# Trade, food prices and food security: a context for the analysis of regulatory issues

FAO International Technical Consultation on Low Levels of GM Crops in International Food and Feed Trade

FAO, Rome
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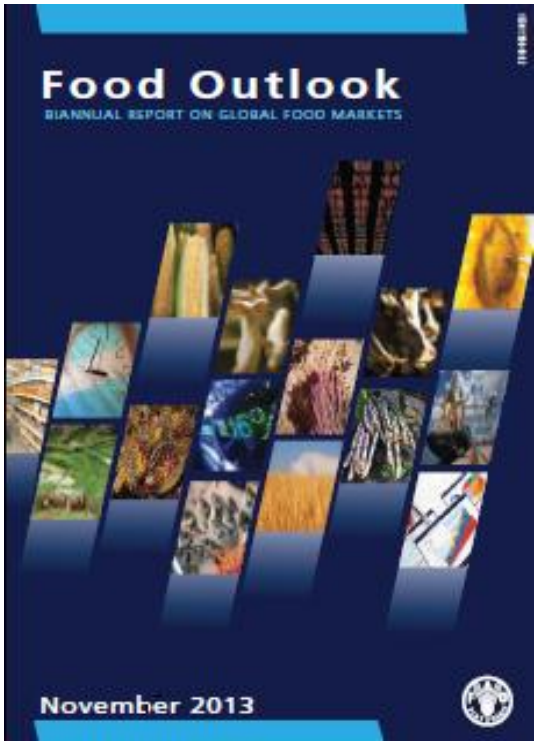
# Outline

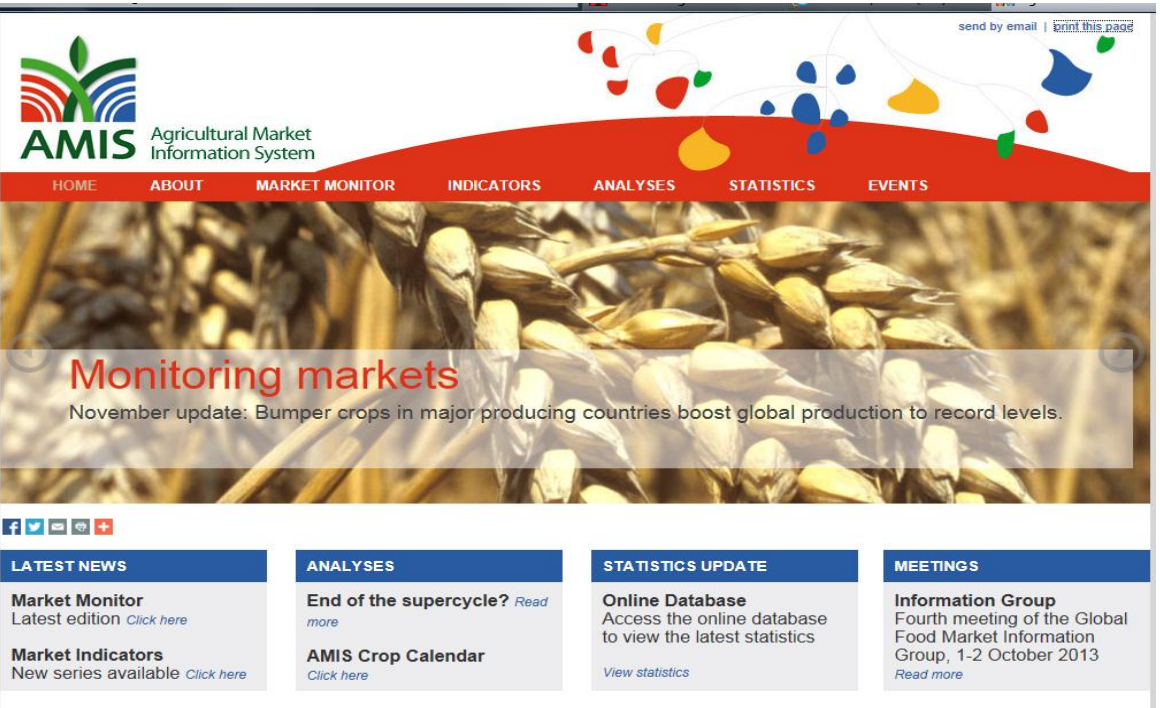
- Global market context
  - Short term market movements
  - Medium term projections
  - Policy challenges
  - Trade policy and global market impacts
- Analyzing the effects of LLP/AP on trade flows
  - Patterns of LLP/AP incidents
  - Econometric analysis
- Looking forward
  - Further research needs

# Global market context

# Short term market adjustments

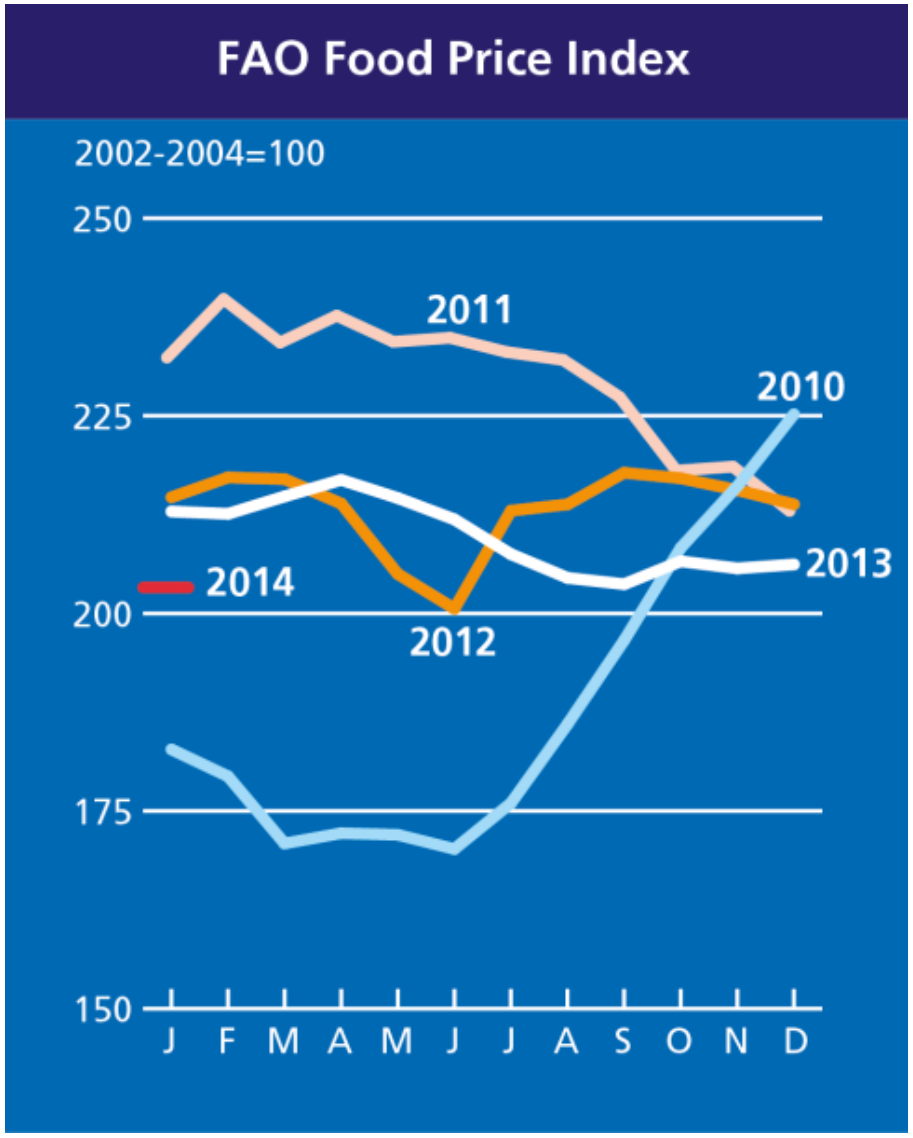
- Market assessments
- Market indicators
- Major policy developments

