

Consumer Economics and Pricing Strategies

Course 2: Retail Structure and Prices

Claire Chambole, Philippe Choné & Laurent Linnemer

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A highly concentrated sector

Successive merger waves have led to the creation of big retail chains such as Wal-Mart stores or Carrefour.

- In 2018, the highest level of concentration are in Nordic countries; CR4: 93% in Denmark, Sweden, Finland.
- In 2018, CR5 within 50% and 70% for Germany, Spain and Portugal.
- Concentration is lower in Italy where traditional stores are still widespread.
- In US: Not so high at the federal level but much higher at the state level (ex: Cotterill (1998) in Vermont CR4:91.6%)

Table: Chain Stores in UK , 2018.

Store fascias	Market share
Tesco	27.4%
Sainsbury's	15.4%
Asda	15.3%
Morrisons	10.3%
Aldi	7.6%
CR5	76%

Table: Chain Stores in France, 2018.

Store fascias	Market share
Leclerc	21.1
Carrefour	20.6
Intermarché	15%
Casino	11.6%
Auchan	10.1%
CR5	78.4%

Retail concentration at the local level

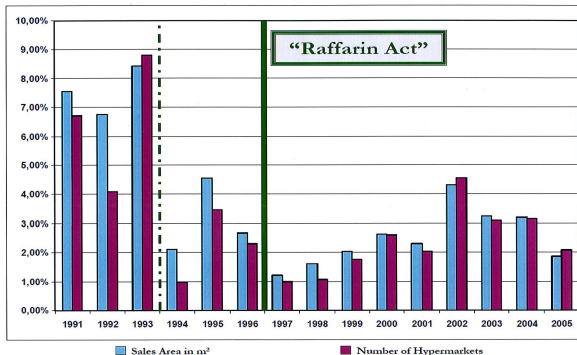
- National concentration ratios are informative but **local concentration** is often much higher; (Paris in 2010 (CA report): Casino has 60%, Carrefour 20%)
- In France stores compete with other stores in their catchment area \neq UK.
 - According to surveys, consumers travel on average between 10 and 20 min drive-time (d-t) (depending store format) to reach a store.
 - The French CA definition: 30% of catchment areas < 4 competitors.
- A regulation of retail structures
 - New stores' opening
 - Merger Control

The control of entry

- > Control of new stores' openings: Royer (1973), Sapin (1993) and Raffarin (1996) laws. LME (2008).

New Store Openings (1991-2005)

5



Retail merger control

In theory, the impact of a retail merger on prices is ambiguous, and competition authorities have to balance several potential effects:

- By contrast with mergers in the manufacturing industry, competition authorities assess the **local** impact of retail merger.
- Efficiency gains (national scale) ⇒ price decrease
- In the retail sector, **buyer power** effects (national scale)
 - Countervailing power effect (Galbraith, 1952;) ⇒ price decrease

→ “Retail Mergers and Food Prices: Evidence from France”, 2017 by Allain, Chambolle, Turolla and Villas-Boas, *The Journal of Industrial Economics*, 65, 3, p 469-509.

A Retail Merger in France

Objectives

- ① Assess *ex post* the impact of a large merger in the retail industry on food prices.
 - ② Local market analysis.
 - ③ Identify causes behind price changes.
- Supermarket prices have a major impact on household purchasing power
 - In 2011, in France, food and beverages amount to 13.4% of household expenditures (on average 12.9% in the E.U).
 - Supermarkets gather approximately 70% of total food sales in 2010, (INSEE).

Preview of the results

Main results

- Before-and-after comparison: prices increase
 - By 4.8% on average at merging firms' stores;
 - By 7.4% on average at rivals' stores.
- Difference in differences:
 - The price increase at the merging firms is not correlated to local changes in concentration: National price increase!
 - Rivals adjust prices locally
 - Rivals prices increase even in markets where the merging firms operate only *one* store;
 - Price increase even stronger in rival stores that compete with more than one store owned by the merging firms.

