



# Price integration in the fresh mussel value chain

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- ❖ **Fresh mussel value chain in Spain**
- ❖ **Fresh mussel value chain in France**
- ❖ **Spanish fresh mussel in the French mussel value chain**

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# Price integration in the fresh mussel value chain in Spain

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- Spain is the **third largest producer of aquaculture mussel** and the **first in the European Union**
- **Mussel is the main species in the Spanish aquaculture** in terms of quantities
- Mussel farming in Spain is **mainly carried out in Galician stuaries** (Galicia)

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- ❑ Mussel in Spain is **consumed mainly whole and fresh**.
  
- ❑ **Fresh market is supplied by national production**
  
- ❑ There is also an important market for canned mussel. In this case there is significant imports from third countries.
  
- ❑ The mussel value chain present **several particularities and constrains** that can affect the interactions between prices along the chain.
  - ❖ Atomization of producers (family business)
  
  - ❖ Environmental issues (red tide)

**Analyze the price transmission mechanisms along the Spanish fresh mussel market in order to know how the negotiation power is distributed along the value chain.**

## **Vertical price integration analyses**

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## Fresh mussel

- The prices for fresh mussel at ex-farm level has been collected **monthly** from from 2004 to 2016 from **PescadeGalicia**.
- The prices for fresh mussel at wholesale and retail levels have been collected **weekly** for sea bream from 2004 to 2016 by **Spain's Ministry of Agriculture and Food** through the **Observatory of Food**.

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## Fresh mussel results

- The **Augmented Dickey-Fuller (ADF)** test (Dickey & Fuller, 1979; 1981) is used to test the time series properties of the data (non-stationarity).

	Constant		Linear trend		Quadratic trend	
	Levels	1st diff.	Levels	1st diff.	Levels	1st diff.
Producer	-3.626***	-9.536***	-5.451***	-9.542***	-5.946***	-9.499***
Wholesaler	-3.042**	-10.17***	-3.241**	-10.16	-4.598***	-10.16***
Retail	-2.097	-10.72***	-3.182*	-10.76***	-2.788	-10.84***

\*\*\* 99% CL; \*\* 95% CL; \* 90% CL

- **Unit root can be rejected for all models** in the producer and wholesale price series. In the case of the retail prices, stationarity can be rejected in models with constant and quadratic trend, and on a 95% confidence level in the case of a model with a linear trend.
- Since the series were found stationary, analysis will be based on a VAR system and no further cointegration tests are performed

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## Granger causality

### Producer

All lags of Producer	$F(2, 123) = 52.290 [0.0000]^{***}$
All lags of Wholesale	$F(2, 123) = 6.5161 [0.0020]^{***}$
All lags of Retail	$F(2, 123) = 0.23456 [0.7913]$
All vars, lag 2	$F(3, 123) = 2.6784 [0.0500]^*$

### Wholesale

All lags of Producer	$F(2, 123) = 0.86142 [0.4251]$
All lags of Wholesale	$F(2, 123) = 127.23 [0.0000]^{***}$
All lags of Retail	$F(2, 123) = 1.4621 [0.2357]$
All vars, lag 2	$F(3, 123) = 1.5632 [0.2017]$

### Retail

All lags of Producer	$F(2, 123) = 2.5719 [0.0805]^*$
All lags of Wholesale	$F(2, 123) = 2.6214 [0.0768]^*$
All lags of Retail	$F(2, 123) = 372.57 [0.0000]^{***}$
All vars, lag 2	$F(3, 123) = 1.4123 [0.2424]$

- Wholesale prices appear to be independent and affecting producer prices and, in less intensity, retail prices.
- Producer prices are significantly affected by wholesale prices but weakly affect retail prices.



# Price integration in the fresh mussel value chain in France

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- ❑ The French market of fresh, live mussels is **supplied firstly by domestic production and then imports**. French production in 2015: 78,720 tons / 33,981 fresh mussel imports
- ❑ The market share of French production in the whole supply reached 70%
- ❑ Between one half and two thirds of **French imports come from the Netherlands and Spain**.

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- ❑ Mussel farming in France is practiced as a main activity by about **400 enterprises** and **1500 jobs** in full-time equivalent.
- ❑ **Mussel farms are mainly family-owned, small-scale companies** with an average employment rate of 3.7 (DCF, 2012).
- ❑ Compared to the two main import countries, **mussel farming is present in the different coastlines of France** (albeit around 50% of the production comes from the enterprises located in Channel and North seas) while it is specialized to one region in Spain (Galicia) and in the Netherlands (Zeeland).

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## Research goals

**Analyze the price transmission mechanisms on the French fresh mussel market in order to know how the negotiation power is distributed along the value chain.**

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- ❑ The information used in the introduction was extracted from the description of the mussel value chain in France made by Sophie Girard (IFREMER) as a contribution to the D4.1.
- ❑ The prices used for the statistical analysis of price transmission in the mussel value chain in France was provided by Sophie Girard (IFREMER).
  - ❑ Imports: Fresh mussel. *Mytilus* spp. (NC8= 03073110). Frequency: Monthly. Period: 2010-2015. Source: Comext Eurostat.
  - ❑ Retail local: Fresh mussel. Frequency: Monthly. Period: 2010-2015. Source: Kantar Panel data.
  - ❑ Retail imported: Fresh mussel. Frequency: Monthly. Period: 2010-2015. Source: Kantar Panel data.

