



“It’s All About Volatility” – Grain and Freight





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Global asset prices are changing more quickly

It is obvious to many that the variability of most asset prices is greater in recent times

	2003	2008
ASX 200 Daily Average Price Movement	0.54%	1.62%
GSCI Daily Average Price Movement	1.14%	1.89%

ASX 200 Index



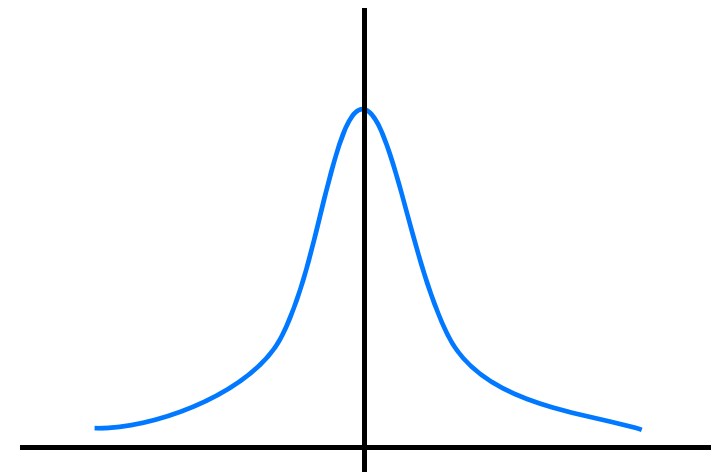
GS Commodity Index





“It’s All About Volatility” – Grain and Freight

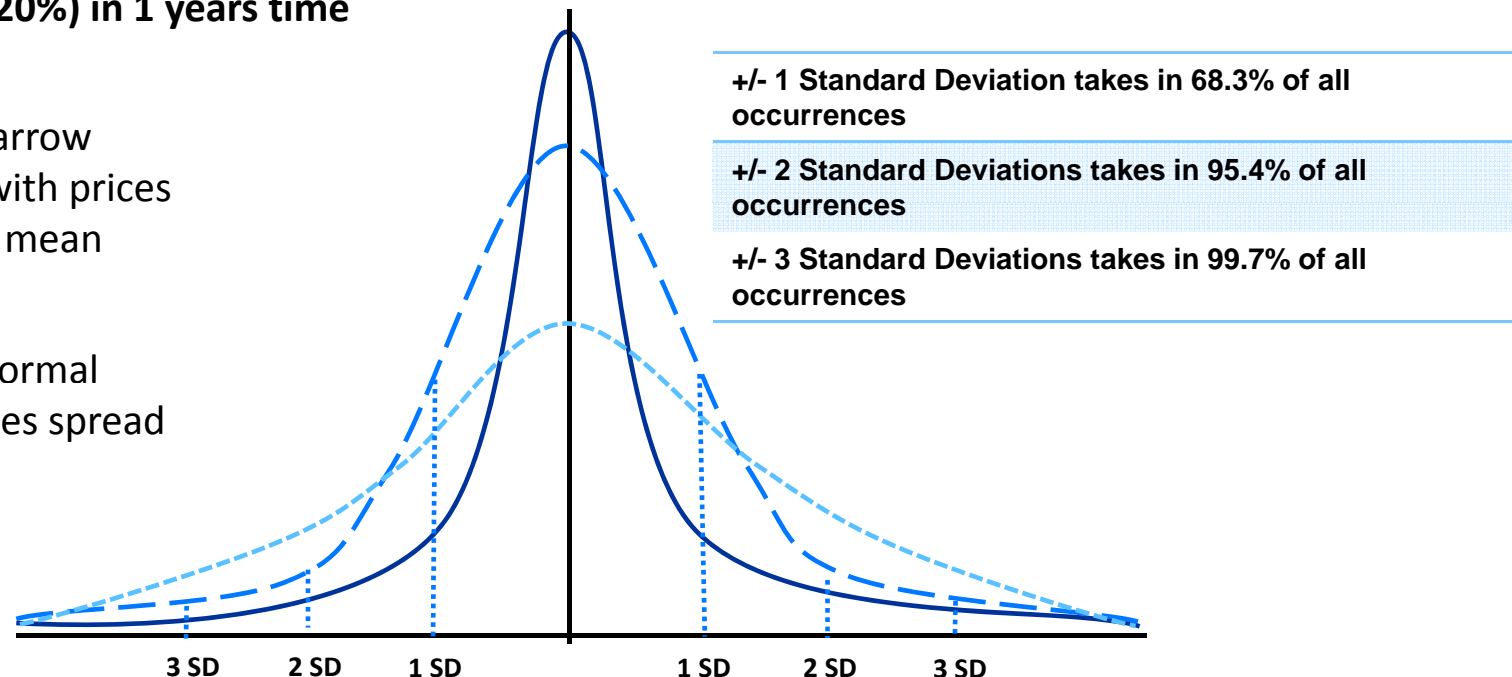
- Volatility Explained
- The Practical Implications of Volatility – Risk
- Observations – Volatility in the Grain and Freight markets
- Implied Volatility – Derivatives and a Predictor of Future Price



- Statistically, volatility is a measure of the dispersion of returns of an asset
- Hence, volatility is like a standard deviation or the degree by which values (e.g. price) will vary from the mean (e.g. today's price)
- Volatility provides us with a 1 standard deviation price change over a period of 1 year ... **one would expect with a 68% confidence level that an asset with a price of 100 and volatility of 20% will have a price of 80 – 120 (100 +/- 20%) in 1 years time**

- Low volatility = a narrow normal distribution with prices gathered around the mean

- High volatility = a normal distribution with prices spread widely





Volatility Explained

- In practical terms, volatility describes the “speed” of a market.
- Volatility refers to the amount of uncertainty or risk about the size of changes in the value of an asset.
- A higher volatility means that an asset’s value can potentially spread out over a larger range of values ... price can change dramatically over a short time period in either direction.
- A lower volatility means that an asset’s value does not fluctuate dramatically, but changes at a steady pace over a period of time.
- We can also differentiate between two types of volatility:
 - Historical Volatility*** is volatility that has been observed or realised
 - Implied Volatility*** is a consensus volatility among market participants with respect to the expected amount of price fluctuation over a period of time



Volatility – The Practical Implications

- Volatility has significant implications for any investor or economic entity because it is inextricably linked with the notion of risk (or the uncertainty of outcome) and the variability of the return of an asset.
- Value at Risk (VaR) methodology enables us to use volatility as an input to calculate the return of an asset over a period of time. VaR attempts to answer a question like:

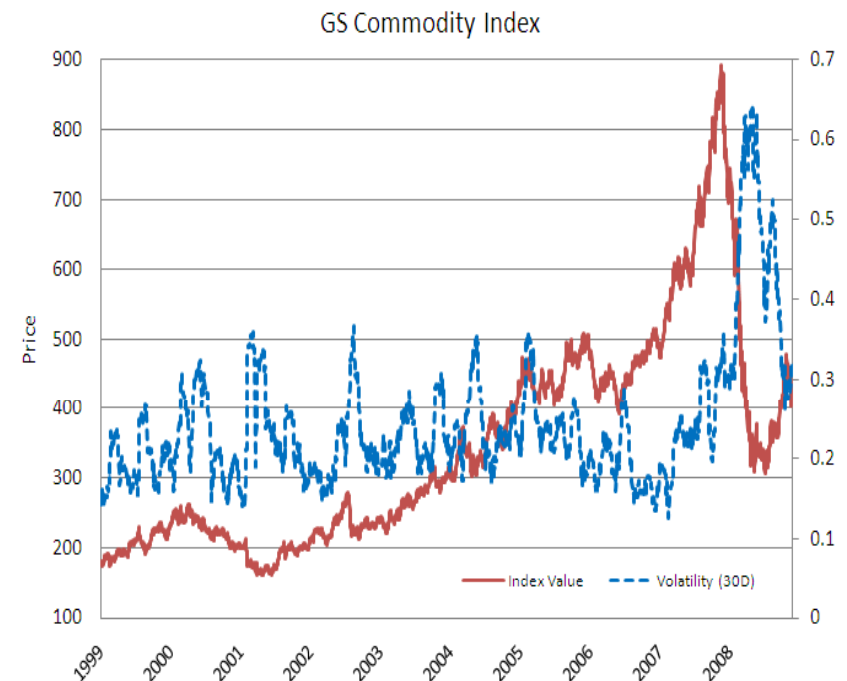
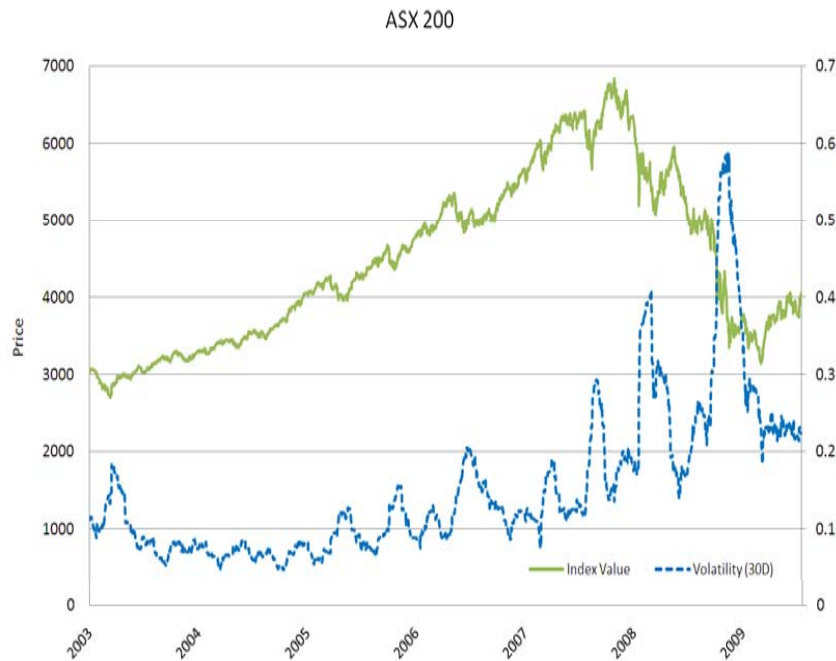
“What is the most I can – with a 95% level of confidence (= 2 Standard Deviations) – expect to lose in dollars over the next week?”

- **Today**, an Australian wheat producer with **1,000mt** of APW wheat and a delivered port price of **A\$250/mt** would expect – with a 95% likelihood – that **in one week** the wheat price could move up or down by **A\$11.87/mt**. The volatility of the domestic wheat market (ASX Futures) is approx. 21%.

- **One year ago**, an Australian wheat producer with **1,000mt** of APW wheat and a delivered port price of **A\$325/mt** would expect – with a 95% likelihood – that **in one week** the wheat price could move up or down by **A\$33.53/mt**. One year ago the volatility of the domestic wheat market (ASX Futures) was approx. 47%.

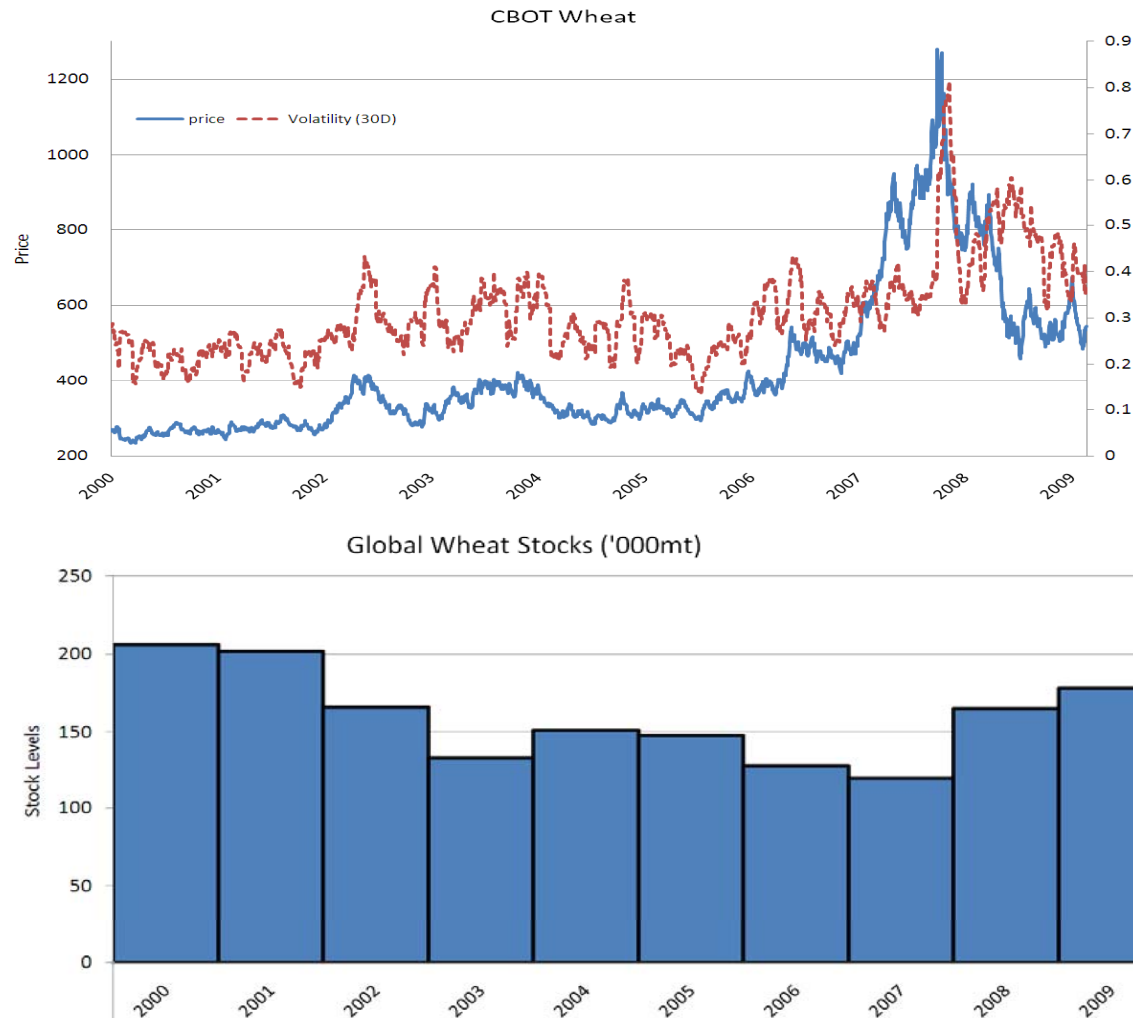
Observations – Grain and Freight

- Volatility tends to increase in bullish commodity markets as stock or inventory reductions make it more difficult for market participants to find price equilibrium (*in 2007/2008 where was the point at which the price of wheat 'rationed' demand?*)
- However, the Global Financial Crisis of 2008, showed that prices can also vary considerably in bearish markets (*consider the spike in volatility coinciding with the collapse of Lehman Brothers on 15 Sept 2008*)