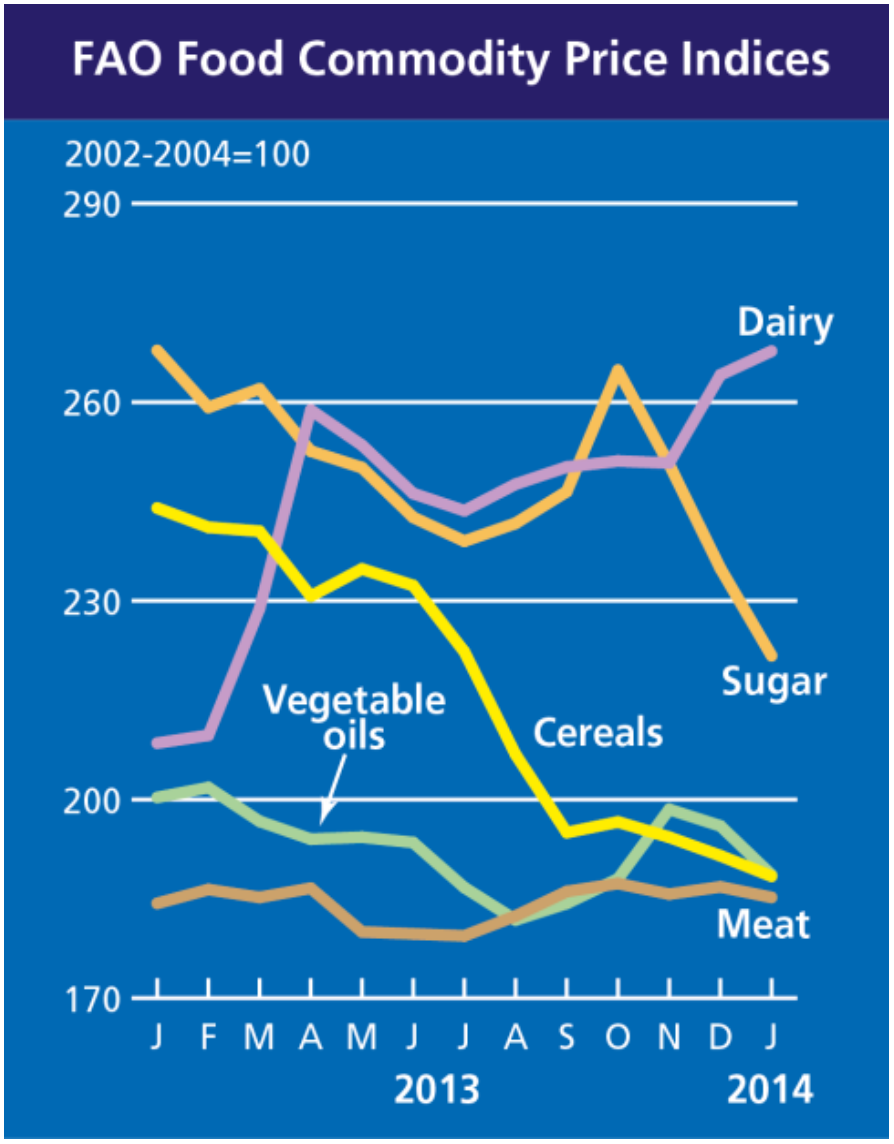


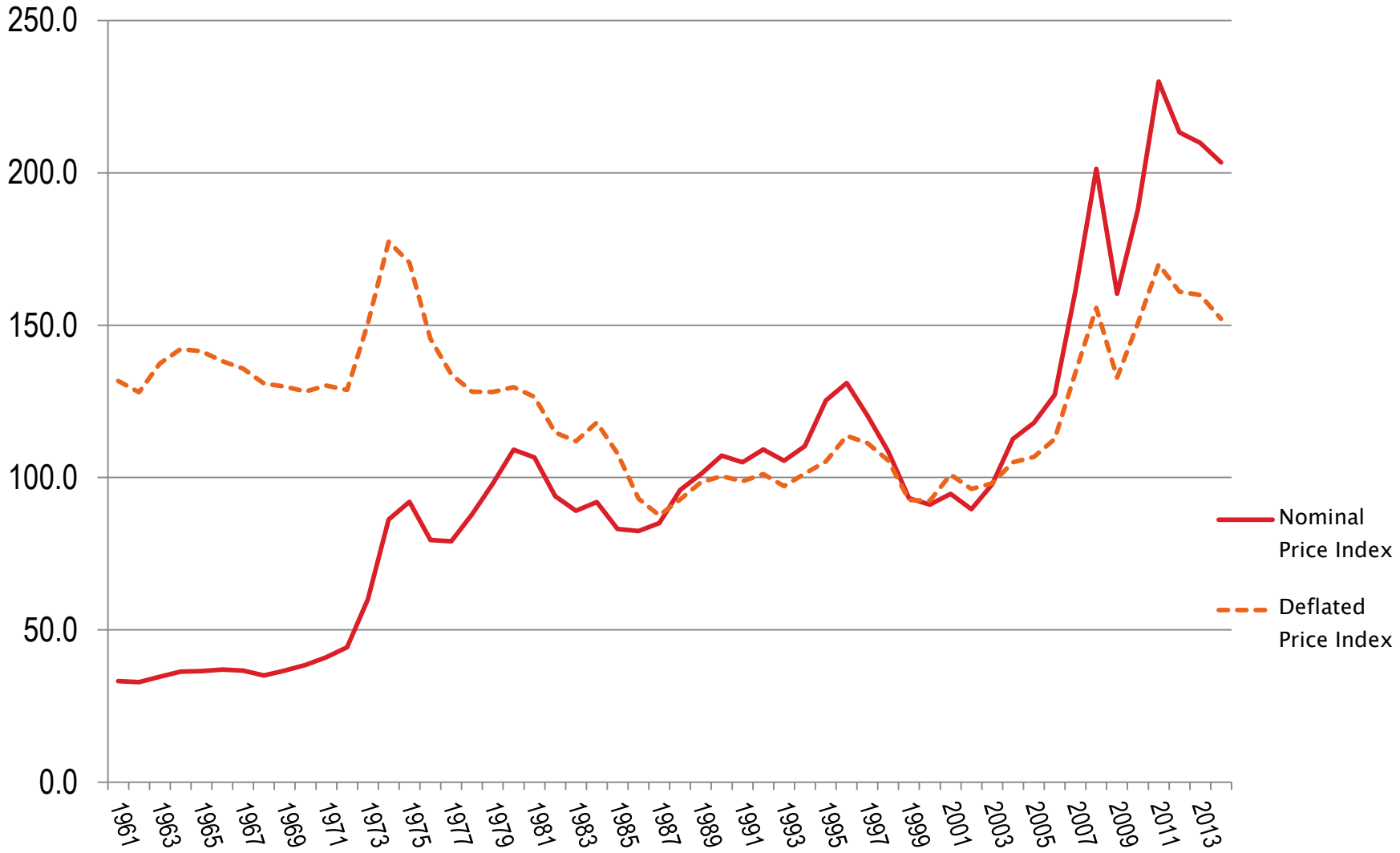

http://www.amis-outlook.org/

# Short term market indicators



# FAO Food Price Index 1961–2014



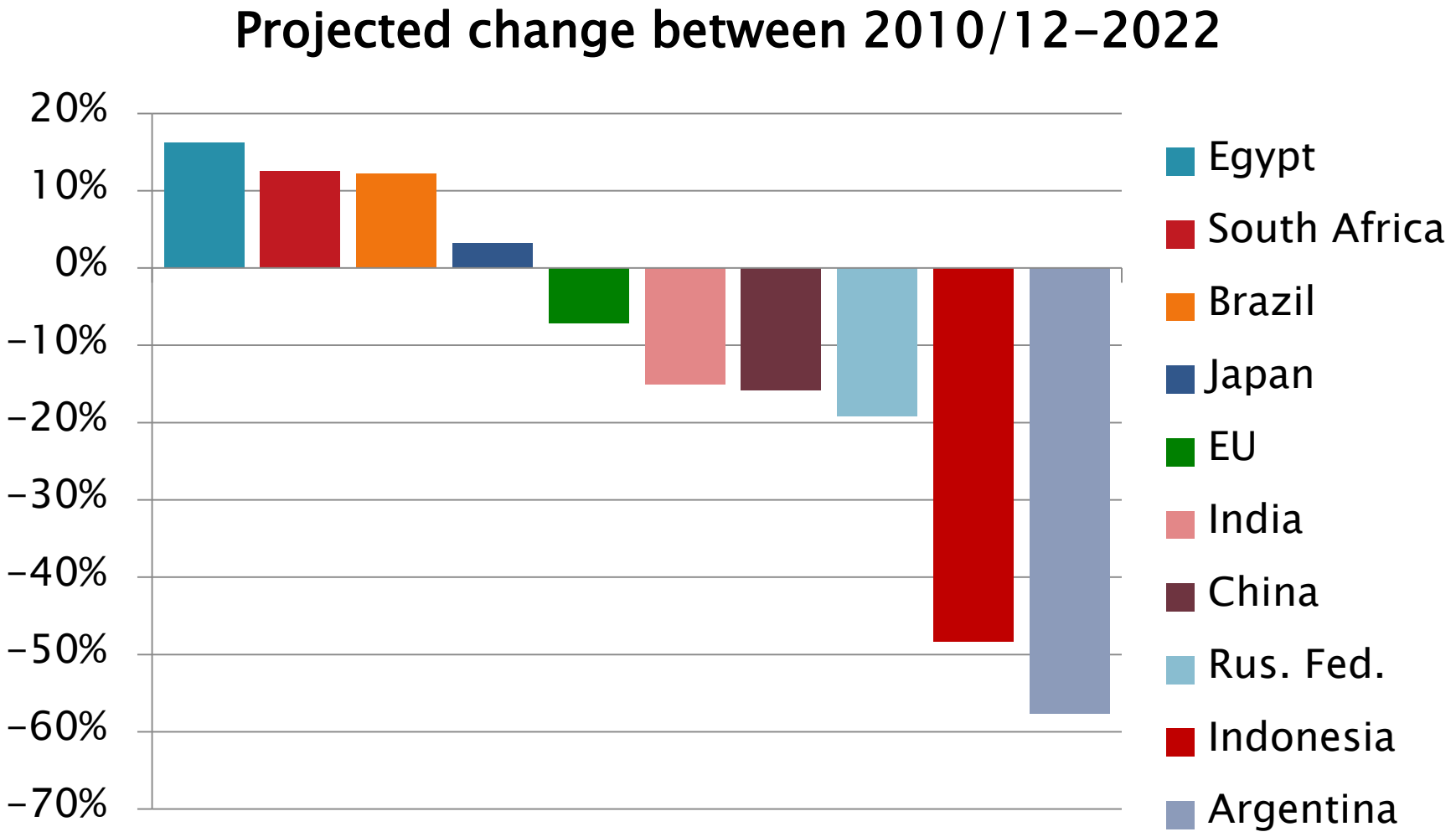
# Medium term projections

- Joint OECD–FAO report
- Model based projection, not forecast
- 10 year horizon
- Major temperate commodities
- Global coverage

# Drivers of market conditions

- GDP growth
  - Recovery at different paces
- Population growth
  - Urbanisation, changing diets
- Oil prices
- Exchange rates
- Market and trade policy
  - Trends, assumptions

