

**SEMINAR: Risk Management Alternatives in  
Global Dairy Markets**

***Price Volatility in European Dairying  
- A new Opportunity for Risk Management***

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**Chicago**

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# Price Volatility in European Dairying

- Introduction: Dairying, Europe and USA
- Review Price Volatility 1990-2011
- Causes of Volatility
- Consequences of Volatility
- Possible measures to alleviate Volatility
- The Future

## Dairying 2010: EU and USA: Milk

|                                     | <b>EU (27)</b>     | <b>USA</b> | <b>EU/USA</b> |
|-------------------------------------|--------------------|------------|---------------|
| <b>Dairy Farms<br/>'000</b>         | 836                | 62.5       | 13            |
| <b>Av. Herd Size,<br/>Cows</b>      | 28<br>(3.5 to 260) | 146        | 0.2           |
| <b>Dairy Cows<br/>Mill.</b>         | 23.2               | 9.1        | 2.5           |
| <b>Milk Supply<br/>Mill. tonnes</b> | 136.4              | 87.5       | 1.5           |

## Dairying 2010: EU and USA: Products, '000 tonnes

|               | EU (27) | USA   | EU/USA |
|---------------|---------|-------|--------|
| <b>Cheese</b> | 8,334   | 4,739 | 1.75   |
| <b>Butter</b> | 1977    | 709   | 2.8    |
| <b>SMP</b>    | 1,050   | 823   | 1.3    |
| <b>WMP</b>    | 728     | 32.2  | 23     |

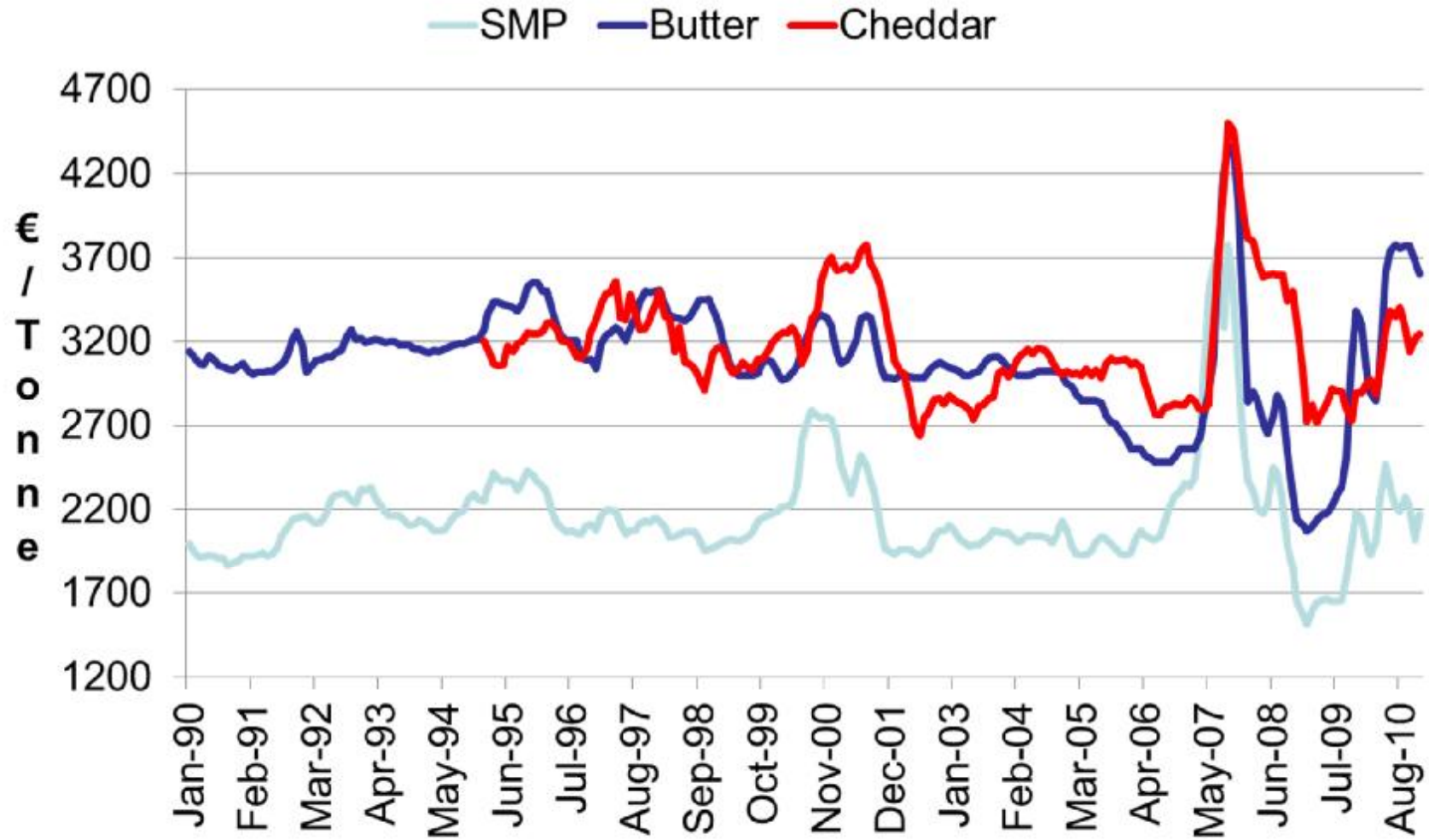
## Global Dairy Companies: (Rabo) Dairy Product Sales 2010: \$ bill

