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# When Quality Management Helps Agri-food Firms to Export

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## Motivation

Increasing demand for **traceability and safety** for food products :

- Public regulation (EC regulation 178/2002 of food traceability)
- Sanitary and Phytosanitary Standards (SPS) and Technical Barrier to trade (TBT) at the border
- Private certifications (HACCP, ISO, IFS, BRC...)

→ The ability to produce safe products, ensure their traceability and have it recognized through certification is an important component of competitiveness

Investigates the impact of **firms' commitment to traceability and food safety** on **export performance**

- Relies on the presence of quality management and control **personnel** to proxy this commitment
- Uses firm-level data from 2009 to 2016
- Estimates the impact of quality management on the intensive and extensive margin of trade, on trade unit values and perceived quality (Khandelwal 2010)
- Explores the heterogeneity of the effect by product-destination (presence of Non Tariff Measures)

## Quality management and control personnel

- Staff in charge of the firm's products **quality**:
  - Design quality protocols
  - Conduct inspections and tests
  - Create quality documentation and traceability systems
  - Report feedback from customers and analyse safety issues
- May impact **trade**:
  - by reducing hazards, recalls and complains
  - by increasing the efficiency of supply chains
  - by helping the products to comply with regulatory requirement
  - by enhancing the firm's reputation (potentially through certifications)

## Literature (1)

- Traceability and quality management system on firms competitiveness on domestic markets (Alfaro and Rabade 2009, Epelbaum and Martinez 2014, Aiello et al. 2015)
- Valuation of food traceability system by consumers (Graia et al. 2013, Liu et al. 2019)

→ No papers on quality management or traceability system and international trade

## Literature (2)

- **Quality and trade** (Verhoogen 2008, Baldwin and Harrigan 2011, Manova and Zhang 2012...) with different proxy for quality :
  - Prices (Schott 2008)
  - Econometric estimation of quality (Khandelwal 2013)
  - Expert ranking (Crozet et al. 2012)
  - R&D and Innovation (Curzi et Olper 2012)
  - Professional classification (Hansman et al. 2020, Emlinger and Lamani 2020)

→ Here a different definition of **quality** : safety, reliability, ability to follow regulatory requirements

## Data sources

- DADS French administrative employee-firm-level database: number of employees, working hours, total salary, by firm and occupation
  - 387d: quality control manager and engineer
  - 475b: quality control technician for the processing industries
- French Customs trade data: value and quantity exported by firm, product (HS6), destination and year

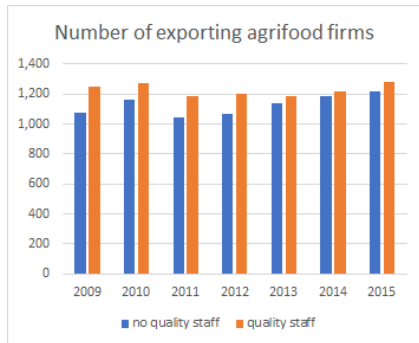
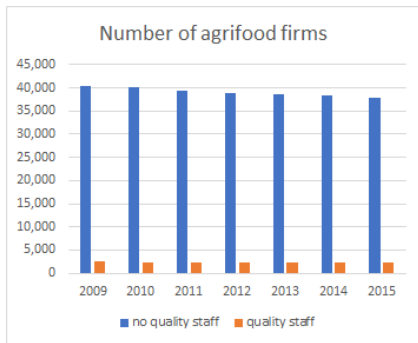
→ From 2009 to 2015

→ Agri-food products only

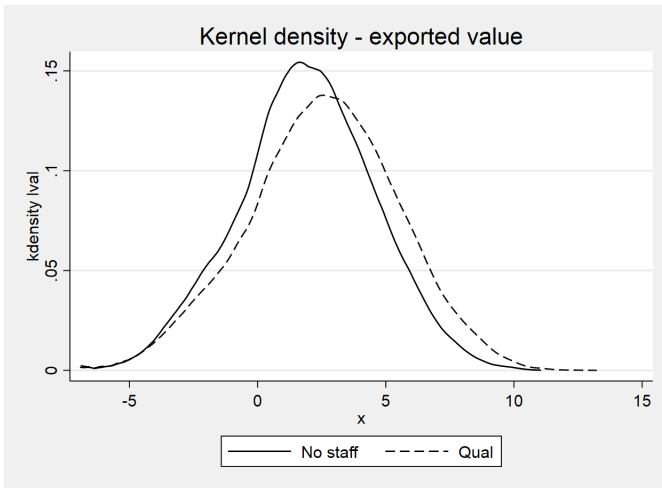
→ Focus on Agri-food producing firms (exclusion of wholesalers)