The merger

- Two of the 5 largest French supermarket groups (" M_1 " and " M_2 ") merged in 2000.
 - International dimension: 26 countries (market leader in 9 countries).
 - Focus on the French market.
- Timeline: take-over bid (aug. 1999), EC conditional approval (jan. 2000); French CA approval subject to divestments (may 2000).
- The merging firms:
 - Jointly 280 hypermarkets and 1300 supermarkets;
 - Joint market share around 29,4% (French CA). Strong concentration at the national level but even stronger at the local level.
 - French CA: competition affected in 27 local areas, some divestments were required.

Empirical facts on concentration

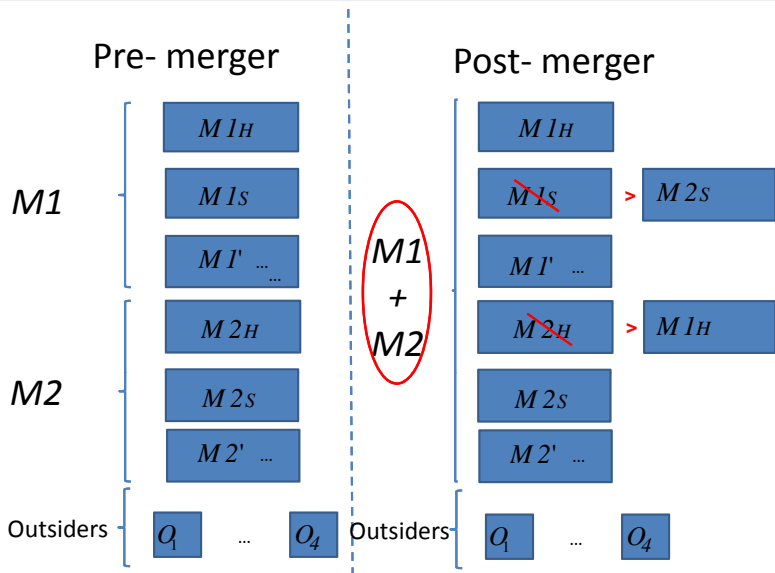
- Herfindhal Hirshman Index ($HHI = \sum(s)^2$) in terms of share of sales area instead of market share (standard proxi).
- National HHI increases from 1214 to 1534, $\Delta HHI = +320$.

Table: HHI Before and After the M1 – M2 Merger

Local market level						
	P_{25}	P_{50}	P_{75}	Mean (S.E.)	Min.	Max.
2000Q1	1939	2424	3310	2939 (16)	1389	10000
2001Q1	2332	2658	3497	3180 (15)	1430	10000
ΔHHI	+393	+234	+187	+241 (5)	–	–

EU guidelines: competition is likely to be affected if post-merger $HHI > 2000$ and $\Delta HHI > 150$.

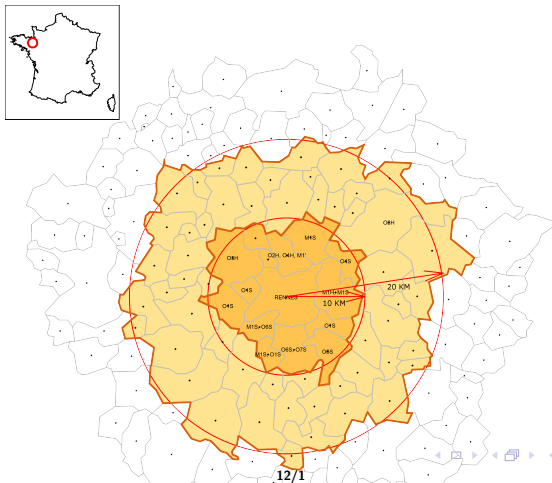
Rebranding after the merger



- TNS Worldpanel data
 - Household panel data, from 1998 to 2001 \simeq 400 food product categories, 11 000 households.
 - Representative panel of the French population.
 - Home-scanned (p,q,upc); store-type, store name, reported surface in sqm
- Panorama Tradedimension database:
 - Detailed information on all stores active over the period
 - Location, selling surface (sqm)
 - Format (Super, hyper(>2500 sqm), HD)
 - Ownership structure, changes of ownership
 - Opening dates, extension of surfaces
 - Number of cashiers, trolleys, parking slot,...
- Census survey (INSEE)
 - population and average households' income at the commune level.

