



Anglia Ruskin
University

**Global Sustainability
Institute**

Food Security & Finance

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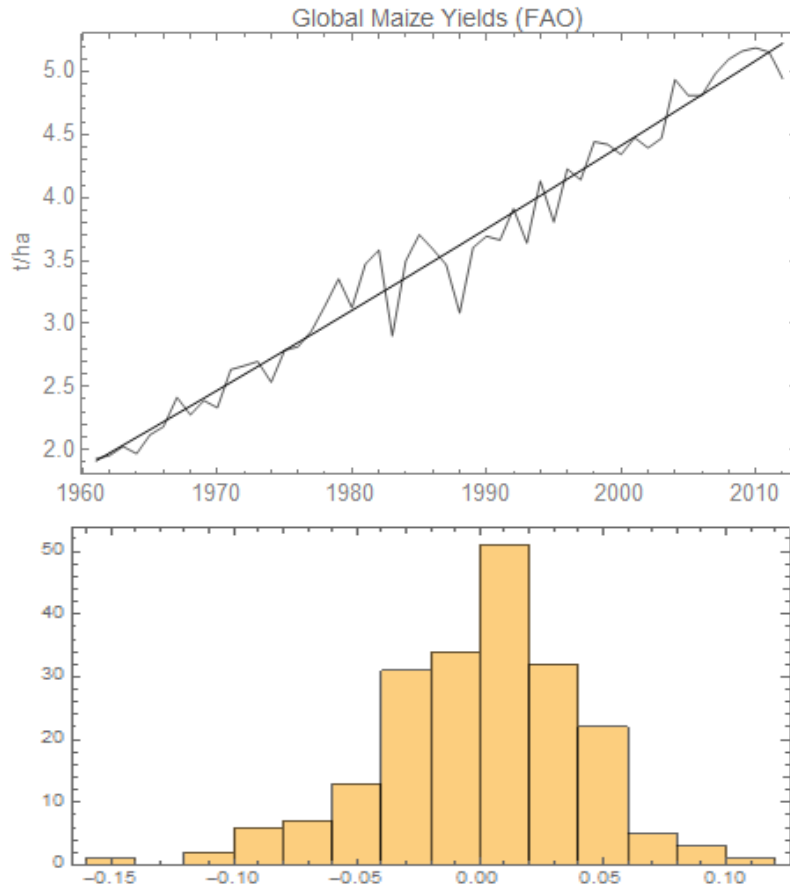


Food Prices

Food prices have in the past been a trigger for major social and political unrest and were a factor in the Arab Spring.

- Food production & consumption
- Land
- Weather
- Governance & political processes
- Trade volumes, partners & policies
- Demography
- Social statistics
- Energy (renewable & non-renewable)
- Water
- Capital & finance
- Investment flows, money creation and banking systems
- Infrastructure
- Global, country & regional

Food shocks

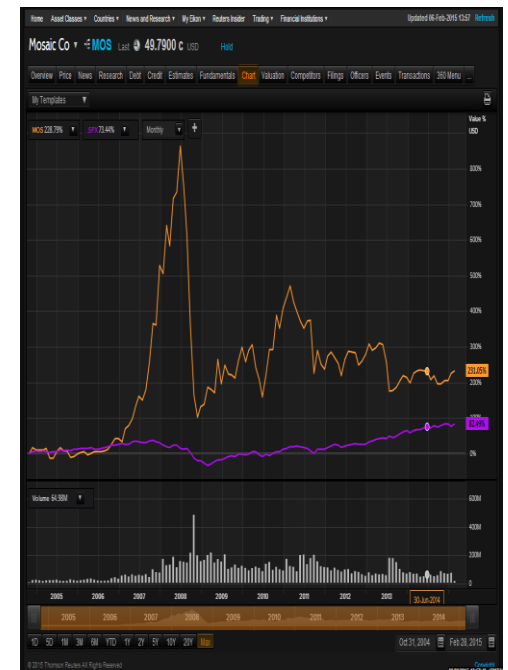
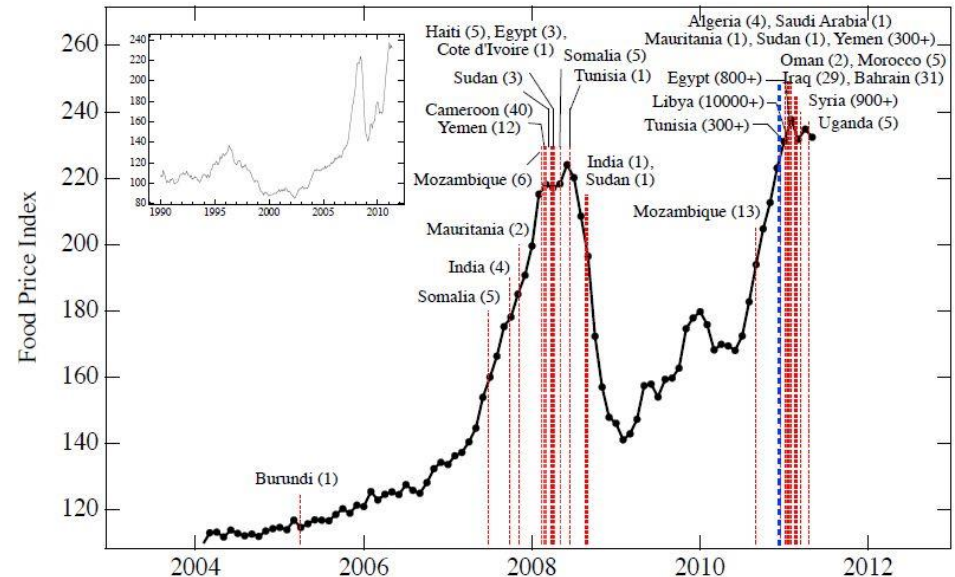