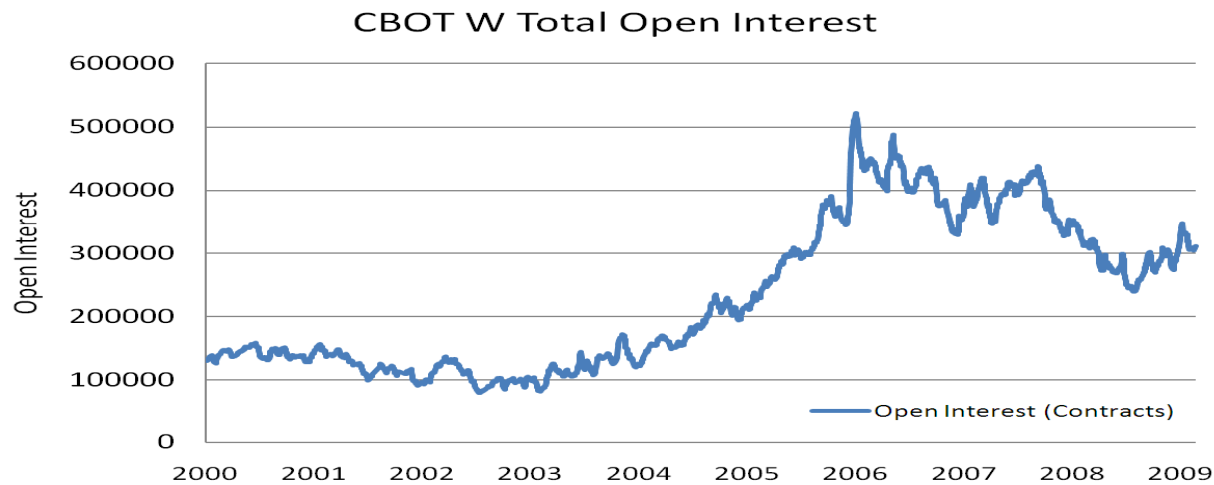
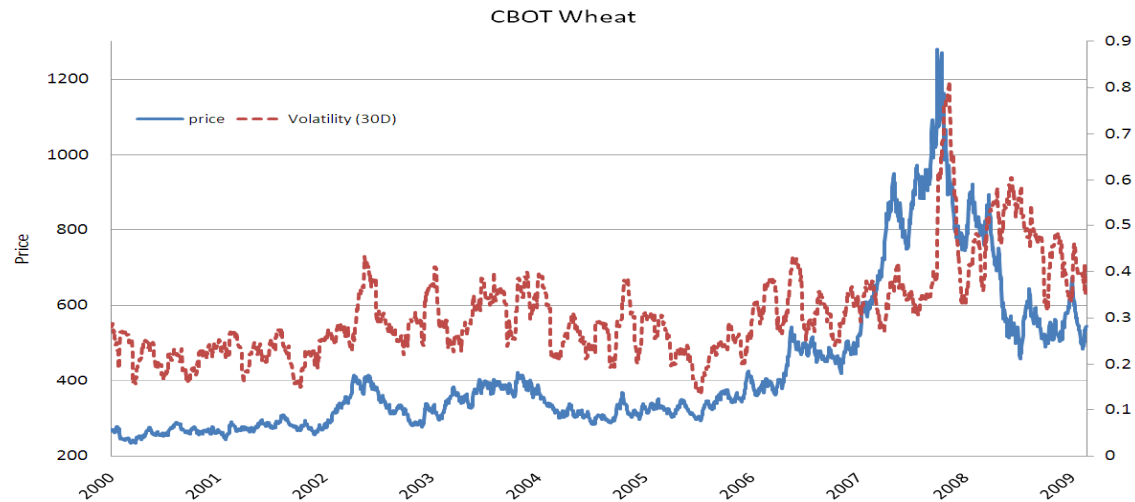


Wheat price volatility is linked to stock levels





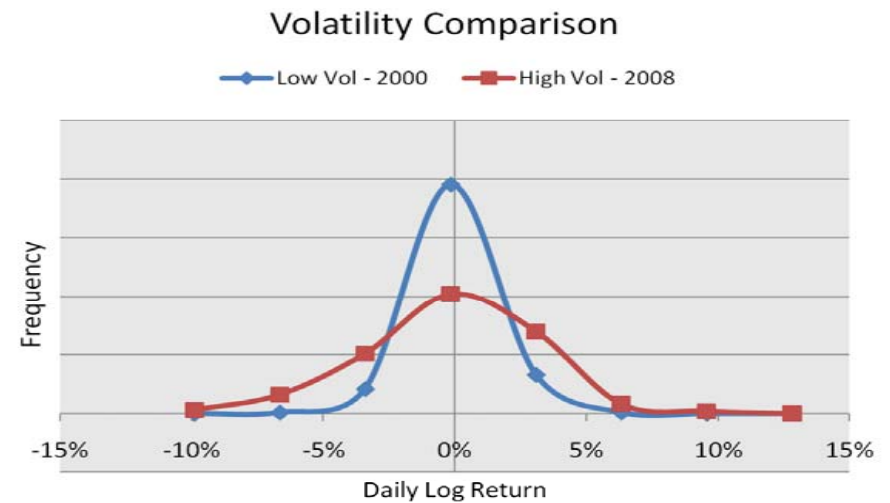
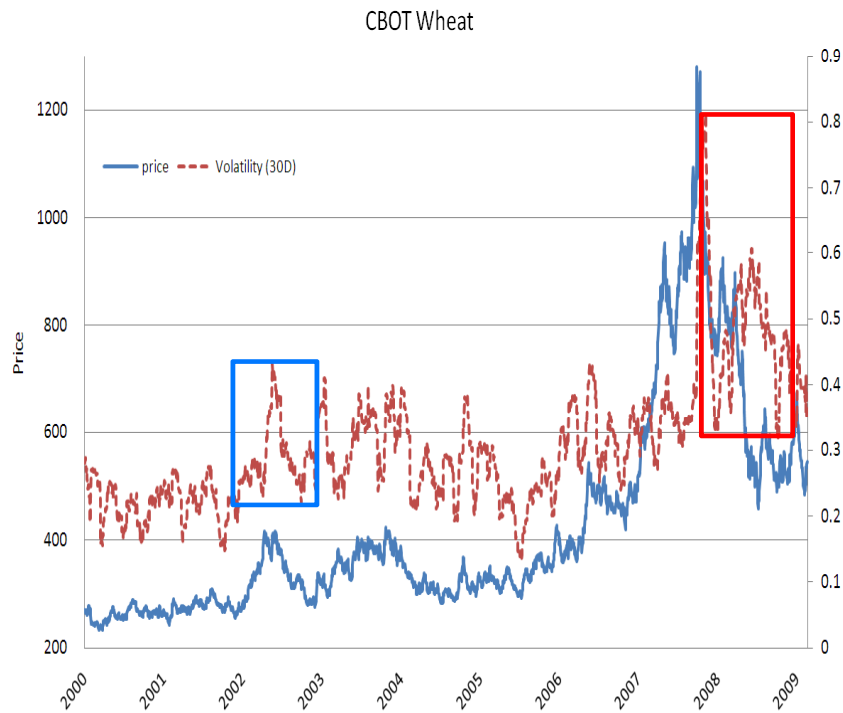
Market open interest impacts volatility





