

Lessons from the Forward Oil and Commodities Markets

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Two Theories About Setting of Forward Pricing Premia for Commodities

1. Forward prices are set by a discount or premium to current prices based on the supply/demand balance for forward hedges

- **This works mainly in a world where prices are near a robust consensus for long term prices**
- **Company strategy and the motives of individual players can influence the result**

- Or -

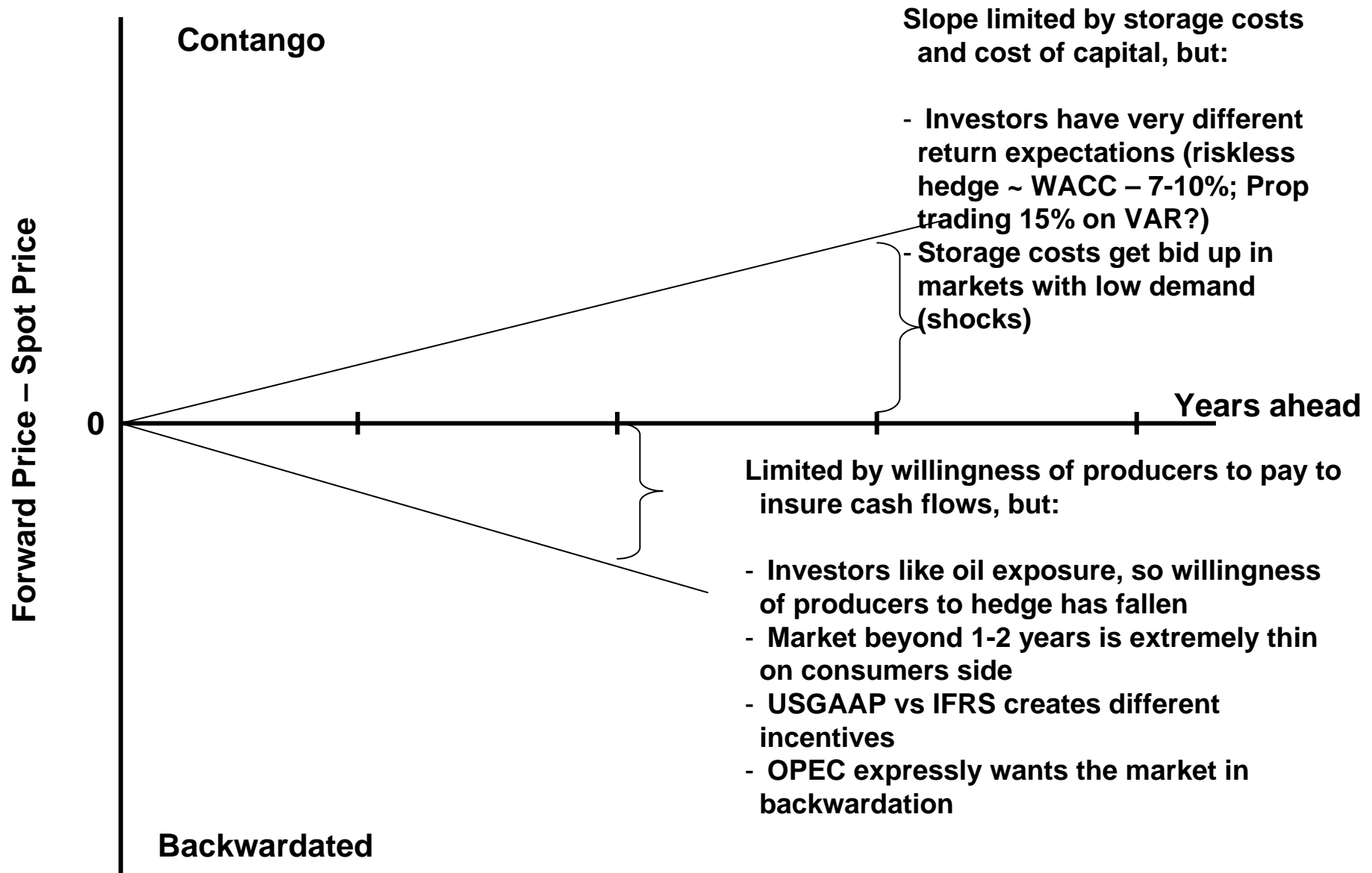
2. Current (spot) prices are set by a netback of storage costs and the cost of carry from the expected longer term price of the commodity

- **Differences in long term expectations can distort the analysis as can large differences in the required rate of return**
- **In tight markets storage costs can be bid up, while sharp unexpected changes in demand/supply can lead to shocks on both forwards and spot**

