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Oil Price Risk and Risk Management Strategies

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Oil Price Risk and Risk Management Strategies

- ▶ Overview of current status of oil markets
- ▶ Risks and risk management
- ▶ Traditional energy financial products and recent product developments
- ▶ Speculation in the energy markets, reasons for new rules for setting position limits

Oil Price Risk and Hedging Strategies

- ▶ Specifics of the oil markets
- ▶ Current status of the forward curve– contango
- ▶ Overview of current status of oil markets 18 months after the crisis
- ▶ Both oil and natural gas collapsed in the Fall of 2008 but while crude oil almost tripled, natural gas (Henry Hub) fell by 1%
- ▶ As a result the ratio of oil to natural gas has risen to record highs

See graph on next slide:

Natural Gas



F-174 May 31, 10

	Open	High	Low	Close
05/07/10	8522	8650	8129	8615
05/14/10	7611	8715	7451	7511
05/21/10	7179	7851	7083	7161
05/28/10	7062	7572	6715	7397

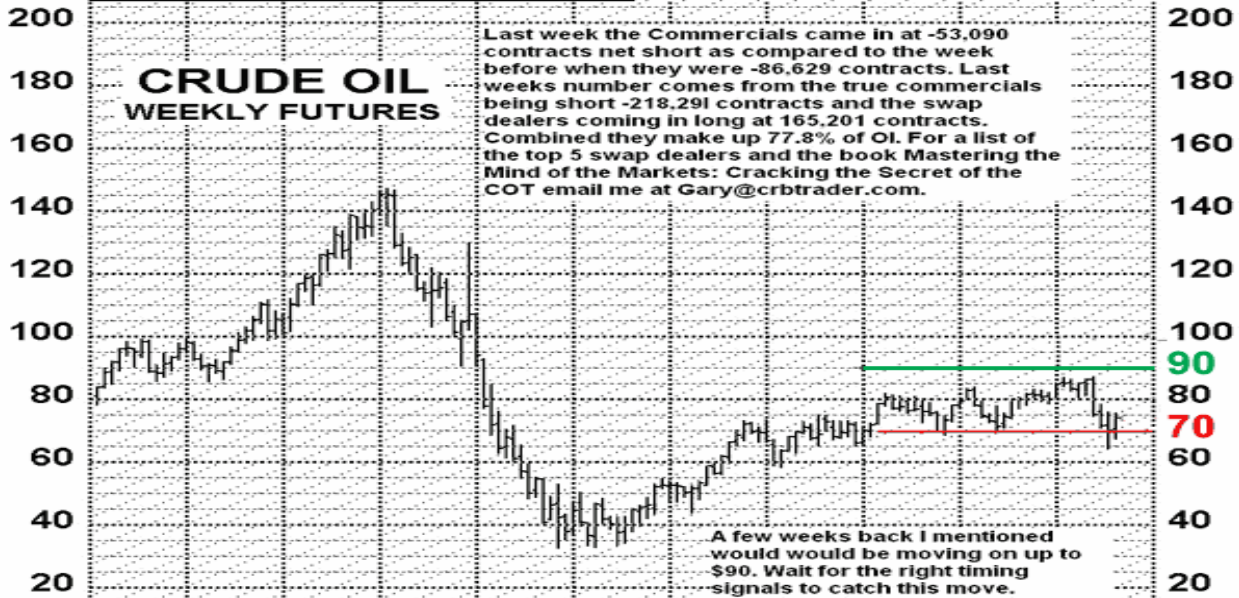
Long	Chg	Short	Chg	Net
260710	-18894	220267	8024	40443
697932	1861	751022	-31678	-53090
81975	-14020	69328	-7399	12647

\$
Bbl.

240
\$
Bbl.

CRUDE OIL WEEKLY FUTURES

Last week the Commercials came in at -53,090 contracts net short as compared to the week before when they were -86,629 contracts. Last weeks number comes from the true commercials being short -218,291 contracts and the swap dealers coming in long at 165,201 contracts. Combined they make up 77.8% of OI. For a list of the top 5 swap dealers and the book Mastering the Mind of the Markets: Cracking the Secret of the COT email me at Gary@crbtrader.com.



7-BAR ADX

MARKET SENTIMENT

NET TRADERS POSITIONS
(THOUSANDS OF CONTRACTS)

— SMALL SPECS
— LARGE SPECS
— COMMERCIALS

OCT-DEC 2008 JAN-MAR APR-JUN JUL-SEP OCT-DEC 2009 JAN-MAR APR-JUN JUL-SEP OCT-DEC 2010

* This chart produced by COMMODITY PRICE CHARTS 1-800-221-4352

The role of Oil / Natural Gas ratio in commodity portfolio investing

- ▶ Similar to Gold–Silver ratio
- ▶ The graph on slide 4 shows the initial rebound of Natural Gas up to \$6.10 in May
- ▶ Crude oil dropped in the beginning of last year to \$68–72 range
- ▶ Non commercials moved to Natural Gas which pushed Natural Gas prices higher
- ▶ As a result the ratio between Crude Oil and Natural Gas has changed to 20. Still high by historic standards (between 5–15)

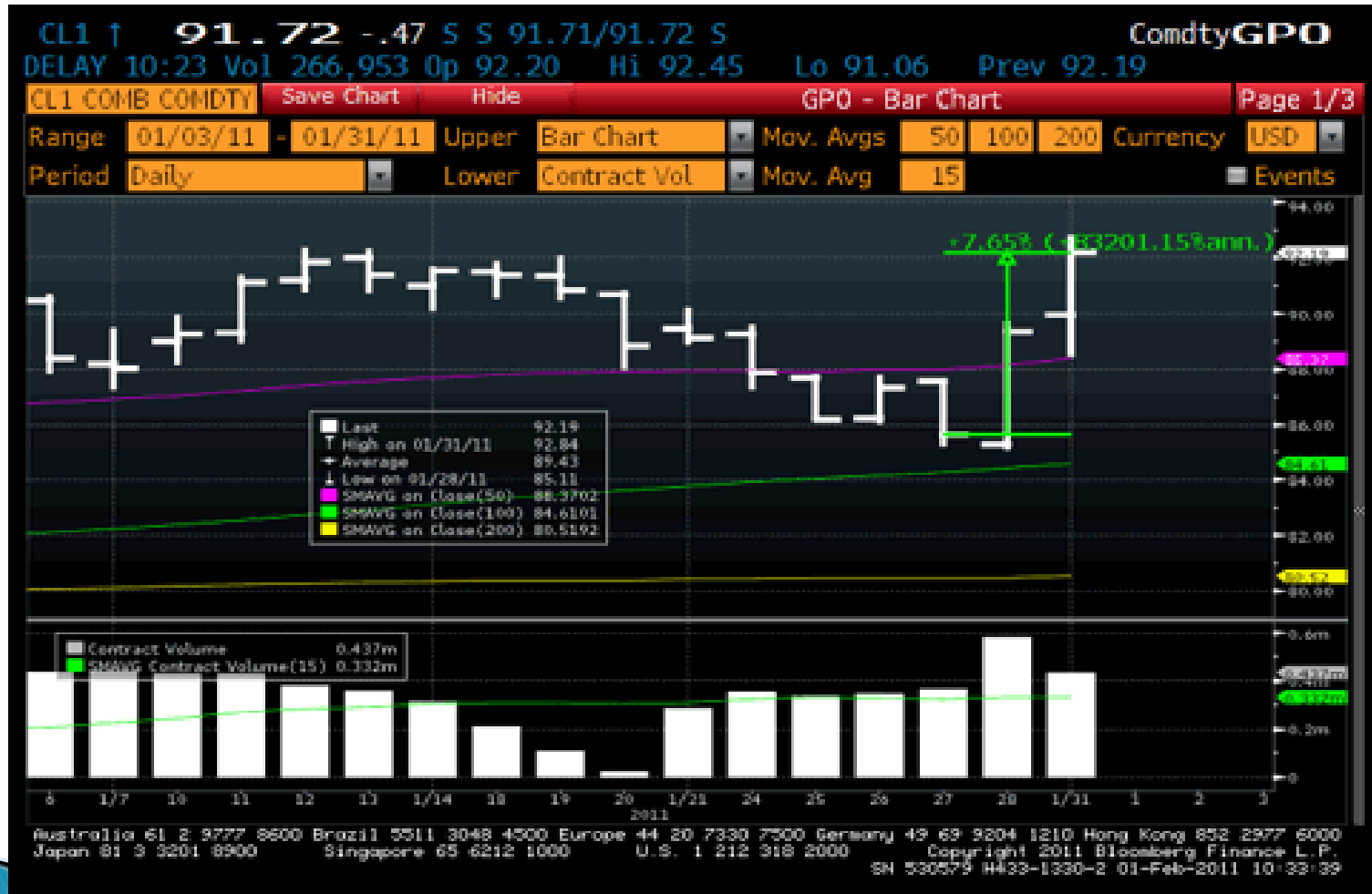
Natural Gas

- ▶ Natural gas outlook – bearish
- ▶ Current price range \$4.00 – \$4.37 (MMBtu)
- ▶ Major reason: over supply: 2.542 trillion cubic feet (Tcf) – up 9 Tcf or 4% from last year
- ▶ Natural gas prices currently in the 4.39–4.50 range after dropping 20% from its high over the past two years
- ▶ Currently the price of oil is up versus the price of gas and the outlook is for oil prices to continue to rise

Oil Outlook

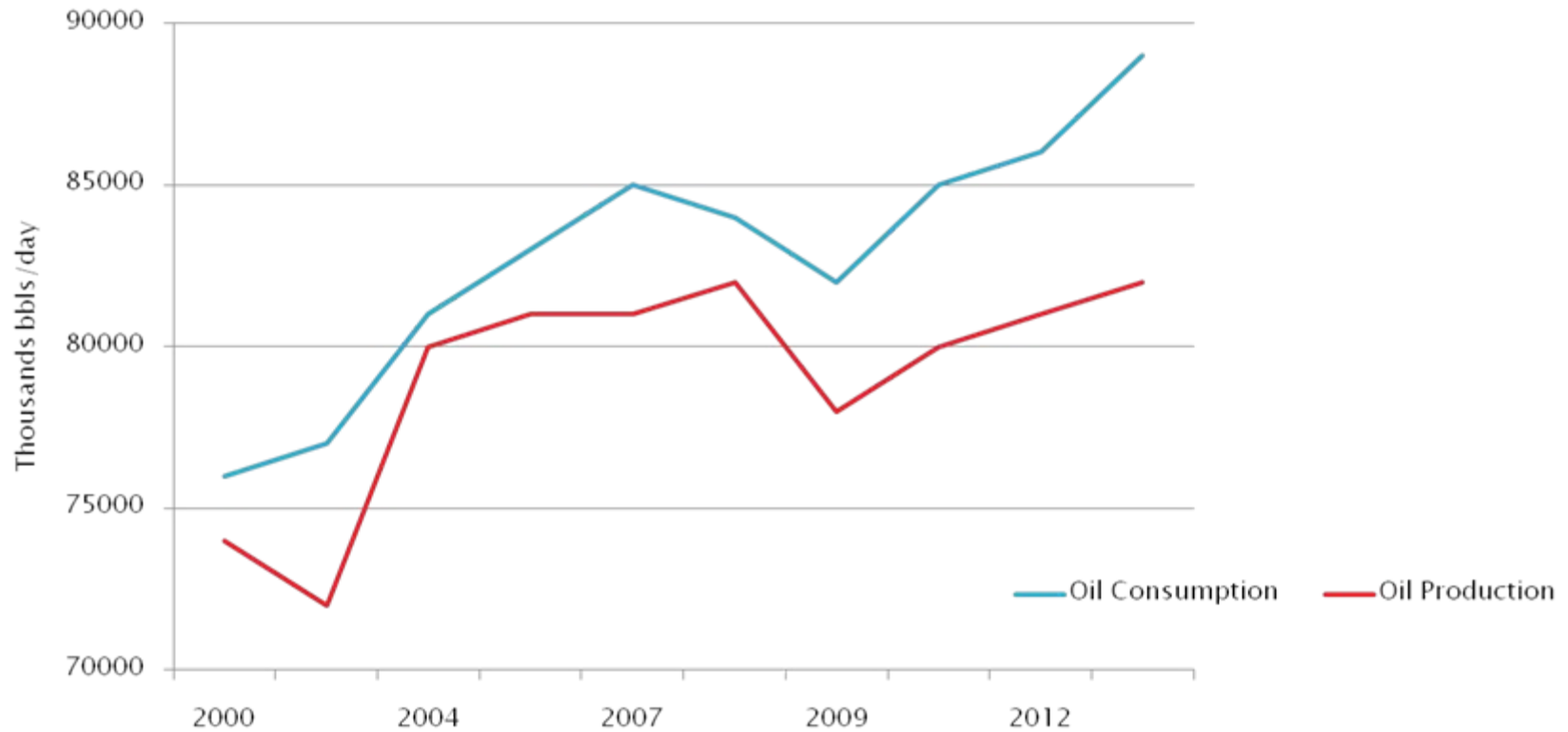
- ▶ Spread between WTI and Brent has widened, over \$16.00
- ▶ Currently WTI around \$85.00 /barrel, Brent-\$104/barrel
- ▶ Historically the spread has been around \$2.00
- ▶ What does it mean? Higher oil prices in the future? Is WTI still a reliable benchmark for investors?

Oil Outlook



Oil Outlook

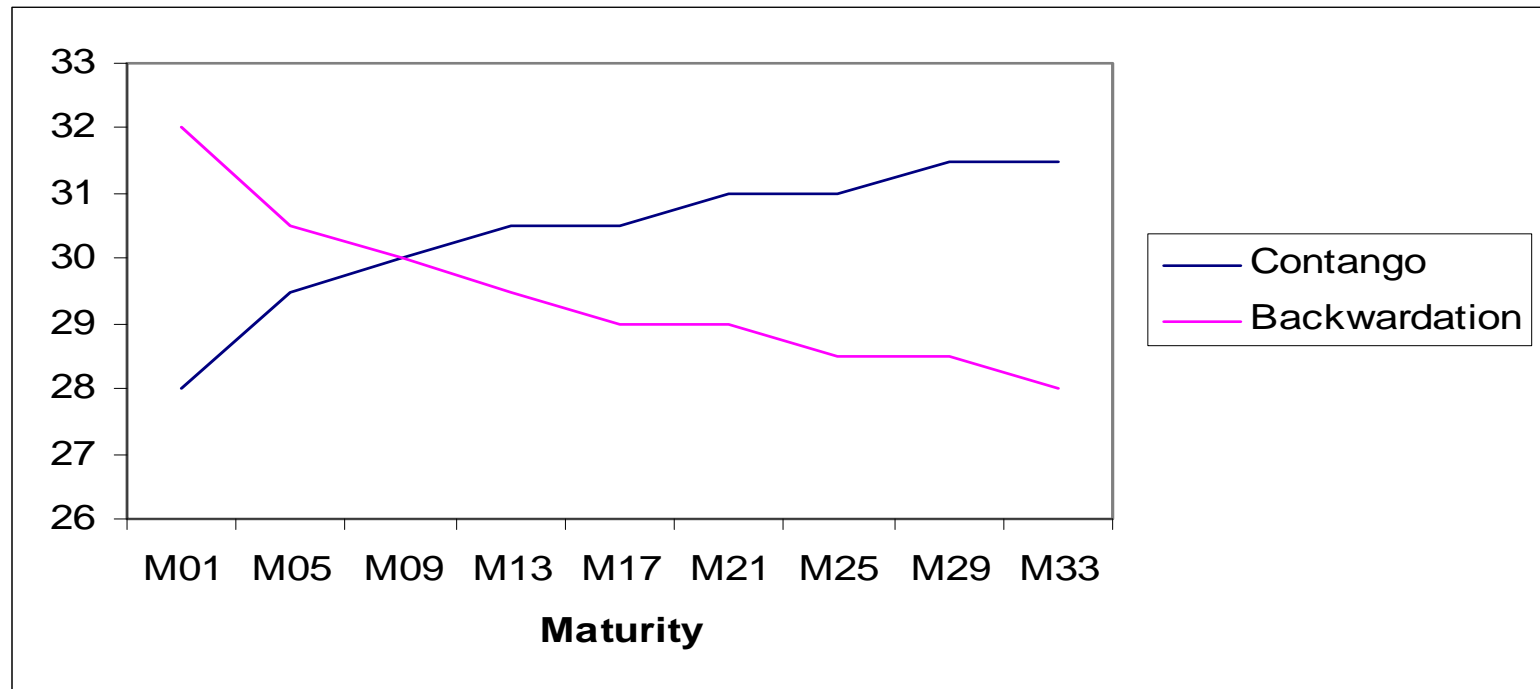
Oil Production and Consumption



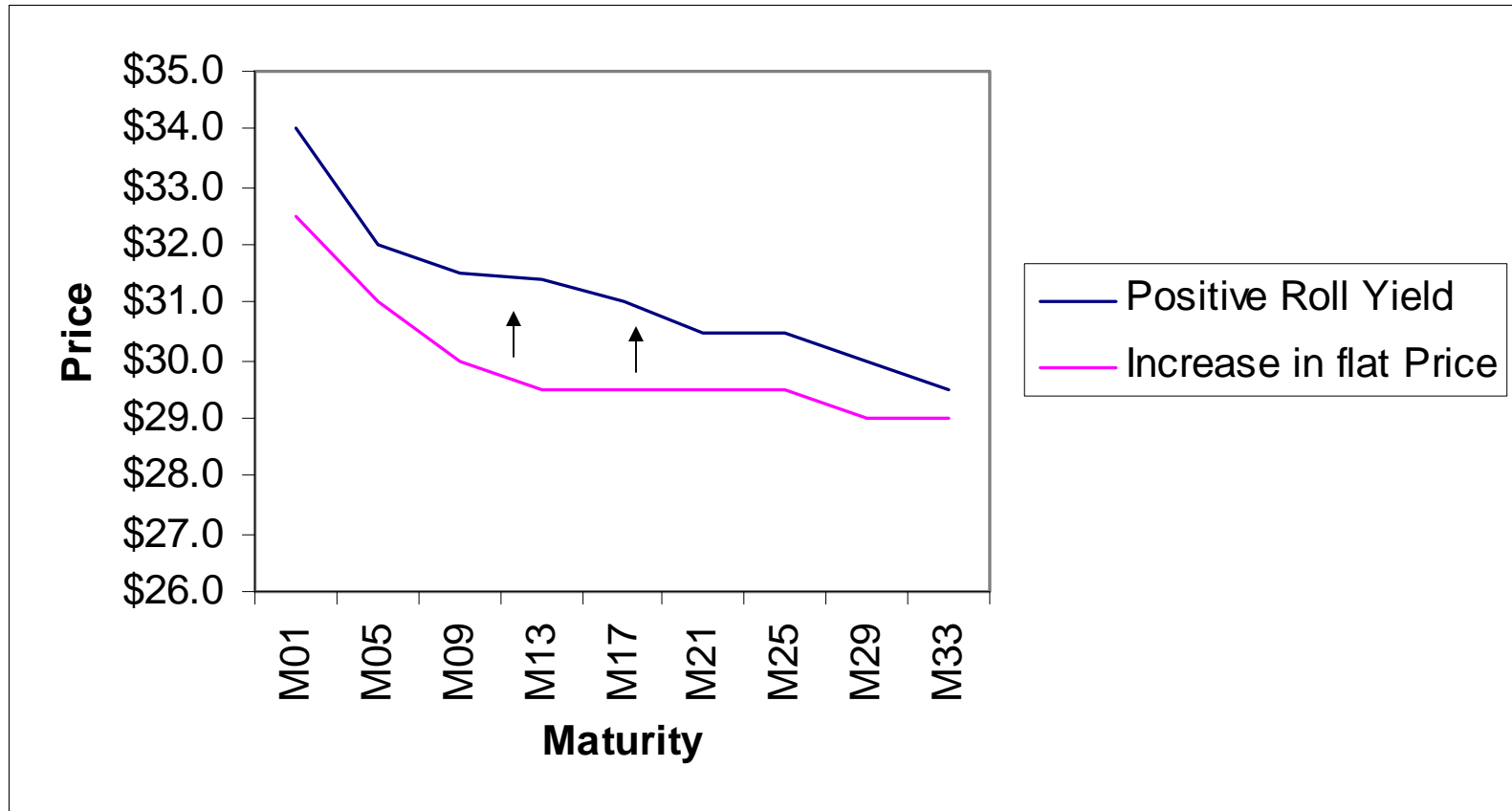
Includes NGL liquids, but not bio-fuel and oil from coal

As a result the ratio between Natural gas and Crude has risen above 20 (closer to 23-25 range)

Backwardation VS Contango



Indices Pay Two Ways in a Rising Market



Backwardation

What does this mean for the speculator? Taking a long position using commodity oil index (MLM, etc) is equal to a long position in one commodity or basket of commodities. The positions are typically held near the front of the month (highest liquidity). But not in the front month (Mo 1) itself. The position in Mo 2 benefits both from the increase in the spot prices and from a positive Roll Yield when the futures' curve is down-sloping when more supply is expensive.

