

Does one price fit all? An analysis of price divergence in dual-channel markets

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Introduction

- There are tremendous price differences for identical goods across similar countries, and sometimes it is impossible to order the same good at a cheaper price from abroad.
- In general, different prices across countries are not surprising, given that living standards, GDP per capita, and tastes vary across countries as well.
- BUT: the Single Market for goods ensures that “products allowed to be sold in the EU can circulate without barriers to trade.”
- The systematic violation of this principle in online markets has caught the attention of the European Commission: In May 2015 they launched a sector inquiry into e-commerce.

Outline

- 1 Political Background
- 2 Recent literature
- 3 Data
- 4 Stylized facts
- 5 Model

Political Timeline - July 15, 2014



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“I intend to take, within the first six months of my mandate, ambitious legislative steps towards a connected digital single market, [...] by modernising and simplifying consumer rules for online and digital purchases.” (Jean-Claude Juncker)

Political Timeline - March 26, 2015



“It is high time to remove remaining barriers to e-commerce, which is a vital part of a true Digital Single Market in Europe. The envisaged sector inquiry will help the Commission to understand and tackle barriers to e-commerce to the benefit of European citizens and business.” (Margrethe Vestager)

Political Timeline - May 6, 2015



“The sector inquiry will focus particularly on potential barriers erected by companies to cross-border online trade in goods and services where e-commerce is most widespread such as electronics, clothing and shoes, as well as digital content.” (Press release IP/15/4921)

Recent Literature

Price dispersion of branded goods

- Cavallo et al. (2014) Use price data of all products sold online by IKEA, Zara, Apple, and H&M.
- Simonovska (2015) Uses price data of products that are sold online only and shipped everywhere from the same warehouse by Mango.

Price points

- Hackl et al. (2014) Round prices are associated with positive properties such as quality.
- Wieseke et al. (2015) Round prices because of convenience.

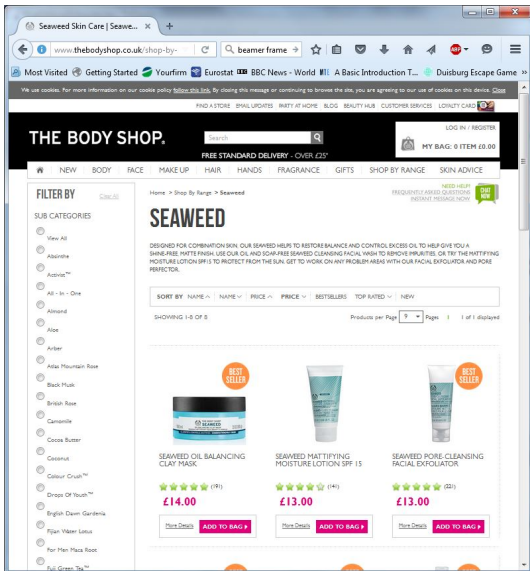
Multi-channel retailing

- Cavallo (2016) Analyzes online-offline price dispersion to see if web scraping can be used for calculation of inflation.

Data

- Focus on branded goods.
- Manufacturer also acts as retailer.
- Scraped prices from online shops.
- Obtained weekly since June 2014 (with a break in January 2016).
- Spot checks in concept stores to collect in-store prices.

This is the page in a browser...



...and this is the underlying html code

OutWit Hub Pro

File Edit View Navigation Tools Help Registration

Local IP: 62.158.130.117

URL: http://www.thebodyshop.co.uk/shop-by-range/seaweed/seaweed.aspx

Remote IP: 62.158.229.74

Find in page

Active: TBSfile Apply If Page URL Contains: body

Source type: Original Execute

CK	Description	Marker Before	Marker After	Format	Replace	Separator	List of Labels
1	id	<div data-id=	</div>				
2	priority	<p class="price" data-price=	>				
3	nonprice						

Save New Duplicate Delete Export Import Revert Properties Close

Stylized facts:

- 1 Geographic barriers exist today.
- 2 These barriers are used to price discriminate.
- 3 Prices online and in-store are identical.
- 4 Prices do not change often.
- 5 Prices are usually “round”, e.g. EUR 1 instead of EUR 0.99.