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## Fresh mussel results

- The **Augmented Dickey-Fuller (ADF)** test (Dickey & Fuller, 1979; 1981) is used to test the time series properties of the data (non-stationarity).

	Constant		Linear trend		Quadratic trend	
	Levels	1st diff.	Levels	1st diff.	Levels	1st diff.
Imports	-4.261***	-9.096***	-4.225***	-9.016***	-4.412***	-8.932***
Retail Local	-3.107**	-8.290***	-7.285***	-8.214***	-7.681***	-8.190***
Retail Imported	-6.850***	-9.070***	-7.152***	-9.005***	-7.088***	-8.917***

\*\*\* 99% CL; \*\* 95% CL; \* 90% CL

- **Unit root can be rejected in all the involved price series.**
- **Analysis will be based on Granger causality.**

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### Granger causality

#### Imports

All lags of Imports  $F(1, 55) = 20.585 [0.0000]^{***}$

All lags of retFR  $F(1, 55) = 1.5521 [0.2181]$

All lags of retIMP  $F(1, 55) = 0.74331 [0.3923]$

#### Retail local

All lags of Imports  $F(1, 55) = 7.5165 [0.0082]^{***}$

All lags of retFR  $F(1, 55) = 0.0062016 [0.9375]$

All lags of retIMP  $F(1, 55) = 0.0018531 [0.9658]$

#### Retail imported

All lags of Imports  $F(1, 55) = 1.7776 [0.1879]$

All lags of retFR  $F(1, 55) = 5.7878 [0.0195]^{***}$

All lags of retIMP  $F(1, 55) = 0.55357 [0.4600]$

- Import prices are exogenous in the system, affecting retail prices of domestic mussels.
- Retail prices of imported mussels are not caused by import prices but are related to domestic mussels.





# Price integration and the Spanish fresh mussel in the French mussel value chain

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- The main evolutions during the period 2001-2013 in the **fresh mussel value chain in France** are related to the progressive **decline of imports from Ireland** and conversely the **growth of Spanish imports**. (Girard, S. D4.1)

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## Research goals

**Analyze price interactions of the Spanish exports of fresh mussel into the French market, from the ex-farm price in Spain, to the retail segment in France**

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## Data sources



- ❑ Ex-farm prices Spain: Fresh mussel. Frequency: monthly. Period: 2010-2015. Source: PescadeGalicia.
- ❑ Spanish export prices to France: Fresh mussel. CN8: 030731. Frequency: monthly. Period: 2010-2015. Source: Eurostat
- ❑ Retail prices of imported mussel in France. Fresh mussel. Frequency: Monthly. Period: 2010-2015. Source: Kantar Panel data. Data provided by Sophie Girard (IFREMER).

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## Fresh mussel results

- The **Augmented Dickey-Fuller (ADF)** test (Dickey & Fuller, 1979; 1981) is used to test the time series properties of the data (non-stationarity).

	Constant		Linear trend		Quadratic trend	
	Levels	1st diff.	Levels	1st diff.	Levels	1st diff.
Producer SP	-3.626***	-9.536***	-5.451***	-9.542***	-5.946***	-9.499***
Exports Spain	-3.383**	-12.01***	-3.383*	-11.90***	-3.202	-7.306***
Retail Imported	-6.850***	-9.070***	-7.152***	-9.005***	-7.088***	-8.917***

\*\*\* 99% CL; \*\* 95% CL; \* 90% CL

- **Unit root can be rejected in all cases with the exception of the price of Spanish exports in a model with quadratic trend.**
- **Analysis will be based on Granger causality.**

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## Fresh mussel results

### Granger causality

#### Producer SP

All lags of Producer SP	$F(1, 55) = 72.739 [0.0000]^{***}$
All lags of Exports Spain	$F(1, 55) = 1.9589 [0.1673]$
All lags of Retail imported	$F(1, 55) = 0.0027318 [0.9585]$

#### Exports Spain

All lags of Producer SP	$F(1, 55) = 10.763 [0.0018]^{***}$
All lags of Exports Spain	$F(1, 55) = 1.1609 [0.2860]$
All lags of Retail imported	$F(1, 55) = 2.8436 [0.0974]^*$

#### Retail imported

All lags of Producer SP	$F(1, 55) = 0.20196 [0.6549]$
All lags of Exports Spain	$F(1, 55) = 0.62745 [0.4317]$
All lags of Retail imported	$F(1, 55) = 0.089256 [0.7663]$

- Producer prices are transferred to exports but do not reach final consumers in France.
- Export prices are weakly affected by retail prices of imported mussels in France

**We are working with data of canned mussel and frozen mussel in the Spanish value chain.**

**We would like to provide these results in the report about Price integration**

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# Thank you!

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