KU LEUVEN

Shrinkflation:
The Impact of Package Downsizing on SKU Sales

Timpe Callebaut (University of Antwerp)

Lieve Heyrman (KU Leuven)

Prof. Kathleen Cleeren (KU Leuven)

Prof. Kelly Geyskens (Maastricht University)

Prof. Kristiaan Helsen (HKUST)

KU Leuven - Department of Marketing
Campus Carolus, Antwerp

Motivation


FINANCIAL TIMES

Brooke Masters MARCH 23 2022

Opinion **Food & Beverage**

Why 'shrinkflation' means you are paying the same for less

Companies are cutting corners on product size or limiting services to preserve margins as their costs rise


BBC

NEWS

France's Carrefour puts up 'shrinkflation' warning signs

By Lucy Hooker

Business reporter, BBC News

14 September 2023


Bloomberg

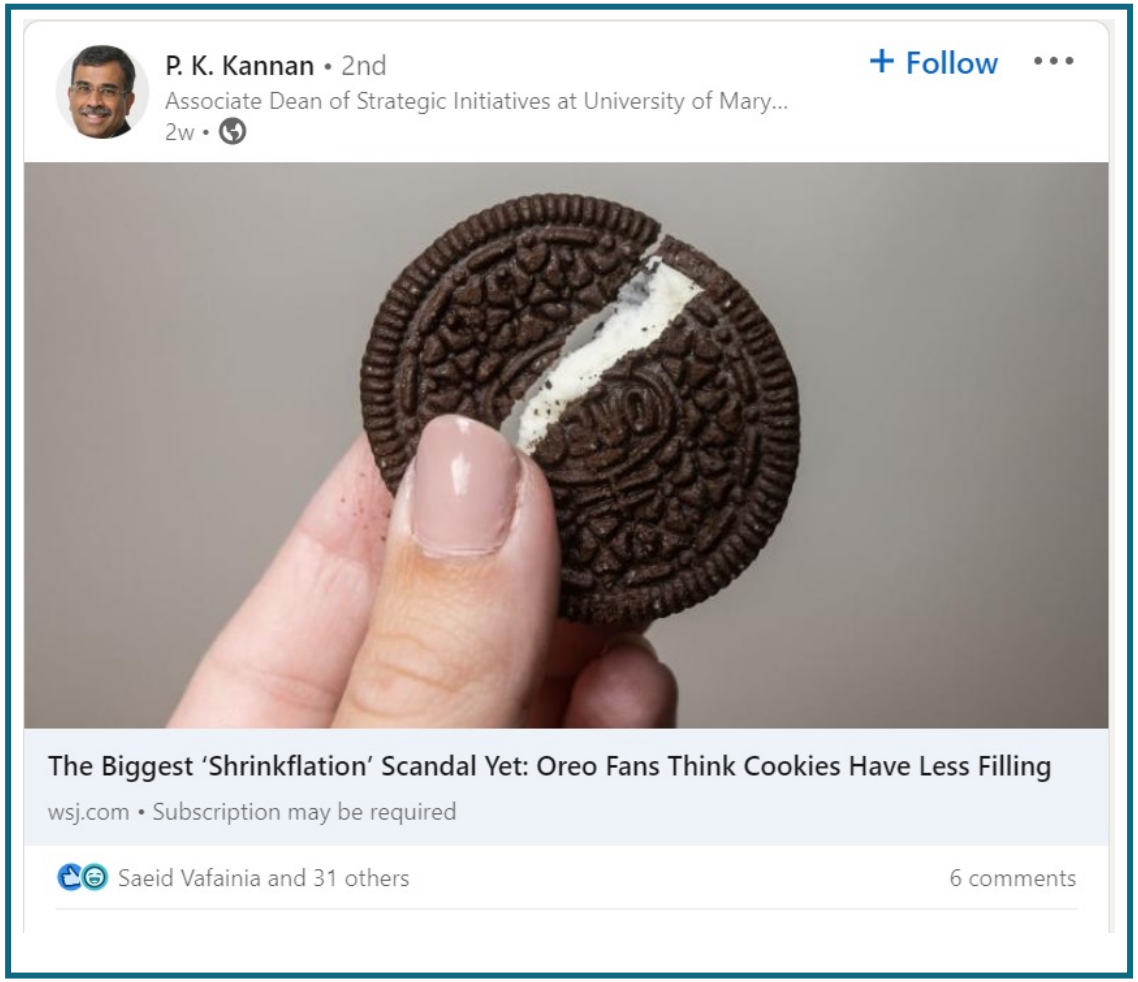
Shrinkflation Is an Economic Monster Worth Watching