|             |      |             |     |
|-------------|------|-------------|-----|
| 1 Nestle    | 28.0 | 11 Unilever | 6.7 |
| 2 Danone    | 16.4 | 12 Saputo   | 5.7 |
| 3 Fonterra  | 12.1 | 13 Meiji    | 5.5 |
| 4 Lactalis  | 12.0 | 14 DMK      | 5.3 |
| 5 Fri-Camp  | 11.7 | 15 Sodiaal  | 5.3 |
| 6 Dean      | 10.9 | 16 Parma.   | 5.2 |
| 7 DFA       | 9.8  | 17 Morin.   | 5.1 |
| 8 Arla      | 9.1  | 18Bongrain  | 4.7 |
| 9 Calif. Dy |      | 19 Mengnui  | 4.5 |
| 10 Kraft    | 7.0  | 20 Yili     | 4.3 |

# Global Dairy Companies: (Rabo) Dairy Product Sales 2010: \$ bill

|        |    | EU |   | USA |   | Other |
|--------|----|----|---|-----|---|-------|
| Top 5  | 4  |    | - |     | 1 |       |
| Top 10 | 5  |    | 4 |     | 1 |       |
| Top 20 | 10 |    | 4 |     | 6 |       |

# EU Dairy Commodity Prices



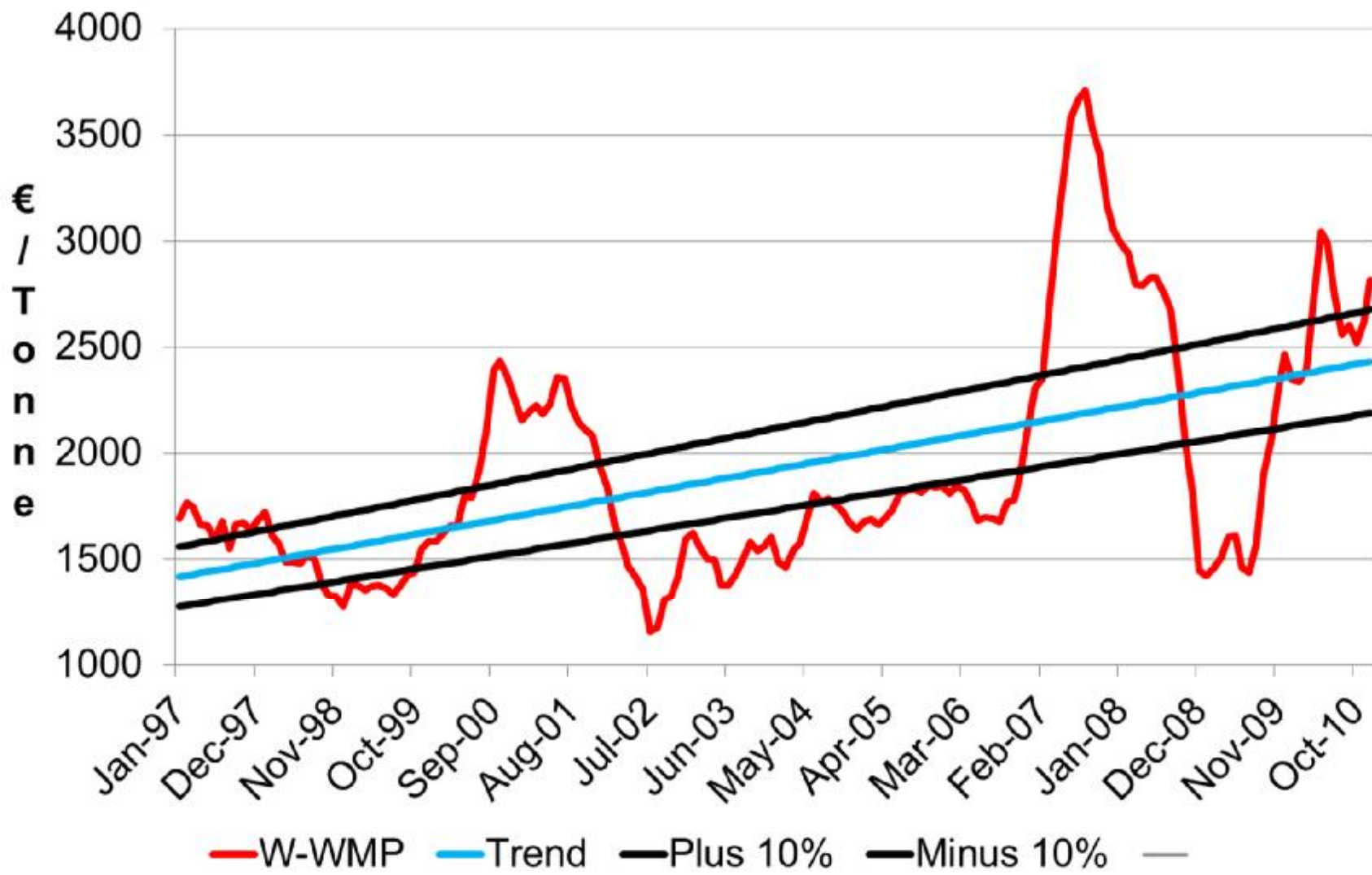
# Defining and Measuring Volatility

Definition: Price volatility is a directionless measure of the extent of the variability of a price. (Gilbert and Morgan 2010).

Measurement:

- Simple – non technical
- Technical - Economics/Statistics
  - Standard Deviation
  - Coefficient of Variation
  - Historic Volatility: Annualised Standard Deviation (ASD)
  - Implied Volatility
  - Econometric Time Series – GARCH

# World SMP, Trend and 10% Bands



## Extreme Volatility 1990-2000 versus 2000-2010 % Outside 20% Band

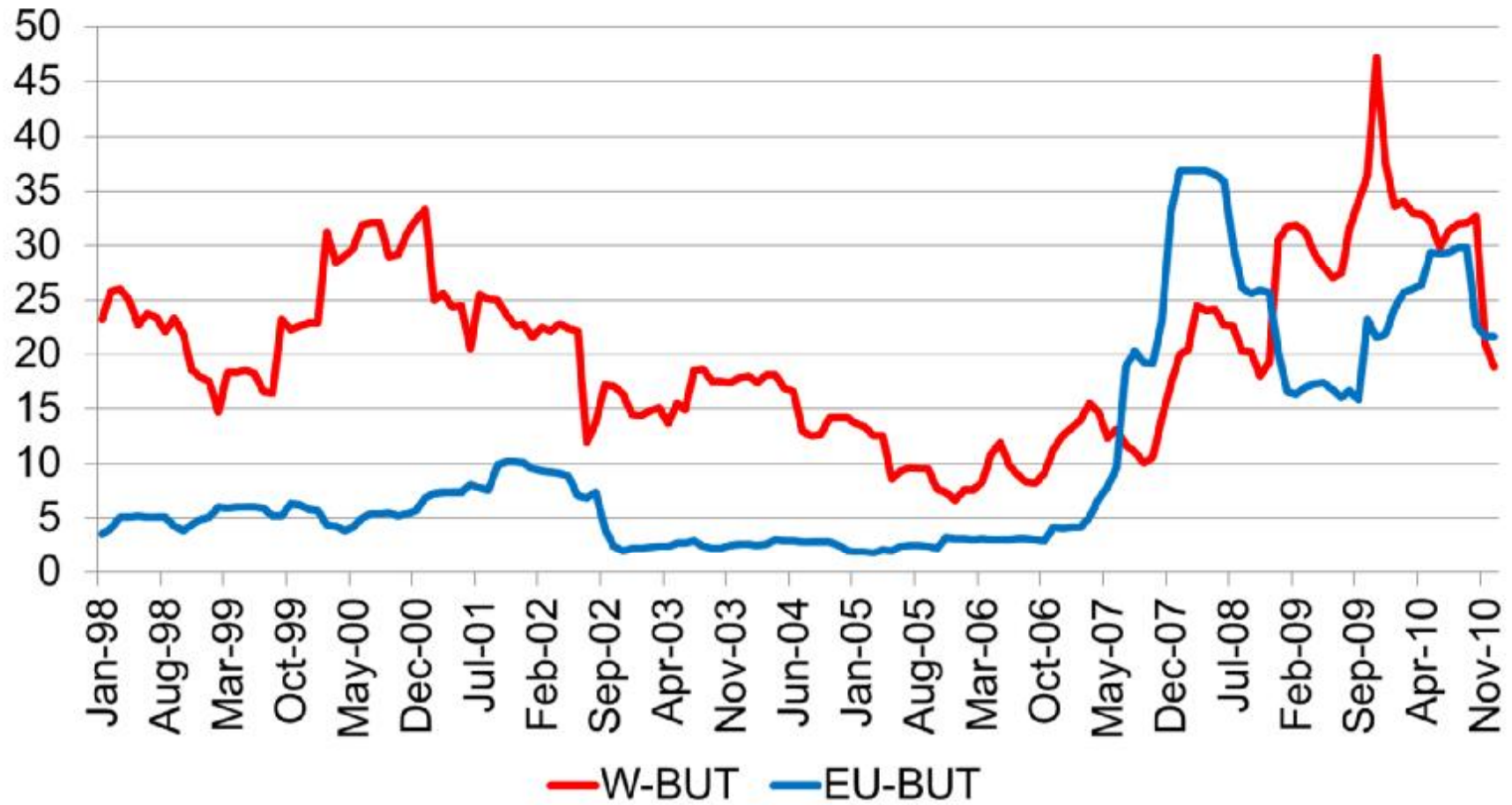
|                | EU        | EU        | World     | World     |
|----------------|-----------|-----------|-----------|-----------|
|                | 1990-2000 | 2000-2010 | 1990-2000 | 2000-2010 |
| <b>Butter</b>  | 10.0      | 25.5      | 46.7      | 75.5      |
| <b>SMP</b>     | 9.2       | 50.0      | 43.3      | 80.0      |
| <b>Average</b> | 9.6       | 37.8      | 45.0      | 77.8      |

