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Investigating the impact of Private Labels on National Brand prices in the Italian yogurt market

E. Castellari, D. Moro, S. Platoni, P. Sckokai

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Background

- **PLs have been recognize to have a strategic role for retailers:**
  - Reinforce their bargain power and can extract more profits (Bontemps et al., 2008);
  - PLs generate higher margins than national brands (NBs) (Sayman et al 2002; Pauwels and Srinivasan, 2004);
  - In markets where profits shrink, retailers with high level of PL shares have been found to have more stable performance with respect to other competitors (Ailawadi et al. 1995);
  - PL might have a central role on gaining consumer loyalty (Corstjens and Lal, 2000; Seenivasan et al., 2009; Ailawadi et al., 2008)

- **Introduction and expansion of PLs can generate a change in NB's prices:**

  - Competition among PLs and NBs can lead to lower prices;
  - PLs can be used by retailers to price discriminate consumers leading to higher NB's prices (Gabrielsen and Sorgad, 2007);
  - Demographic characteristics have a significant role on the probability of buying a PL (Bouhlal and Capps, 2012);

EMPICAL ANALYSIS HAVE FOUND MIXED EFFECTS:

Empirical literature

- Positive relationship between PL share and NB prices:
  - US market for different products Positive (Ward et al., 2002);
  - French market, for different products (Bontemps et al., 2005).
  - mostly non-significant or few significant positive effects on NB prices. In Norway and different products categories (Gabrielsen et al. ,2002)
  - Bontemps et al. (2008): standard PLs (me too) have the strongest effect on increasing NB prices, while premium PLs have no significant effect;

- Negative relationship:
  - Chintagunta et al. (2002), significant negative increase of the NB price due to a PL introduction. US cereal market.

- Mixed results:
  - Sckokai and Soregaroli (2008) in the Italian market;
  - Bonfrer and Chintagunta (2004) PL entry on different products categories;

Research Questions:

We further investigate the relationship between PL share and NB prices in the yogurt milk market in Italy.

Novelty:

- Use of high frequency data , at weekly and point of sale level;
- Analysis at the segment level;
- We look just at the relationship between the PL expansions and the market leader, in a given segment.

Model Specification and estimation:

Within the Yogurt market, for each of the four segments

we estimate the following model using a **two-way ECM** estimator:

$$ln(\mathrm{P_{it}}) = \beta_1 \cdot \mathrm{PL\ Share_{it}} + \beta_2 \cdot \mathrm{vol_{it}} + \beta_3 \cdot \mathrm{BU_{it}} + \beta_4 \cdot \mathrm{leader_{it}} + \beta_5 \cdot \mathrm{prom_{it}} + \beta_6 \cdot \mathrm{PLprom_{it}} + \mu_i + \nu_t + u_{it}$$

Where $\boldsymbol{P_{it}}$: price of the Leader if the brand is leader more than 70% of the weeks, otherwise it is the average of Leader and co-leader price.

We use an **IV approach** to correct for the endogeneity problem in $\mathbf{PL}\ \boldsymbol{Share_{it}}$

As IV we use PL share in other segment at time t t and $t - n$ (Bontemps et al., 2008).

We estimate random effect and fixed effect models.

Explanatory variables:

- ✓ $PL\ share_{j,t}$ = Value PL sold / total value sold
- ✓ $Leader_{i,t}$† =Dummy, 1 if the brand "leader and/or co-leader" are the leader in a given POS and week.
- ✓ $BU_{j,t}$ = number of Brand Units (BU) in a given POS and week
- ✓ $Promotion\ _{j,t}$† = Dummy. 1 if Leader and/or co-leader are sold under promotion in a given week and POS.
- ✓ $PL\ Promotion_{i,j,t}$† = Dummy. 1 if PL is sold under promotion, zero otherwise.

† Using a semi-logarithmic model, we refer to Hanvorrsen and Plamquist (1980) to transformation the coefficients of dichotomous variables.

Data

Data are from Symphony IRI Group

- **156 weeks (2009-2011)**

- **400 points of sale (POS) described by**
  - Chain name (blinded as “chain A”)
  - Retailer Formats (Hyper, Super, Superette)
  - We don’t know where the store is located (just in Italy), discounts are excluded
  - Sample is not representative

- **Market segments within the yogurt category**
  - Whole, functional, with snack, whole and skim

Table 1: Summary statistics - Yogurt market by segments				
	Mean	Std Dev	Minimum	Maximum
Whole				
Price (€/kg)	3.8163	0.5970	1.2400	7.2900
PL share in value	0.1316	0.1051	0	0.9531
Total Volume Sold (ton/week)	1.2079	1.5598	0	13.3680
Number Brand Units	42.6366	20.2990	1	135
Skim				
Price (€/kg)	4.2742	0.8071	1.2800	8.2200
PL share in value	0.2219	0.1685	0	0.9865
Total Volume Sold (ton/week)	1.2123	1.5612	0.0010	13.3680
Number Brand Units	21.5492	11.9970	1	60
Yogurt with snack				
Price (€/kg)	5.7269	1.0455	1.6450	19.3300
PL share in value	0.0221	0.0629	0	0.9565
Total Volume Sold (ton/week)	1.2172	1.5627	0	13.3680
Number Brand Units	5.5969	2.7108	1	16
Functional				
Price (€/kg)	5.6127	1.0000	2.6386	10.4000
PL share in value	0.0404	0.0552	0	0.8095
Total Volume Sold (ton/week)	1.2104	1.5605	0.0020	13.3680
Number Brand Units	18.3605	7.6263	1	50
Source: Our elaboration on SymphonyIRI data.				

Table 2: Results for the fixed effects model. Yogurt market by segments.

	Whole	Skim	With snack	Functional
PL share in value	0.2698**	0.5400***	-0.3318	-0.0921
	(0.1215)	(0.1592)	(0.2485)	(0.3431)
Total volume sold	-0.0142***	-0.0028	-0.0197***	-0.0246***
	(0.0020)	(0.0025)	(0.0027)	(0.0037)
Number Brand Units	0.0008**	0.0007	-0.0065***	0.0020***
	(0.0003)	(0.0010)	(0.0014)	(0.0006)
Leader†	-0.0245***	-0.0396***	-0.0350***	₀-.0307 ***
	(0.0032)	(0.0054)	(0.0040)	(0.0039)
Promotion†	-0.0812***	-0.0829***	-0.1850***	-0.1426***
	(0.0032)	(0.0052)	(0.0030)	(.0030)
PL promotion†	-0.0073*	-0.0217***	0.0403*	0.0072
	(0.0039)	(0.0071)	(0.0240)	(0.0064)
Observations	61993	61753	61489	60663
Number of clusters (Points of sale)	400	400	400	400
R-squared	0.2584	0.2920	0.3973	0.3875
P-value Hansen J test	0.5975	0.2547	0.1144	0.1652
F test first stage	20.12	21.32	19.01	14.10

Results 1:

- An increase of the PL share leads to a increase in the leader's price for the Whole yogurt and for the Skim yogurt.
  - In line with the empirical finding by Bontemps et al. (2005), (2008) and Ward et al. (2002) and as predicted by the theoretical model by Gabrielsen and Sorgad (2007).
  - PLs might be used by retailer to price differentiate among different groups of consumers.
- In other two segments PL share do not influence Leader(s) branded prices:
  - Maybe given the low magnitude of the PL share (under 5%) shows PL do not have enough power on influencing branded leader prices.

Result 2:

- Leader position might be reinforced by promotion activity;
- A higher number of brand units in a store tends to be associate with lower prices in the “functional” and “whole” segments;
- while in the “yogurt with snack” segment we found higher number of brand units leads to higher prices. The effect is not significant in the “skim” segment.

Thank you for your attention!

Comments?