Distance to destination and export price variation within agri-food firms

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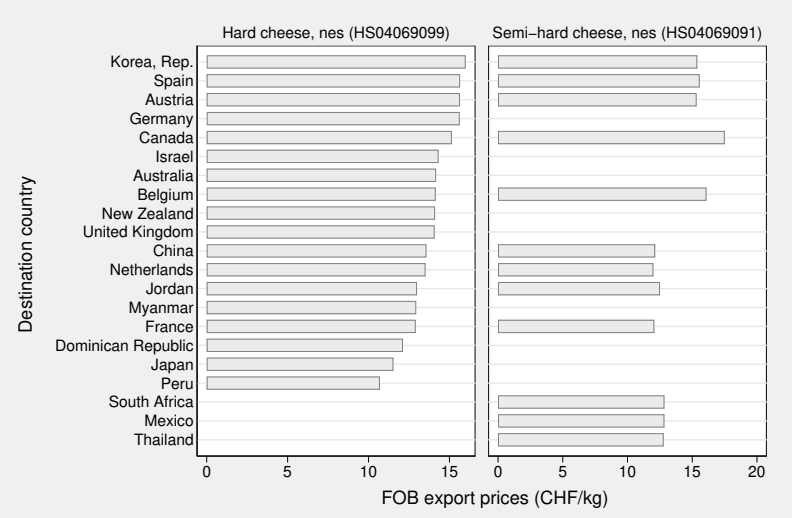
Motivation: substantial within-firm-product variation in FOB unit values



Motivation

We can attribute this empirical regularity to

1. Quality sorting
   - Selection of high-quality firms in distant markets (Martin, 2012; Bastos and Silva, 2010)
   - Alchian-Allen type effects (Curzi and Pacca, 2015; Emlinger and Guimbard, 2021)
2. Variable markups
   - Exporters may arbitrarily vary their mark-ups across destinations (Chen and Juvenal, 2022)

Contributions

1. For manufacturing firms, studies examine export price variation across markets using firm-level data (Martin, 2012, Bastos & Silva, 2010, Görg et al., 2017, Manova & Zhang, 2012)
   - The agricultural and manufacturing sectors are characterised by different market situations
   - Are the effects due to selection across or within firms (Emlinger and Lamani, 2020)?
   - I show that Swiss agri-food exporting firms behave in a manner similar to manufacturing firms
2. I decompose the distance elasticity of export prices into quality and markups
   - Understanding the contribution of these mechanisms is the next step before we can evaluate precisely the gains from trade linked with this empirical regularity in trade data (Martin, 2012).

Previewing my findings

- If distance doubles the average Swiss agri-food firm increases its FOB export price by 2.3%.
- I test my findings across different firm structures and across the agriculture and food sectors.
- I disentangle the quality and mark-up mechanisms and show that for a given product quality, exporting firms charge higher markups in distant markets.
- However, this form of price discrimination is less pronounced for higher quality products

Firm-level customs transaction data

- Firm-level export data on Swiss agri-food exporting firms from 2016 and 2020
- It contains information on HS8-digit products, FOB trade values in CHF, trade volumes in kg, export destinations, and year for every shipment within the HS01 to HS24 category.
- With this data, I calculate firm-specific HS8 digit FOB unit values

Table 1: HS8-digit classifications within the HS6 digit code 040690

HS8	HS8-digit description
04069011	Brie, Camembert, Crescenza, Italico, Pont-l'Évêque, Reblochon, Robiola, Stracchino
04069019	Soft cheese (excl. blue-veined cheese or containing veins, and Brie, Camenbert ...)
04069021	Green cheese [herb cheese], hard or semi-hard
04069031	Caciocavallo, Canestrato, Aostataler Fontina, Parmigiano Reggiano, semi-hard cheese
04069039	Caciocavallo, Canestrato, Aostataler Fontina, Parmigiano Reggiano, hard cheese
04069051	Asiago, Bitto, Brà, Fontal, Montasio, Saint-Paulin, Saint Nectaire, semi-hard cheese
04069059	Asiago, Bitto, Brà, Fontal, Montasio, Saint-Paulin, Saint Nectaire, hard cheese
04069060	Cantal

Swiss agri-food exporting firms: stylised facts

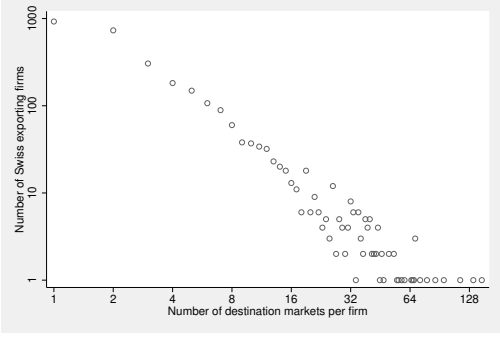
Table 2: Swiss exporters and their exporting characteristics by year

