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SEVENTH FRAMEWORK PROGRAMME

FP7NTM IMPACT

EC FP7 KBBE 2008 N° 227202

The impact of regulatory heterogeneity on agri-food trade

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Presented by Christine Wieck

Organised Session “New NTM data and new findings”

1. Introduction

- Declining tariffs have increased the relative importance of non-tariff measures (NTMs)
- Measurement and comparability of NTMs is often difficult, particularly for non-numerical standards
- Our analysis draws on new NTM data collected as part of the NTM-Impact project to assess the impact of regulatory heterogeneity on agri-food trade

2. The NTM-Impact project

- "The impact of non-tariff measure (NTMs) on agri-food trade"
- Co-financed by the European Commission under the 7th Framework Program (project contract No. 227202)
- Focuses on government standards and regulations
- Brings together 19 partners from 10 countries
- Project web site: http://www.ntm-impact.eu

2. The NTM-Impact project

- Project components:
  - Formation of an analytic framework for defining measures and methods
  - Construction of a new NTM database for agri-food trade
  - Analysis of the impact of NTMs using the new database
  - Analysis of the impact of NTMs on product trade clusters
  - Analysis of the impact of private and public standards on least developed countries

3. A new NTM database

- The database includes **eight product groups** (beef, pig meat, cheese, barley, maize, rape, and some fruits and vegetables), and **10 regions**.

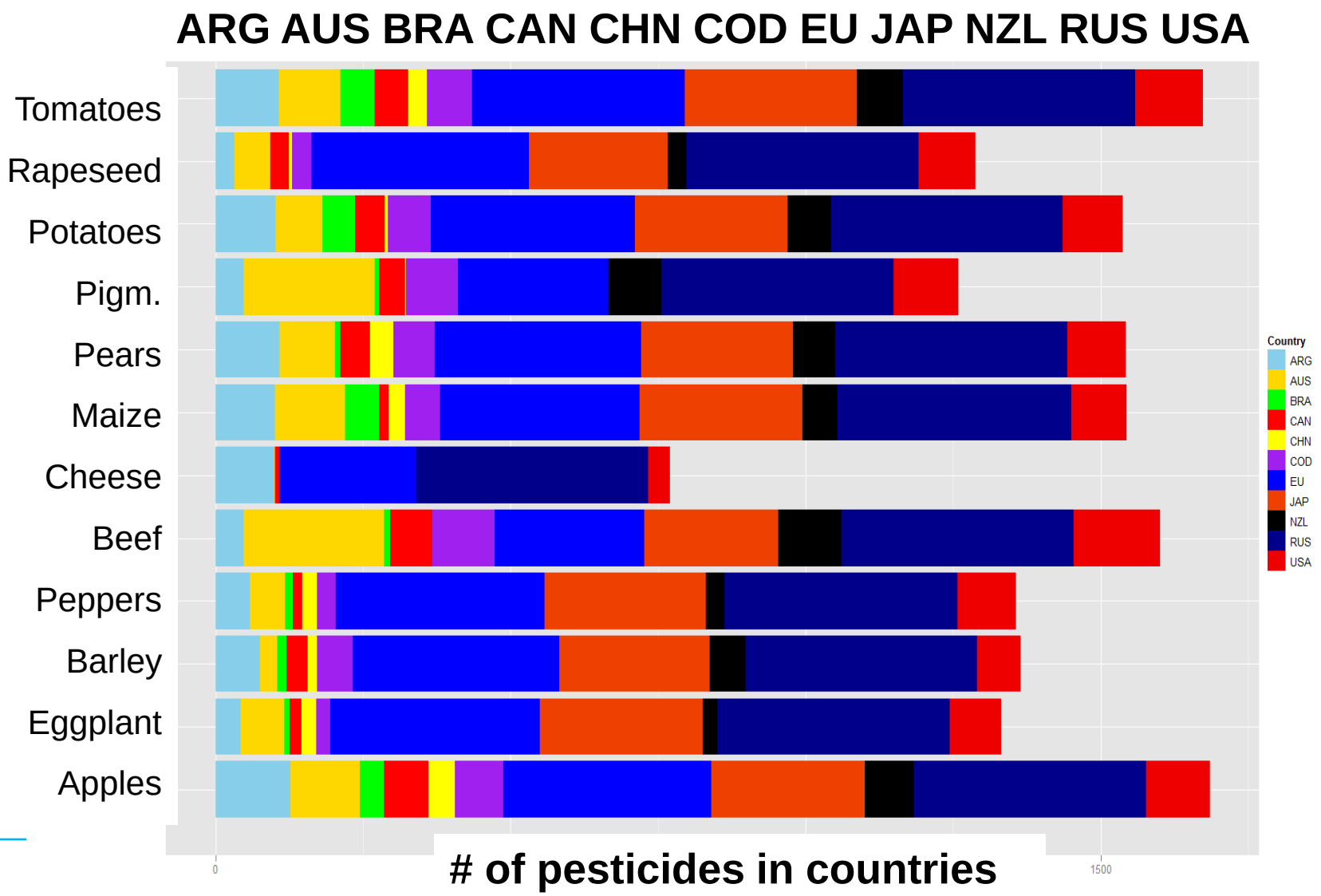
Region	Data collector
European Union	Agricultural Economic Research Institute (LEI)
Argentina	Instituto Nacional de Tecnologia Agricola
Australia	University of Sydney
Brazil	University of Sao Paulo
Canada	Université de Laval
China	Centre for Chinese Agricultural Policy
Japan	Osaka University & Keio University
New Zealand	University of Otago
Russia	Institute for Agricultural Market Studies
United States	Virginia Tech University