Illustration of Fact #2 and Fact #5



SEAWEED MATTIFYING
MOISTURE LOTION SPF 15

★★★★★ (3)

16,50 €



SEAWEED MATTIFYING
MOISTURE LOTION SPF 15

★★★★★ (3,5 / 5)

€ 19,00



LOCIÓN HIDRATANTE
CONTROL BRILLOS DE ALGAS
MARINAS CON FPS 15

★★★★★

19,00 €



LAIT HYDRATANT MATIFIANT
IND.15 ALGUES

★★★★☆ (3,0 / 5)

18,50 €



SEAWEED MATTIFYING
MOISTURE LOTION SPF 15

27.00 €



SEAWEED MATTIFYING
MOISTURE LOTION SPF 15

€ 17,50

Example for online ↔ store uniformity (Fact #3)



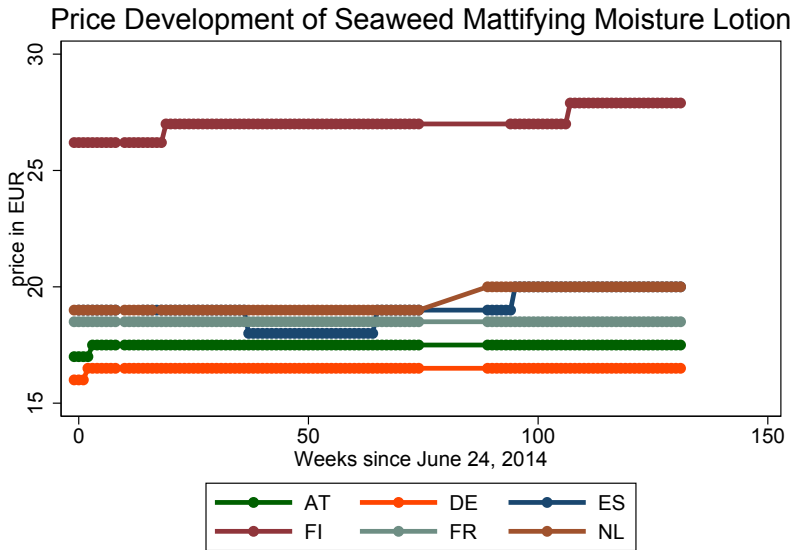
SEAWEED MATTIFYING
MOISTURE LOTION SPF 15



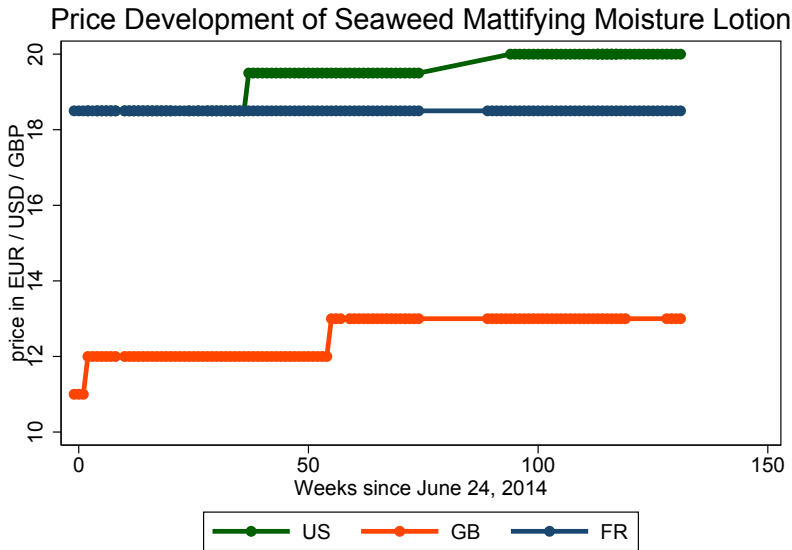
16,50 €



Example for price stability (Euro Area) (Fact #4)



Example for price stability despite XR volatility (Fact #4)



Model: Aim and Assumptions

Research Question

What is the impact of an enforced prize harmonization?

