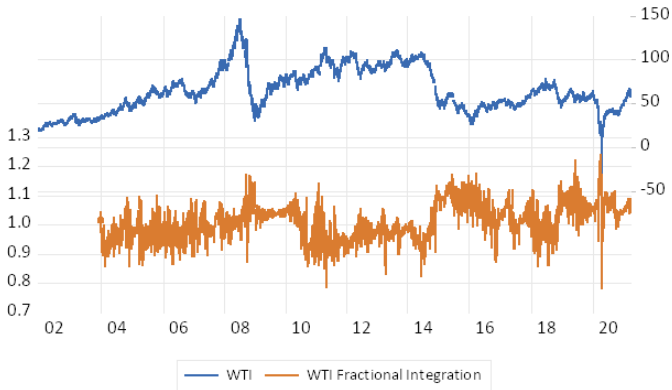
## Let's take a look at the data



## Dynamic efficiency

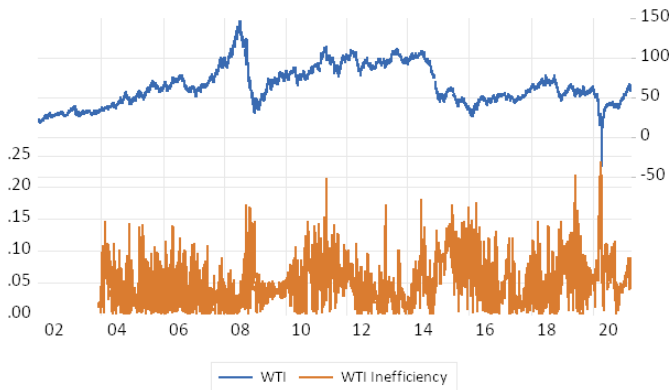
- Random walk and market efficiency
- Random walk: integrated of order 1.
- Fractional integration: integration order not restricted to integer values 0 or 1.
- Fractional integration: Long memory in time series
- Based on estimate of fractional integration parameter  $d$ , measure of market inefficiency  $D = |1 - d|$
- Feasible Exact Local Whittle (FELW) Estimator, Phillips and Shimotsu (2005)

## Preliminary results

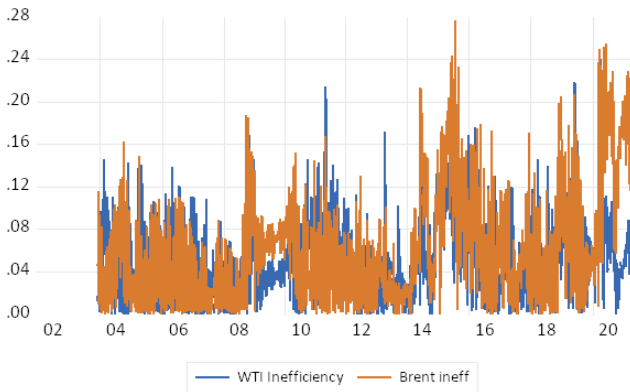




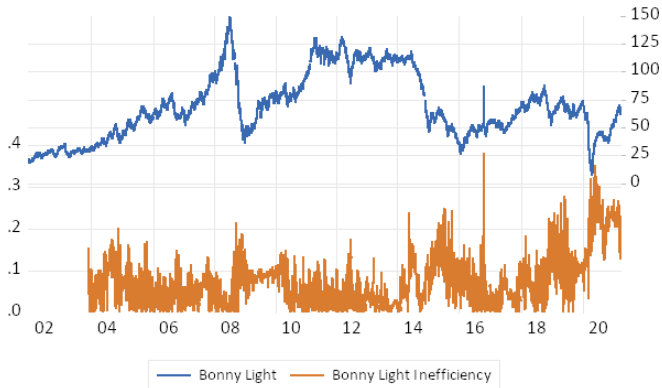
## Preliminary results



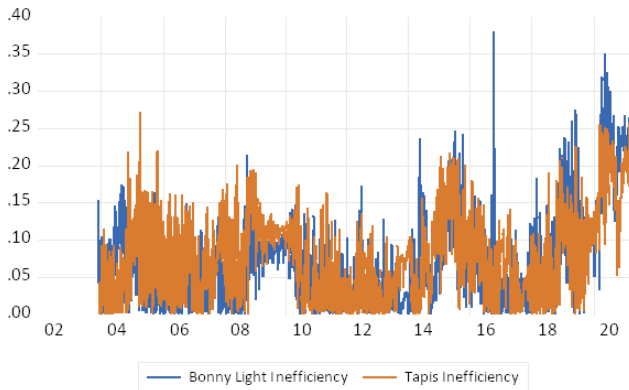
## Preliminary results



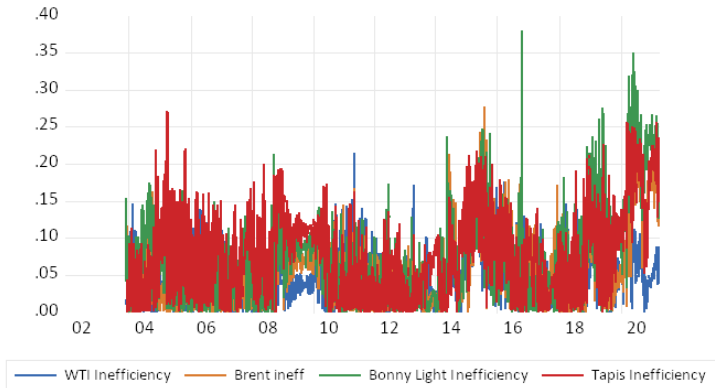
## Preliminary results



## Preliminary results



## Preliminary results



## Conclusions

- The world oil market, like the world ocean, is one great pool
- But with varying depth...
- But with varying degrees of informational efficiency