Data Issues

1. Define a catchment area around each store, i.e the relevant market or the relevant set of competitors space (French CA definition)
 - All hypermarkets within 20 km;
 - All supermarkets and convenience stores within 10 km.



2. Matching purchases and store databases (exact store unknown)
3. Define homogeneous products sold.

For instance: "Mineral Water, Plastic bottle, Still, Evian".

- For each homogenous product, we compute an **average price per measurement unit** (e.g. liter, gram) **per store per six-months period**.
 - Example: Danone Velouté plain yoghurt => average price per jar (weighted by quantity).
 - We eliminate promotional prices (5.4% of the data).

Before and After Analysis

- We first estimate the following regression (OLS):

$$\ln P_{ijt} = \alpha_1 + \alpha_2 PostM_t \times Rival_i + \alpha_3 PostM_t \times MergF_i \quad (1) \\ + \delta' \mathbf{Z}_{it} + \mu_i + \tau_j + \varepsilon_{ijt}$$

- P_{ijt} = average price (in centimes of Franc) charged by the i -th store, for product j during the half-year t
- $PostM_t$, $Rival_i$, $MergF_i$ are dummy variables
- Set $\mathbf{X}_{ijt} = \{\mathbf{Z}_{it}, \mu_i, \tau_j\}$ of observable covariates by store-time, store, product.
- Prices weighted by the expenditure shares of food products calculated at the national level
- Year 2 000 is removed.

Before and After Analysis

Table: Before and After Price Comparisons
Estimates

Dependent variable: (log) price (P_{ijt})	
Variable	(1)
PostMerger \times Rival	0.0737*** (0.0048)
PostMerger \times Merging Firm	0.0476*** (0.0056)
log(market income)	-0.0925 (0.0572)
Constant	10.0331*** (0.5461)
Store FE	Yes
Product FE	Yes
R^2	0.988
Observations	33714

DID (1)

- We now compare the mean change in prices for stores affected by the merger to stores unaffected by the merger: Causal effect of the merger!
- Key assumption: absent the merger the prices would have evolved identically between the two groups. Assignment to the treatment group should be random.
- Definition 1 of Affected and Comparison Markets (standard definition):
 - We separate the local markets in which the merger caused a change in the local concentration, from those in which it did not.
 - The affected group consists in all stores located in a market where at least one store of the group M_1 and one store of M_2 were active before the merger.

DID (1): Results

Table: Direct Price Effect Estimates

Dependent variable: (log) price (P_{ijt})		
	All stores (1)	All stores (2)
PostMerger \times T	0.0114** (0.0051)	
PostMerger \times T \times Rival		0.0236*** (0.0056)
PostMerger \times T \times Merging Firm		-0.0077 (0.0059)
log(market income)	-0.0302 (0.0657)	-0.0350 (0.0647)
Constant	7.5008*** (0.6281)	7.5468*** (0.6184)
Store FE	Yes	Yes
Product-time FE	Yes	Yes
R^2	0.989	0.989
Observations	33714	33714

DID (1): Puzzle

- Why do the DID estimates highlight no price changes for the merging firms?
- Possible answers:
 - Increase in market power compensated by efficiency gains? But if so, rivals prices would not increase.
 - OR the merging firms have increased their prices uniformly on a national scale.