# Real exchange rates
# Depreciating vs. appreciating

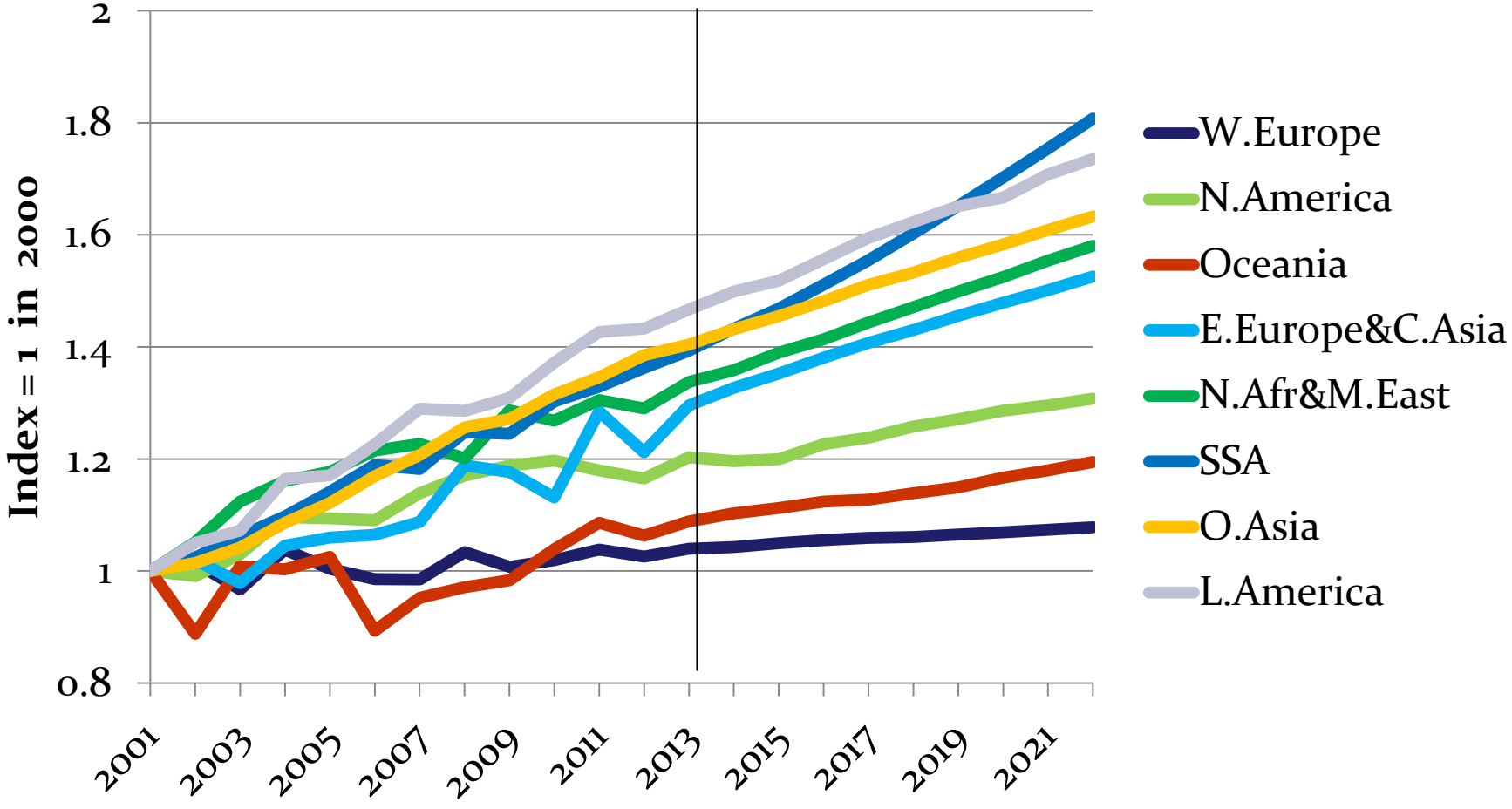


# Aggregate picture

- Growth in global agricultural production is slowing – projected at 1.5% annually in coming decade
- Consumption increasing
  - But response to income growth is low in many countries
- Strong prices (expected to remain firm) are prompting investments into production capacity and technology (but not by all)
- Constrained by structure of agriculture, high energy costs, limitation on land and water, tighter environmental regulations
- Emerging economies remain agricultural growth leaders