					Exports per firm			
Year	N	Firms	Products	Destinations	Mean	Median	Products	Destination
2016	20374	1724	593	172	332.88	5.15	9.62	4.30
2017	20217	1829	623	163	352.43	5.17	9.77	3.95
2018	19252	1914	608	157	383.33	5.16	10.12	3.79
2019	18593	1888	599	160	401.39	4.95	10.11	3.73
2020	16788	1695	577	162	430.90	5.23	9.27	3.77

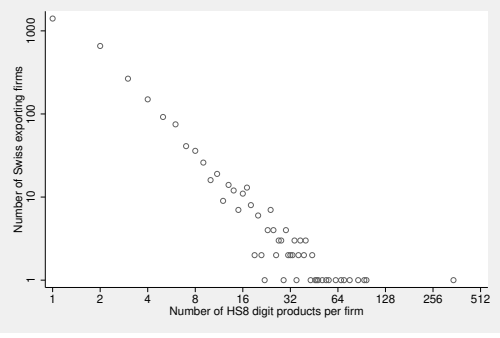
Notes: The mean and median values are in 1000 CHF.

Swiss agri-food exporting firms: stylised facts

Figure 1: Swiss firms, destination markets and HS8-digit products



(a) Destination markets

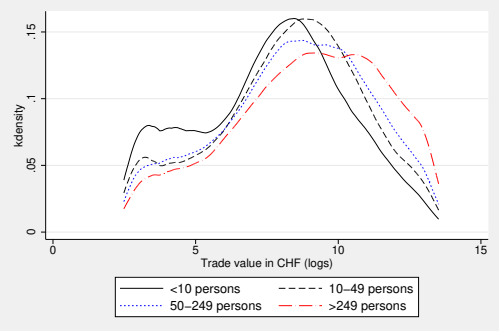


(b) HS8-digit products

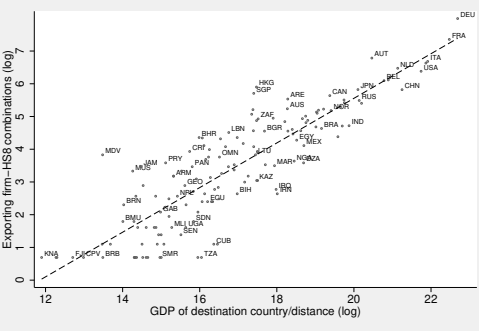
Note: While the axes are reported as absolute values, I impose a log-log specification on the distribution to ease the depiction

Swiss agri-food exporting firms: stylised facts

Figure 2: Exports by firm size and destination market attractiveness



(a) Exports by firm size



(b) Export market attractiveness

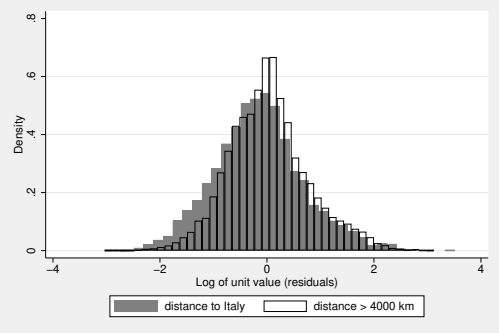
Model specification

$$\ln \text{UV}_{fjkt} = \beta_0 + \beta_1 \ln \text{Distance}_j + \mathbf{b}'\mathbf{w}_{jkt} + \phi_{fkt} + \varepsilon_{fjkt} \quad (1)$$

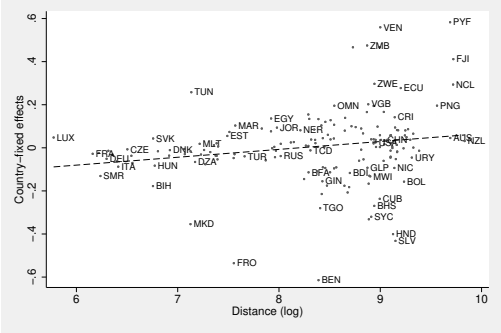
- Where f = exporting firm, j = destination country, k = product, t = year
- UV = FOB unit values
- $\mathbf{w}_{jkt}$ = vector of destination country-specific varying controls
- ϕ_{fkt} = firm-product-time fixed effects

Descriptive evidence

Figure 3: Unit values and distance



(a) Distributions of unit values by distance



(b) Destination-specific prices and distance

Empirical evidence

Table 3: The effect of distance on unit values

	(1)	(2)	(3)
Log Distance$_j$	0.031***	0.024***	0.024***
Log GDP$_{jt}$		−0.032***	−0.032***
Log GDP per capita$_{jt}$		0.005	0.006
Log Remoteness$_{jt}$		0.017***	0.015***
Log (1 + Tariff$_{jkt}$)		0.009***	0.010***
Non-tariff measures$_{jkt}$		0.033***	0.053***
Taste$_j$		0.006	0.047**
Log Unit value$_{jkt}$			0.011
Firm-product-time FE	Yes	Yes	Yes
Observations	78773	76049	58036

Notes: The dependent variable is the log of free on board unit values of firm f, HS8 digit product k to destination j in year t. All models are estimated using ordinary least squares. ***, ** and * denote significance at 1%, 5% and 10% respectively. Intercepts included but not reported.

