Changes in Aflatoxin Standards: Implications for EU Border Controls of Nut Imports

Ibtissem Taghouti ⁽¹⁾, Jose-Maria Garcia-Alvarez-Coque⁽²⁾, Victor Martinez-Gomez ⁽²⁾
⁽¹⁾ **National research Institute of rural engineering, Water and Forests (INRGREF), Tunisia**
⁽²⁾ **Polytechnic University of Valencia, Spain**
ibtissem.taghouti@gmail.com

Introduction

- ✓ Public concerns about food-related health risks and suitable sanitary standards have been rising in many regions, particularly in EU
- ✓ Aflatoxin (AF) standards are a common reason for trade disagreement and import notifications in the RASFF (Rapid Alert System for Food and Feed)
- ✓ Few empirical analyses have identified the influencing factors in implementing Non-Tariff Measures (NTMs), specifically a Sanitary and Phytosanitary (SPS) measure
- ✓ This study examines the factors influencing border controls of AF, based on political economy considerations, in a highly problematic group of products : Nuts

- Natural AF contamination of nuts is unavoidable, yet it poses a major challenge for nut safety and quality
- Contamination can occur at any stage of the value chain especially when storage and drying facilities are inappropriate
- AFs affect 4.5 billion people worldwide, with chronic exposure leading to various forms of cancer and even death (US Centers for Disease Control and Prevention, 2004; Emmott, 2012)
- The most toxic and common AF is B1 and affects generally **groundnuts, Brazil nuts, pistachio and walnuts**

AF contamination can directly increase the likelihood of rejection at the border and constrain nut exports

Aflatoxins and nuts in the EU

Data & Empirical analysis

- The model relies on RASFF notifications of AFS in nut imports
- The study examines 65 countries covering the period 1998 -2015
- The outcome variable provided the notification count by HS-6 code, country of origin and year
- Trade data are used to account for annual bilateral trade volume
- We focus on notifications emitted by only the 15 first EU member states to explore policy changes over an invariant number of EU member states

Conceptual Framework

- The adapted framework to assess the trade impact of EU policy change includes the Exporting countries' capacity to meet EU standards & Path dependence on previous decisions
- Many efforts made by the public administration to optimise producer and consumer welfare through enforcing standards and border controls. The welfare objective W for the public administration affecting import controls is given by

$$W = \varphi (\omega_s, \omega_c)$$

Assuming that, N_{ijt} is influenced by other political economy considerations : lobbying by producers (ℓ_s) and consumers (ℓ_c)

$$N_{ijt} = \phi (\ell_s, \ell_c, W)$$

- Previous research (Jouanjean et al., 2015; Tudela-Marco et al., 2016) found that more developed countries are less likely to fail a SPS control due to more developed pre-export facilities : measured by GDP *per capita* (**pcGDP**)
- The model allows for dynamics aspect of RASFF notifications through identifying the effect of the history of member states' actions on present control measures
- Current Notifications are likely affected by previous decisions
- Product notifications for period (t) (HS-6 category) are path dependent on previous product notifications (N_{ijt-1}) & the reputation of the exporting country is related to total number of notifications received in previous periods ($N_{jt-1} = \sum_i N_{ijt-1}$)

$$N_{ijt} = \phi (\ell_s, \ell_c, W, N_{ijt-1}, N_{jt-1}, pcGDP_{jt-1})$$

Concept	Model variables
Capacity of exporting countries	☐ Development level (per capita GDP_j)
Consumer concerns (Wc and Ic)	☐ Alerts (Ai)
	☐ Scientific awareness (S)
	☐ Imports from each country of origin (Mij)
Producer concerns (Ws and Is)	☐ Imports from each country of origin (Mij)
	☐ EU production of each nut (Qit)
Path dependence effects	☐ Previous product notifications (Nijt-1)
	☐ Country reputation (Njt-1)
Policy substitution effects	☐ Applied tariffs (T_{pt})

Findings and Discussion

	Negative binomial	Logit
(Intercept)	-1.50447 (0.12020)***	2.58930 (0.10508)***
N _{ijt-1}	0.02125 (0.00180)***	-2.69360 (0.12514)***
N _{jt-1}	-0.01520 (0.00168)***	-0.00756 (0.00165)***
A _{ijt-1}	0.21035 (0.02918)***	0.74469 (0.31713)*
Ln (pcGDP _{t-1})	-0.00029 (0.00012)*	0.00013 (0.00011)
Ln (M _{ijt-1})	0.00022 (0.00005)***	-0.00034 (0.00006)***
Ln (Q _{it-1})	0.00488 (0.00215)*	0.01582 (0.00255)***
Ln (S _t)	0.04900 (0.00834)***	0.01892 (0.00766)*
T _{ijt}	-0.06204 (0.01263)***	
Dummy 1998-2001	-1.34639 (0.08990)***	
N _{ijt-1}	0.11488 (0.02097)***	
N _{jt-1}	-0.09371 (0.01915)***	
A _{ijt-1}	0.54243 (0.07669)***	
Dummy 2010-2015	-0.82279 (0.07627)***	
N _{ijt-1}	0.04583 (0.00583)***	
N _{jt-1}	-0.01044 (0.00297)***	
A _{ijt-1}	-0.18422 (0.05195)***	
Country fixed effects	***	
Product fixed effects	***	

Impact on notification count per period (percentage change)

	Pre harmonisation of EU standards 1998-2001	Pre Codex compliance 2002-2009	Post Codex compliance 2010-2015
Per unit change in			
N _{ijt-1}	13.77	2.13	6.73
N _{jt-1}	-11.05	-1.52	-2.56
Alerts _{ijt-1}	77.15	21.03	2.38
Tariffs T _{ijt-1}		-6.20	
Per 1 % increase in			
Imports _{ijt-1}		0.022	
EU production _{it-1}		0.488	
pcGDP _(t-1)		-0.029	
Scientific references _t		4.90	
Fixed effect period	0.26	1	0.44

Average notification count (2013-2015): non-Codex scenario

Average notification count (2013-2015)		Non-Codex scenario	Observed with Codex	% Impact on notification count
Country	South Africa	12	3	-78
	United States	67	26	-62
	Argentina	9	4	-53
	India	24	13	-45
	Brazil	19	11	-41
	Nigeria	2	1	-40
	Iran	51	35	-32
	Egypt	10	9	-13
	Turkey	55	49	-11
	China	56	54	-3
Product	Pistachios	98	51	-48
	Peanut	80	56	-43
	Almond	4	3	-25
Total		196	103	-47

Notes: Source: Authors' calculations; ***p < 0.001, **p < 0.01, *p < 0.05

Conclusions

- NTMs depend on domestic consumer and producer concerns,
- NTMs depend also on the export capacity of nut exporters and, most importantly, on scientific awareness of the health impact of AFs
- The implementation of NTMs is affected by product and country reputation, indicating that past notifications on SPS non-compliance have a significant effect on current notifications
- Events requiring rapid action like withdrawal from the market have a significant effect on the next year notifications
- Results also support that NTMs may substitute tariffs in EU trade
- Further research is needed to analyse how changes in AF standards affect nut exports to the EU
- Considering standard reforms as endogenous to the model would also provide an interesting research opportunity