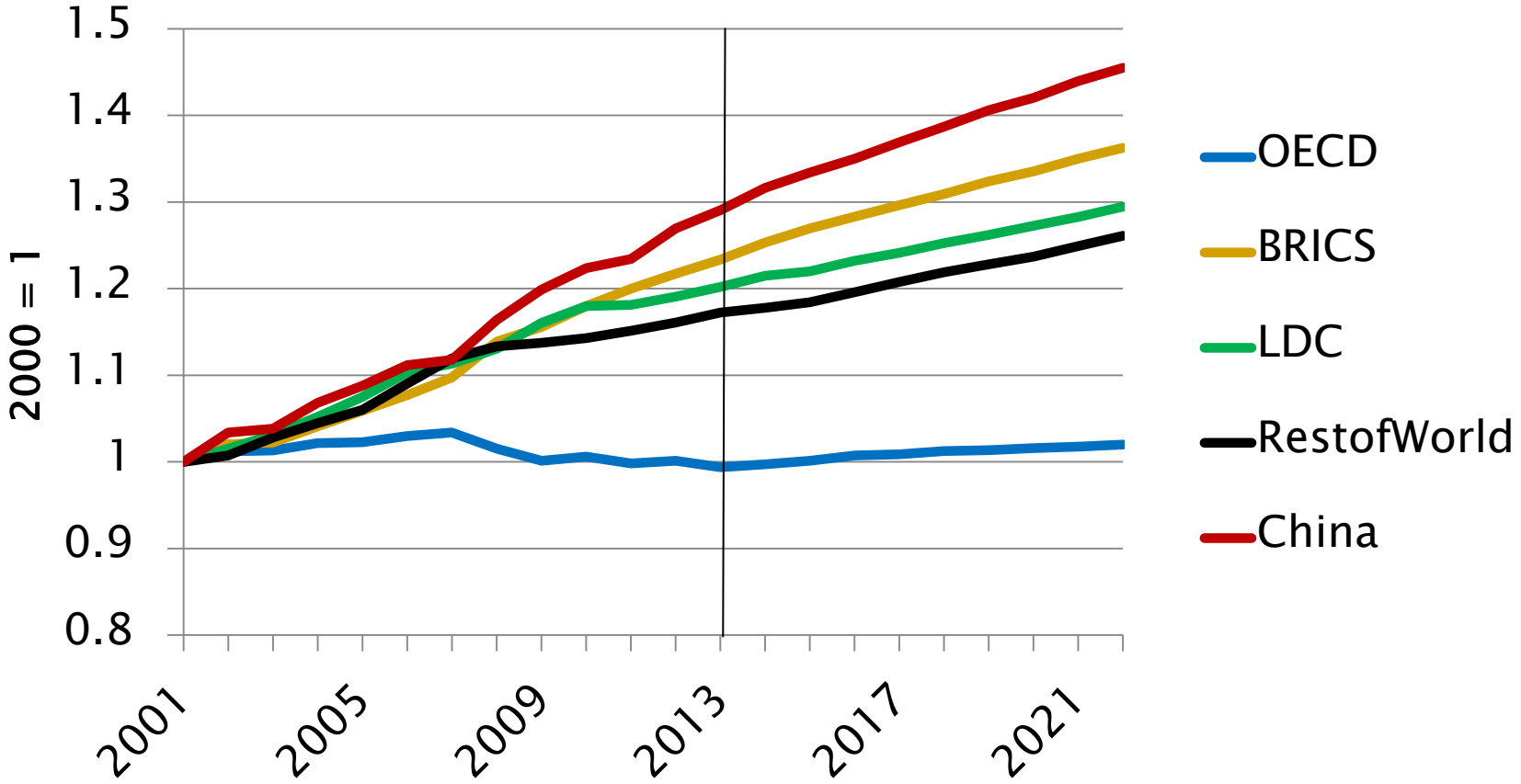
# Net agricultural production index

## Growth slowest in W. Europe, quickest in L. America/SSA



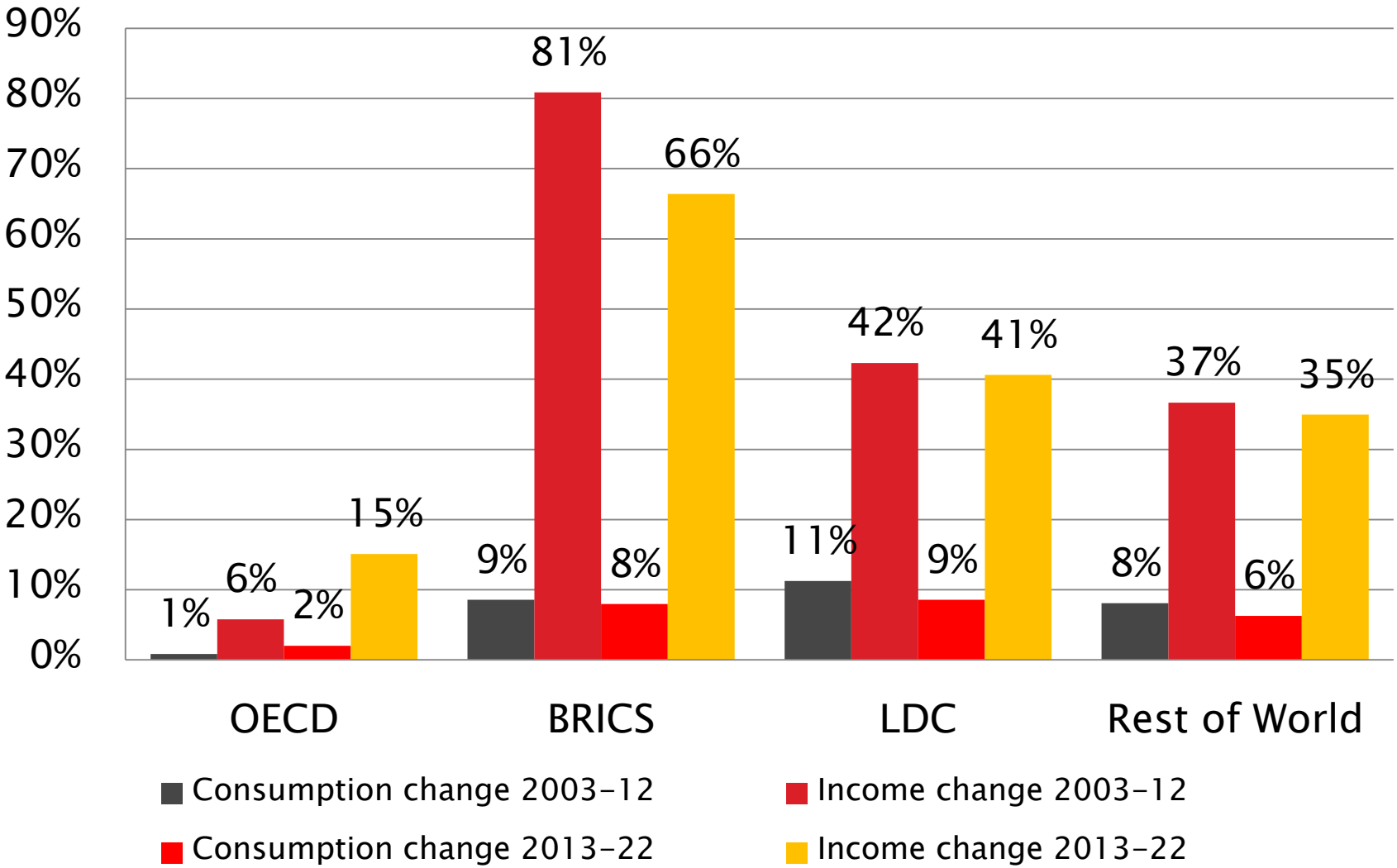

Index based on constant 2004-06 dollars