Retailers pricing strategies

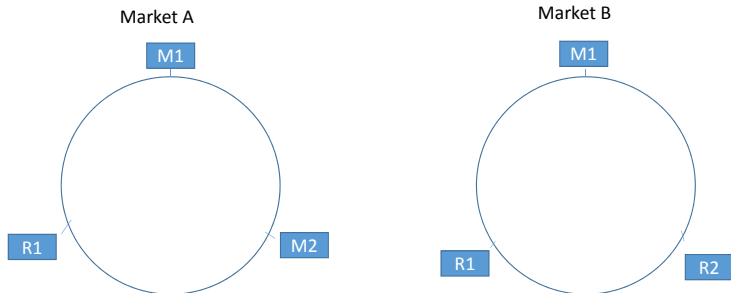
Table: Regression of Prices on Local Markets' Concentration

Variable	Pre-merger period	Post-merger
Store size ($\text{m}^2/1000$)	-0.0002 (0.0002)	0.0001 (0.0002)
$\log(\text{market income})$	0.0262*** (0.0022)	0.0236*** (0.0024)
$\log(\text{market population})$	0.0014*** (0.0002)	0.0015*** (0.0003)
$\text{HHI } (/10000) \times M_1$	0.0070 (0.0051)	
$\text{HHI } (/10000) \times M_2$	0.0134 (0.0096)	
$\text{HHI} \times \text{Merging Firm}$		0.0073 (0.0049)
$\text{HHI} \times \text{Rival}$	0.0103*** (0.0031)	0.0097*** (0.0030)
Constant	7.2668*** (0.0198)	7.3352*** (0.0208)
Chain store FE	Yes	Yes
Product-Half-year FE	Yes	Yes
R^2	0.981	0.981

DID (1): Conclusion

- The merging firms have changed their prices uniformly on a national scale.
- The usual definition of affected / unaffected markets cannot capture this price increase by the merging firms;
- The usual definition of affected / unaffected markets also fails to estimate the price effect for the rivals:
 - A rival facing ONLY ONE store of the merging firms can be affected by the uniform price increase !!!

An illustration with the Salop model



Salop Model (Hotelling model on a circle): $U = v - p - t(x - x_s)$

Before the merger : All prices are $1/3$ at all stores on each market.
True even if M1 has a national pricing strategy because of symmetry.

After the merger between M1 and M2 :

If merging firms price locally (DEF1): On market A, $PM1=PM2=5/9$ and $PR1=4/9$.

On market B: No change!

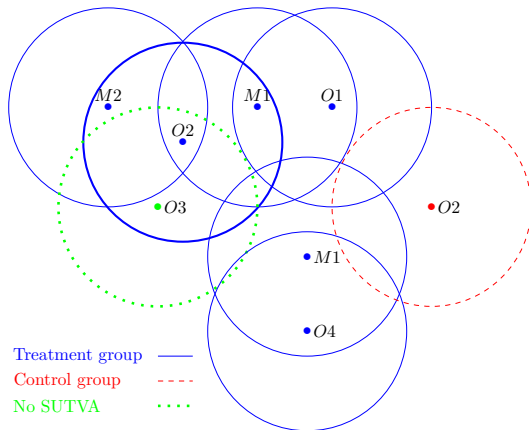
If merging firms price nationally (DEF 2): On market A, $PM1=PM2=0.41$, and $PR1=0.37$.

On market B, $PM1=0.41$, and $PR1=PR2=0.35$.

- Definition 2 of Affected and Comparison Markets:
 - The affected group consists in all stores located in a market where at least one store of EITHER the group M_1 OR the group M_2 was active before the merger.
 - Remark: no more merging firms in the comparison groups' markets.
 - We focus on the price effect at rivals' stores and remove merging firms from the price sample.

DID (2)

Assess the average treatment effect (ATE) of the merger on prices.