Production shock distribution
Maize: max global production
loss is 15% (1988)

- Global extreme events based on de-trended analysis of the FAO data record (from 1961-2012)
- Complicated by changing technology, cultivated areas, economies, and political stability over the 52 year period
- Over this period, global average yields for the four biggest global crops (maize, wheat, rice, and soybean) have more than doubled (and nearly tripled for wheat)
- Climate change alters probability distribution for these events and potentially geo-links large impact events – quantification of change in long tail distribution through climate ensemble estimates
- Qualitative data (literature & interviews) to understand market and government responses
- Quantitative analysis using historic data

Food shock impacts

- Business cost risks
 - Increasing and volatile base costs for agriculture products – equity or corporate bond risks
- Political instability
 - High price linked to riots and political instability (Arab Spring)
- Economic risks
 - Political instability and business risks lead to a ‘flight to quality’ impacting government bonds/gilts (USA)
 - Ongoing risks (including link to energy prices) could lead to inflation
- Supply chain risks
 - Lack of stable supply chain for key grains leading to business risks (and equity risks)
- In country governance and stability
 - Changes to governance and political fragility can change risks from food impacts



Lloyds scenario

- *Food production shock (developed by Molly Jahn, University of Wisconsin)*
 - *Maize: 10% production shock*
 - *Soy: 11% production shock*
 - *Wheat: 7% production shock*
 - *Rice: 7% production shock*



From left to right: Sophie Abraham (Willis), Lucy Stanbrough (Lloyd's), Dr John Alarcon (Willis), Oliver Bettis (Munich Re), Nigel Ralph (Lloyd's), Tom Hoad (Tokio Marine Kiln), Trevor Maynard (Lloyd's), Mike Maran (Catlin), Will Steeds (Catlin), Kenneth Donaldson (Munich Re), Dr Aled Jones (Anglia Ruskin University), Prof Molly Jahn (University of Wisconsin-Madison)

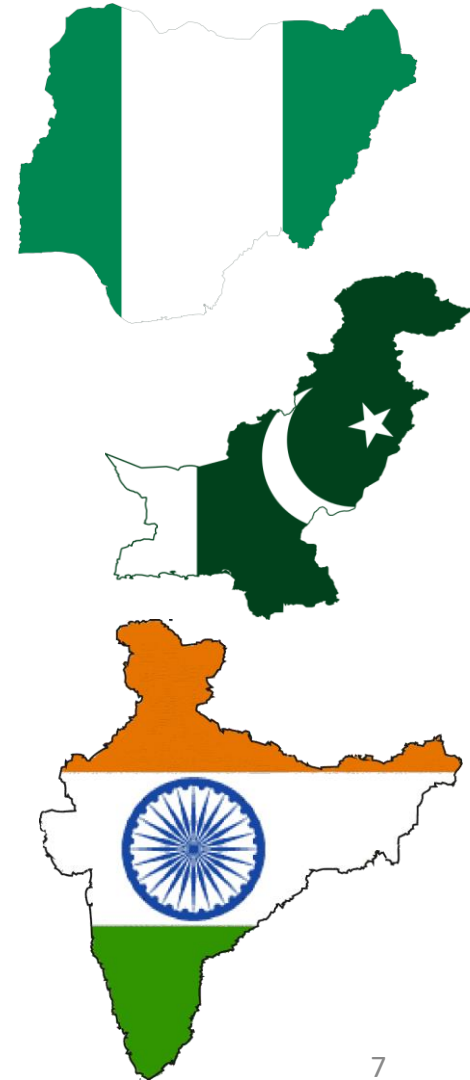
Attendees not pictured: Nick Beecroft (Lloyd's), Andrew Hitchcox (Tokio Marine Kiln), Falk Niehörster (RMS)

Insurance impacts

- Political risk insurance
 - Contract frustration (e.g. China-Brazil)
 - Cargo/marine hull (e.g. Liberia)
 - Trade credit
- Political violence and terrorism
 - Strikes, riots & civil commotion (e.g. Egypt)
 - Contingent business interruption
 - Terrorism
 - War on land
- Crop insurance
- Liability insurance (directors & officers, errors & omissions)

Possible responses: Nigeria civil war and terrorism in India

- Food riots break out in urban areas across the Middle East, North Africa and Latin America.
- Nigeria civil war following major offensive by Boko Haram. Onshore and shallow offshore oil rigs attacked.
- Pakistan terrorist group targets major cricket tournament. India cricket cancellations.
- Europe has an increasingly militarized border with Russia as political tensions continue.
- The Euro weakens and the main European stock markets lose 10%; US stock markets follow and lose 5% of their value.
- Public agriculture commodity stocks increase 100% in share value, agriculture chemical stocks rise 500% and agriculture engineering supply chain rise 150%





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