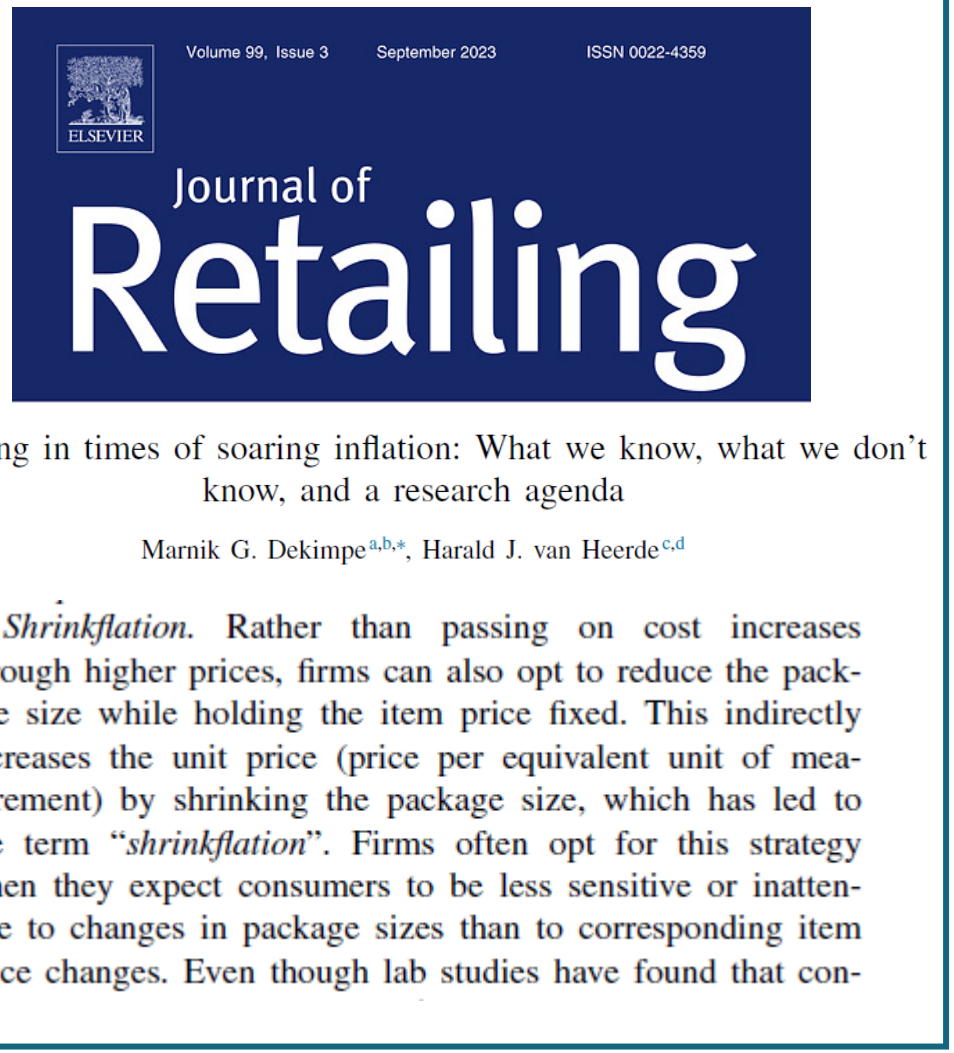
When inflation strikes, retailers have a proven strategy to pass the costs on to consumers.

By Stephen Mihm

June 24, 2021 at 3:30 PM GMT+2

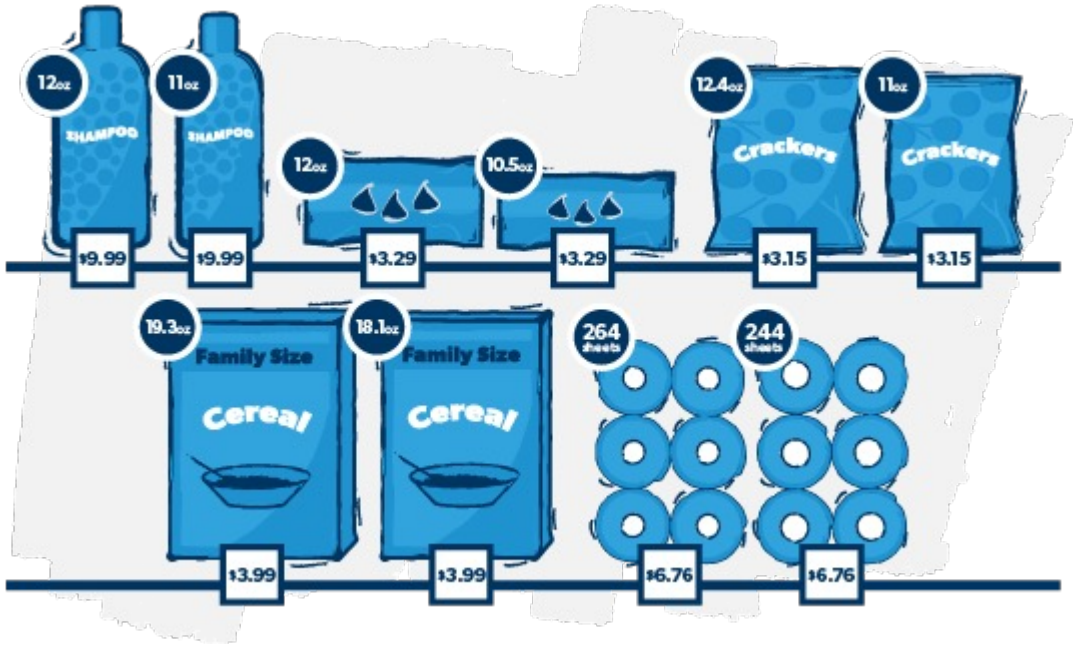
Motivation


P. K. Kannan • 2nd
Associate Dean of Strategic Initiatives at University of Mary...
2w •
+ Follow
The Biggest 'Shrinkflation' Scandal Yet: Oreo Fans Think Cookies Have Less Filling
wsj.com • Subscription may be required
Saeid Vafainia and 31 others
6 comments