DID (2): Results

Table: Local Effects on Rivals

Dependent variable: (log) price (P_{ijt})			
Variable	(1)	(2)	(3)
PostMerger \times T	0.0181** (0.0076)		
PostMerger \times # of Merging Firms		0.0004* (0.0002)	
PostMerger \times T \times Hypermarket			0.0236*** (0.0078)
PostMerger \times T \times Supermarket			0.0110 (0.0083)
log(market income)	-0.0261 (0.0776)	-0.0491 (0.0803)	-0.0230 (0.0776)
Constant	7.5958*** (0.7412)	7.8214*** (0.7676)	7.5687*** (0.7415)
Store FE	Yes	Yes	Yes
Product-time FE	Yes	Yes	Yes
R^2	0.989	0.989	0.989
Observations	25164	25164	25164

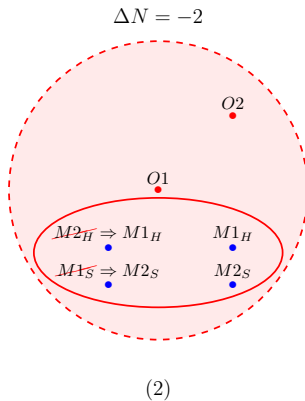
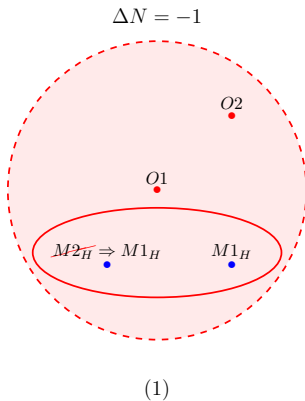
Notes: Merging Firms are removed from the sample.

Robustness tests

- Definition of catchment areas: similar results with 10/5 km, or 20/10/5 km.
- Affected and comparison markets have different characteristics (in the two definitions): comparison markets are poorer, less populated, less concentrated (rural areas) \Rightarrow bias.
 - Method to improve the matching between the treatment and the control group: **propensity scores**. Price increase at rivals increases from 1.8% to 2.7%.

Differentiation effect

- **Differentiation effect:** Change in the total number of retail brands in a catchment area:
 - “ $\Delta N = -x$ ”: drop of x in the number of retail brands after the rebranding.



The effect of rebranding and differentiation

Table: Differentiation and Rebranding Effects on Rivals

Dependent variable: (log) price (P_{ijt})		
Variable	(1)	(2)
PostMerger \times T \times $\Delta N = -2$	0.0322*** (0.0094)	0.0322*** (0.0094)
PostMerger \times T \times $\Delta N = -1$	0.0120 (0.0098)	0.0120 (0.0098)
PostMerger \times T \times $\Delta N = 0$	0.0158* (0.0081)	
PostMerger \times T \times $\Delta N = 0 \times$ Rebranding		0.0171* (0.0091)
PostMerger \times T \times $\Delta N = 0 \times$ No Rebranding		0.0148 (0.0091)
log(market income)	-0.0260 (0.0771)	-0.0237 (0.0771)
Constant	7.5956*** (0.7367)	7.5735*** (0.7367)
Store FE	Yes	Yes
Product-time FE	Yes	Yes
R^2	0.989	0.989

Notes: Merging firms are removed from the sample.

Conclusion

- In the post-merger period, **the merging firms and the rivals increase their prices.**
- In the post-merger period, **the merging firms increase their prices on a national scale.**
- In the post-merger period, **rivals adjust their prices locally**
 - the rivals increase their prices more in markets where they competed with at least one store of the merging firms (DID definition 2).
 - the rivals increase their prices more in markets where they competed with a larger number of stores from the merging firms.

Implications

- Consumer welfare
 - A back of the envelope calculation: a rise in 2.5% in supermarket prices (given the 12.9% of food expenditure share and the 70% market share of supermarkets for food sales) results in a 0.2% drop in consumers purchasing power.
- Competition policy
 - An approved merger caused a price increase.
 - We challenge the usual definition of the affected markets (e.g. 27 local areas identified by the French CA) : other markets may be affected if the merging firms follow a national pricing strategy.
 - heterogeneity of pricing policies must be taken into account in the analysis!