# Increasing Price Volatility - Conclusions

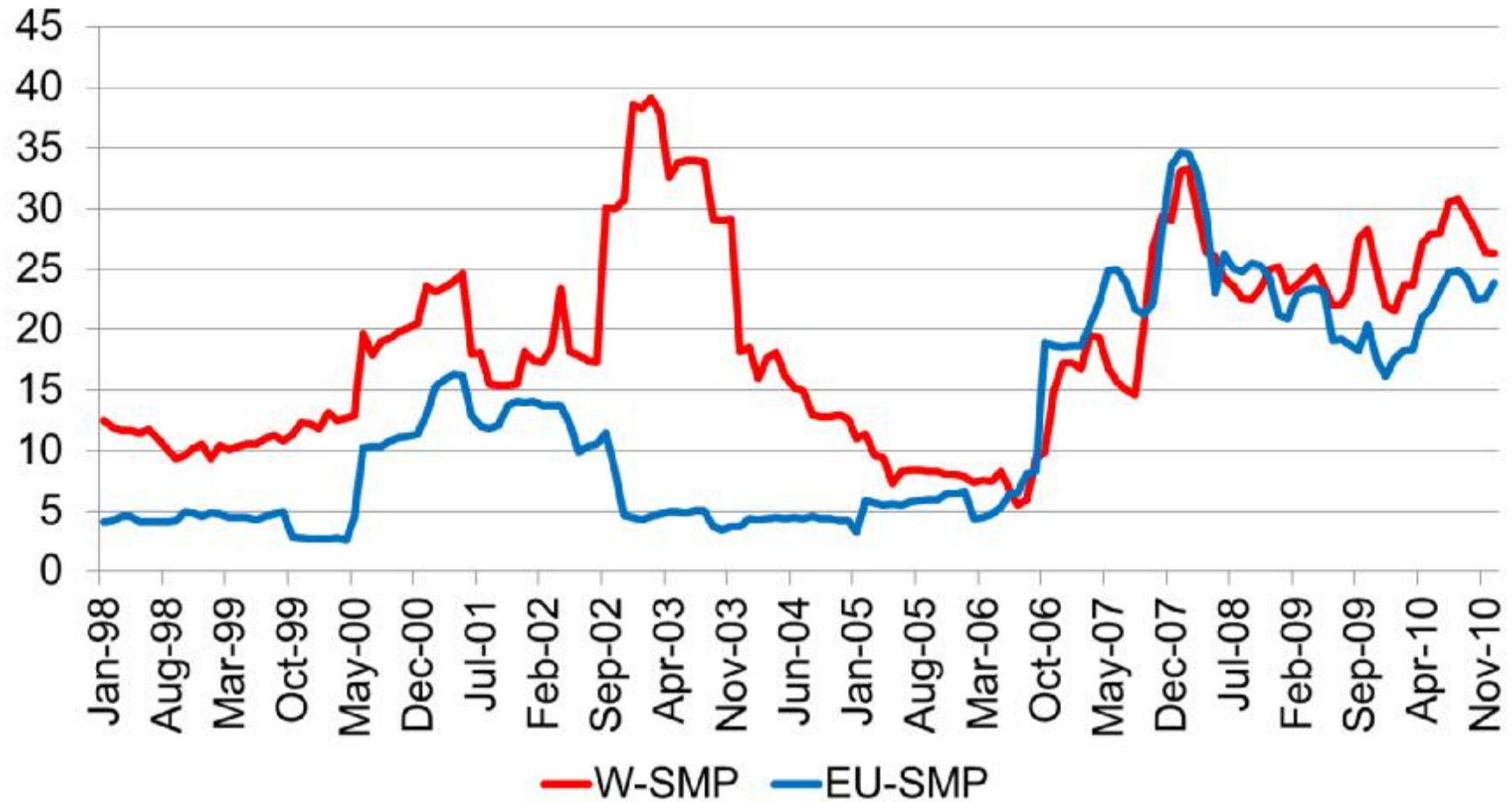
1990 - 2000    Versus    2000 – 2010

- Price volatility has increased substantially
- Butter:        EU + 260%        World + 62%
- SMP:         EU + 540%        World + 86%
- Av: EU + 400%        World + 74%