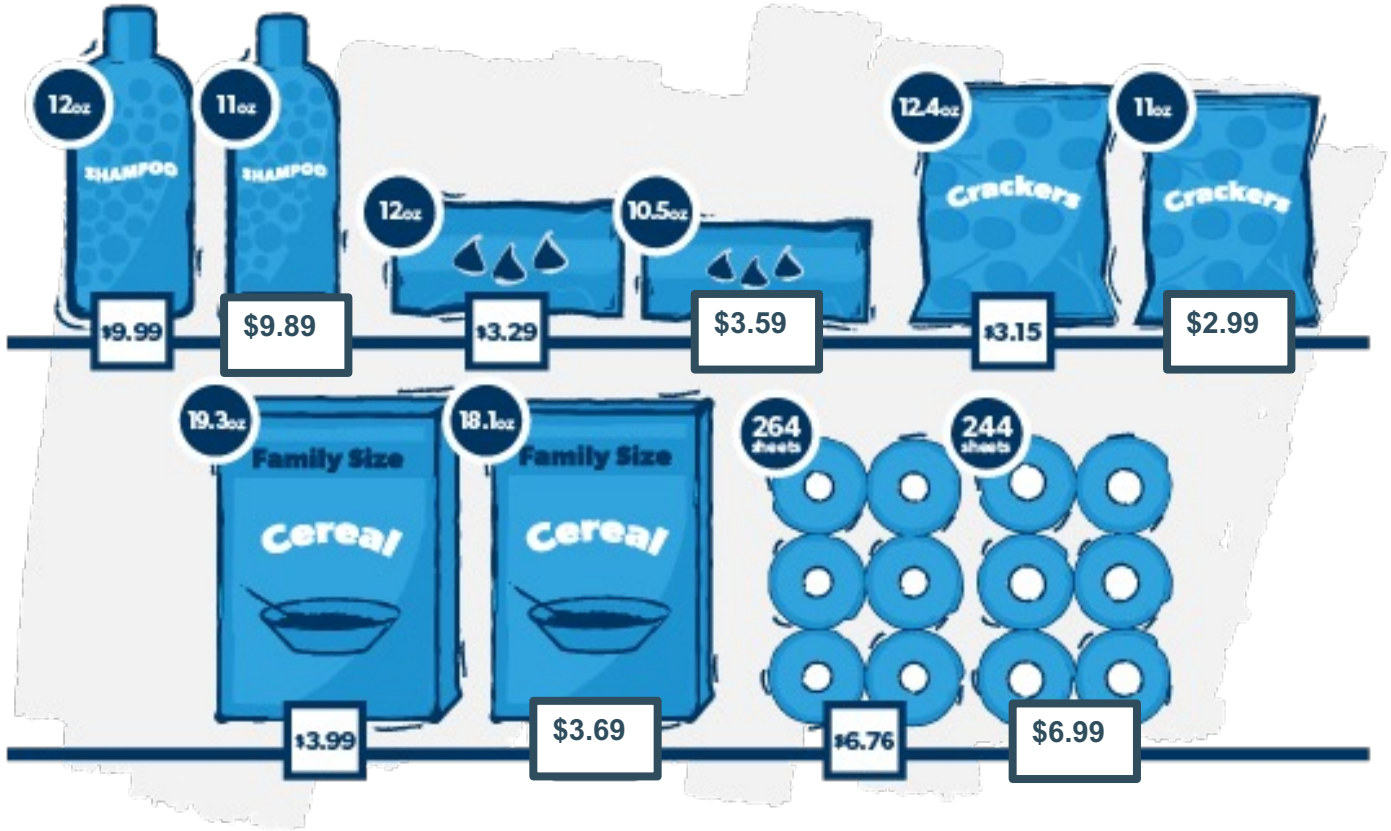

ELSEVIER
Volume 99, Issue 3
September 2023
ISSN 0022-4359
Journal of
Retailing
Retailing in times of soaring inflation: What we know, what we don't know, and a research agenda
Marnik G. Dekimpe[a,b,*], Harald J. van Heerde[c,d]
Shrinkflation. Rather than passing on cost increases through higher prices, firms can also opt to reduce the package size while holding the item price fixed. This indirectly increases the unit price (price per equivalent unit of measurement) by shrinking the package size, which has led to the term "*shrinkflation*". Firms often opt for this strategy when they expect consumers to be less sensitive or inattentive to changes in package sizes than to corresponding item price changes. Even though lab studies have found that con-

Agenda

- What is shrinkflation (and what isn't)
- Research goal
- Theoretical context
- Outcome scenarios
- Data & methodology
- Results
- Implications

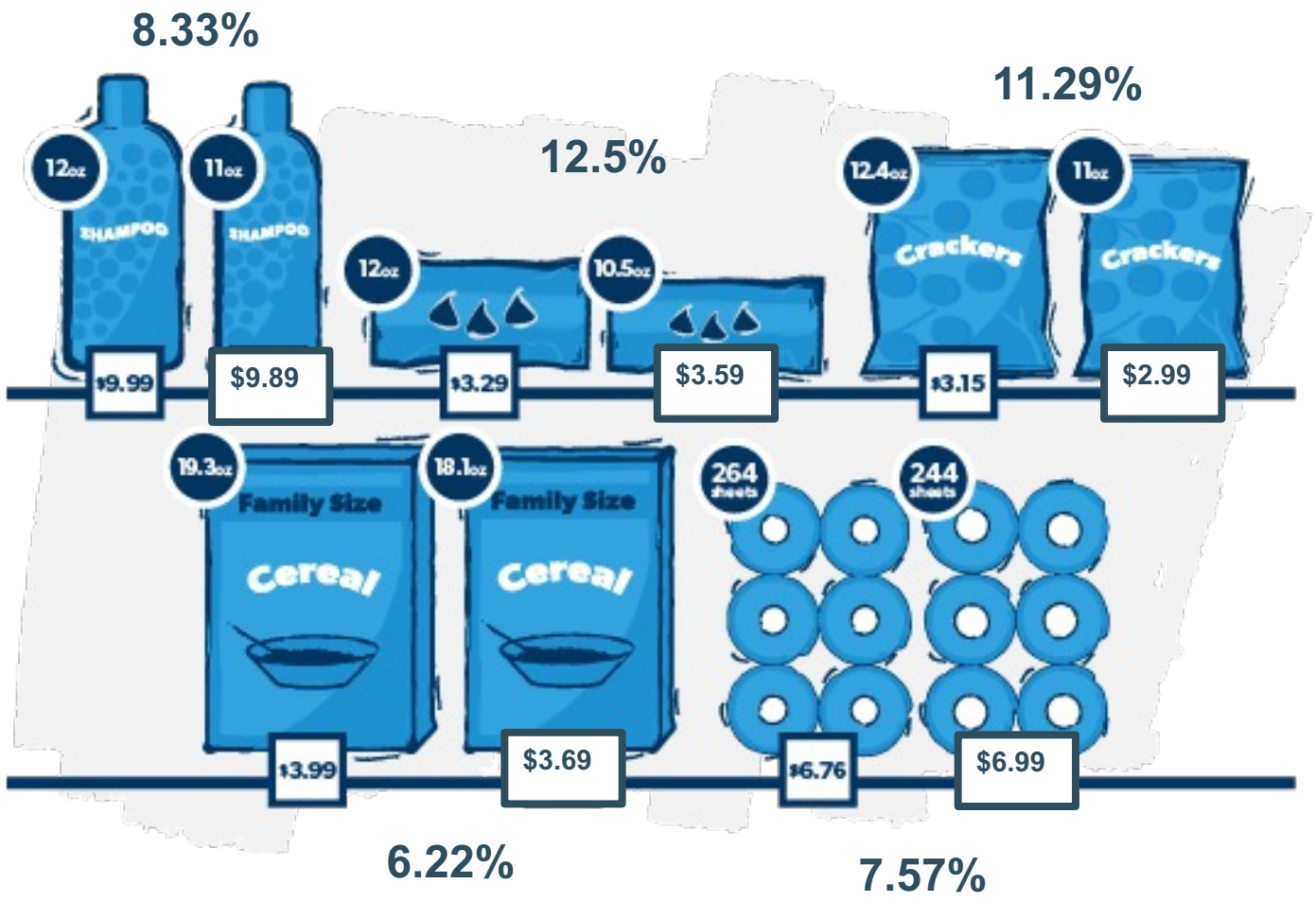


Motivation



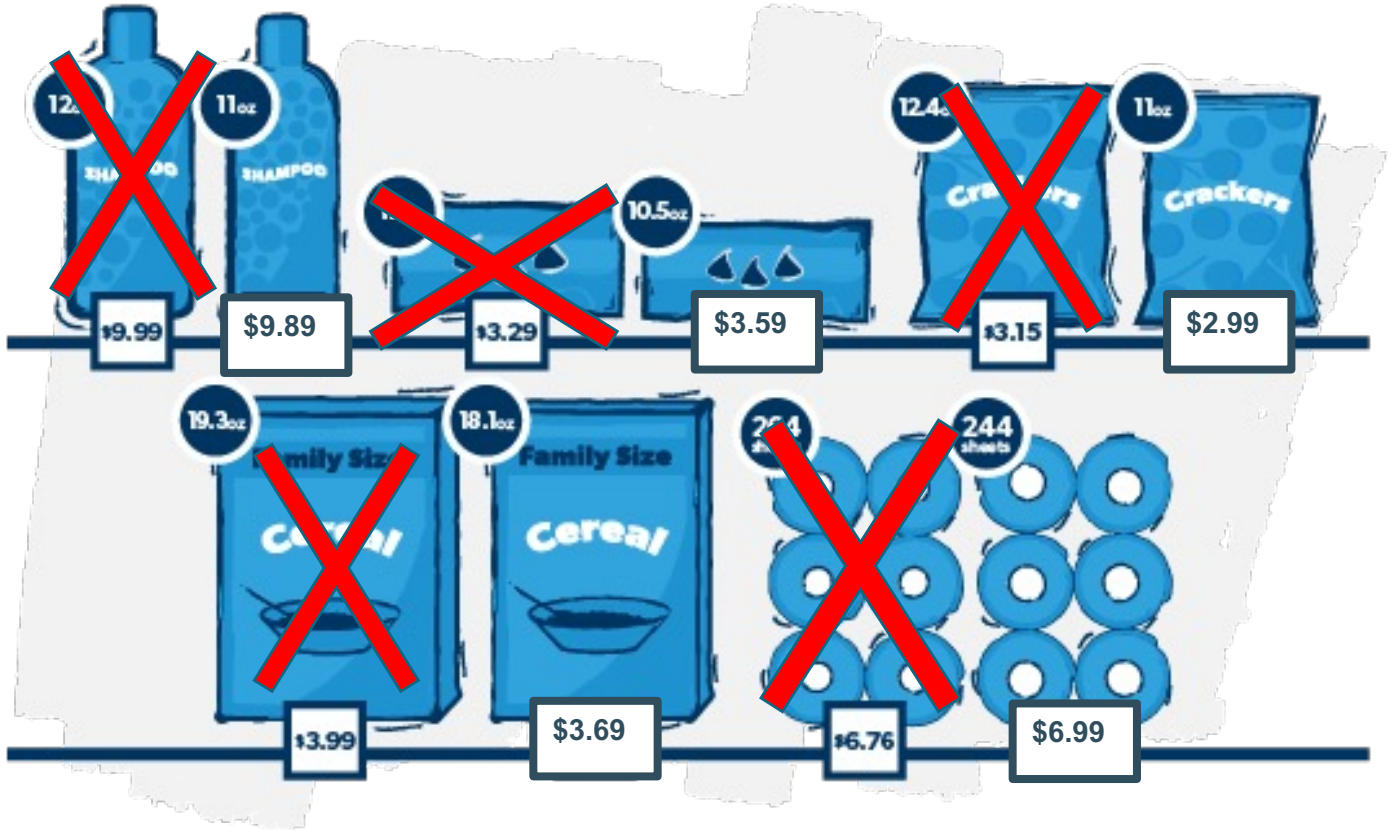
1. Subtle downsizing
   - Max. 33%
2. Replacement
   - versus addition
3. Price per volume unit increase