3. A new NTM database

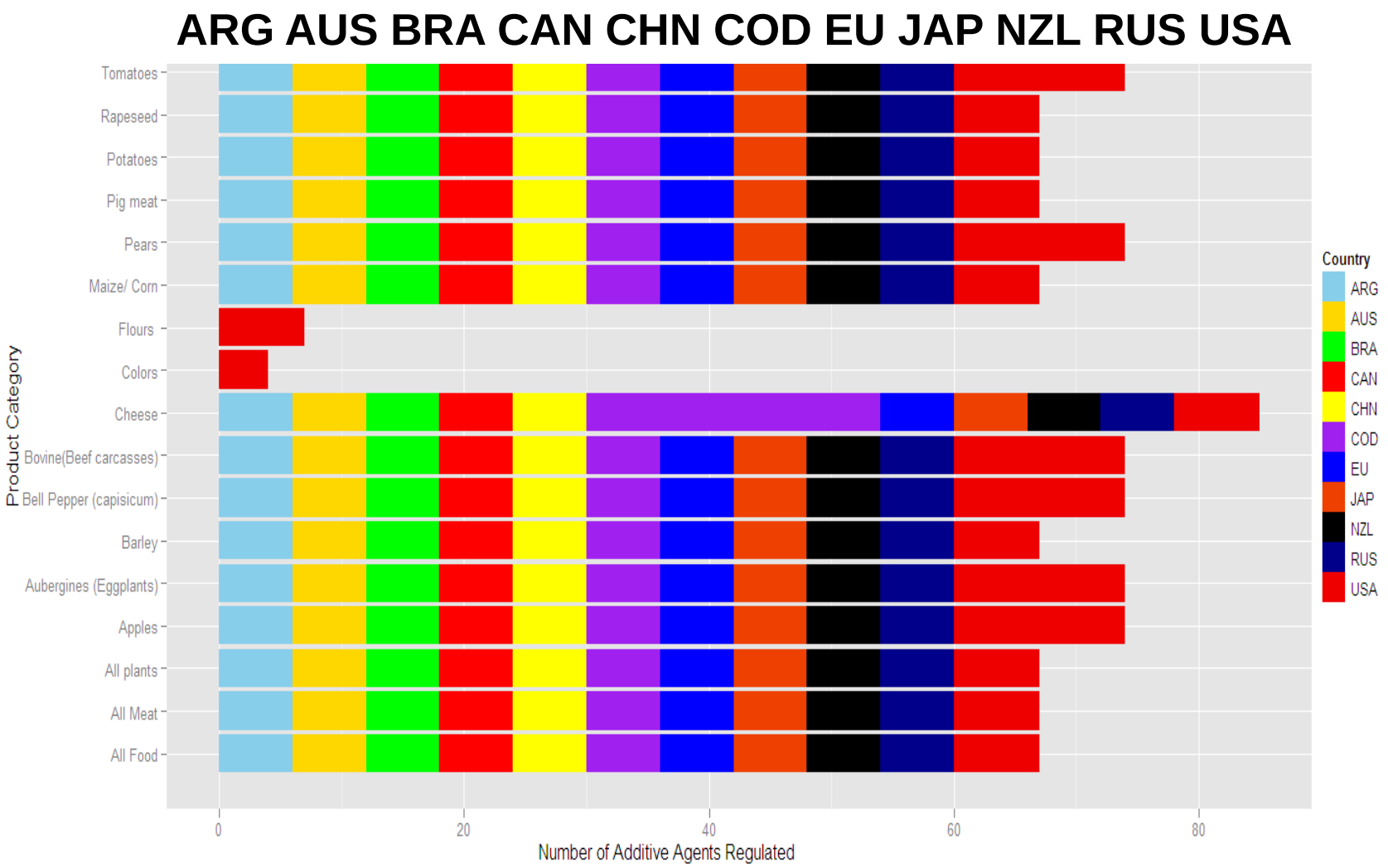
Numerical measures	Qualitative measures
Pesticide maximum residue levels	Labeling requirements
Veterinary drugs maximum residue levels	Plant health measures
Microbial agent measures	Animal health measures
Contaminant agent measures	Traceability requirements
Additives	Conformity assessment

- Data sampling using official data bases for numerical measures, measure specific online questionnaires with associated keywords, logbooks, & commenting

3. Example: # of pesticides in countries + Codex



3. Example: # of regulated additive agents



3. Example: traceability questionnaire

5. **t005 Does your country have a mandatory system for traceability?**

•t 00501 For Beef products
•t 00502 For Pork products
•t 00503 For Fruit products
•t 00504 For Vegetable products
•t 00505 For Cereal products
•t 00506 For Dairy products

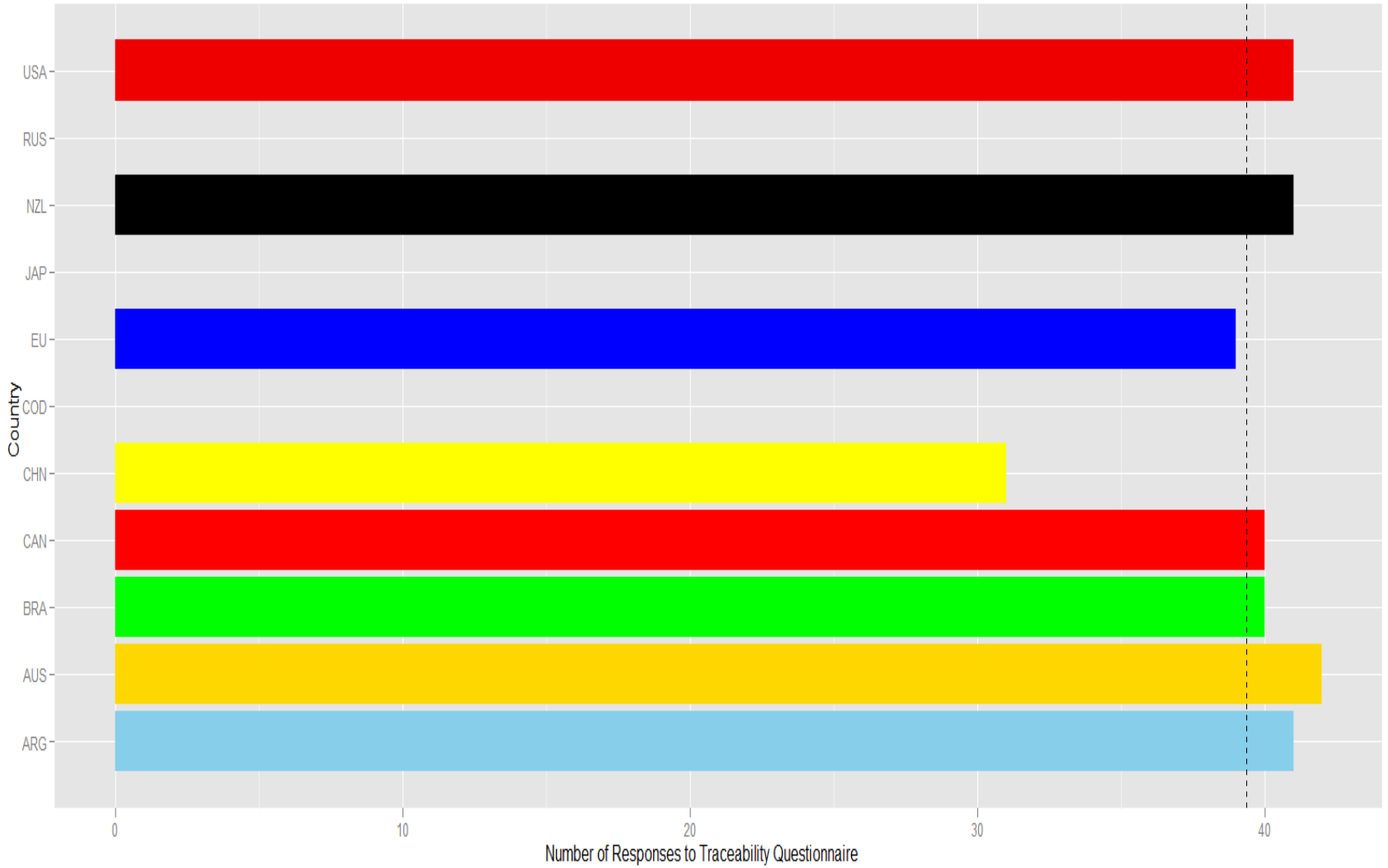
6. **t006 Which parts of the supply chain need to be recorded (not necessarily in paper form)?**

Check one or more of the appropriate boxes
•t00601 One step towards the consumer
•t00602 One step towards the previous supplier
•t00603 Two steps towards the consumer
•t00604 Two steps towards the previous supplier
•t00605 The whole supply chain
•t00606 No traceability requirements

7. **t007 Do your country's traceability requirements cover:**

•t00701 Agricultural production inputs (feed)
•t00702 Agricultural production inputs (not feed but e.g. fertilizer)
•t00703 Transport intra business t00704 Veterinary medicine products

3. Example: # of responses to traceability questions



4. Measuring Heterogeneity in NTMs

- Quantification of differences in NTMs across countries using the heterogeneity index of trade (HIT)
- HIT facilitates aggregation of diverse regulations involving different kinds of information, including binary, ordered and quantitative data

	Binary	Ordered	Quantitative
Type of measure	Rule based calculation	Rank based qualitative or quantitative information	Numerical elements
Example	EU regulates (1) and Australia does not regulate (0)	EU imposes the tightest labeling requirements (5), US is average (3) and Mexico has the most lenient requirement (1)	Maximum residue levels of a specific substance for a specific product

4. Measuring Heterogeneity in NTMs

- Following Gower (1971), dissimilarity between importing country *j* and exporting country *k* for specification *i* is defined as:

$$DS_{ijk}^{HIT} = \frac{|x_{ij} - x_{ik}|}{\max(x_i) - \min(x_i)}$$

where x_i is the observation on specification *i*

4. Measuring Heterogeneity in NTMs

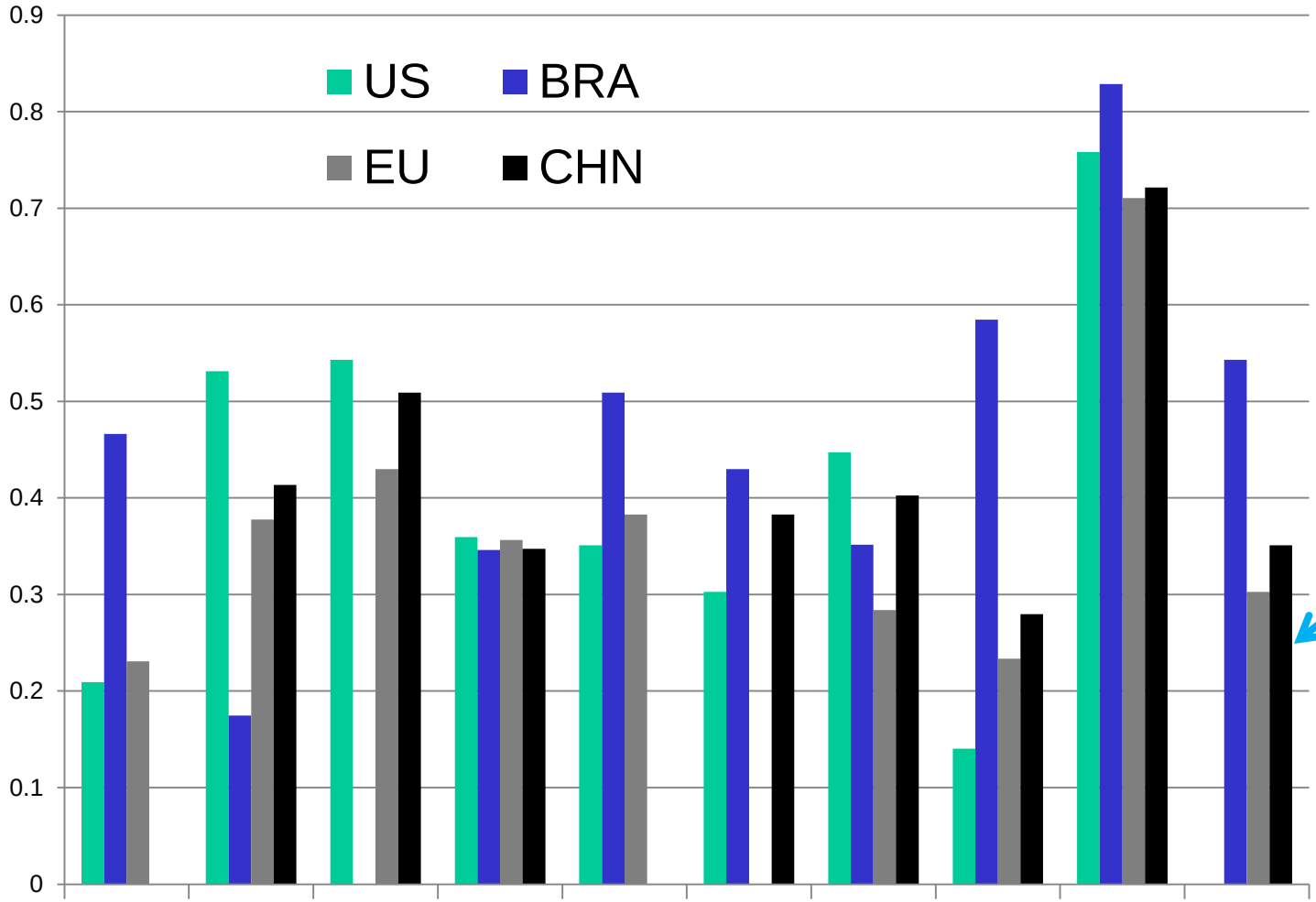
- The HIT between importing country *j* and exporting country *i* is then defined by:

$$HIT_{jk} = \frac{\sum_{i=1}^{n} w_{ijk} DS_{ijk}^{HIT}}{\sum_{i=1}^{n} w_{ijk}}$$

where w_{ijk} is the weight placed on requirement *i* for trade between *j* and *k*

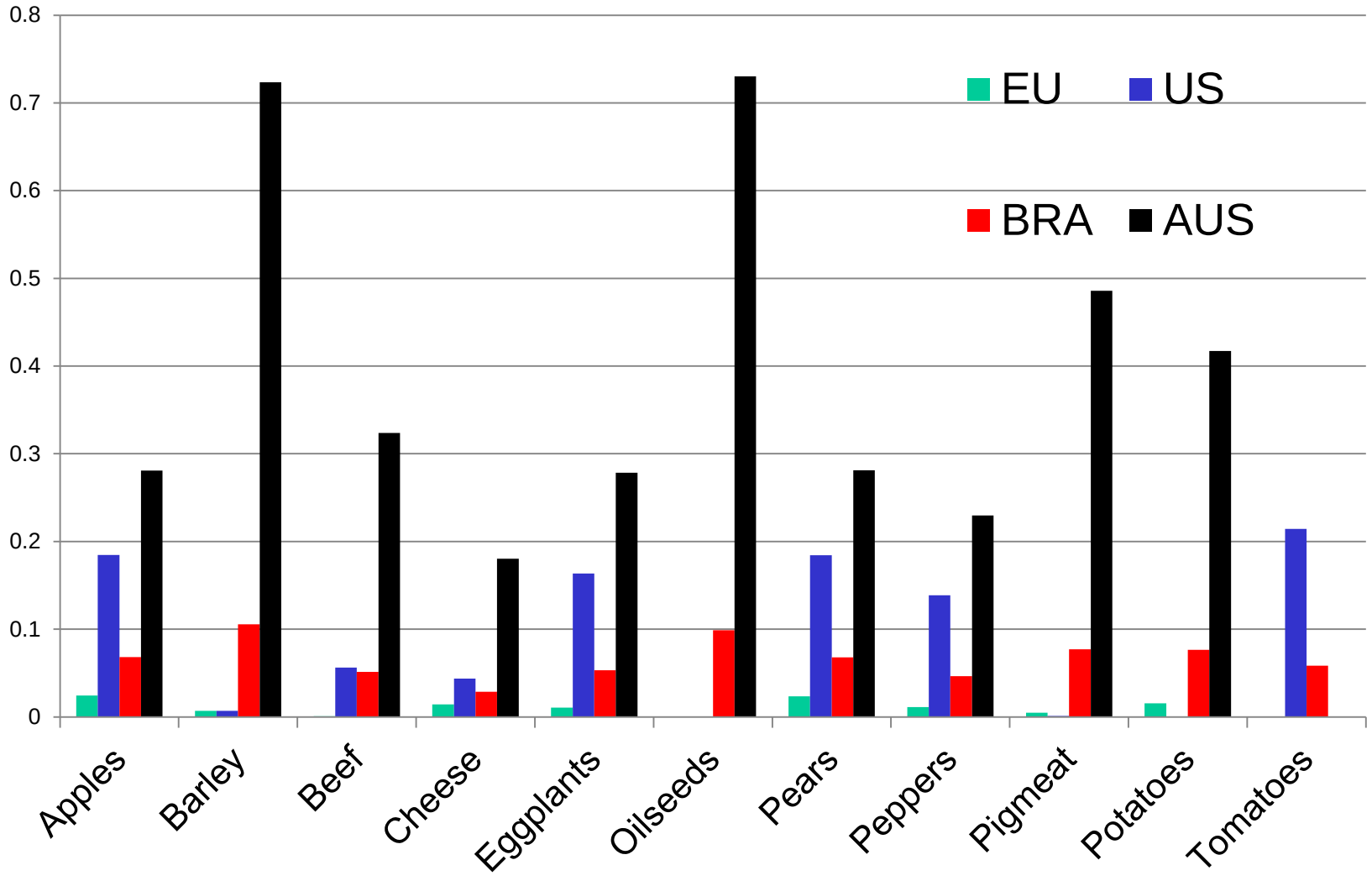
- HIT is bilateral & specific wrt to trade direction
- The HIT is bounded between 0 (identical regulations) and 1 (maximum dissimilarity)
- Link between difference in regulation and cost of compliance not considered

4. Descriptive analysis of HIT: Tracebility requirements Apples



HIT for exports of CHN into US

4. Exports into China: HIT for additives across products



5. Gravity analysis

- For each product group, we specify the following gravity equation

$$x_{ij} = \alpha_0 + \alpha_1 prod_i + \alpha_2 gdp_j + \mathbf{\beta D_{ij}} + \varepsilon_{ij}$$

where
x_j is the log of exports from *i* to *j*
$prod_i$ is the log of production in region *i*
gdp_i is the log of consumption in region *j*
$\boldsymbol{D_{ij}}$ is a matrix of observables trade cost determinants

- Different estimation methods used (OLS, PPML, HMR, 2-stage Heckmann)

5. Gravity analysis

- Bilateral trade between EU27, Argentina, Australia, Brazil, Canada, China, Japan, New Zealand, Russia, and the US
  - Various products, aggregates (plant, animal)

- Up 13 Heterogeneity indexes included + MRL stringency indicator
  - Additives, Contaminants , Pesticide MRL , Veterinary drugs MRL
  - Veterinary, traceability, product, process, plant, monitoring, Certification & labelling requirements
  - Conformity assessment
  - Percentage of pesticide MRLs for which the exporter has a more stringent standard

5. Gravity analysis

Product	Meat	Animal products	All products
Method	PPML	HMR	Heckmann
Dependent	trade	lntrade	lntrade
CONSTANT	5.204	19.22	-3.804
LN_DISTW	-0.118	-0.255	-0.675**
GDP	-0.266	-0.374	1.305
PRODUCTION	0.009	0.649***	0.448***
CLANG_O	1.01	1.941***	0.338
CONTIG	-4.28***	14.91*	4.432***
COLONY	-0.291	5.740	-4.053*
LN_TRFAH	0.599**		
FTA_NAFT	7.388***	-18.23*	-1.021
FTA_MERC	5.232**	-19.81*	0.833
FTA_ANZ	-3.283	-2.728	3.045***
LOCKED_E			13.85**
LOCKED_M			23.45*

5. Gravity analysis

Product	Meat	Animal products	All products
Method	PPML	HMR	Heckmann
Dependent	trade	ltrade	ltrade
VET MRL	-0.129	-0.170	-0.658
PEST MRL	-0.261**	-1.656	0.399
VETREQ	-0.157		
MONITOR	0.29		
PEST STINGC	0.223***	0.0173	-0.00696
CONTAMIN	-0.395*	-1.085	1.263***
ADDITIVE	-0.249**	4.909	0.585

6. Conclusions

- Aggregation of NTMs using heterogeneity indices provides new impetus for comparisons across country pairs and products of NTMs
- Diverse impacts of regulatory heterogeneity across products and aggregation levels found in trade flow analysis
- More information on stringency/cost of compliance may improve indices
- NTM data collected under the NTM-Impact project provides a rich dataset for future analysis

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Thank you!

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