# EU and World Butter (ASD)



# EU and World SMP (ASD)



# Measuring Price Volatility - Conclusions

1990 - 2000    Versus    2000 – 2010

- Price volatility has increased substantially on both EU and World Markets
- Price volatility has increased much more substantially on EU Markets
- EU volatility now much more closer to that of World Markets

# **Causes of Price Volatility**

Price Volatility in Food and Agricultural Markets

G20 Report May 2011

Contributors

FAO, IFAD, IMF, UNCTAD, WFP, World Bank, WTO, IFPRI, HLTF

# **G20 Ministerial Declaration, June 2011**

“Market-based risk management, such as physical or financial commodity price hedges, insurance and guarantee instruments, as well as counter –cyclical lending, can play an important role in managing the risks associated with excessive food price volatility”

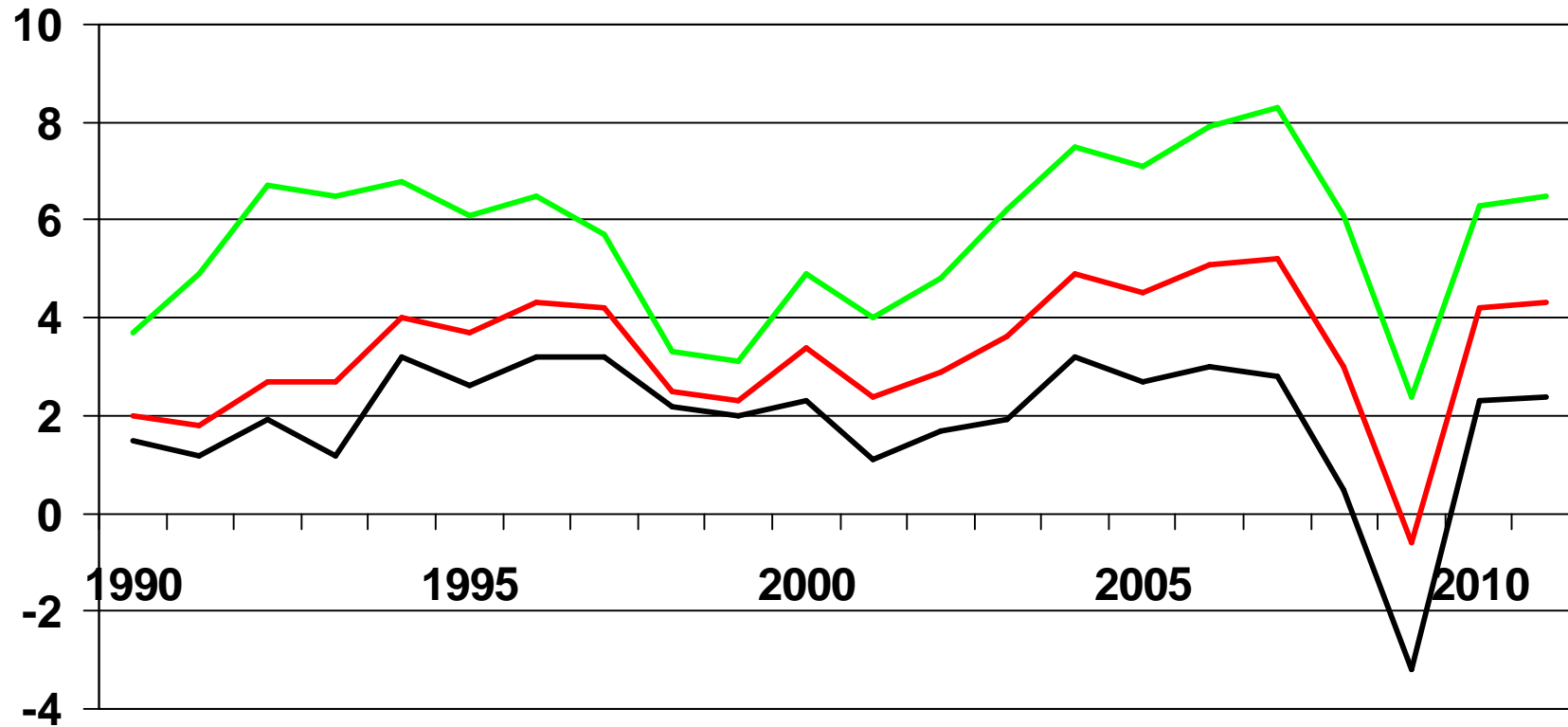
# Causes of Price Volatility

- Economic Fundamentals,
  - Demand, Supply
- Policy Change
  - EU Luxembourg Agreement (2003), US Farm Bill.
- Market Speculation
  - Hedge Funds, Index Traders