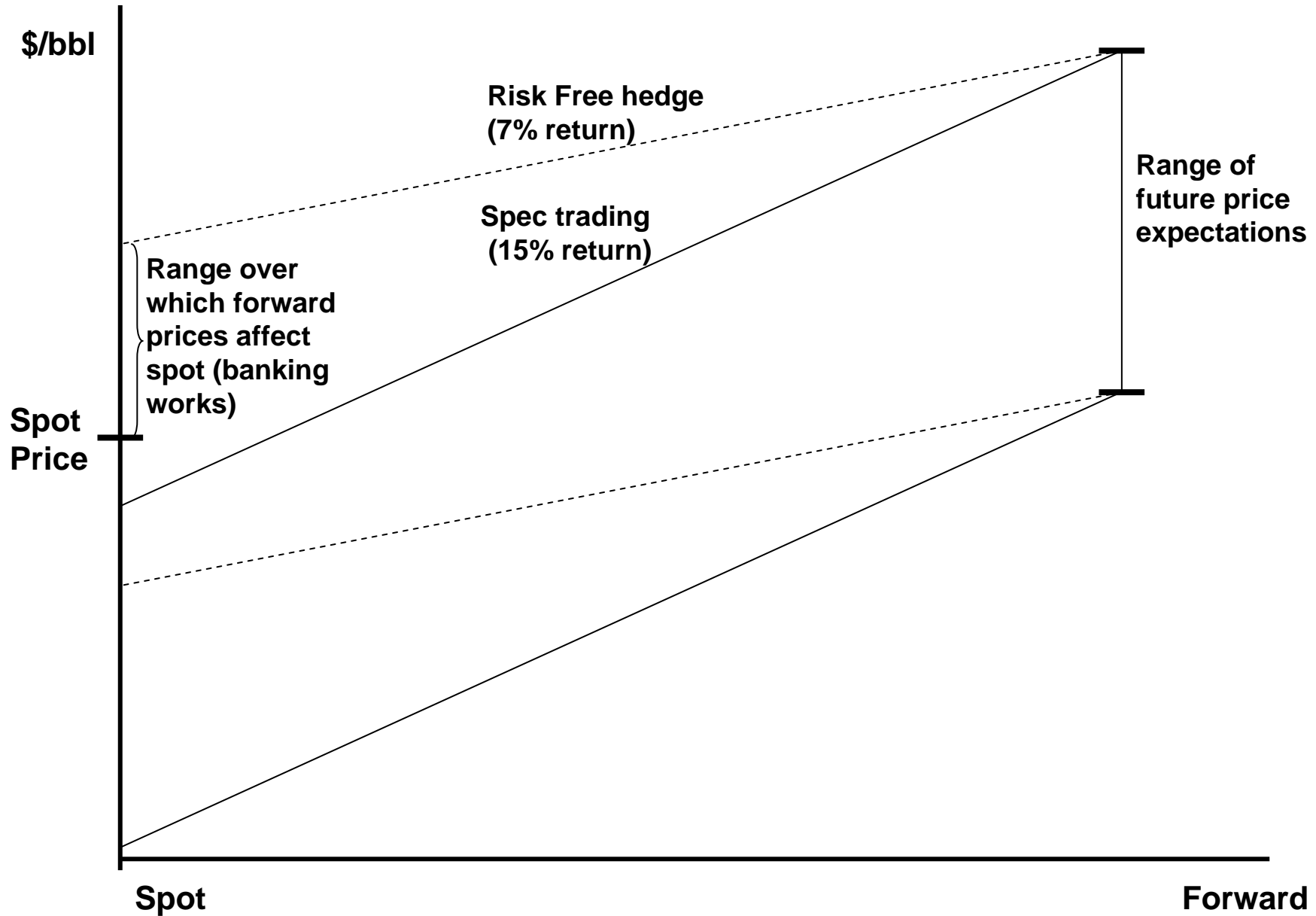
Players in the Forward Oil Markets

Players	Investment Process / Motive	Impact on Market Price
Speculators	Top down, event driven, momentum driven, very short term	No long term impact (as markets eventually clear on supply/demand), but speeds up adjustment process and can lead to overshoot
LT Commodity funds	Buy 1 month futures and roll to provide exposure to commodity price	Can cause one off demand as commodity is put into storage by counterparty (to hedge)
Equity hedge funds	Buy commodity futures to immunize investment from commodity risk	As with speculators and LT investors
All Asset/ Commodity hedge funds	Often quant based, roll return vs momentum, LT avg price, expected normal, etc	As with speculators and LT investors
Producers	Hedge capital intensive investments, but very different views between Majors and E&Ps, Europe and US, and OPEC	Willingness to pay for hedge should create discount (Backwardation) in the forward market
Consumers	Protect earnings against production cost spikes	Willingness to pay for hedge should create premium (Contango) in the forward market
Storage Owners	Maximize value of assets	In tight markets can bid up the price of storage causing Contango to widen

