



HAL
open science

When Quality Management Helps Agri-food Firms to Export

Charlotte Emlinger, Karine Latouche

► **To cite this version:**

Charlotte Emlinger, Karine Latouche. When Quality Management Helps Agri-food Firms to Export. EAAE congress, European Association of Agricultural Economists (EAAE), Aug 2023, Rennes, France. hal-04329817

HAL Id: hal-04329817

<https://hal.inrae.fr/hal-04329817>

Submitted on 7 Dec 2023

HAL is a multi-disciplinary open access archive for the deposit and dissemination of scientific research documents, whether they are published or not. The documents may come from teaching and research institutions in France or abroad, or from public or private research centers.

L'archive ouverte pluridisciplinaire **HAL**, est destinée au dépôt et à la diffusion de documents scientifiques de niveau recherche, publiés ou non, émanant des établissements d'enseignement et de recherche français ou étrangers, des laboratoires publics ou privés.

When Quality Management Helps Agri-food Firms to Export

Charlotte Emlinger^a, Karine Latouche^b

^a *CEPII*

^b *SMART, INRAE*

EAAE congress, Rennes, August 2023



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

This paper

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 2019
- Estimates the impact of quality management on the intensive and extensive margin of trade, on trade unit values
- 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 **sanitary and safety 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 increasing the **efficiency** of supply chains
 - by helping the products to **comply** with regulatory requirement
 - by enhancing the firm's **reputation** (by reducing hazards, recalls and complains, and potentially through certifications)

Literature

- 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

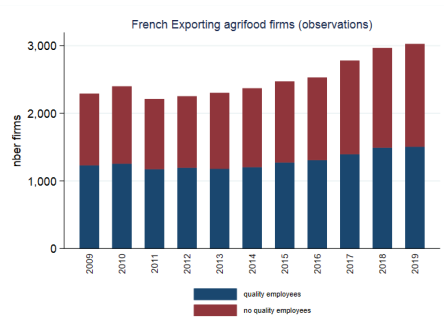
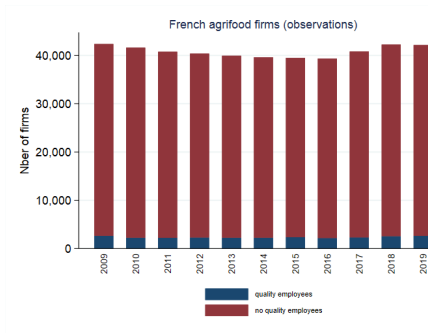
Data sources

- 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
- FARE Data characteristics of firms (value added, turnover)

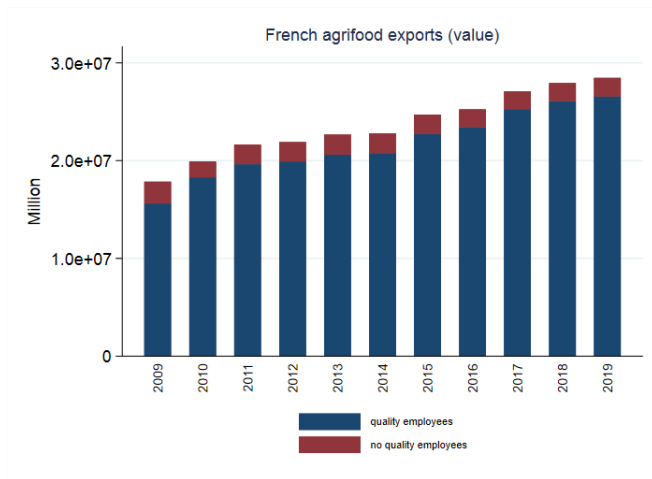
Sample

- From 2009 to 2019
- Agri-food products only : 878 products
- Focus on agri-food producing firms (exclusion of wholesalers and retailers): 5,033 exporting firms