## 2. Causes of Price Volatility – Economic Fundamentals

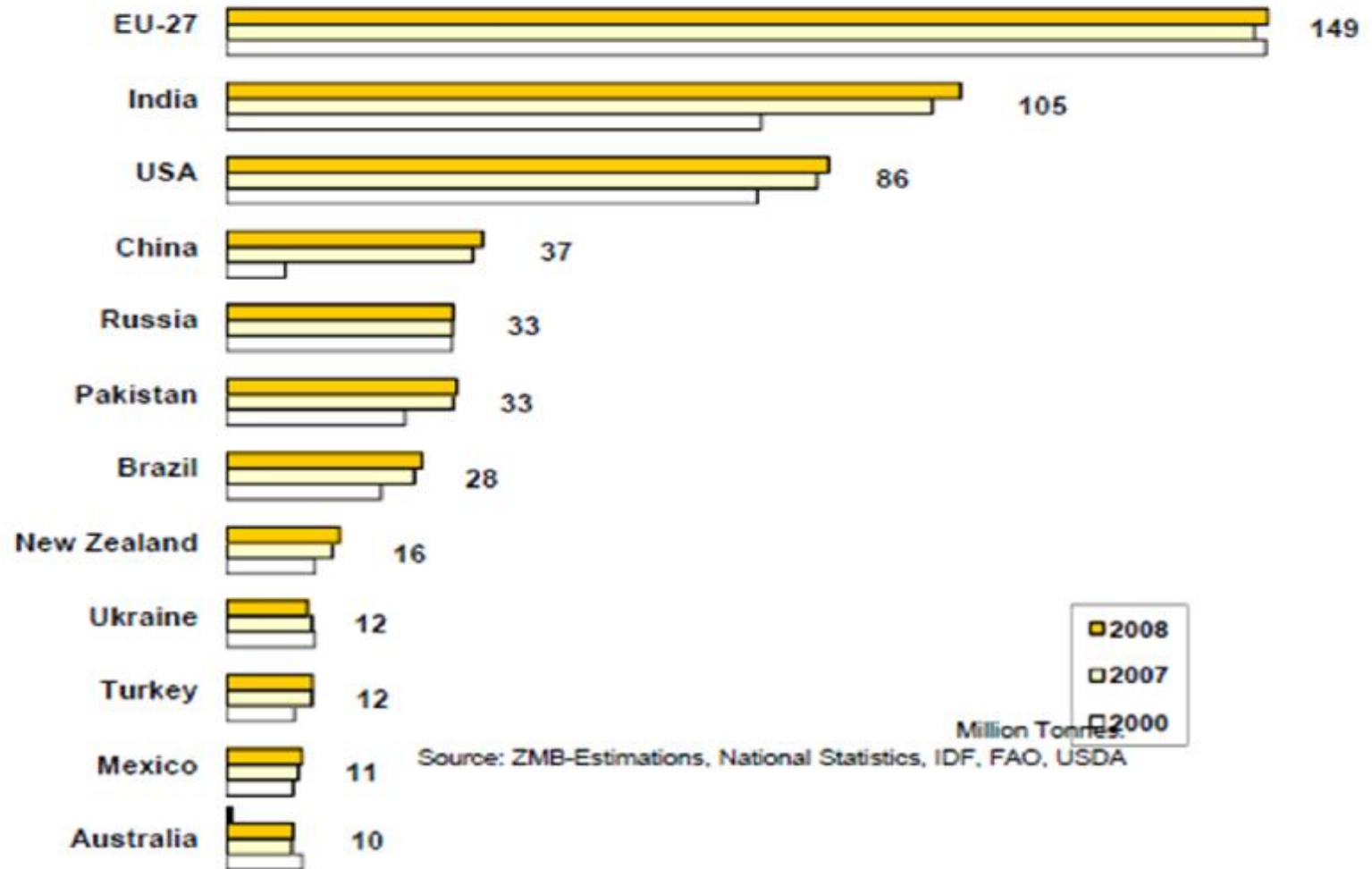
- Unique Characteristics of demand for Dairy (and Food) Commodities i.e. Inelastic Demand
- Modest scarcity causes prices to be bid up to very high levels
- Modest surplus causes prices to fall to very low levels to clear market
- Modest scarcity or surplus are frequent occurrences (weather, disease etc)
- Impact further accentuated by low stocks