A comparison of daily price returns

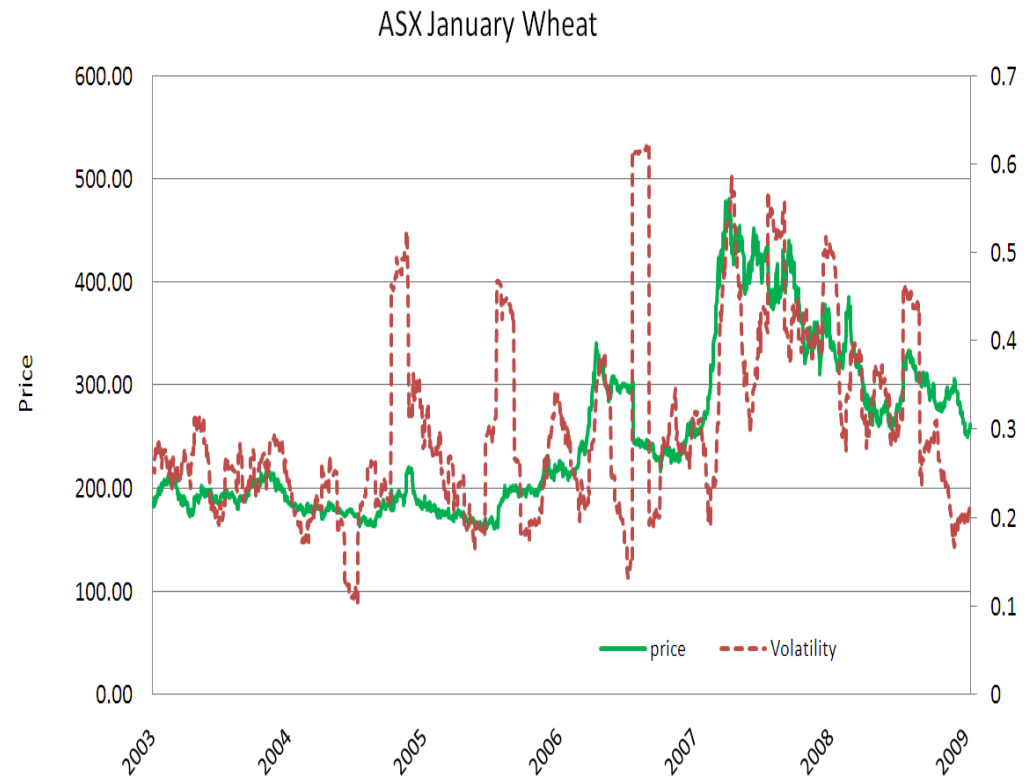
- The distribution of daily price variance in CBOT wheat futures is greater in 2008 than in 2000





The Australian wheat producer

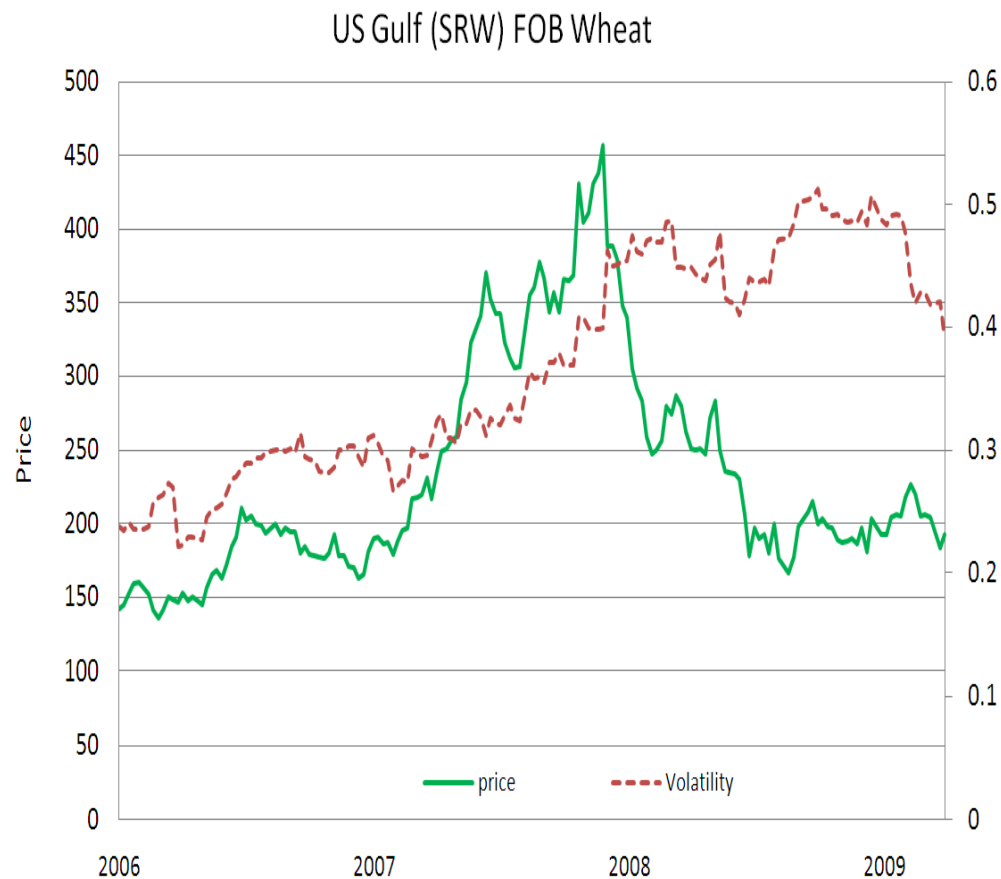
- Over the past 3 years, the average historical volatility in the Australian domestic APW market was 34.7%
- Today the historical volatility for the APW wheat market is 21% so in 1 week a producer might expect (with a 95% confidence level) price to move up or down by 4.75%





The US wheat producer

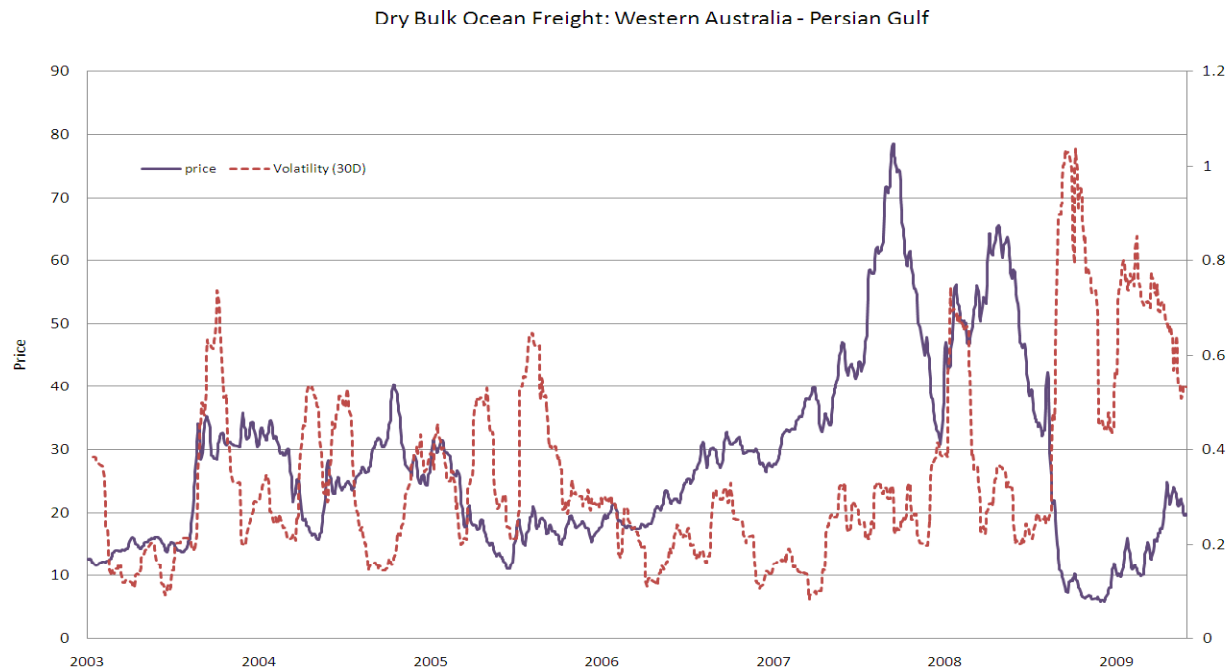
- Over the past 3 years, the average historical volatility in the US SRW market was 37.5%
- Today the historical volatility for the SRW wheat market is 39% so in 1 week a producer might expect (with a 95% confidence level) price to move up or down by 8.64%





Freight – the most volatile of all

- In the corresponding 3 years the panamax market experienced an average historical volatility of 38.9%
- Today the historical volatility for the panamax spot market is 43.5% so in 1 week a ship owner might expect (with a 95% confidence level) price to move up or down by 9.59%



Source: Baltic Exchange, Macquarie.