Motivation



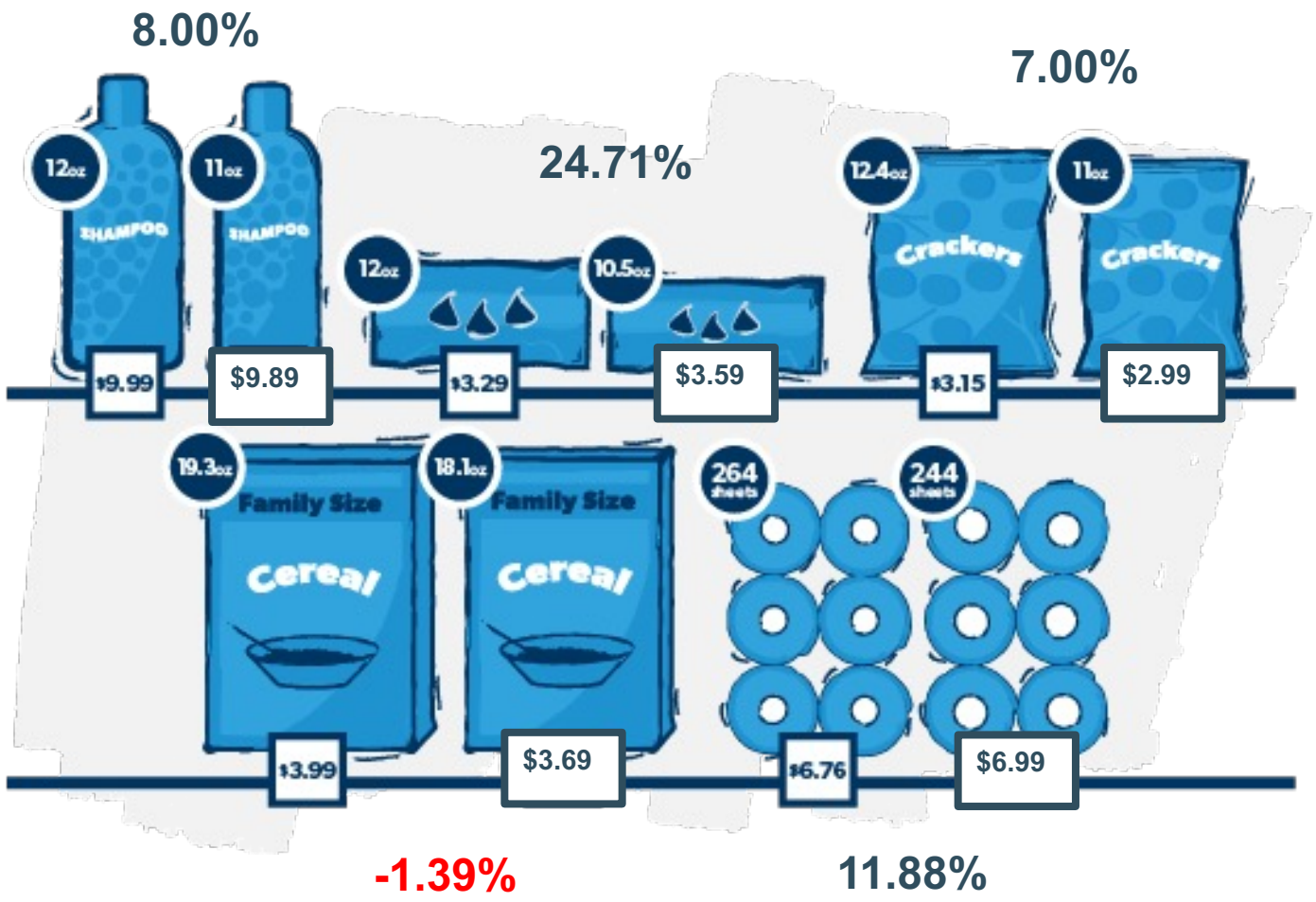
1. **Subtle downsizing**
   - Max. 33%

Motivation



1. Subtle downsizing
   - Max. 33%
2. **Replacement**
   - versus addition

Motivation



1. Subtle downsizing
   - Max. 33%
2. Replacement
   - versus addition
3. **Price per volume unit increase**

Motivation

Shrinkflation

Product replacement

Fly under the radar

No added value for consumer

Package size addition

Product addition

Marketed as increased variety

Added value for consumer

Motivation

Shrinkflation

Product replacement

Fly under the radar

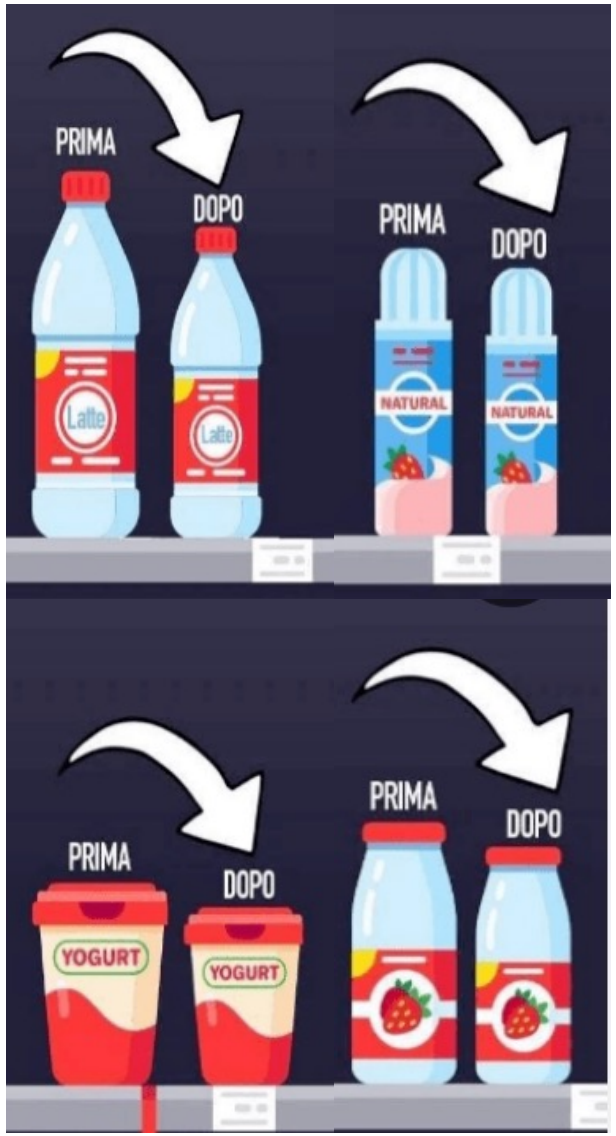
No added value for consumer

Research Questions

1. What is the impact of shrinkflation on **SKU performance**?
   - SKU sales
   - Volume sales
   - Value sales

2. Is the impact **dependent** on the **implementation** of the shrinkflation?
   - Change in SKU price
   - Change in volume

3. What is the **moderating** effect of **brand** and **category** characteristics on the impact of shrinkflation?



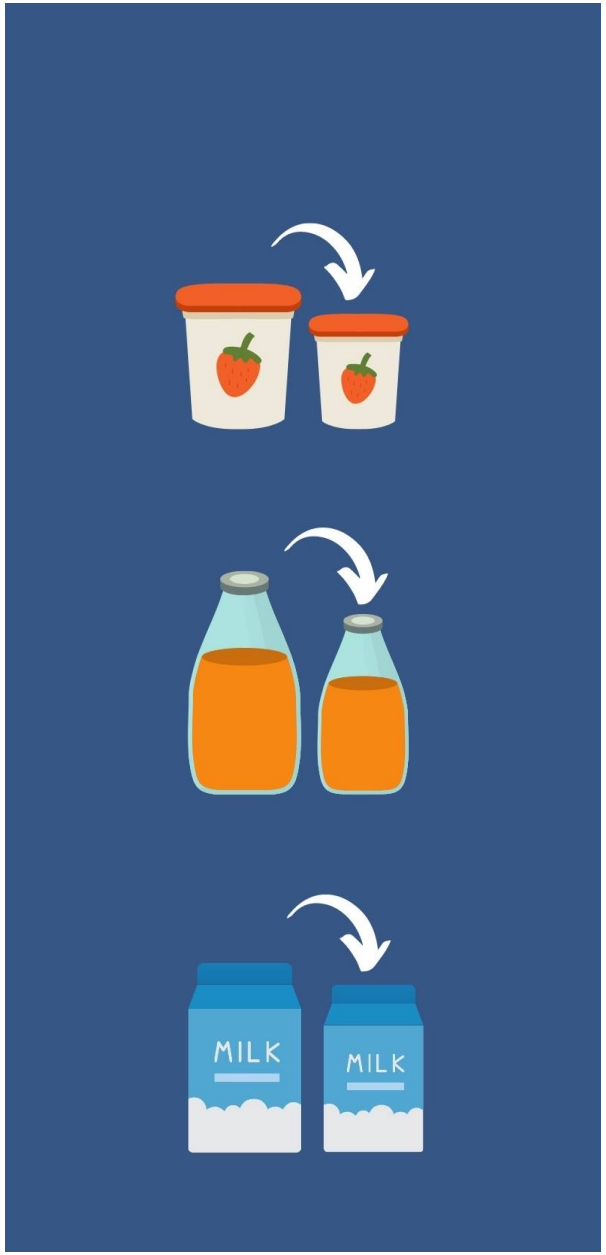
Theoretical context

Package downsizing

- Downsizing additions may lead to more volume sold (Keller & Guyt, 2022)
- Underestimate actual package size changes (CHandon & Wansink, 2007)
- Consumers only notice a volume size decrease if large enough (= Weber's law of Just noticeable differences)

Price increase tactics

- SKU price increase = negative reactions (Janakiraman et al., 2006)
- Consumers only notice a price increase if large enough (= Weber's law of Just noticeable differences)
- Consumers concentrate on SKU prices and not on volume unit prices (Homburg et al., 2005)



Theoretical context

Shrinkflation as an effective price increase tactic

+ Higher sensitivity to price changes than volume changes (Kachersky, 2011)

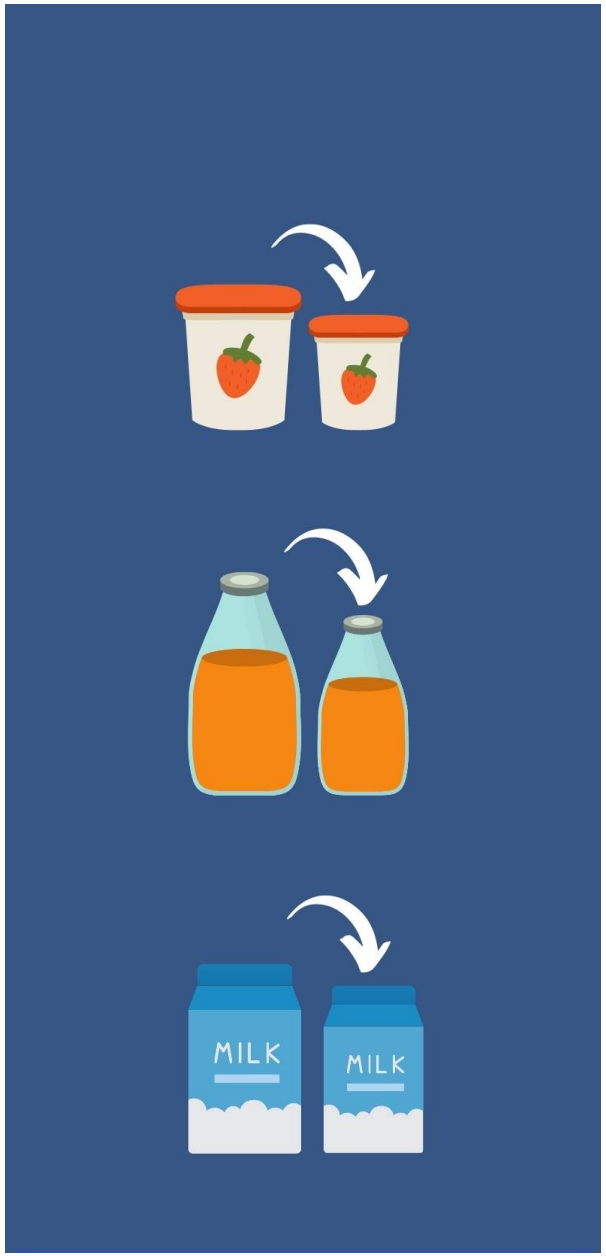
+ SKU pricing as more diagnostic cue vs volume unit pricing (Homburg et al., 2005)

+ Do not breaching pricing/volume thresholds (= Weber's law of Just noticeable differences)

+ Consumers tend to stick to habits (Dijksterhuis et al. 2005)

BUT

- Media exposure ➔ consumer awareness (Dekimpe & van Heerde, 2023)
- If consumers are aware of shrinkflation, they find this unfair (Evangelidis 2024)
- More attention to volume unit pricing in store (Yao & Oppewal, 2016)