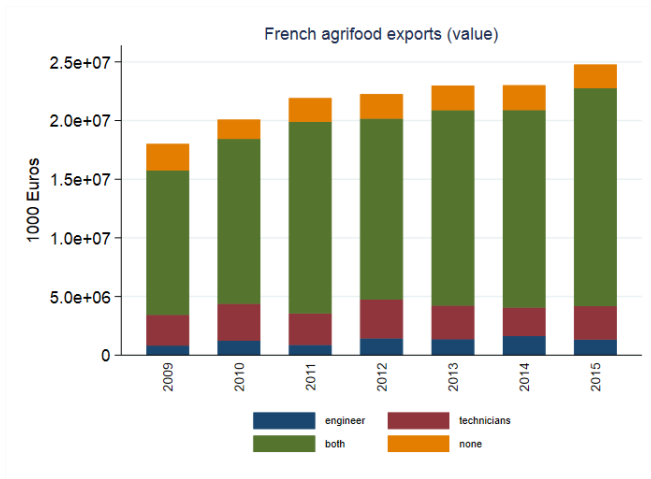
# Data: Trade and quality management



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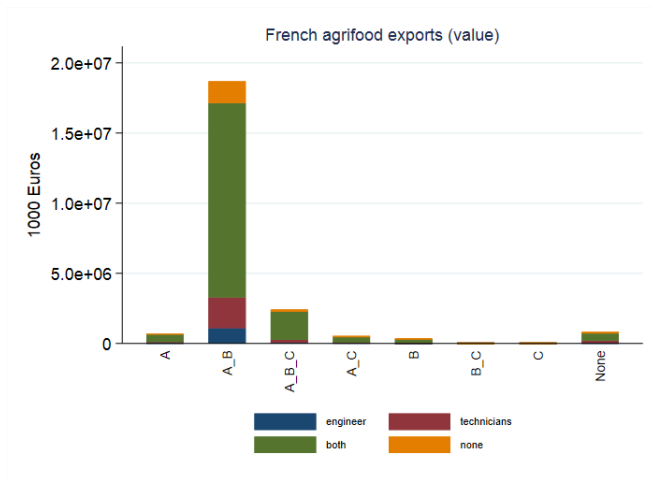
# Data: Trade and quality management



## Data: NTMs

- Occurrence of Non-Tariff Measures by country and product (6 digits of the Harmonized System) from WITS
- We restrict NTMs to Sanitary and Phytosanitary measures (SPSs), Technical Barriers to Trade (TBTs) and preshipment inspection - chapters A, B and C of UNCTAD classification
- 80 countries

# Data: Trade, quality management and NTM



# Specification

$$Exp_{fjkt} = \alpha_1 Quality_{ft} + \xi_{jkt} + v_f + \varepsilon_{fjkt}$$

- $Quality_{ft}$  is a dummy indicating whether firm  $f$  has quality management the year  $t$
- $f$  fixed effect controls for time invariant firms characteristics
- $jkt$  fixed effects controls for characteristics of the market of country  $j$  and good  $k$  the year  $t$

→ Intensive margin  $Exp_{fjkt} = lv_{fjkt}$  log of exports of  $f$  to  $j$  for the  $k$  at  $t$

## Results

	$lv_{fjkt}$			
	(1)	(2)	(3)	(4)
Quality <sub>ft</sub>	0.09** 0.02			
Quality <sub>ft</sub> × EU <sub>j</sub>		0.13*** 0.02	-0.05 0.06	-0.05 0.06
Quality <sub>ft</sub> × nonEU <sub>j</sub>		-0.16*** 0.02	-0.03*** 0.14	-0.18** 0.07
Quality <sub>ft</sub> × EU <sub>j</sub> × NTM <sub>jk</sub>			0.19*** 0.06	
Quality <sub>ft</sub> × nonEU <sub>j</sub> × NTM <sub>jk</sub>			0.14** 0.08	
Quality <sub>ft</sub> × EU <sub>j</sub> × SPS <sub>jk</sub>				-0.24 0.17
Quality <sub>ft</sub> × nonEU <sub>j</sub> × SPS <sub>jk</sub>				0.11 0.08
Quality <sub>ft</sub> × EU <sub>j</sub> × TBT <sub>jk</sub>				0.43** 0.18
Quality <sub>ft</sub> × nonEU <sub>j</sub> × TBT <sub>jk</sub>				-0.04 0.05
Quality <sub>ft</sub> × EU <sub>j</sub> × Preship <sub>jk</sub>				-0.13 0.21
Quality <sub>ft</sub> × nonEU <sub>j</sub> × Preship <sub>jk</sub>				-0.18*** 0.04
Nber Obs.	382,027	329,024	329,024	329,024
R-squared	0.49	0.50	0.50	0.50

Firm and destination-product-year fixed effects included

\*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ .

## Conclusion

- We show that quality management employees:
  - help firms to export more in value ...
  - ... but only to destination-products with NTM
  - Reduce exports on non EU markets without NTM: cost effects?
  - Have a heterogeneous effect according to the type of NTM
- Future steps:
  - Explore the different type of personnel: Engineer, Technicians
  - Explore the intensity of quality management: number of employees, salaries, working time
  - Look at the effect of quality management on the extensive margin of trade, on unit values and perceived quality (Khandelwal 2010)