A comparison of returns

- A comparison of returns in 2009

Commodity	Price	Historical Volatility	Weekly VaR Price Move (%)	Weekly MTM VaR
Australian Wheat (1,000mt)	A\$250/mt	21%	4.75%	A\$11,873
US Wheat (1,000mt)	US\$192/mt	39%	8.64%	US\$16,588
Panamax Freight (65,500mt)	US\$20/mt	43.5%	9.59%	US\$125,595

- A comparison

Commodity	Price	Historical Volatility	Weekly VaR Price Move (%)	Weekly MTM VaR
Australian Wheat (1,000mt)	A\$325/mt	47%	10.32%	A\$33,532
US Wheat (1,000mt)	US\$263/mt	45%	9.9%	US\$26,040
Panamax Freight (65,500mt)	US\$58/mt	20.5%	4.64%	US\$176,223

Source: Baltic Exchange,



Freight has a very high volatility of volatility

- In the period between 1999 and 2007 commodity (absolute) returns were extremely variable

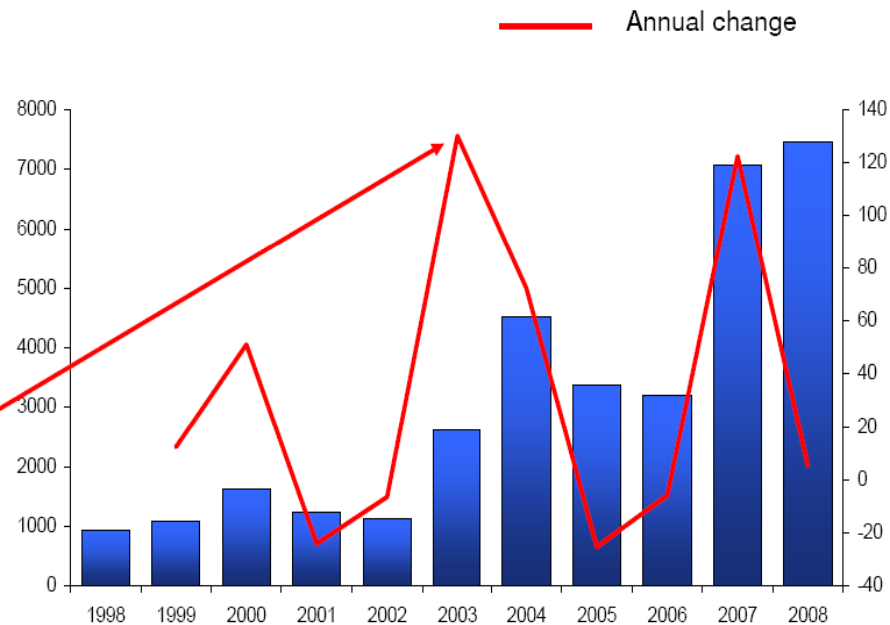




Freight has a very high volatility of volatility

- Freight however trumps them all!

	BDI	Change (%)	Rank
1998	945		
1999	1063	12.5	9
2000	1608	51.3	3
2001	1217	-24.3	11
2002	1137	-6.6	12
2003	2617	130.2	2
2004	4510	72.3	1
2005	3371	-25.3	15
2006	3179	-5.7	13
2007	7070	122.4	1

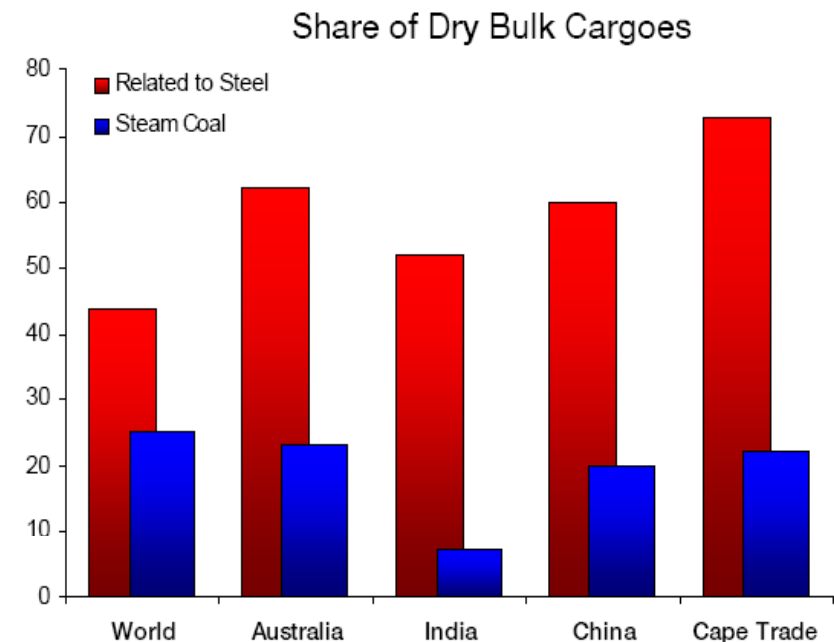
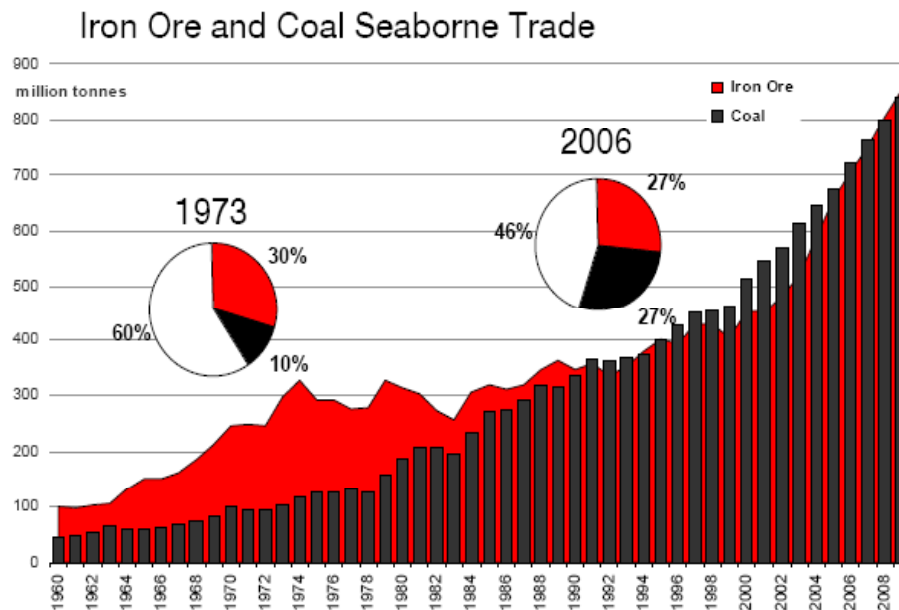


- In recent years, freight has either been in the top or bottom of annual commodity price changes



So why is Freight so volatile? - Demand

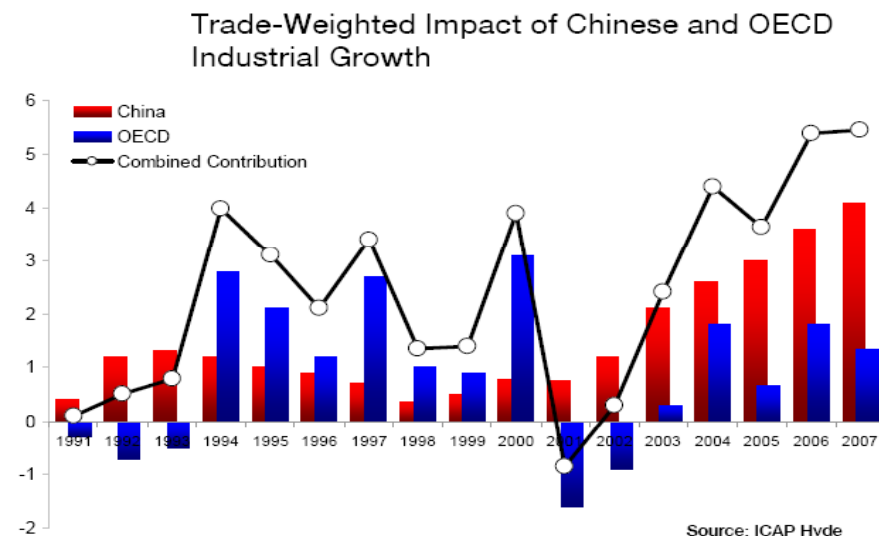
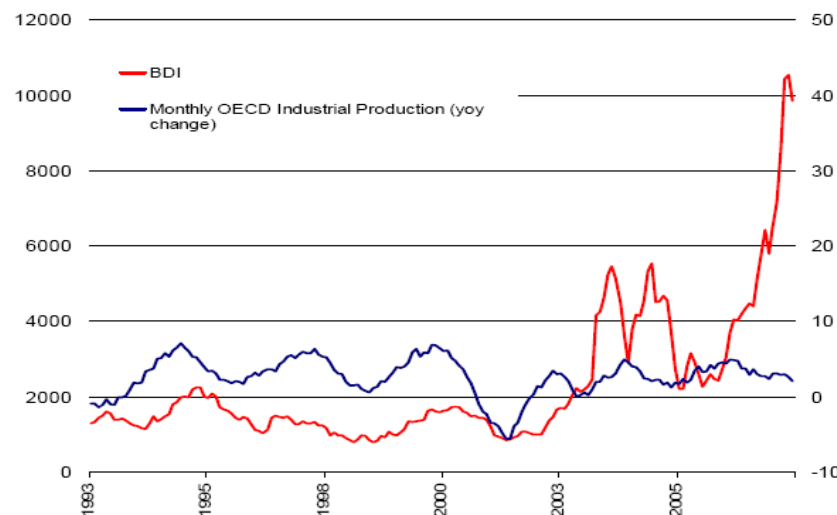
- Dry bulk freight (represented by the Baltic Dry Index) has often been called a measure of global industrial production
- Dry bulk freight encompasses a variety of commodities (and historically, grain was the 'swing' factor) but it is dominated by the inputs for steel and thermal coal for electricity generation
- The BDI is therefore a measure of heavy industrialisation in ocean freight dependent countries





So why is Freight so volatile? - Demand

- More specifically, iron ore and coal dominate the freight market as does one country ... China
- Historically freight was predictable – there was an obvious correlation between OECD industrial growth and the price of freight
- After the 1990 recession, the trends of OECD growth impacted freight rates. However this relationship broke down in 2003 as OECD growth remained in its historic range while freight rates rallied to the extreme
- Chinese industrial growth had been strong for more than a decade – but only after 2003 did China's aggregate impact on global industrial production outweigh that of the OECD



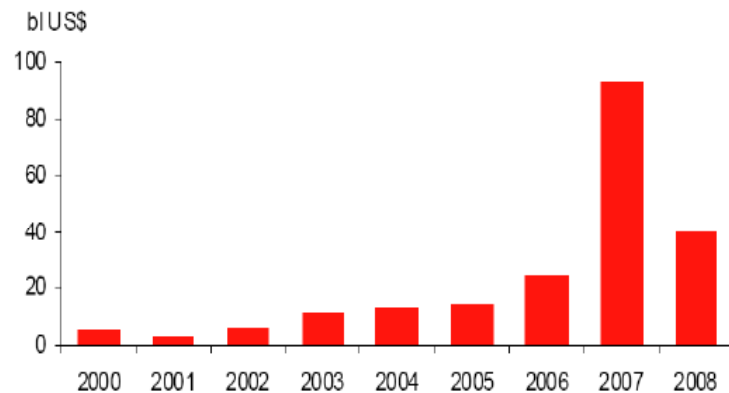
Source: Baltic Exchange, ICAP Hyde, OECD.



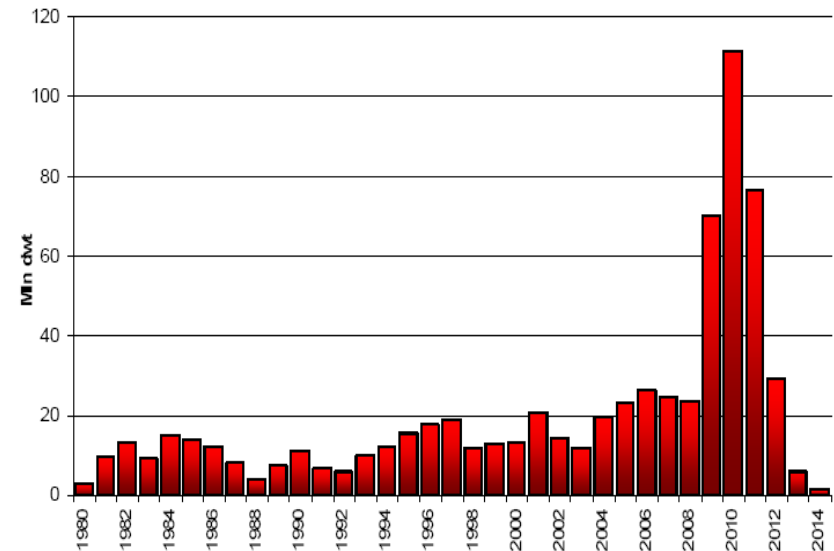
So why is Freight so volatile? - Supply

- The insatiable Chinese demand driving freight rates drove up the investment in dry bulk vessels in 2007

Investment in Dry Bulk Vessels (\$bn)



Dry Bulk Fleet Profile



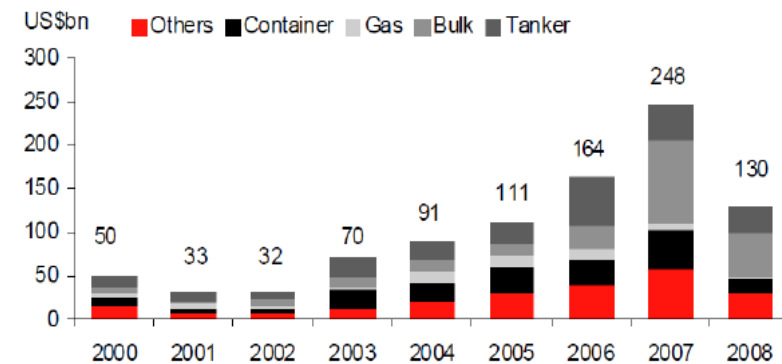
- The potential scale of deliveries, even in the face of Chinese demand, dwarf anything in recent history
- Most of the growth is in the Capesize market and the sector could be burdened with oversupply for years