Even if Spot prices remain unchanged, the position holder (Mo 2) still benefits from the yield curve, lets it mature and then rolls it back to the longer-date contract. Method and timing varies by index.

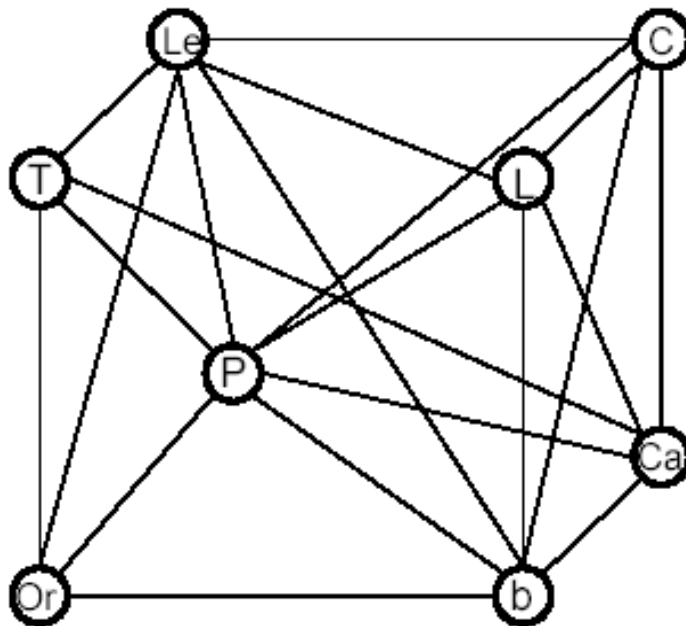
GSCI rolls each month by selling 20% of the prompt contract on each of the fifth through ninth business days of the calendar month and buying into the next contract on the same schedule.

Contango and the loss of roll yield profits

- ▶ Why portfolio managers lose money when the market is in Contango:
- ▶ The price of crude oil futures in the front month is lower (\$75/barrel) than the price of the futures contract (\$80/barrel) in the further month
- ▶ At expiration the front month and spot price of oil converges, the investor rolls the contract to the next month, (higher price of the futures contract) and can buy fewer contracts for the same amount (does NOT lose money)
- ▶ The next month the investor needs to sell (again the price converges with the current spot price), he is selling a smaller number of futures contracts (if the price stays the same \$75/barrel, the futures contract will slowly decay from \$80/barrel – \$75/barrel and the investor LOSES money)

What risk?

Fig. 1.1 *The Risk Matrix*



•Price Risk	–	P
•Credit Risk	–	C
•Liquidity Risk	–	L
•Cashflow Risk	–	Ca
•Basis Risk	–	B
•Legal Risk	–	Le
•Tax Risk	–	T
•Operational Risk	–	Or

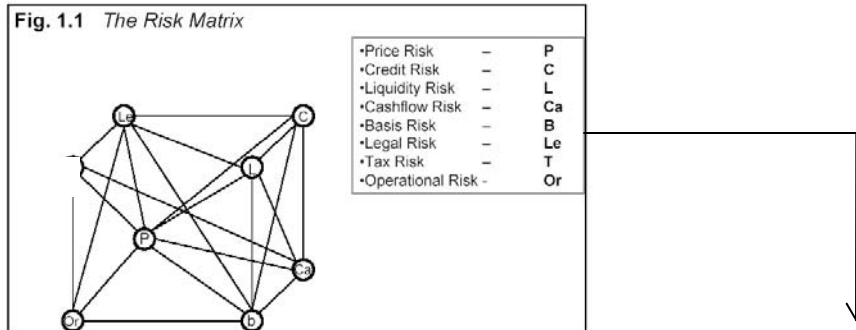
•Structural Risk – Forward curve dynamics

What risk?

