



# Comments on “Do Financial Investors Destabilize the Oil Price?”

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$p_t = \log$  of spot price

$f_t = \log$  of futures price

Suppose:

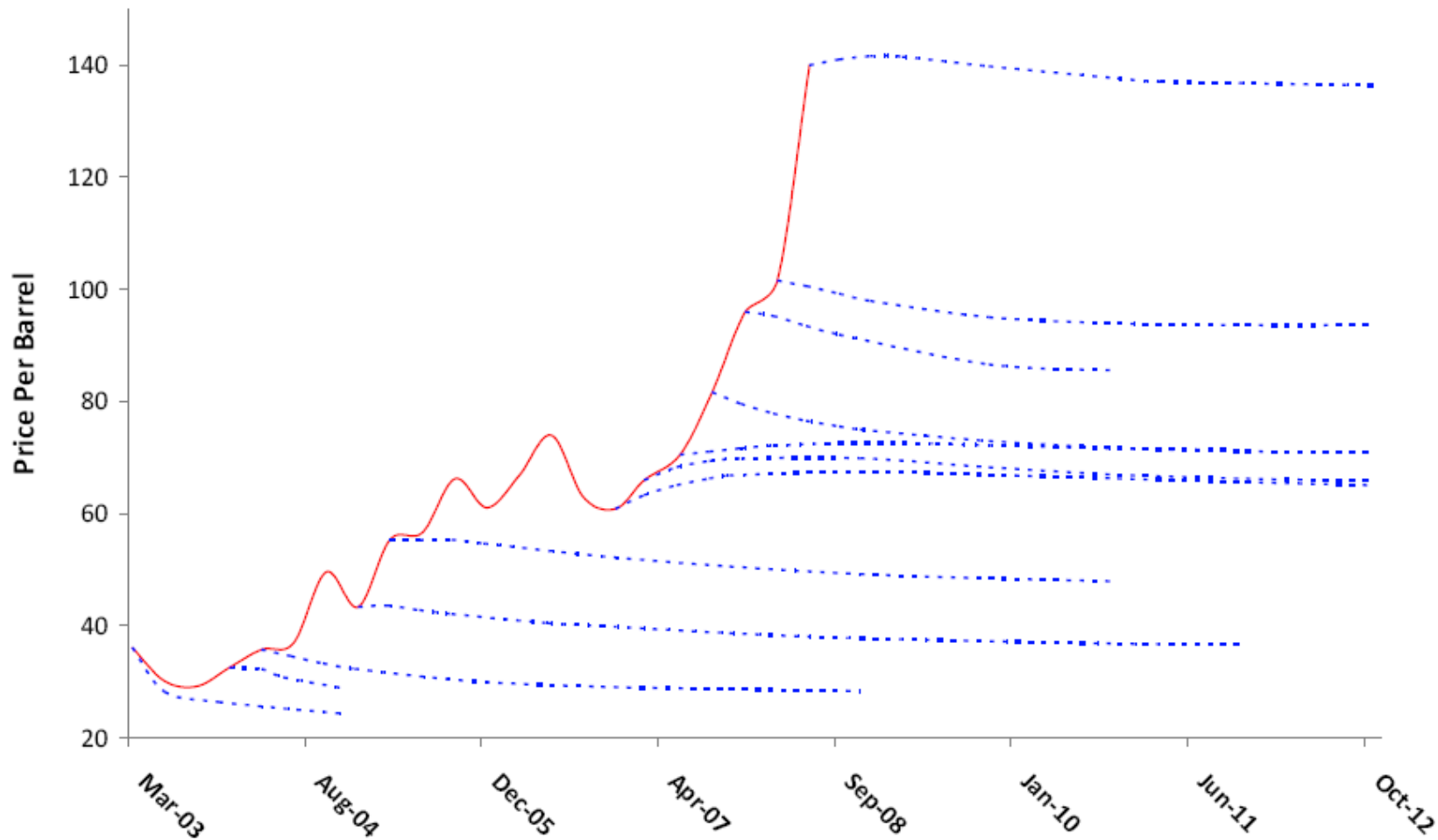
no storage costs, interest costs, or  
convenience yield

If  $p_t < f_t$ :

- buy oil at  $p_t$
- store the oil
- guaranteed selling price  $f_t$
- risk-free profit

equilibrium requires:

$$p_t = f_t$$



Source: Interim Report on Crude Oil, Interagency Task Force on Commodity Markets, July 2008

Under risk neutrality and non-zero inventories:

$$E_t(p_{t+1}) = f_t$$

$p_t$  follows random walk

Regression of 3-month futures on 1-month  
imposing intercept = 0 and slope = 1 has  
 $R^2 = 99.7\%$

Above framework implies:

If  $p_t > f_t$ , inventories should be zero

Convenience yield: benefit to refiners of holding inventories in addition to possible capital gains

$c_t$  = log of convenience yield less storage  
and interest costs

$I_t$  = inventories

If  $I_t \downarrow$  then  $c_t \uparrow$

profit-maximization by refiners requires:

$$p_t = f_t + c_t$$

Social planner: what should we want to see in order to maximize total welfare?