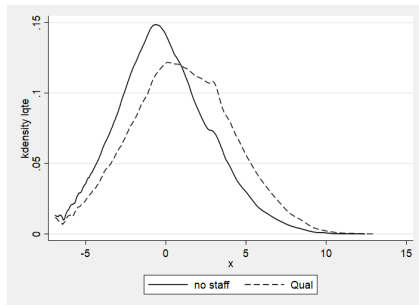
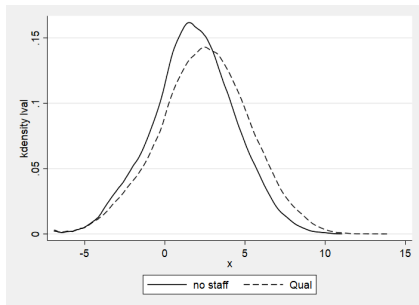
Data: Trade and quality management



Data: Trade and quality management



Data: Trade and presence of quality management



Specification

$$Exp_{fjkt} = \alpha Quality_{ft} + \beta \Pi_{ft} + \nu_f + \xi_{jkt} + \varepsilon_{fjkt}$$

- $Quality_{ft}$ is a dummy indicating whether firm f has quality management the year t
- Π_{ft} time variant firm characteristics (size, productivity)
- jkt fixed effects controls for characteristics of the market of country j and good k the year t
- f firm fixed effect controls for time invariant firms characteristics
- $Exp_{fjkt} =$
 - lv_{fjkt} log of export values of f to j for the k at t
 - X_{fjkt} dummy=0 if f exports k to j at t

Endogeneity

- Endogeneity of firm's decision to invest in quality management: could be linked to the firm's decision to export (or to export more / to some specific destination) or to its product specialization
- Instrumental variable approach, using the following IV :
 - Share of firms in the same sector (APE) and department with quality management staff
 - Share of exported products with NTM on the European market

Results : intensive margin of trade

	$\ln v_{fjkt}$				
	(1)	(2)	(3)	(4)	(5)
	All	$\Delta Quality_{ft}=0$	All	All	All
	OLS	OLS	IV	OLS	IV
Quality _{ft}	0.187*** (0.018)	0.195*** (0.040)	1.962*** (0.116)	0.025** (0.012)	0.718*** (0.119)
productivity _{ft}	0.454*** (0.013)	0.517*** (0.016)	0.409*** (0.016)	0.030*** (0.010)	0.026** (0.012)
Size 2 _{ft}	0.425*** (0.024)	0.492*** (0.038)	-0.065 (0.047)	0.028 (0.025)	-0.095*** (0.035)
Size 3 _{ft}	0.630*** (0.030)	0.814*** (0.047)	-0.219*** (0.066)	0.123*** (0.033)	0.025 (0.040)
Size 4 _{ft}	1.438*** (0.030)	1.561*** (0.044)	0.313*** (0.081)	0.190*** (0.042)	0.056 (0.052)
N	594,383	393,903	490,878	593,758	490,773
r ²	0.344	0.363	0.004	0.483	-0.004
Underidentification stat.			4769.369		1411.635
F stat for weak id			1773.104		1130.119
Weak id. p-value			0.000		0.000
Endogeneity test stat			229.228		35.994
p-value endogeneity test			0.000		0.000
destination-product-year	yes	yes	yes	yes	yes
firm	no	no	no	yes	yes

Notes: All continuous variables are in logarithm.

Robust standard errors clustered by firm-year in parentheses.

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

Results : extensive margin of trade

	X_{fjkt}				
	(1)	(2)	(3)	(4)	(5)
	All	$\Delta Quality_{ft}=0$	All	All	All
	OLS	OLS	IV	OLS	IV
Quality _{ft}	0.008*** (0.000)	0.014*** (0.001)	0.022*** (0.002)	0.001*** (0.000)	0.018*** (0.003)
productivity _{ft}	0.017*** (0.000)	0.015*** (0.000)	0.020*** (0.000)	0.002*** (0.000)	0.002*** (0.000)
Size 2 _{ft}	0.021*** (0.001)	0.019*** (0.001)	0.015*** (0.001)	0.006*** (0.000)	0.003*** (0.001)
Size 3 _{ft}	0.034*** (0.001)	0.028*** (0.001)	0.023*** (0.001)	0.012*** (0.001)	0.008*** (0.001)
Size 4 _{ft}	0.057*** (0.001)	0.054*** (0.001)	0.042*** (0.002)	0.015*** (0.001)	0.010*** (0.001)
N	11,127,999	7,209,619	7,624,979	11,127,997	7,624,977
r2	0.124	0.132	0.007	0.171	-0.000
Underidentification stat.			94066.504		41955.844
F stat for weak id			8157.149		6562.125
Weak id. p-value			0.000		0.000
Endogeneity test stat			60.305		44.885
p-value endogeneity test			0.000		0.000
destination-product-year	yes	yes	yes	yes	yes
firm	no	no	no	yes	yes

Notes: All continuous variables are in logarithm.

Robust standard errors clustered by firm-year in parentheses.

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

Results : markets with NTM

	ln v_{fjkt}			X_{fjkt}		
	(1)	(2)	(3)	(4)	(5)	(6)
	All	$EU_{\hat{t}=1}$	$EU_{\hat{t}=0}$	All	$EU_{\hat{t}=1}$	$EU_{\hat{t}=0}$
Quality $_{\hat{t}} \times NTM_{jk}$	0.026** (0.013)	0.022 (0.015)	0.042** (0.021)	0.002*** (0.000)	0.002*** (0.001)	0.001*** (0.000)
Quality $_{\hat{t}} \times noNTM_{jk}$	-0.058 (0.056)	-0.141* (0.076)	0.061 (0.076)	-0.007*** (0.001)	0.007** (0.003)	-0.003*** (0.001)
productivity $_{\hat{t}}$	0.029*** (0.010)	0.055*** (0.012)	0.001 (0.017)	0.002*** (0.000)	0.004*** (0.000)	0.001*** (0.000)
Size 2 $_{\hat{t}}$	0.040 (0.027)	0.077** (0.034)	0.024 (0.042)	0.007*** (0.001)	0.015*** (0.001)	0.003*** (0.001)
Size 3 $_{\hat{t}}$	0.124*** (0.035)	0.194*** (0.041)	0.016 (0.059)	0.015*** (0.001)	0.028*** (0.002)	0.007*** (0.001)
Size 4 $_{\hat{t}}$	0.214*** (0.044)	0.393*** (0.053)	-0.023 (0.073)	0.019*** (0.001)	0.038*** (0.002)	0.007*** (0.001)
N	541567	358155	183189	7830743	3199581	4631141
r2	0.49	0.53	0.47	0.18	0.21	0.16
destination-product-year	yes	yes	yes	yes	yes	yes
firm	yes	yes	yes	yes	yes	yes

Notes: All continuous variables are in logarithm.

Robust standard errors clustered by firm-year in parentheses.

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

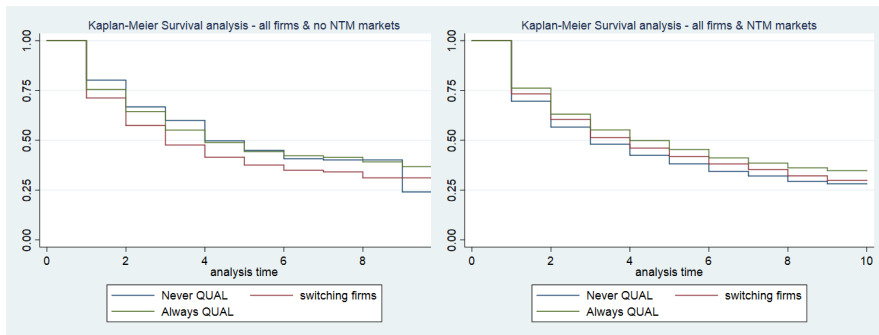
Conclusion

- We show that quality management employees:
 - increase firms market access to foreign countries
 - help firms to export more ...
 - ...but only to destination-products with NTM

→ Compliance effect

Future steps : impacts on the duration of trade

Kaplan-Meier survival functions of each length of spell



→ Different survival probability for firms with and without quality management on market with NTM