Some acute outside risks:

- ▶ Inflation risk
- ▶ Geopolitical risk
- ▶ Weather risk
- ▶ Other risks

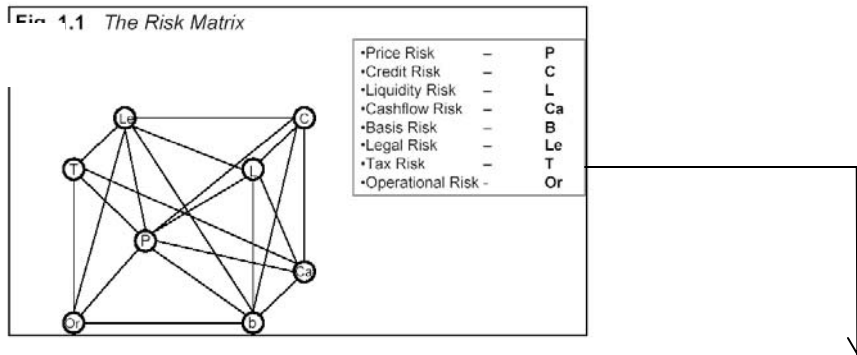
What Risk ?



► Price Risk

- This is the risk of losing money as a result of price movements in the energy markets and is sometimes referred to as ‘market risk’
- Typically, producers will lose money when prices fall, while users will find themselves out of pocket when prices increase

What Risk ?



▶ Basis Risk

- Basis risk is the risk of loss due to an adverse move or the breakdown of expected differentials between two prices (usually different products)
- In the context of price risk management, basis risk describes the risk that the value of a hedge (using a derivative contract or structure) may not move up or down in sync with the value of the price exposure that is being managed

What Risk ?

- ▶ The larger the basis risk, the less useful the derivative is for risk management purposes
- ▶ Basis Risk Components
 - Energy product
 - Location
 - Time

Strategies to hedge oil price risk

- ▶ From the prospective of the commercial hedgers who are strictly participants in the physical market
- ▶ What do refiners use?
- ▶ Most commonly used options structures are crack spread options, Asian options and Calendar options

Strategies to hedge oil price risk

- ▶ From the perspective of the commercial hedgers who are strictly participants in the physical market
- ▶ What do energy producers use?
- ▶ Asian options, Calendar spread options

Strategies to hedge against Basis Risk

- ▶ From the prospective of the commercial producers and refiners
- ▶ From the prospective of the non-commercial hedgers
- ▶ What derivative structure are used
- ▶ New derivative contract (WHC) was launched on the Montreal Derivative Exchange June 18, 2010
- ▶ WCH (futures contract) will hedge West Canadian Crude–WCS
- ▶ WCH Price Methodology is $100 +$ the price difference between one barrel of WCS and one barrel of WTI

Strategies to hedge against Basis Risk

- ▶ Producer hedges the production of WCS using WCH
- ▶ Producer sells his production in the future (3 weeks later) at a price agreed upon today, to protect this price against the risk of price fluctuation between WCS and WTI especially if the price difference widens (his profit will be negatively affected)
- ▶ To lock-in the price differential between WCS and WTI, he enters a hedge using WCH Diff contract

WCH producer hedging the production of heavy crude oil

	TODAY	IN THREE WEEKS
Price of the WTI futures	US\$70.00	US\$66.00
WCS WTI different price (the NGX WCS WTI Crude Oil Index represents the price differential between WCS and WTI)	-US\$10.00 Note: WCS is priced US\$10.00 per barrel lower than WTI.	-US\$16.00 Note: WCS is priced US\$16.00 per barrel lower than WTI.
Implied price of one barrel of WCS	US\$60.00	US\$50.00

WCH producer hedging the production of heavy crude oil

Action	Today	In 3 weeks	Remarks
Step 1 – Hedge the price of one barrel of WCS	Sell WTI futures @ US\$70.00	Buy WTI futures @ US\$66.00	<p>Producer closes out the position in WTI futures.</p> <p>Note: there is no delivery of WTI crude oil as the position is closed before the expiration of the WTI futures.</p> <p>Profit = US\$4.00</p>
Implied price of one barrel of WCS (producer's inventory of heavy crude oil resulting from future production)	US\$60.00	US\$50.00	<p>Loss as a result of the price drop of one barrel of WCS heavy crude oil.</p> <p>Loss = US\$10.00</p>