# Income growth drives higher per capita consumption

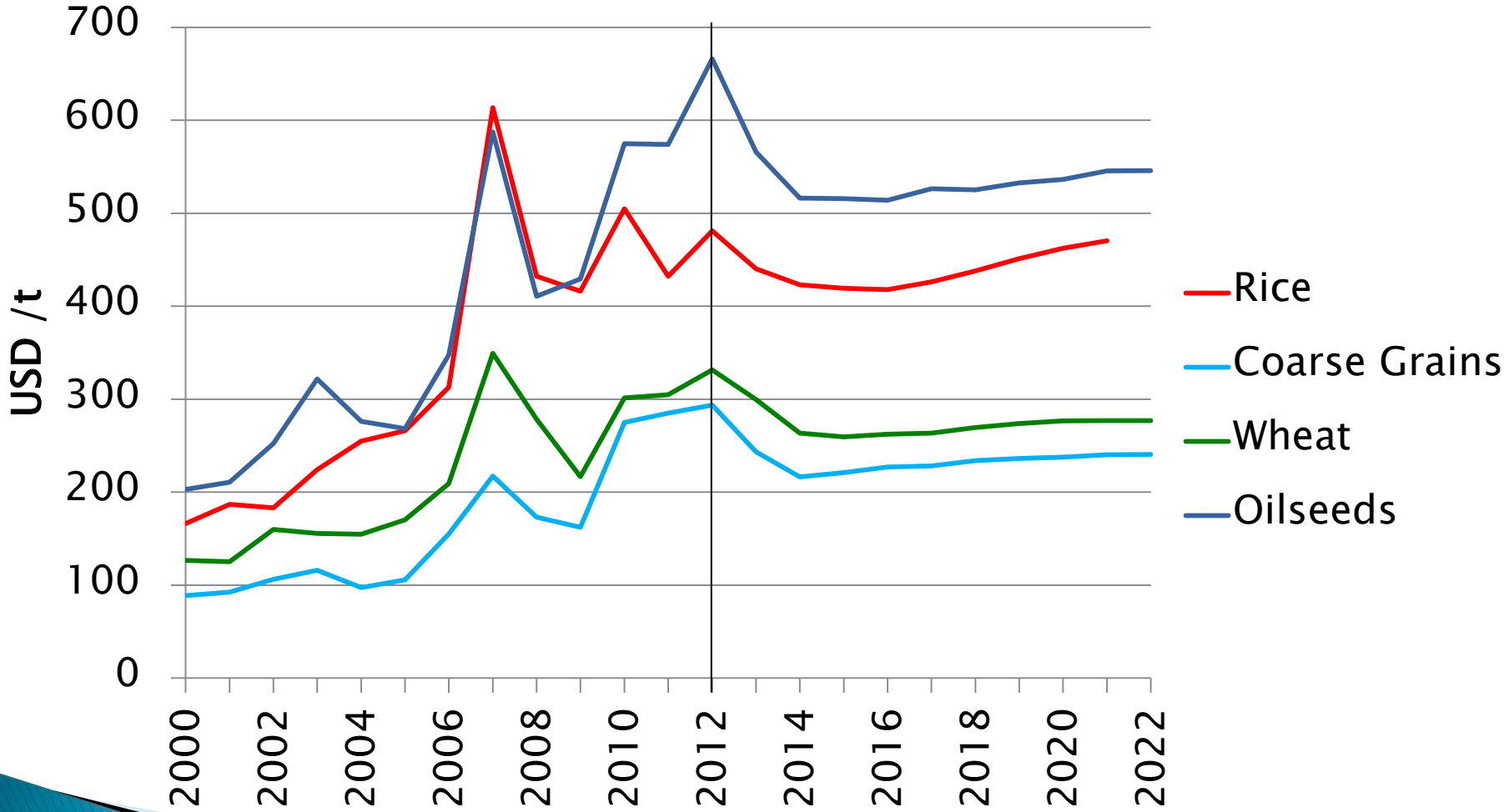



Index of consumption based on constant

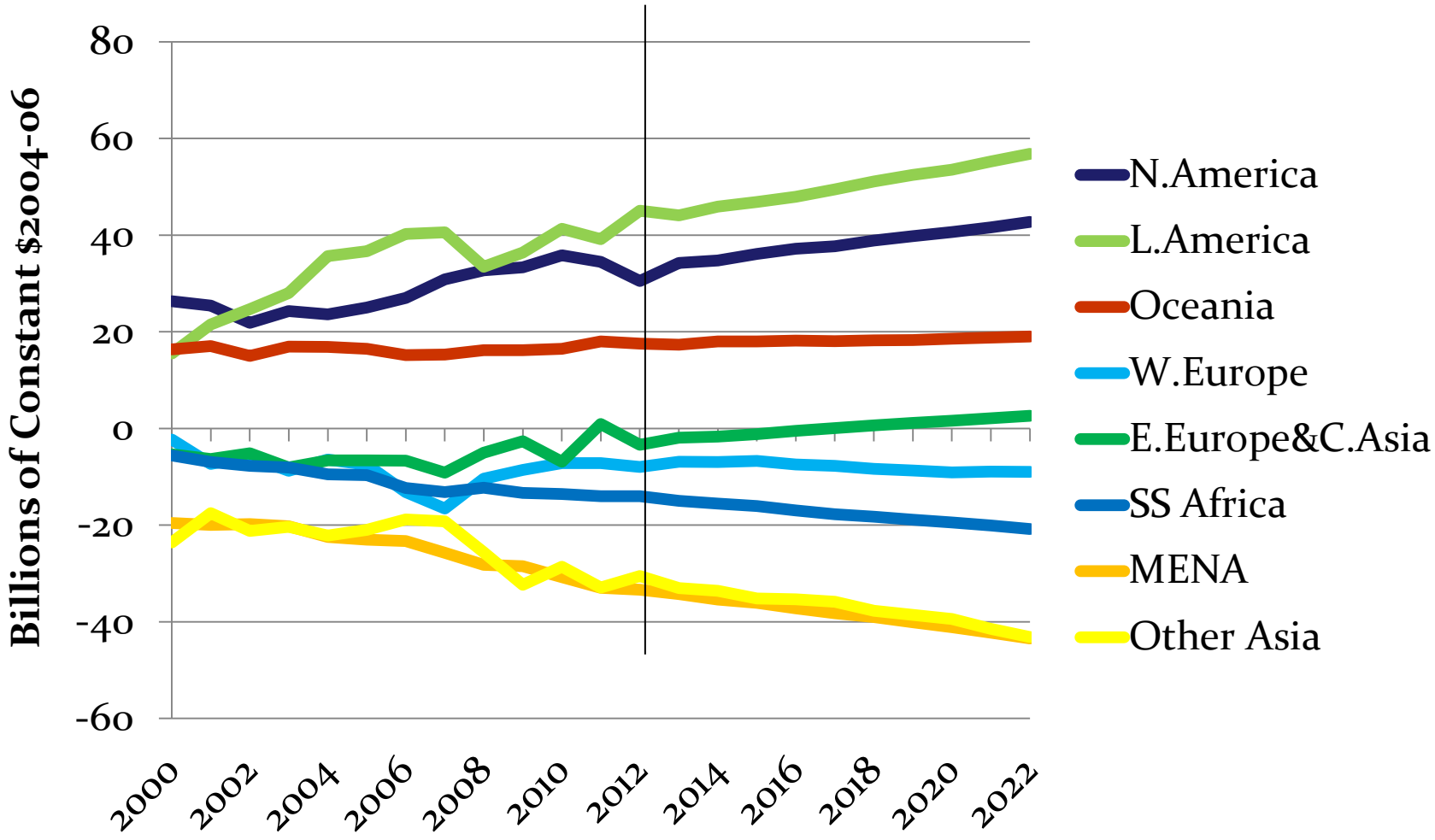
# But impact lower than expected in many countries



# Prices: Cereals & Oilseeds

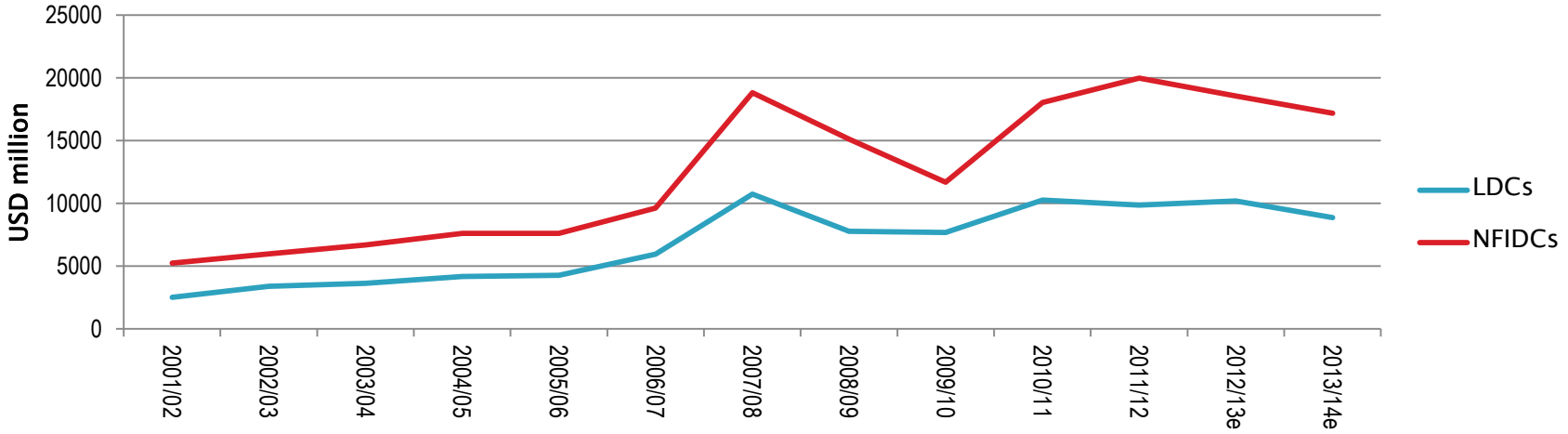


# Americas are increasingly the largest net exporters

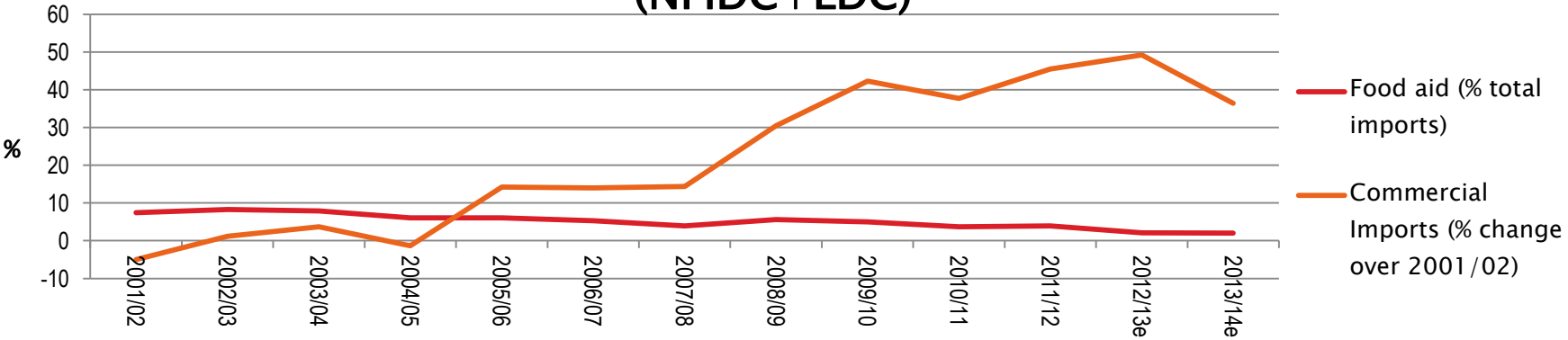


# But cereal import bills have increased significantly in NFIDC

## Cereal import bill – 2001/02 – 2013/14e




## Commercial cereal import and food aid volumes (NFIDC+LDC)



# "New" policy challenges

- Food security
  - Availability, access and stability concerns. Greater focus on domestic markets in pursuit of national FS objectives

    Exporters:
    - Export restrictions to moderate domestic price increases

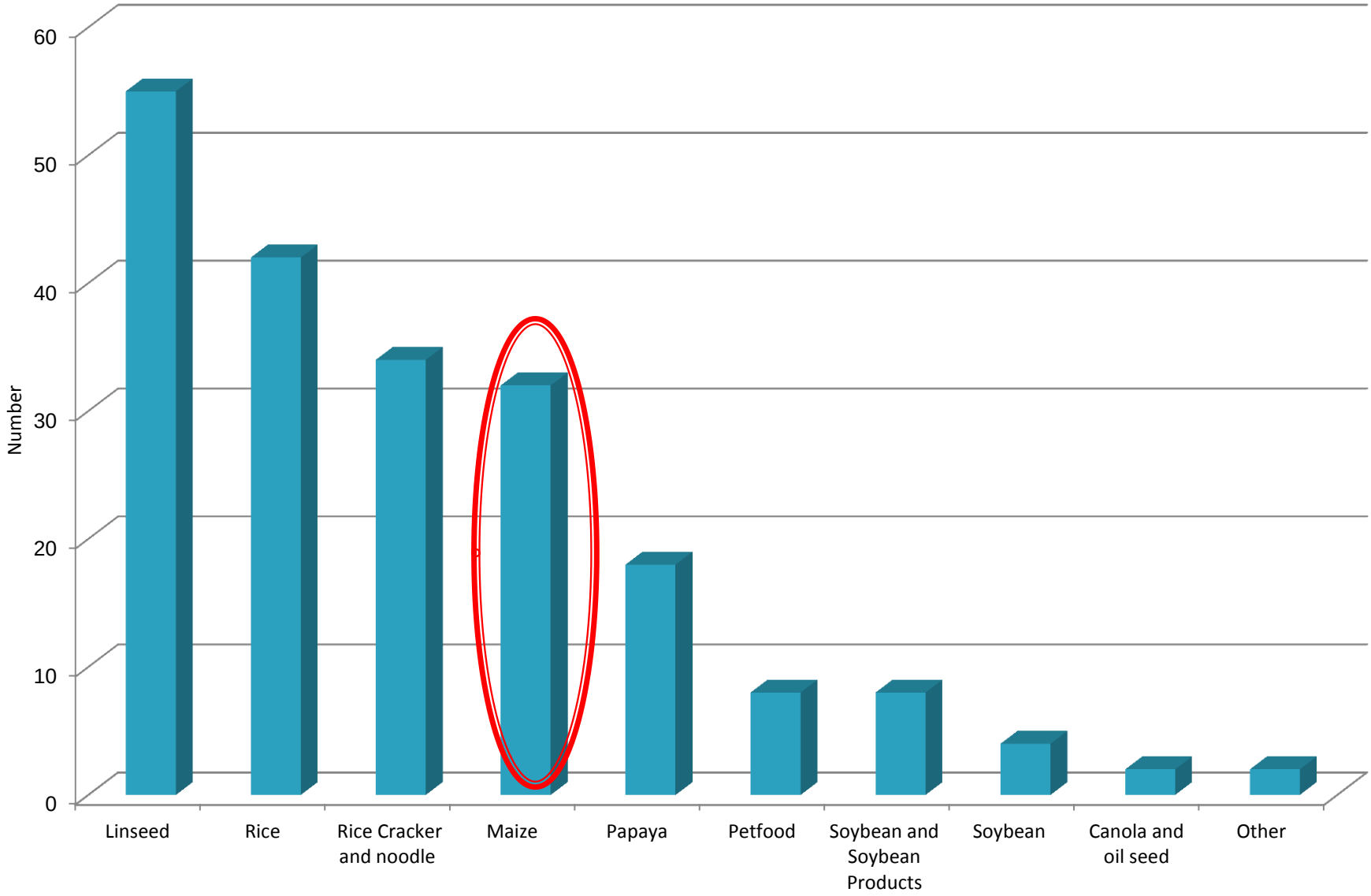
    Importers:
    - Tackling higher food import bills
    - Productivity increases/food self-sufficiency more in focus
    - Enabling higher response by smallholders more in focus
    - Importance of stage of development now recognized
- But trade policy is not just about Food Security
  - Minimizing rural-urban income differentials
  - Export led growth: getting the balance right
- And trade barriers are not just tariffs
  - Food safety
  - TBT

# Implications of policies affecting trade

- Impact on global markets determined by:
  - Way in which increase in production handled by producing country
  - Size of any surplus that finds its way onto the international market
  - Characteristics of that market …
- Extent to which other countries are affected by a change in global market conditions depends on their own trade status:
  - Food exporter
    - country's exporting firms may face reduced prices with implications for the farmers from which they source
  - Food importer
    - fall in price may be positive development if the country is in a structural deficit for agroclimatic reasons;
    - but may be less positive for a country with ag potential

# Analyzing the effects of LLP/AP on trade flows

# LLP/AP incidents by commodity



# Econometric analysis of the effect of LLP on trade flow: Maize

- Gravity-type bilateral export flow model:
  - Assumes that bilateral trade between partner countries increases with size (income, population) and closeness
  - Cross-sectional data
  - Introduce GMO regulation index and LLP threshold

$$lnE_{ij} = ln\alpha + \beta_1 lnY_i + \beta_2 lnY_j + \beta_3 lnD_{ij}$$

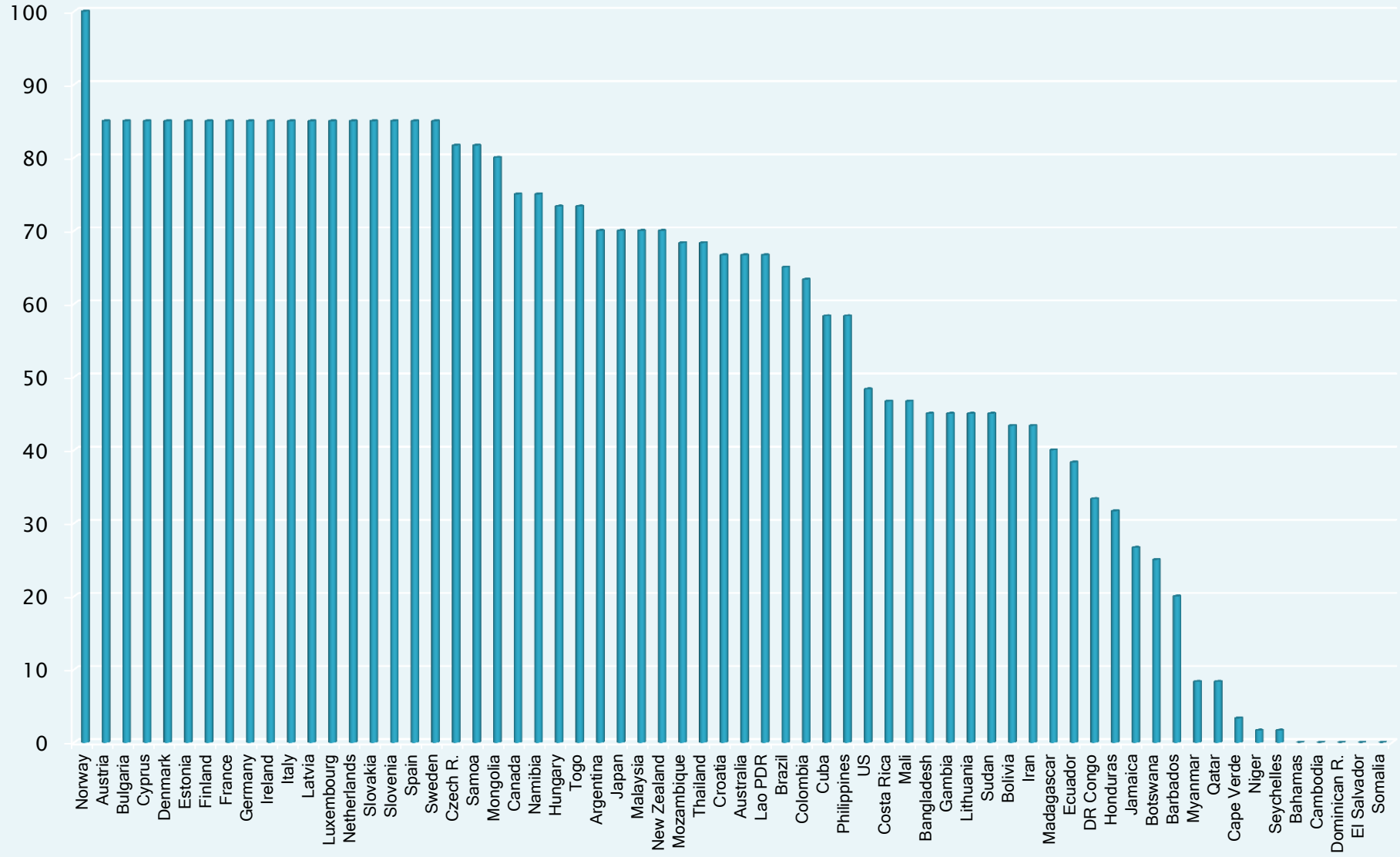
$$+\beta_4 lnReg\text{-}Index_j + \beta_5 lnLLP_j + ln\,\varepsilon_{ij}$$

# Indices

- GMO regulation index of importing country – $Reg\text{-}Index_j$
  - existence of food, feed, and environmental regulation
  - safety risk assessment
  - labelling requirement
  - LLP test requirement
  - traceability requirement
  - socio-economic assessment
  - existence of zero tolerance for unauthorized GM crops
  - food, feed, and environmental safety assessments to international guidelines
  - restrictiveness of authorization policy
  - testing requirement form exporting country
  - technical capacity to detect GMOs
  - detection methods utilized

- LLP threshold of the importing country – $LLP_j$
  - Model 3 – LLP variable takes either the value 0.1, or 10 for countries that do not have the threshold.
  - Model 4 – LLP threshold takes into account reported threshold levels and combination of factors – zero tolerance and existence of GMO regulation.
  - Model 5 – LLP variable takes the value 0.1 for the EU members, and 1 for other countries, controlling for EU internal trade.