# World Economic Growth: IMF (% Change)



— World — Advanced — Developing —

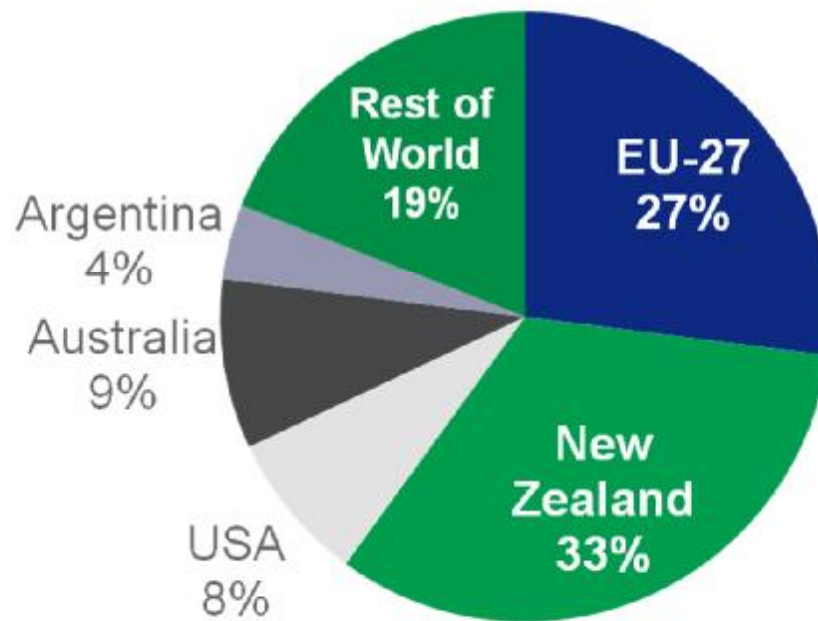
# Ranking of World Milk Producers



# Key Suppliers onto the World Market

*Just 7% of world milk output is traded internationally*

2009, volume in milk equivalent



Total trade volume: 50.2 million tonnes

## 4. Extreme Price Volatility – Public Policy

Various Governments seek to lessen extreme volatility

USA

- US Farm Acts include specific counter cyclical measures
- US Dairy Industry Advisory Committee 2010  
“avoid boom and bust cycle”  
“build a more stable market for dairy producers”
- US Farm Bill 2012: Active Consultation Process –Market Risk Management top of agenda

# Price Volatility - EU

## Public Risk Management (1968-2003)

A stated objective in Article 39 of the Treaty of Rome 1957 was “**to stabilize markets**”

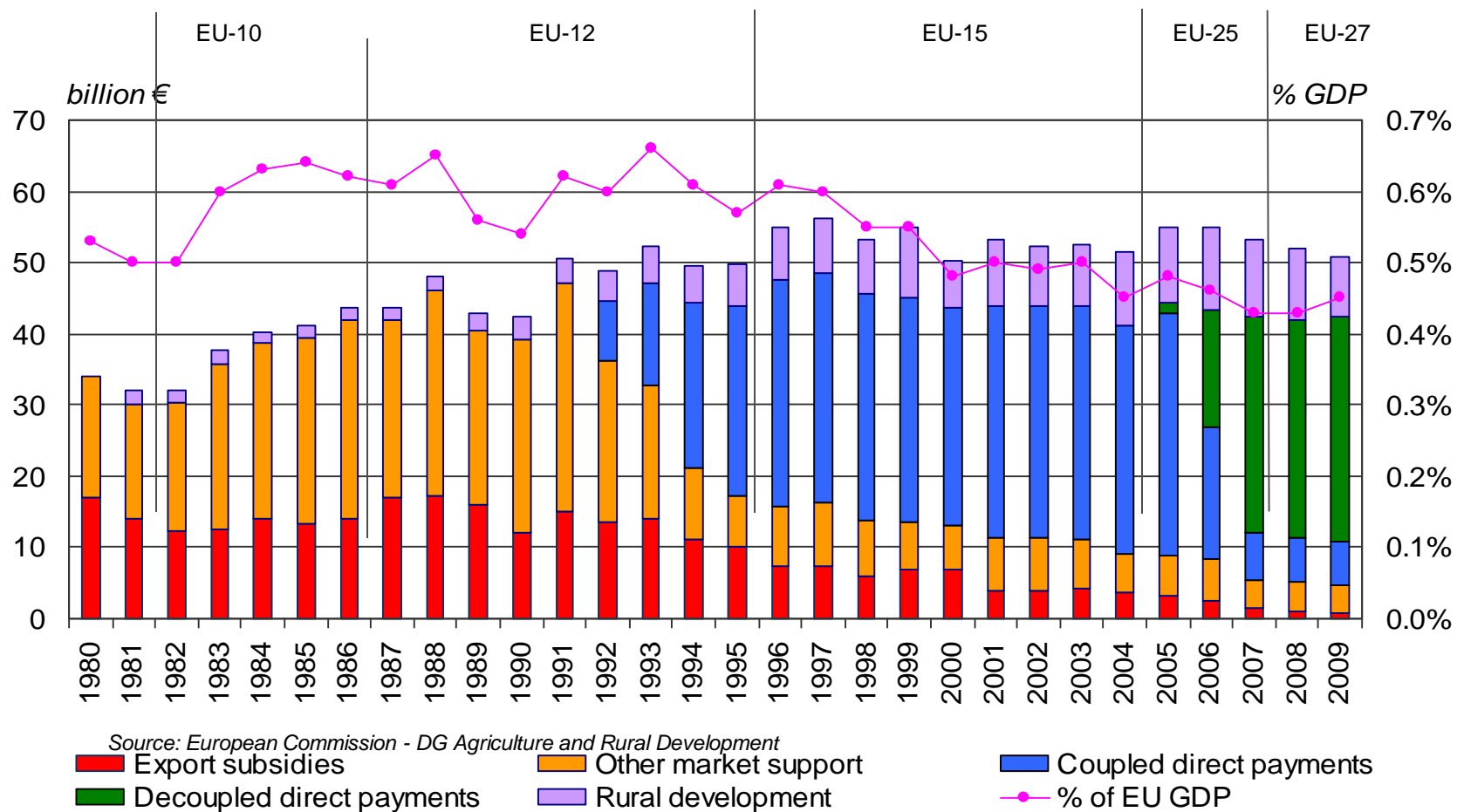
- Target Price for Milk
- Intervention and PSA
- Export Refunds
- Import Tariffs
- Subsidised Consumption
- Production Quota