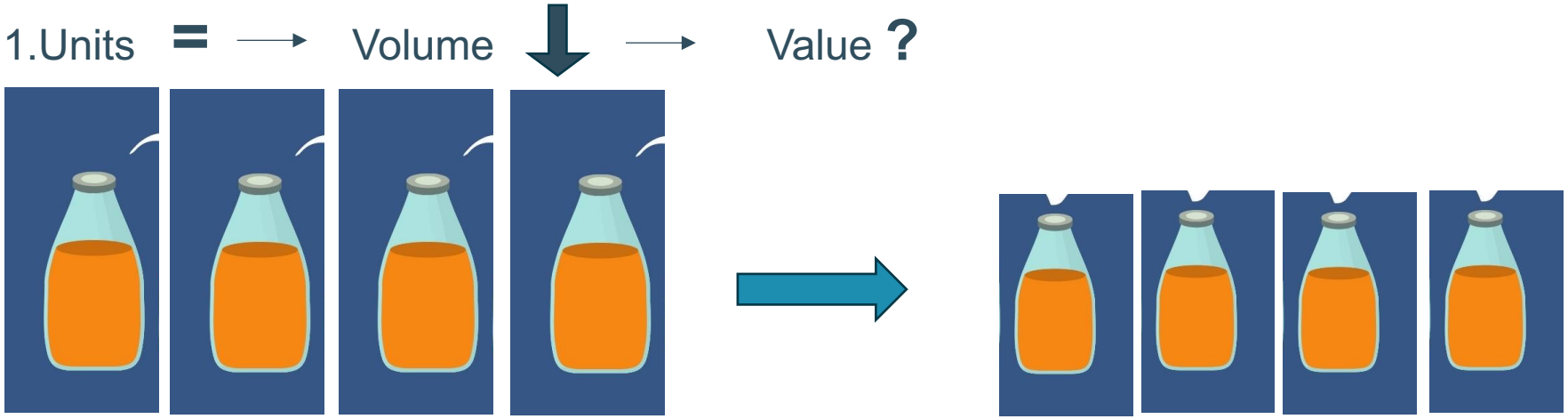


Potential reactions to shrinkflation

EXAMPLE

Household X purchases 4 bottles of 1,000 ml orange juice of a brand per week.

What happens if the bottle is shrinkflated from 1,000 ml to 900 ml?



Potential reactions to shrinkflation

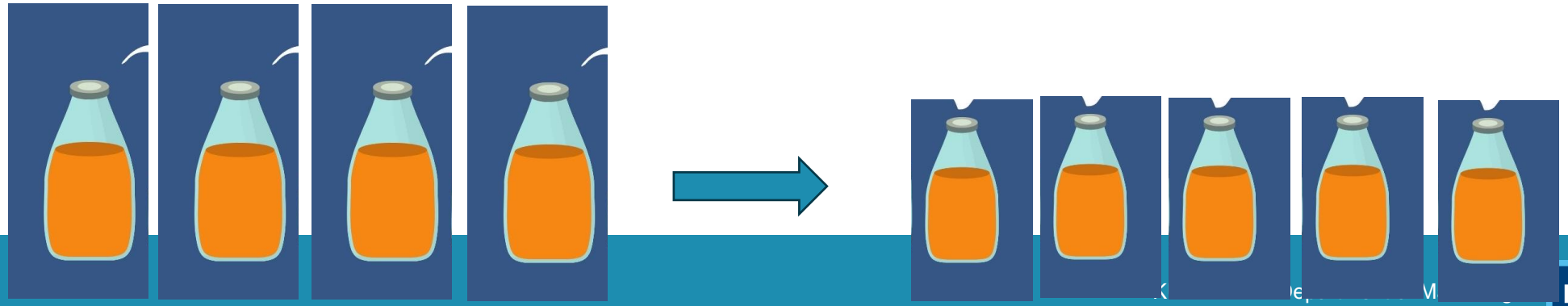
EXAMPLE

Household X purchases 4 bottles of 1,000 ml orange juice of a brand per week.

What happens if the bottle is shrinkflated from 1,000 ml to 900 ml?

1.Units = → Volume ↓ → Value ?

2. Units ↑ → Volume = **OR** ↑ → Value ↑

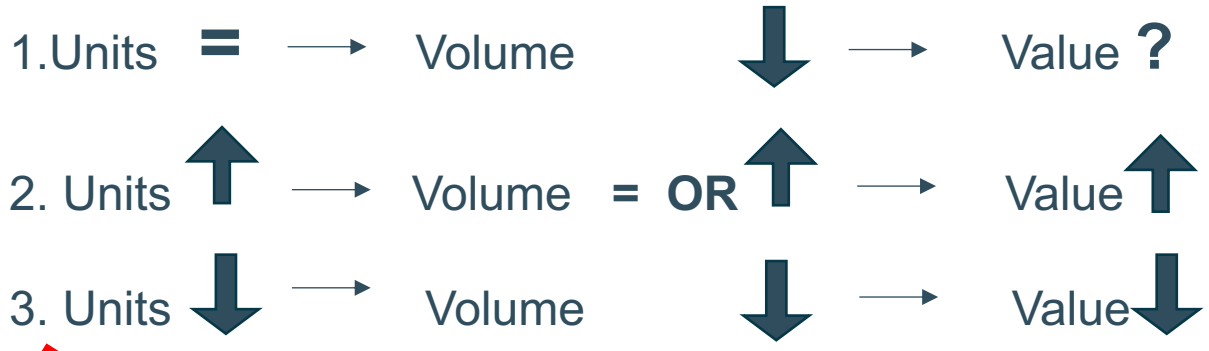


Potential reactions to shrinkflation

EXAMPLE

Household X purchases 4 bottles of 1,000 ml orange juice of a brand per week.

What happens if the bottle is shrinkflated from 1,000 ml to 900 ml?



Data

Identification of shrinkflation cases

Shrinkflation

- Smaller volume (max 33%) ✓
- New SKU replaces old one ✓
- Increased price per volume unit

First sale: January 2015

200 GMS

July 2019

180 GMS

Final sale: August 2019

March 2020
(end of dataset)

Data

Identification of shrinkflation cases

Shrinkflation

- Smaller volume (max 33%) ✓
- New SKU replaces old one ✓
- Increased price per volume unit ✓

First sale: January 2015

200 GMS

Price per volume change: 14.47%

July 2019

180 GMS

Final sale: August 2019

March 2020 (end of dataset)

408 cases in 4,789 stores in 62 product categories in The Netherlands

Sample description

	Total N	Min	5th %	Median	Mean	95th %	Max	Std dev
Panel A: Case level								
Volume decrease	408	0.26	2	12.14	13.19	25	32.86	8.12
Private label	408	0	0	0	0.48	1	1	0.50
Original product size	408	0.01	0.04	0.3	0.41	1.24	2.52	0.43
Category expensiveness	408	2.68	3.04	3.90	4.08	5.36	5.39	0.69
Category usage frequency	408	2.32	3.06	3.80	3.98	5.21	5.52	0.66
Panel B: Case-store level								
SKU price increase	35,132	5.00	5.50	11.29	12.21	20.41	23.53	5.23
SKU price decrease	44,006	5.00	5.32	10.59	11.32	19.35	20.13	4.45
Private label	165,193	0	0	0	0.26	1	1	0.44
Shrinkflations last year	165,193	1751	1767	1941	1930.37	2080	2093	94.42