# GMO Regulation Index



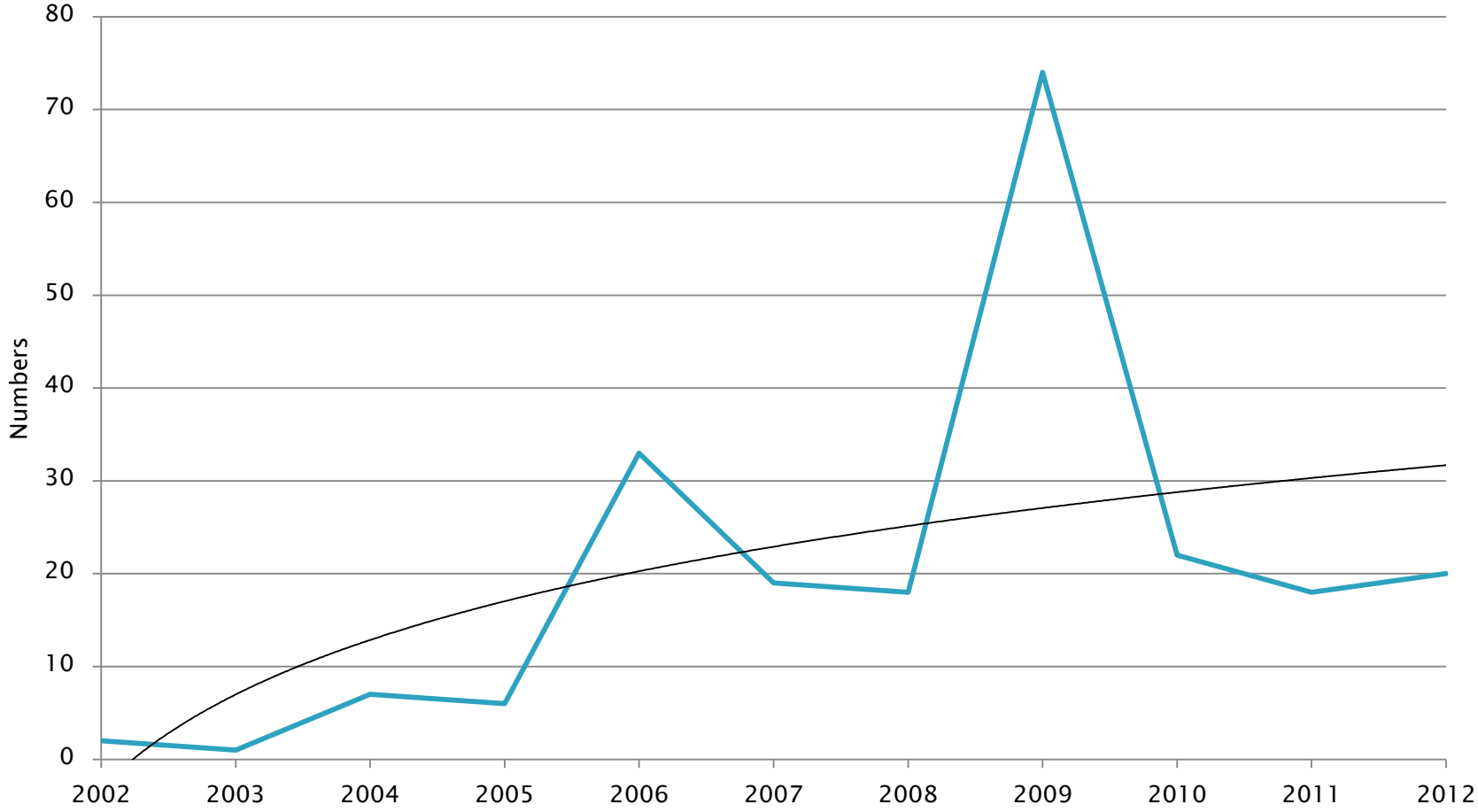
| *Variable* | [Model 1] (GMO regulation impact) | [Model 2] (GMO regulation impact) | [Model 3] (LLP impact) | [Model 4] (LLP impact) | [Model 5] (LLP impact) |
|---|---|---|---|---|---|
| ***Constant*** | –10.28 (–3.43***) | –10.28 (–3.43***) | –10.68 (–3.99***) | –10.73 (–3.98***) | –5.22 (–1.89*) |
| ***Ln-$Y_i$*** | 1.00 (10.20***) | – | – | – | – |
| ***Ln-$Y_j$*** | 0.84 (9.23***) | – | – | – | – |
| ***Ln-$GDPC_i$*** | –1.70 (–7.72***) | –0.69 (–3.76***) | –0.69 (–4.08***) | –0.68 (–3.94***) | –0.64 (–3.68***) |
| ***Ln-$GDPC_j$*** | –0.56 (–3.43***) | 0.28 (2.10**) | – | – | – |
| ***Ln-$P_i$*** | – | 1.00 (10.21***) | 1.03 (10.47***) | 1.01 (10.23***) | 0.72 (6.62***) |
| ***Ln-$P_j$*** | – | 0.84 (9.23***) | 0.86 (9.39***) | 0.86 (9.44***) | 0.81 (8.80***) |
| ***Ln-$D_{ij}$*** | –0.97 (–8.68***) | –0.97 (–8.68***) | –0.92 (–8.20***) | –0.93 (–8.35***) | –0.90 (–7.17***) |
| ***Ln-Reg-$Index_j$*** | –0.49 (–1.70*) | –0.49 (–1.70*) | – | – | – |
| ***Ln-$LLP_j$*** | | – | –0.10 (–1.48) | –0.17 (–1.48) | –0.24 (–2.10**) |
| ***$R^2$*** | 0.23 | 0.23 | 0.22 | 0.22 | 0.18 |
| ***F*** | 28.21*** | 28.21*** | 32.63*** | 33.10*** | 26.03*** |
| ***Schwarz B.I.C.*** | 1468 | 1468 | 1467 | 1467 | 1481 |
| ***N*** | 582 | 582 | 582 | 582 | 582 |

# Interpretation

- Regulation variable is negative and significant at the 10 percent level. Implies that a more restrictive GMO regulation has a deterrent effect on maize trade flow.
- Models 3 and 4 indicate that LLP does not have a significant impact on trade flows
- Model 5 (lower threshold) suggests that the impact of LLP on trade flows may be significant, but not necessarily trade distorting.
- The inclusion of fixed effects yielded similar results for the regulation index, but the LLP variable became positive (but significant only at the 10 percent level).

# Looking forward

# Number of LLP/AP incidents and trend (2002–2012)



# Further research needs

- Improved datasets required on:
  - policies on GMOs existing between trading partners
  - different timings for approvals etc
- Further studies examining the impacts of regulations and threshold levels on global trade in the context of multiple products
- When limitations of datasets overcome, impact of regulations should be analyzed in a dynamic setting