# Price Volatility - EU

## Public Risk Management (Post 2003)

- Price: Lower Intervention prices  
(-20%), safety net only
- Production Quotas (increases for “soft landing” and abandonment 2015)
- Export Refunds phasing out
- Import tariffs
  - Large cuts proposed under WTO
- Decoupled Single Farm Payment

# CAP expenditure and CAP reform path



# Dairy Price Volatility – EU

European Commission

1. Dairy High Level Group (HLG) Report 2010

[http://ec.europa.eu/agriculture/markets/milk/hlg/index\\_en.htm](http://ec.europa.eu/agriculture/markets/milk/hlg/index_en.htm)

2. Draft Legislation Expected – Autumn 2011

# EU Dairy High Level Group (HLG)

## June 2010

Price Volatility and managing price risk were key issues

1. Enhance bargaining power of dy. farmers

- Promote Voluntary contracts
- Promote Interprofessional organisations
- Enhance Competition legislation

2 New tools eg futures markets

# HLG and Futures Markets

- A futures market would have to be a private initiative in a market oriented environment. Authorities would play a role in training, supervision and regulation
- The HLG invites the Commission to consider facilitating the use of futures markets, in particular via targeted training programmes. Supervision and regulation should be dealt with in overall context (MiFID)

### **3. Consequences of Increased Price Volatility**

- “Normal” volatility is desirable. It reflects changes in supply, demand and policy and provides price signals to facilitate efficient reallocation of resources
- Extreme volatility is undesirable with many adverse consequences

# Extreme Volatility – Adverse Consequences

- Low prices: grave financial problems, low investment, reduced R and D. Ultimately solvency threatened, farms and dairies
- High prices: Substitutes replace dairy products; fat, protein, lactose
- Buyers (ingredient and retail) prefer to do business with suppliers providing stability, price and volume

# **European Processing Industry Survey 2009– General Problems of Extreme Volatility**

- Much increased business risk; customers, milk suppliers, banks
- Customer led longer term investment strategies much harder to pursue

# **Processing Industry Survey - Extreme Volatility Problems**

- Market power of retailers enhanced, branded versus own label
- Product substitution difficult to reverse
- Threat to milk supplies
- Processing Capacity, utilisation and costs
- Product portfolio not appropriate
- Innovation, R and D investment
- Contracts more difficult, time, volume, price

## **5. Price Volatility - Options Available Private Risk Management**

- Futures Markets
- Options (Put and Call)
- Over the Counter (OTC) Contracts
- Forward Contracting
- Insurance Products
- Mutual Funds

## 6. Other Sectors - Lessons

- Futures markets are normal in free markets, they provide various risk management benefits, but
- For success, good public price information, education for participants and appropriate regulation are required

# The Future – Dairy Commodity Prices

- Uncertain, but
- Positive Trend to 2020 (FAO/OECD, FAPRI, etc)
- Expect fairly extreme price volatility, due to
  - Market fundamentals: demand, supply uncertainty
- Public policy – very difficult to control price volatility, EU Budget largely committed elsewhere

# Publications

- **O'Connor, D and M. Keane (2009)** Price Volatility in the EU Dairy Industry: Causes, Consequences and Coping Mechanisms. European Dairy Association, Brussels
- **O'Connor, D., M. Keane and Barnes, E. (2009)** "Measuring Volatility in Dairy Commodity Prices". Proceedings 113th Seminar European Association of Agricultural Economists, Chania Greece September 2009.  
<http://ideas.repec.org/s/ags/eea113.html>
- **Keane, M., and D. O Connor (2010)** "EU Dairy Commodity Price Volatility" International Dairy Federation World Dairy Situation 2010
- **Curran H, Keane M, O'Connor D (2010)** An Analysis of Irish and EU Milk Price Volatility, AESI Conference, Dublin
- **O'Connor, D., and M. Keane (2011)** "Empirical Issues Relating to Dairy Commodity Price Volatility" Chapter in "Methods to Analyse Agricultural Price Volatility" Piot-Lepetit, Isabelle; M'Barek, Robert (Eds.)
- **Keane, M., and D. O Connor (2011)** "Agricultural Policy Schemes: European Union's Common Agricultural Policy" Encyclopedia of Dairy Sciences 2nd Edition, Elsevier Science
- **Thorne F., Keane M., O'Connor D (2011)** Volatility in Agricultural Markets: Evidence, Causes and Possible Solutions. TResearch, Teagasc, Dublin

# Thank You

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