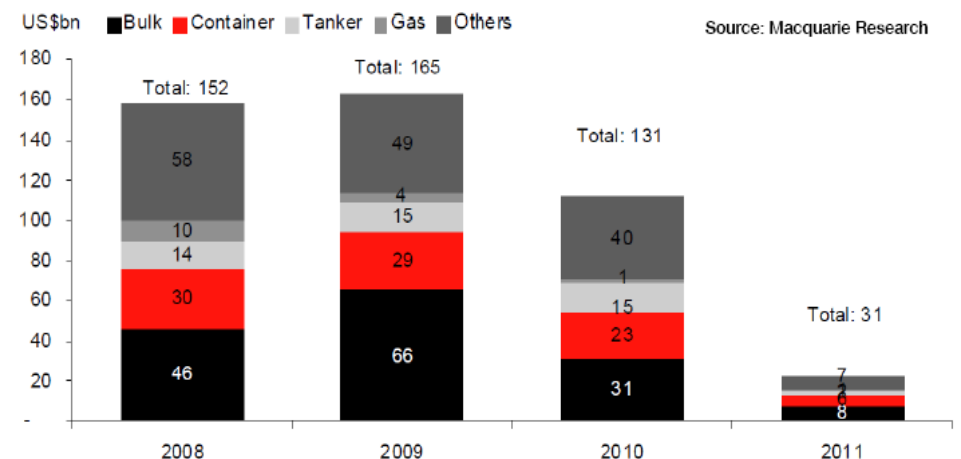
So why is Freight so volatile? - Supply

- The financial crisis is making it difficult to gauge how much shipping capacity will actually be delivered to the market
- Estimates from the Macquarie equity team show that current rates sit just under a breakeven scenario for the investment that occurred in the period 2H07 – 1H08.
- The delivery of much of the order book will depend on banks funding and whether or not financing obligations are fulfilled... a recent S&P report downgraded many of the European banks which cater to the ship builders stating that “the current vessel order book represents a threat to banks’ collateral values, and substantial liquidity/financing risk for shipping companies”.

Ship investment



New-build orders needing to be financed in following years



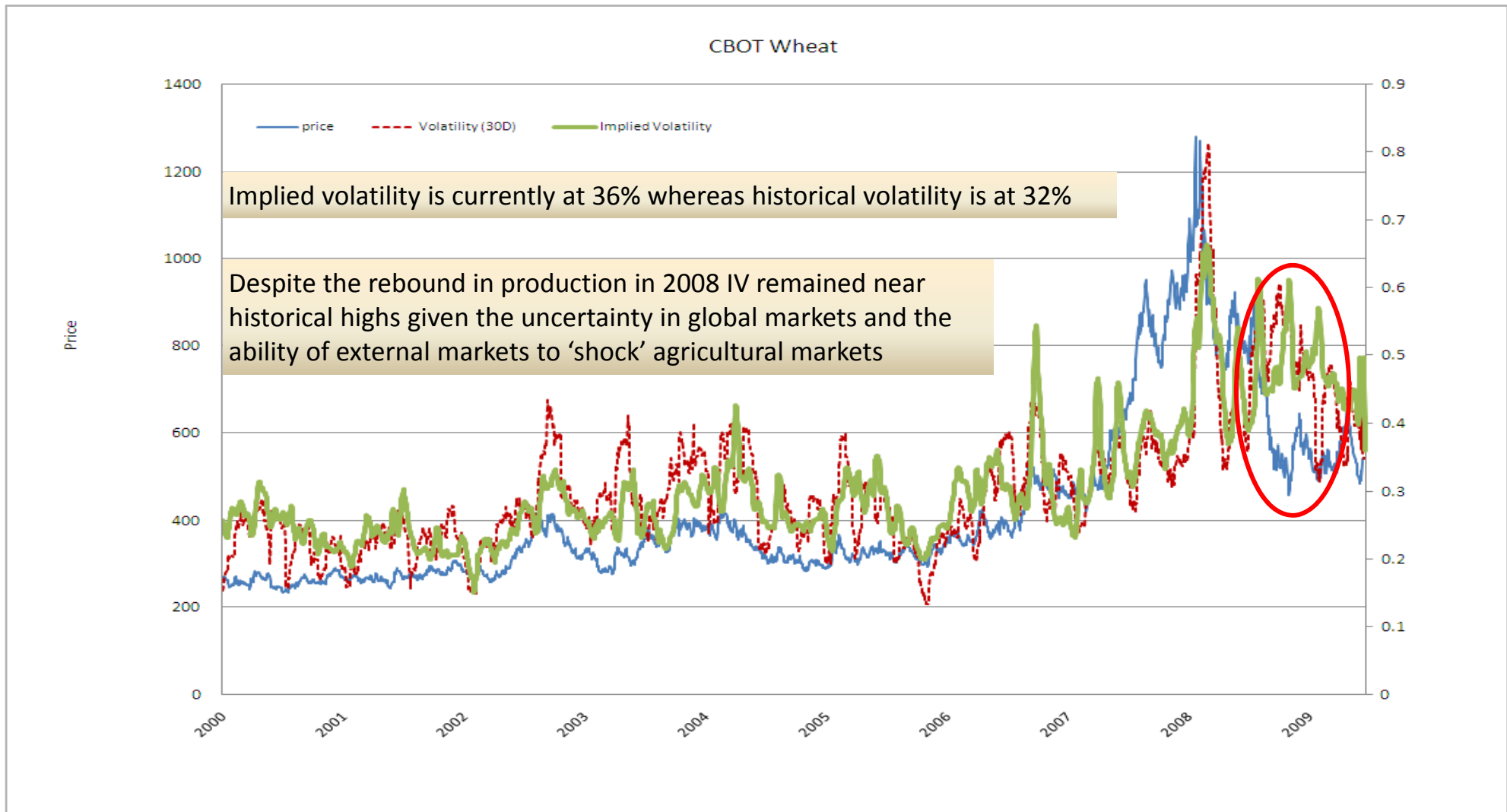


Implied Volatility

- Implied volatility reflects what the market thinks about the future volatility of the price of an asset
- Implied volatility most likely takes into account what has happened in the past (the historical volatility of a market)
- Implied volatility can be found in the price of an option in a market
- As an option is an insurance or a derivative instrument entailing the right to buy or sell an asset at a particular price, implied volatility impacts the cost of this insurance