Competitive outcome: how would this plan be implemented with ideally functioning competitive markets?



# Example 1: Temporary tight supply conditions

Social planner:

reduce consumption today and in future

reduce inventories today

Competitive implementation ( $p_t = f_t + c_t$ ):

$p_t \uparrow$

$f_t \uparrow$  (but less than  $p_t$ )

$I_t \downarrow$

$c_t \uparrow$

In response to this kind of shock,

$$f_t \uparrow$$

$$s_t = f_t - p_t \downarrow$$

Example 2: Pure speculation:  
investors bid up  $f_t$  for no reason

Social planner:

wants no changes in any real variables

Competitive response:

If no change in  $p_t$ , profit from  $I_t \uparrow$

$C_t \downarrow$

$f_t \uparrow$  by more than  $p_t$

In response to this kind of shock,

$$f_t \uparrow$$

$$s_t = f_t - p_t \uparrow$$

this shock is destabilizing

# Example 3: Expected future tight supplies

Social planner:

reduce consumption today and in future  
increase inventories today

Competitive implementation ( $p_t = f_t + c_t$ ):

$p_t \uparrow$

$f_t \uparrow$  (but more than  $p_t$ )

$I_t \uparrow$

$c_t \downarrow$

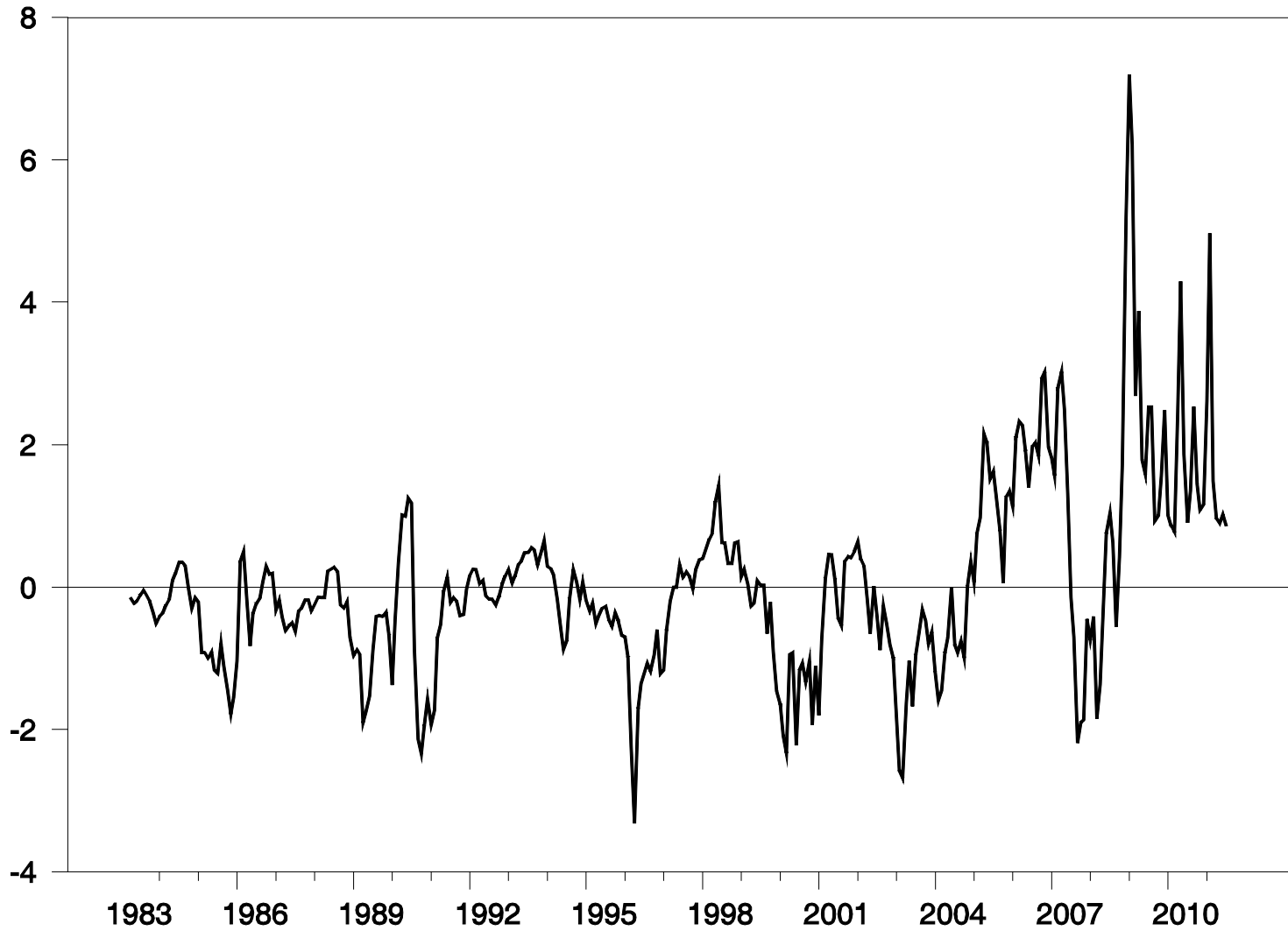
In response to this kind of shock,

$$f_t \uparrow$$

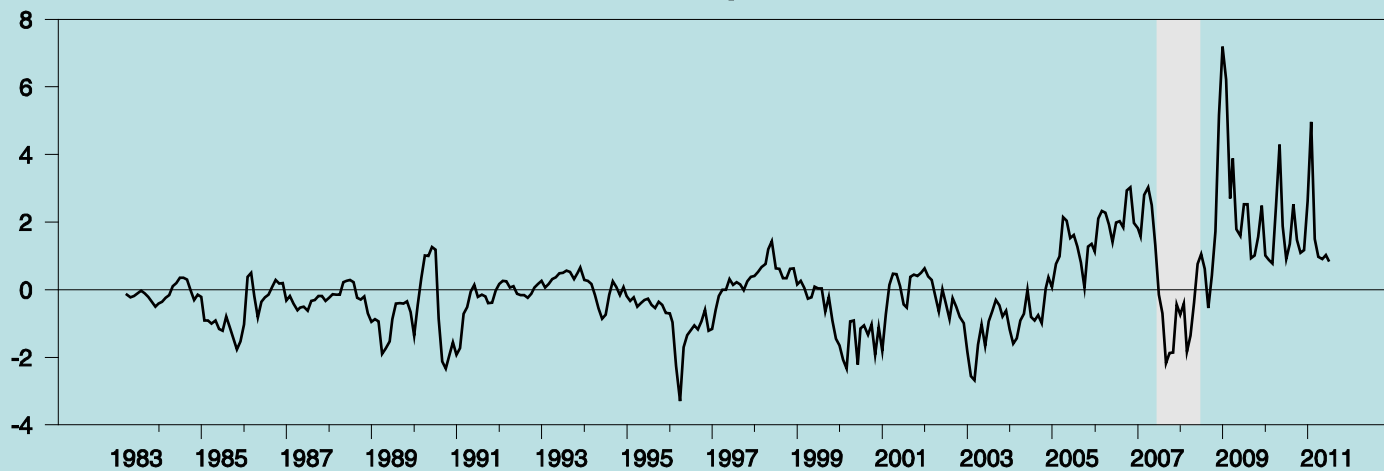
$$s_t = f_t - p_t \uparrow$$

this shock is stabilizing

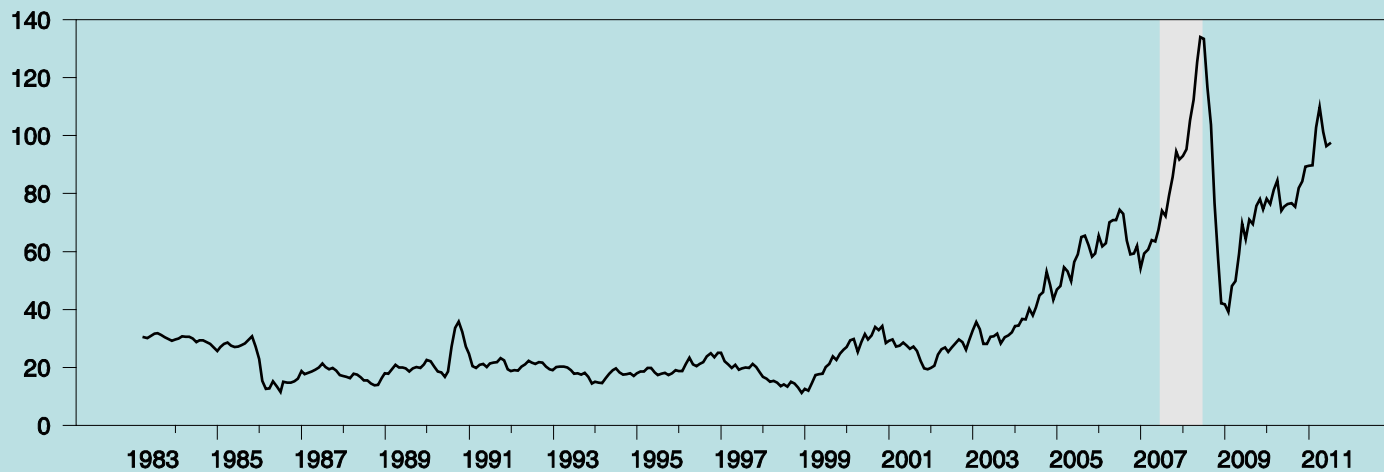
# 3m-1m spread



**3m-1m spread**

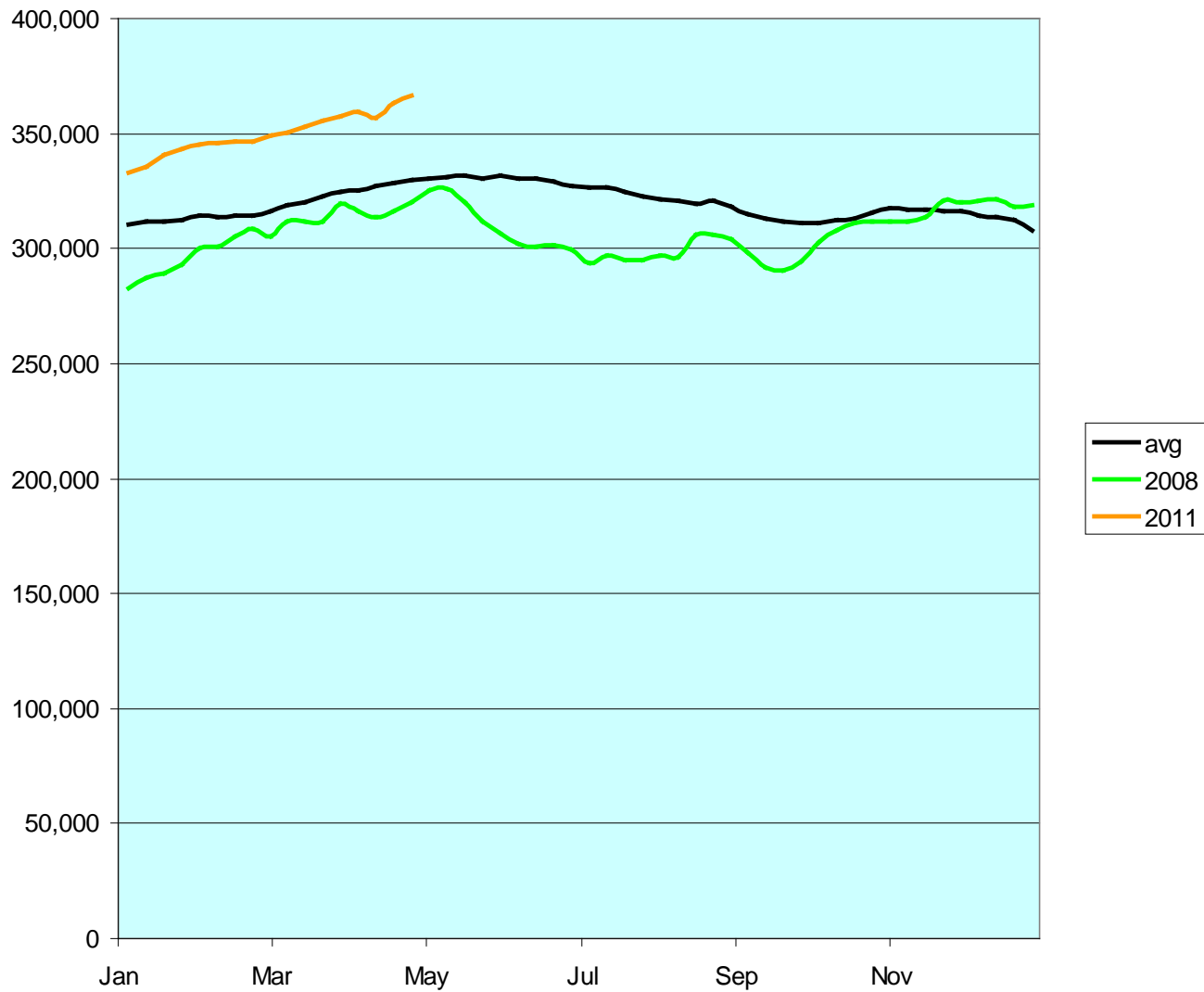


**1m level**



Shaded region: July 2007 - June 2008





Weekly U.S. ending stocks of crude oil (excluding SPR), thousands of barrels