Does size matter?

Table 4: The effect of distance on unit values — sample split by firm structure

	Firm size	Exports > 500 CHF	Destinations > 20
	(1)	(2)	(3)
Log Distance$_j$	0.019***	0.034***	0.026***
	(0.005)	(0.004)	(0.006)
Log Distance$_j$ × Firm size 2	0.006*		
	(0.003)		
Log Distance$_j$ × Firm size 3	0.003		
	(0.004)		
Log Distance$_j$ × Firm size 4	0.008*		
	(0.005)		
Firm-product-time FE	Yes	Yes	Yes
Observations	57676	43903	26104
Adjusted R^2	0.768	0.838	0.767

Notes: The dependent variable is the log of free on board unit values of firm f, HS8-digit product k to destination j in year t. p values are in parentheses. ***, ** and * denote significance at 1%, 5% and 10% respectively. Intercepts included but not reported. Firm size 2 are firms with 10 – 49 employees, Firm size 3 refers to firms with 50 – 249 employees and Firm size 4 are employees with > 249 persons. The reference group is thus firms with < 10 employees.

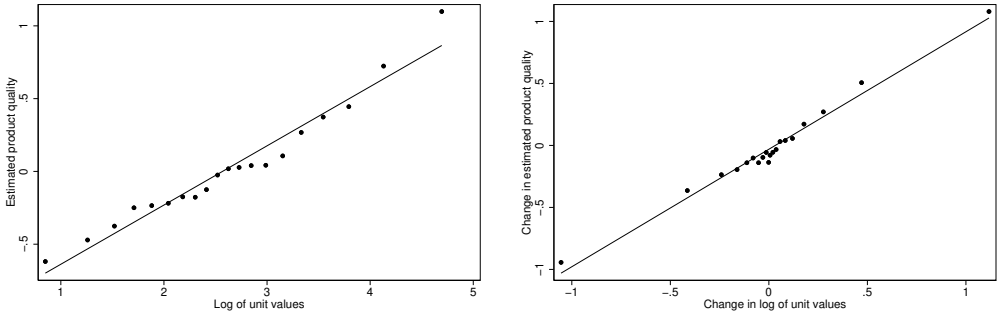
Isolating the quality and markup channels

- If $UV_{fjkt} = \mu_{fjkt} mc_{fkt}$, where $\mu_{fjkt} > 1$ is the markup and mc_{fkt} is firm-specific marginal cost which is assumed to not vary across destinations.
- By accounting for ϕ_{fkt}, we identify the variation in unit values of product k exported by firm f in year t between destination j and j′ as follows:

$$\ln UV_{fjkt} - \ln UV_{fj'kt} = \ln \mu_{fjkt} + \ln mc_{fkt} - \ln \mu_{fj'kt} - \ln mc_{fkt} = \ln \mu_{fjkt} - \ln \mu_{fj'kt} \quad (2)$$

Isolating the quality and markup channels

Figure 4: Relationship between unit values and estimated product quality



Notes: Both figures present binned scatter plots of estimated product quality a la Khandelwal et al. (2013) and unit values. The left panel plots the cross-sectional values and the right panel presents the changes (calculated as the differences between the first and last years of the dataset). All values are divided into 20 equal-sized groups, with each dot representing the mean value within each bin. In each plot, the line shows the best linear fit estimated via OLS.

Isolating the quality and markup channels

Table 5: Mechanisms: quality and markups

	(1)	(2)	(3)	(4)
Log Distance$_j$	0.026***	0.027***	0.025***	
	(0.003)	(0.004)	(0.005)	
Estimated Quality$_{fjkt}$	0.123***	0.276***	0.276***	0.272***
	(0.010)	(0.050)	(0.050)	(0.047)
Log Distance$_j$ × Estimated Quality$_{fjkt}$		−0.020***	−0.020***	−0.016**
		(0.007)	(0.007)	(0.006)
Firm-product-time FE	Yes	Yes	Yes	Yes
Firm-destination-time FE	No	No	No	Yes
Observations	34081	34081	34081	26144
Adjusted R^2	0.778	0.778	0.778	0.803

Notes: The dependent variable is the log of free on board unit values of firm f, HS8 digit product k to destination j in year t. All models are estimated using ordinary least squares. p values are in parentheses. ***, ** and * denote significance at 1%, 5% and 10% respectively. Intercepts included but not reported.

Conclusion

- If distance doubles Swiss agri-food firms increases their FOB export price by 2.3%.
- This indicates variable markups or quality differentiation by firms across destinations
- I decompose the observed effect and find that for a given product quality, exporting firms price discriminate and charge higher markups in distant markets.
- Consistent with Chen and Juvenal (2022), they price discriminate less for higher quality products.

References i