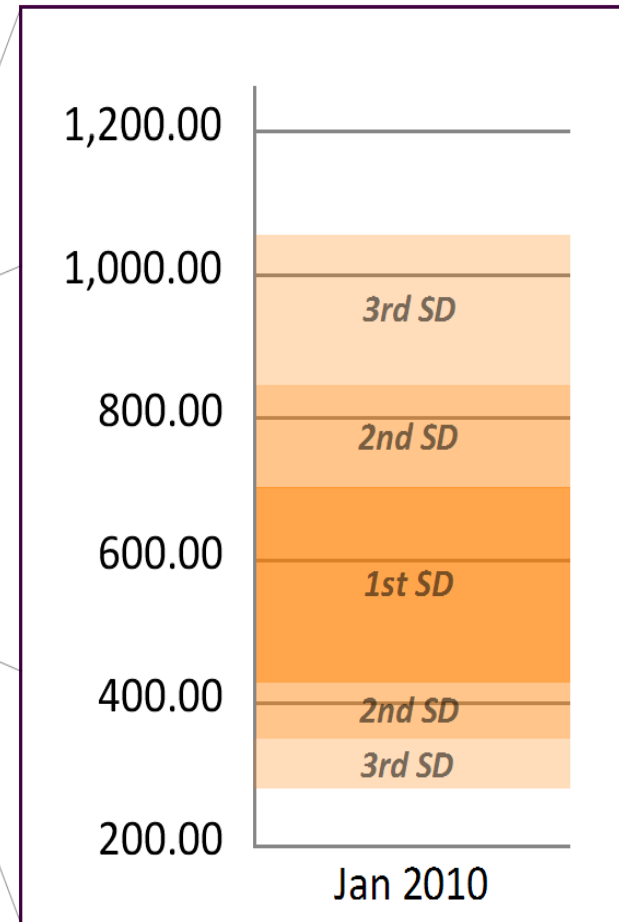
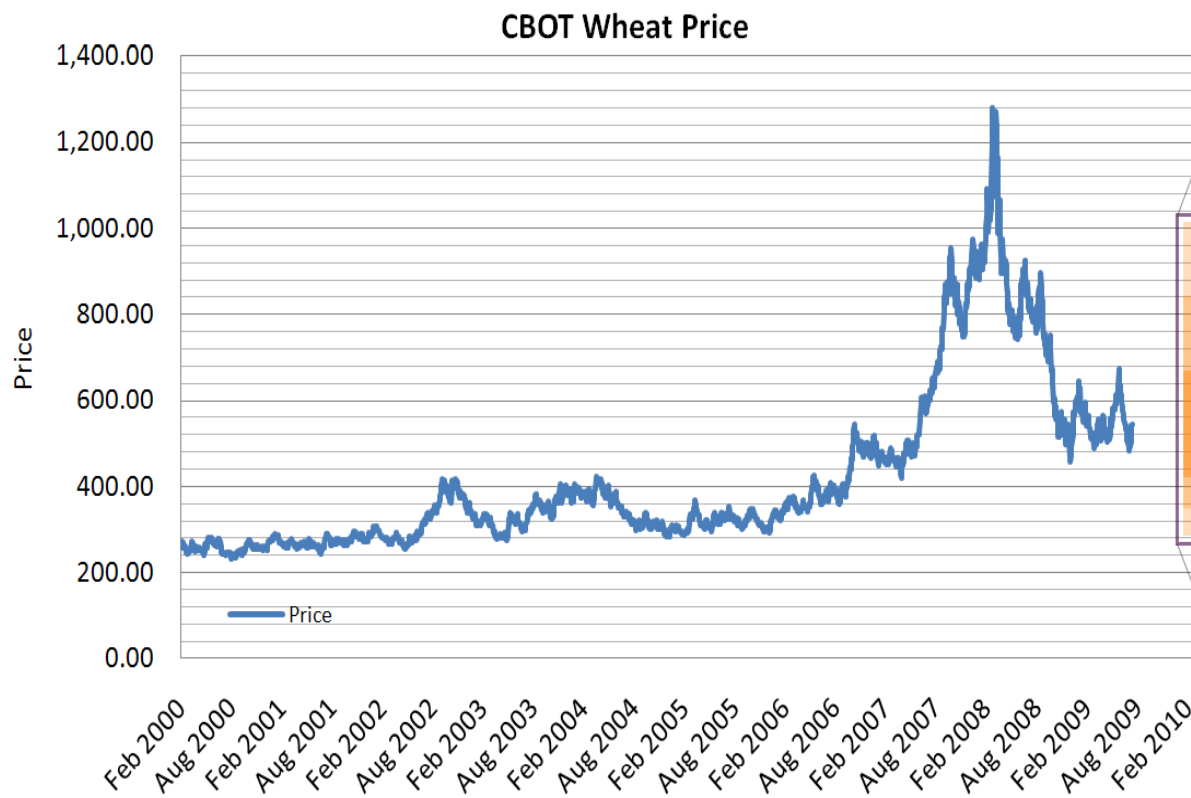
CBOT Wheat Implied Volatility



Source: Bloomberg, Macquarie.

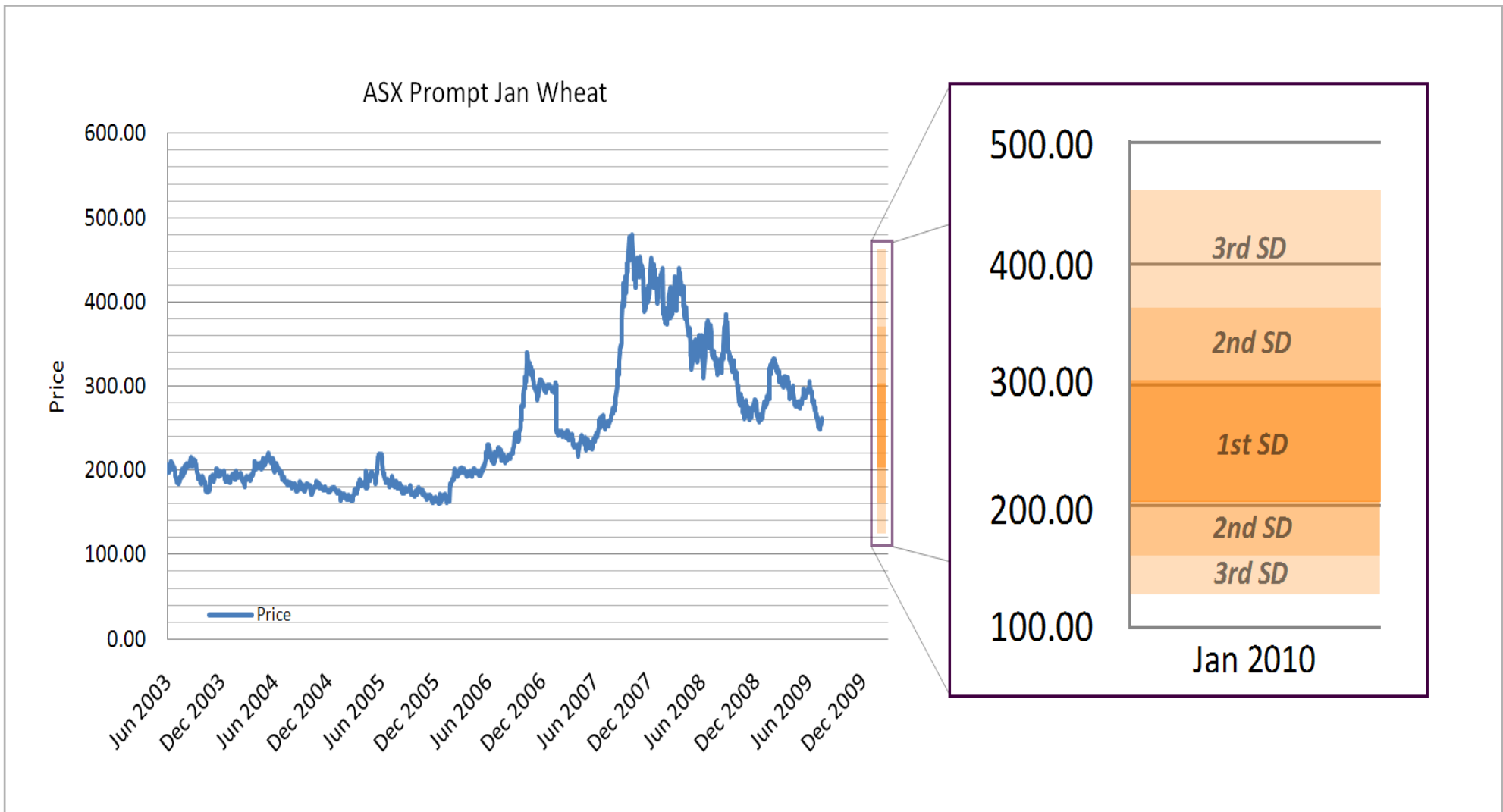


Implied Volatility – a predictor of price





Australian wheat price in the next 6 months?



Source: Bloomberg, Macquarie.



Summary and Conclusions

1. Volatility is more than just a commonly bandied term amongst traders! It is a real concept and has significant implications for an individual or firm
2. In a highly volatile price environment these implications are; greater variability in the costs and returns of production (profitability)
3. The higher correlation between most asset classes today and the variable nature of production will not see volatility diminish greatly in the coming months
4. The speed of markets will effect both pain and gain on its participants
5. Take the time to educate yourself on the advantages and limitations of derivatives and try and embrace risk management products ... explore beyond the possibilities of a 'Swap' and consider paying money for commodity price insurance (an option)



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Thank you