Assumptions

- There is a fixed share of consumers that prefers to shop online.
- There is a mass of n firms, each offering a (horizontally) differentiated product.
- The wage is the same for all firms within a country.
- The wage level only differs between countries.
- Per unit wages in online retail are lower than per unit wages in brick-and-mortar stores.

Model: Scenarios

Baseline

- Prior to cross-country online price harmonization, firms are operating both online and offline channel in all countries.
- Firms charge uniform prices in online and store channel.
- Defecting causes punishment that overrides excess profit.

Harmonization

- Cross country price harmonization in the online channel.
- Firms are still operating in all countries, at least in the online channel.
- Punishment constraint is now relaxed.

Model: Findings

- The brick-and-mortar stores in the country with the lowest wage will never close.
- It is never beneficial to close the online store in favor of only operating brick-and-mortar stores.
- Assuming a firm would lose all customers when using different prices for online and offline channel, brick-and-mortar stores will close in high-wage countries when they are not sustainable after price harmonization.
- Assuming a firm would only lose part of its customers when using different prices for online and offline channel, defecting in the store channel may prevent store closures in the high-wage country.

Model: Conclusion

- A forced price harmonization may lead to store closures and leave some consumers worse off than prior to implementation of Digital Single Market by closing their preferred sales channel.
- Moreover, a harmonization will by construction lead to a price increase in low-wage countries, so the poorest and most vulnerable consumers may suffer from a harmonization.

Model: Simplified setup

The outer utility function:

$$U_k = (Q_k^{\text{on}})^{\alpha} (Q_k^{\text{st}})^{1-\alpha}$$

The inner utility function:

$$Q_k^{\text{on}} = \left(\int_{i=0}^n (q_{ik}^{\text{on}})^{\rho} di \right)^{\frac{1}{\rho}} \quad \text{with } \rho = \frac{\sigma-1}{\sigma}, \sigma > 1$$

$$\max Q_k^{\text{on}} = \left(\int_{i=0}^n (q_{ik}^{\text{on}})^{\rho} di \right)^{\frac{1}{\rho}} \quad \text{s.t.} \quad \int_i p_{ik}^{\text{on}} q_{ik}^{\text{on}} di = \alpha E_k$$

	Demand	Prices
Channel pricing	$q_k^{\text{on}} = \frac{\alpha E_k \rho}{\gamma \phi_k w_1}$ $q_k^{\text{st}} = \frac{(1-\alpha) E_k \rho}{\phi_k w_1}$	$p_k^{\text{on}} = \frac{\gamma \phi_k w_1}{\rho} = \gamma p_k^{\text{st}}$ $p_k^{\text{st}} = \frac{\phi_k w_1}{\rho}$
Uniform pricing	$\bar{q}_k^{\text{on}} = \frac{\alpha E_k \rho}{(\alpha \gamma + 1 - \alpha) \phi_k w_1}$ $\bar{q}_k^{\text{st}} = \frac{(1-\alpha) E_k \rho}{(\alpha \gamma + 1 - \alpha) \phi_k w_1}$	$\bar{p}_k = \frac{\alpha \gamma + 1 - \alpha}{\rho} \phi_k w_1$
Harmonized Int'l	$\tilde{q}_k^{\text{on}} = \frac{\alpha E_k \rho}{(\alpha \gamma + 1 - \alpha)(\delta_1 + \delta_2 \phi_2) w_1}$ $\tilde{q}_k^{\text{st}} = \frac{(1-\alpha) E_k \rho}{(\alpha \gamma + 1 - \alpha)(\delta_1 + \delta_2 \phi_2) w_1}$	$\tilde{p} = \frac{\alpha \gamma + 1 - \alpha}{\rho} (\delta_1 + \delta_2 \phi_2) w_1$ Case 1: Online and store: \tilde{p}

VAT is not the reason for price differences:

