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Estimating Price Rigidity in Vertically Differentiated Food Product Categories with Private Labels

Milena Bocionek, Research Associate

University of Giessen, Germany
Institute of Agricultural Policy and Market Research
Milena.Bocionek@agrار.uni-giessen.de

Sven Anders, Associate Professor

University of Alberta
Department of Resource Economics and Environmental Sociology
Sven.Anders@ales.ualberta.ca

Kristin Kiesel, Assistant Professor

California State University
Department of Economics
Kiesel@csus.edu

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Estimating Price Rigidity in Vertically Differentiated Food Product Categories with Private Labels

Milena Bocionek*, Sven Anders** and Kristin Kiesel***

* Research Associate, University of Giessen, Germany, Institute of Agricultural Policy and Market Research. Contact: Milena.Bocionek@agrar.uni-giessen.de

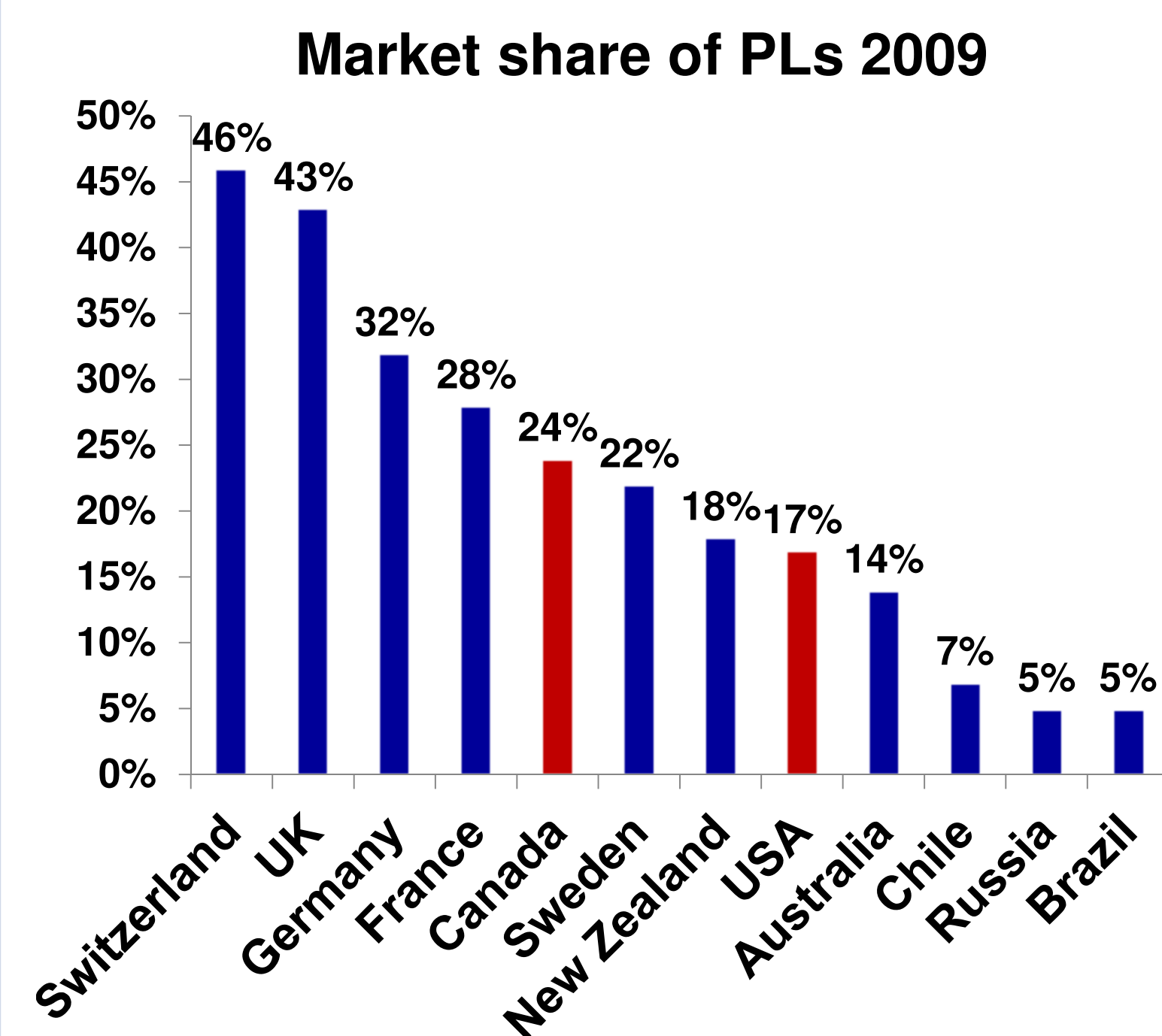
** Associate Professor, University of Alberta, Department of Resource Economics and Environmental Sociology. Contact: Sven.Anders@ales.ualberta.ca

*** Assistant Professor, California State University, Department of Economics. Contact: Kiesel@csus.edu



Background

- Rapid emergence of private labels (PL) → new and stiff competition for manufacturers of national brands (NB)



Source: The Nielsen Company, 2011.

Perceptions of PL quality in North America	
42 %	PL substitute for NB
37 %	Quality PL = quality NB
36 %	Some PL of higher quality than NB
33 %	PL as good as NB
18 %	PL have cheap looking packaging
10 %	PL not suitable when quality matters

- Agri-food industrial organization literature has paid limited attention to the new differentiated PL product lines and the deeper analysis of role of wholesale prices.
- Relatively constant prices despite changes in demand and costs → Prices change gradually because of price adjustment costs (Blinder et al., 1998).
- Variation of retail prices rather explained by price promotions than by changes in costs (Hosken and Reiffen, 2004).
- Kumar and Steenkamp (2007) divided PLs into:
 - Generics:** low price, standard quality, no advertising
 - Copycat:** price below and quality/packaging close to brand leader, frequent price promotions
 - Premium:** price and quality close or higher than leading brand, source of differentiation, limited price promotions, higher margins
- Assumption: Price rigidity (PR) higher for PLs than for NBs
→ $PR_{\text{Premium}} > PR_{\text{Generic}} > PR_{\text{Copycat}}$

Objectives

Quantifying the impact of the different types of PLs on price rigidity.

Analyzing the impact of wholesale prices on price rigidity across products and categories.

Data

Case study analysis:

- Weekly store level scanner data from 2004/W1– 2007/W22
- Major U.S.- Canadian retail chain
- 70 stores across Canada
- Two case studies: Packaged side bacon and bottled salad dressings

Case study 1



high quality, few varieties, input price of pork subject to fluctuations, PL share 48%

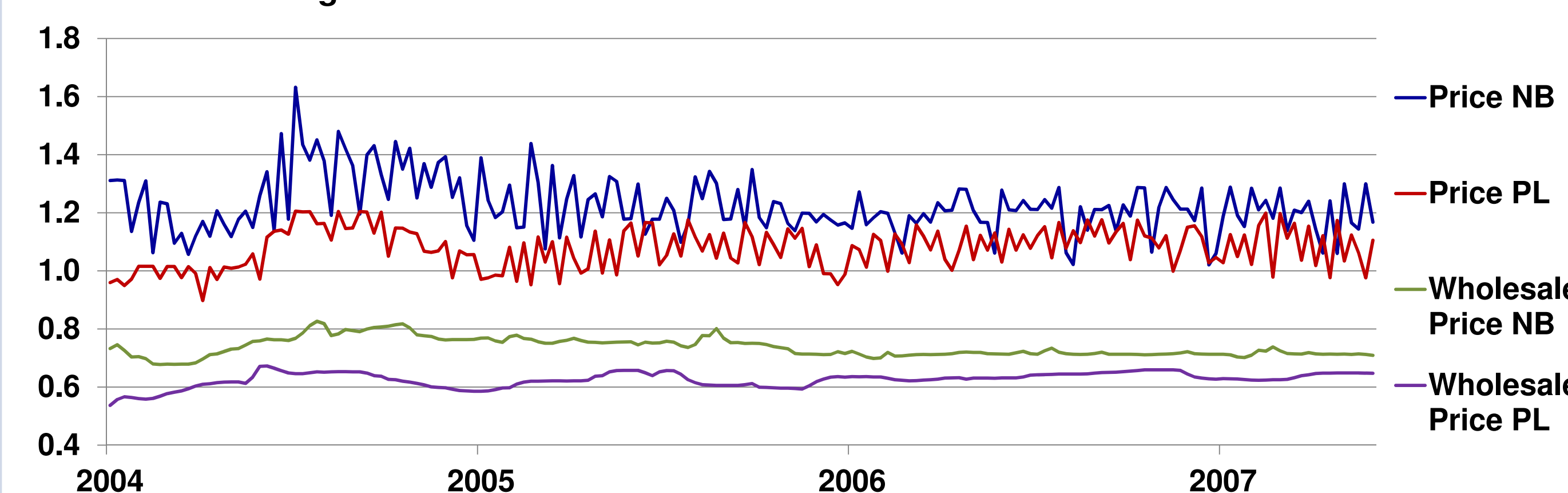
Case study 2



convenient, long shelf-life, manifold flavors, prominent NB share 74%

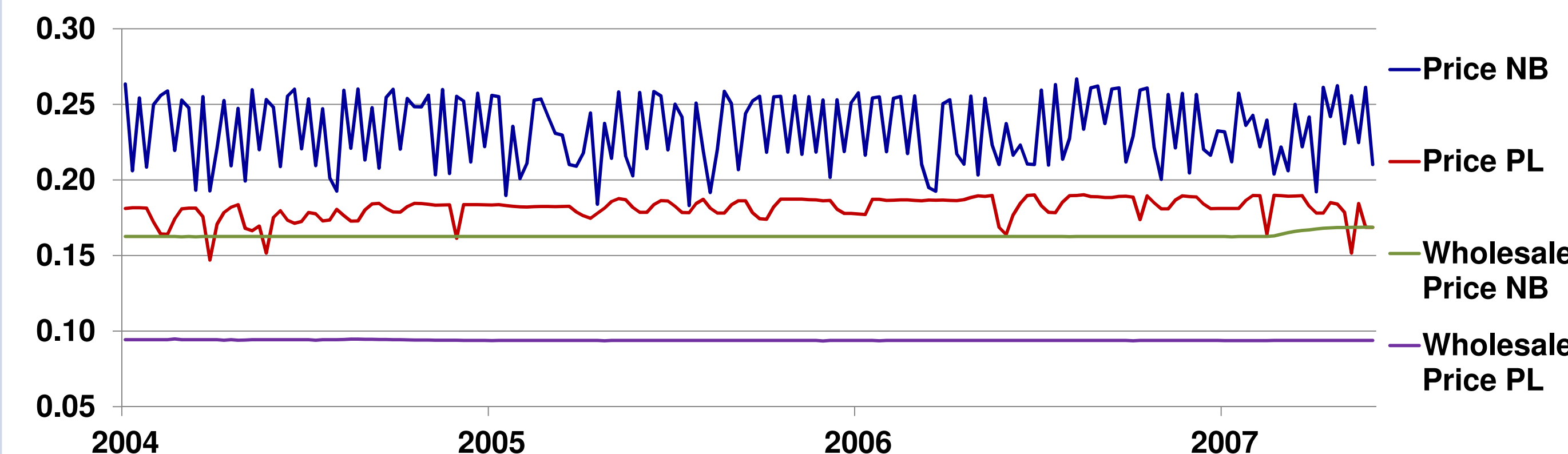
Bacon: retail price variability > wholesale price variability

Price in CAD/100 g



Salad dressings: price variability despite rigid wholesale prices

Price in CAD/ounce



Methods

1) Double-log regression model of price rigidity:

$$PR = f(PL_G, PL_C, PL_P, SP_W, Z)$$

2) Probabilistic model of retail price adjustment:

$$Y(\Delta P=1) = f(PL_G, PL_C, PL_P, \Delta P_W, \Delta P_{W-1}, Z)$$

PR: price rigidity = mean duration of unchanged price
 ΔP : dummy for price change
 PL_G : dummy for generic
 PL_C : dummy for copycat brand
 PL_P : dummy for premium PL
 SP_W : share of changed wholesale prices
 ΔP_W : dummy for change in wholesale price
 ΔP_{W-1} : dummy for lagged change in wholesale price
Z: vector of control variables: management area, store location, package size, store size, for regression additional price promotions (PROMO) and price jumps

Results^{a)}

Variable	Bacon		Salad dressings	
	OLS ^{b)}	Probit ^{c)}	OLS ^{b)}	Probit ^{c)}
PL_G	0.091***	-0.066***	-	-
PL_C	0.109***	-0.186***	0.686***	-0.386***
PL_P	-0.021***	-0.060***	0.853***	-0.584***
SP_W	-0.035***	-	-	-
PROMO	-0.490***	-	-0.358***	-
ΔP_W	-	0.037***	-	-
ΔP_{W-1}	-	0.034***	-	-
ΔP_{W-2}	-	-0.024***	-	-
ΔP_{W-3}	-	-0.017***	-	-

^{a)} Selected results of estimation ^{b)} coefficients ^{c)} marginal effects of probability

*** 99.9 % significance level.

- If SP_W increases by 1 %, PR decreases by 0.035 %:
→ Marginal effect.
- If ΔP_W , immediately or in following week passed.
- PR differs across categories and quality levels:
 - Salad dressings: 98.6 % higher for PL_C , 134.7 % for PL_P compared to NBs.
 - Bacon: PR of PL_P lower than PR of NBs in the regression and effects are marginal.

Conclusions

Wholesale prices more rigid than retail prices
→ high price variation due to sales.

Rigid wholesale prices provide evidence for long term contracts.

Salad dressings: Higher PR for all types of PLs.
Bacon: Marginal effect and no consistent results for the types of PLs.

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