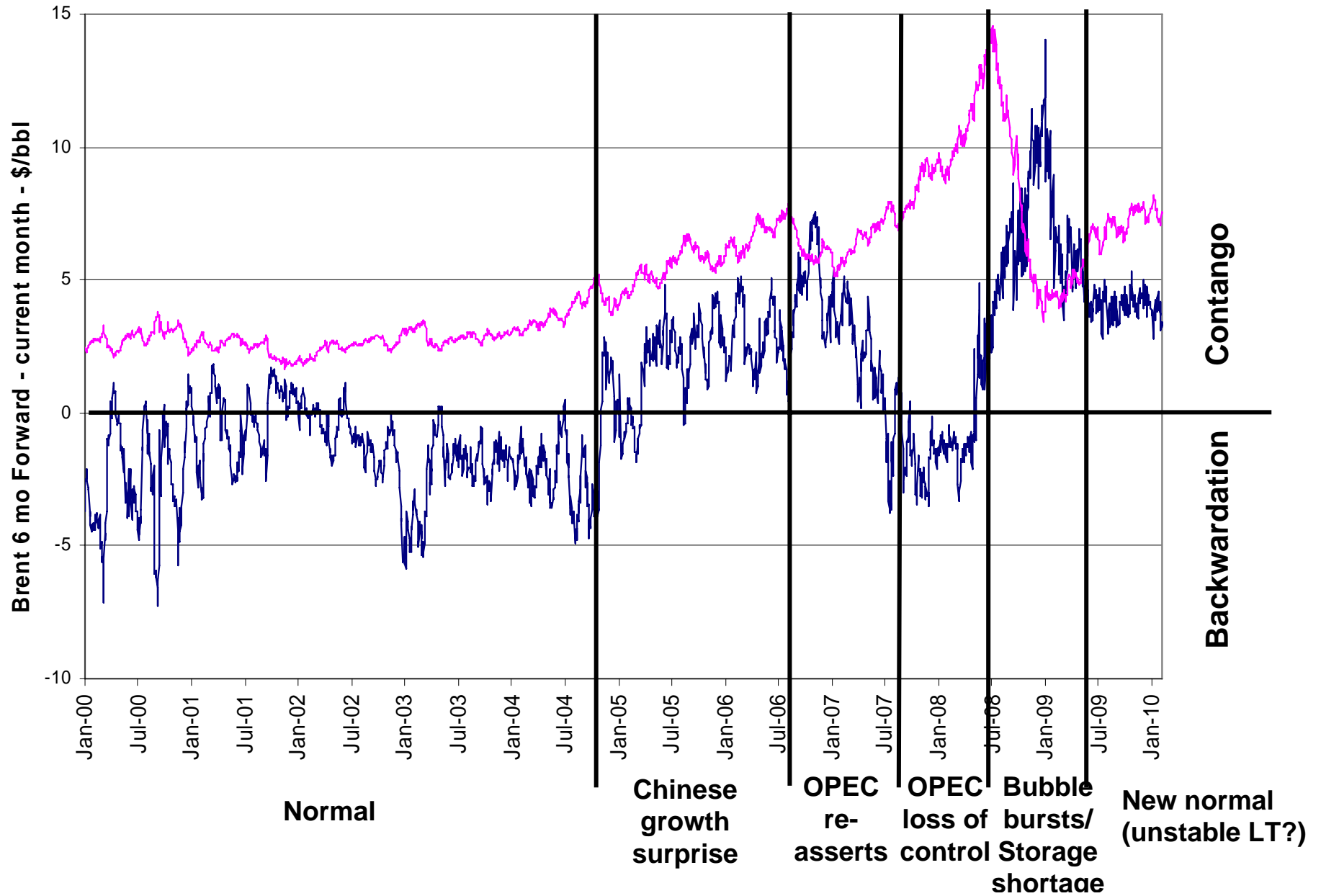
Limits to Forward Premia and Discounts



Forward Price implications on Spot



Six Month Brent Oil Premium Versus Oil Price



Questions for CO2 Forward Markets

What are market expectations for forward prices and how wide is the range of expectations?

What is the supply/demand for forward hedges?

Who might trade and what is their cost of capital and risk position (and investment horizon)?

And therefore:

Is the market consensus strong enough, the consensus price high enough, the market liquid enough, and the relevant cost of capital low enough such that the phase III emissions market can influence Phase II enough to underpin CO2 reducing investments?