WCH producer hedging the production of heavy crude oil

Action	Today	In 3 weeks	Remarks
Step 2 – Hedge the basis risk between heavy crude oil and light crude oil	Sell WCH DIFF futures @ US\$90.00	Buy WCH DIFF futures @ US\$84.00	<p>Producer closes out the position in WCS DIFF futures.</p> <p>Note: The producer sells WCH DIFF futures to hedge the basis risk between heavy crude oil and WTI light crude oil.</p> <p>Profit = US\$6.00</p>
Net profit / loss			<p>Net profit / loss = US\$0.00 (resulting in a fully hedged position)</p>

Hedging one barrel WCS (by selling the ETI futures contract) and selling the WCH DIFF contract to hedge the basis risk results in an efficiently hedged position. Without the hedge against basis risk, the producer would have suffered a loss of US\$6.00 per barrel.

Non commercials hedge against basis risk using WCH future contract

- ▶ If investor's view is that the differential between WCS and WTI will widen in the next 2 months
- ▶ Then WCH is quoted @ \$87.75 and the price differential is equal to \$12.25 per barrel (price of WCS=\$100- price of WTI) and investor sells 5,000 barrels of WCS

After 2 months:

- ▶ The price of WCH futures contract drops to \$83.50 and the price differential equals \$16.50 per barrel
- ▶ The investor closes the position
- ▶ The price differential between heavy crude and light crude widens from \$12.50 to 16.50 per barrel
- ▶ Realized profit = \$4.25 per barrel x 1000 barrels of the futures contract before commissions equals \$ 4,250.
- ▶ Total profit: \$4,250 x 5 contracts = \$21,250
- ▶ Size of futures contract = 1000 barrels per futures contract

Risk management strategies for non-commercials

- ▶ Use ETFs
- ▶ Use ETCs
- ▶ Use Co2 and Coeq

Oil ETF / ETC

- ▶ Offer exposure across the oil curve
- ▶ Exchange traded funds, tracking an index , which is linked to a commodity (crude oil) and tracking the spot price
- ▶ Fully collateralized or fully backed (ETC) by the commodity they are representing
- ▶ Short ETC versus Long ETC: Short ETCs track spot movements more closely , more affected by contango
- ▶ Long ETC: Longer dated futures are more driven by long term supply/demand, less affected by contango

Risk Strategies for non-commercial / non-traditional investors

- ▶ Depend on the investor's risk appetite and time horizon
- ▶ To hedge against negative roll yield
- ▶ First calculate your cost of the negative roll yield carry
- ▶ For a long position buy ETC with longer maturities (3 months) which are less sensitive to contango
- ▶ For more risk averse investors who prefer to ride the forward curve buy ETC with shorter maturities

The new energy commodity and how non-commercials use it to manage price risk

- ▶ The new energy commodity is Co₂ (carbon dioxide) and carbon equivalent (Coeq)
- ▶ What is it? Classified as a commodity similar to energy
- ▶ Price is formed by market dynamics, but compliance is government mandated
- ▶ Important for non-commercials because the price of Co₂ and Coeq tends to go in the opposite direction of crude oil.

Geopolitical Risk

- ▶ What can/cannot be predicted using models, statistics etc?
- ▶ Was the crisis in Egypt predictable or is it “Black Swan”?
- ▶ Is there a hedge against it?
- ▶ Example: Russia and China have a direct pipeline from China to Kazakhstan
- ▶ Example: US– Alberta direct pipeline
- ▶ Are these oil safe heavens?

New rules setting position limits proposed by the CFTC

- ▶ Volcker Rule
- ▶ Sets speculative position limits in the Energy Markets
- ▶ What is the methodology for setting position limits?
- ▶ Regulations in the OTC Swaps Market

New rules setting position limits proposed by the CFTC

- ▶ CFTC sets speculative position limits in energy futures markets (on products beyond agricultural commodities)
- ▶ What are the liquidity and price risks of the new rules
- ▶ Discussion of arguments presented for and against the new rules