- 52% of the cases without price change = “pure shrinkflation”
- 21% of the cases with an SKU price increase
- 27% of the cases with an SKU price decrease

Sample description: top 15 categories

Category	n Cases	n case-store
Sauces and mixers	54	43,957
Laundry detergents	24	6,155
Spreads and toppings (for bread)	21	7,699
Chocolate	21	6,274
Biscuits & cookies	19	10,876
Savory snacks	16	10,421
Snacks & peanuts	13	1,099
Diapers	12	1,702
Baking products & desserts	11	3,174
Shelf-stable meals	11	3,739
Ready-to-eat meals	11	5,233
Fresh desserts	11	7,390
Vegetable preserves (jars)	10	2,542
Shelf-stable bread	10	2,567
Tea	9	1,790

Methodology

- Fixed-effects model to capture effect of shrinkflation on performance SKU *i* in category *c* in store *s* during week *t:*

$$Log(Y_{icst}) = \alpha + \beta_1 SHRINK_{icst} + \beta (SHRINK_{icst} \text{ X CASE CHAR}_{ics}) + \beta (SHRINK_{icst} \text{ X BRAND CHAR}_{ics}) + (\beta \text{ SHRINK}_{icst} \text{ X CATEGORY CHAR}_{c}) + \beta X_{icst} + \lambda_{is} + \gamma_{ct} + \delta_r + \varepsilon_{icst}$$

Variable	Description
Y	Focal dependent variable (SKU sales, volume sales, value), year before and after each shrinkflation case
SHRINK	Dummy variable to signal shrinkflation introduction (step dummy)
CASE CHARACTERISTIC	Percentage SKU price increase/decrease, percentage volume decrease, original volume
BRAND CHARACTERISTIC	Private label (vs national brand), brand size assortment (number of unique package sizes)
CATEGORY CHARACTERISTIC	Expensiveness, usage frequency, number of shrinkflations is last year
CONTROL	Price, promotion depth, size assortment at SKU, brand, competitors + overlap dummy variable

Results

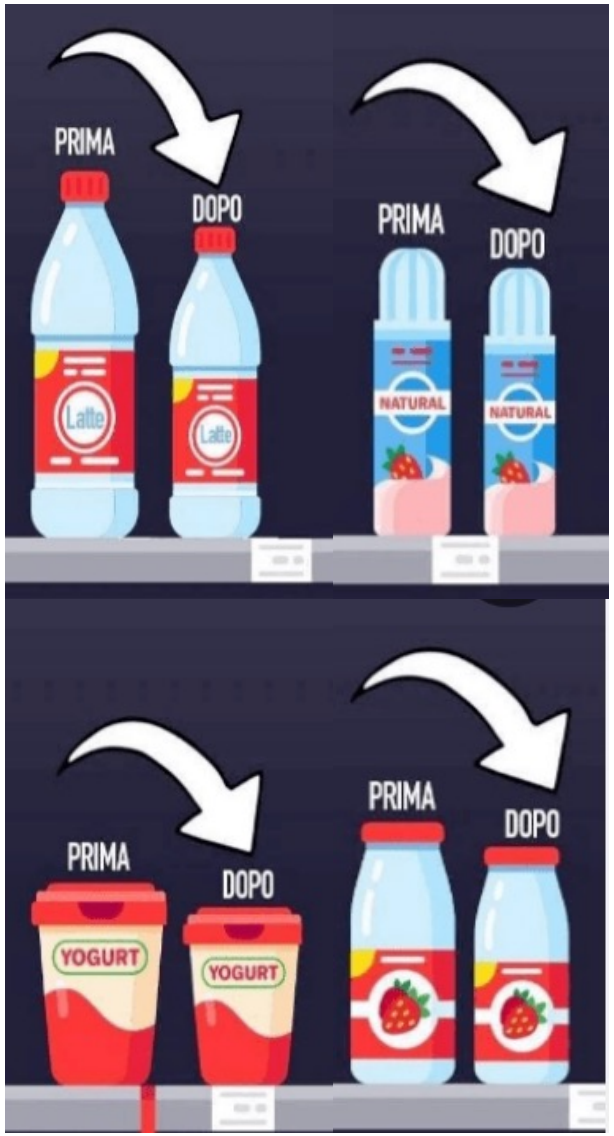
Table 3: Results	***SKU Sales***			***Volume Sales***			***Value Sales***		
	estimate	*p-value*	*SE*	*estimate*	*p-value*	*SE*	*estimate*	*p-value*	*SE*
Main effect									
Shrinkflation	0.157	0.000	0.004	0.048	0.000	0.003	0.078	0.000	0.004
Moderators									
Shrinkflation Case Characteristics									
Shrinkflation × volume decrease	0.002	0.324	0.002	-0.067	0.000	0.002	-0.054	0.000	0.002
Shrinkflation × SKU price increase	-0.000	0.395	0.001	0.003	0.000	0.000	0.005	0.000	0.001
Shrinkflation × SKU price decrease	0.003	0.000	0.000	0.001	0.320	0.001	-0.001	0.011	0.001
Shrinkflation × original SKU volume	0.011	0.000	0.002	-0.002	0.236	0.002	0.001	0.588	0.003
Brand Characteristics									
Shrinkflation × private label	-0.006	0.021	0.003	-0.001	0.754	0.002	-0.003	0.251	0.003
Shrinkflation × brand size assortment	0.011	0.000	0.001	0.010	0.000	0.001	0.011	0.000	0.001
Product Category Characteristics									
Shrinkflation × expensiveness	-0.007	0.667	0.017	0.048	0.001	0.015	0.020	0.275	0.018
Shrinkflation × usage frequency	-0.022	0.250	0.019	-0.047	0.001	0.016	-0.0120	0.558	0.020
Shrinkflation × shrinkflations prev year	0.005	0.000	0.001	0.003	0.000	0.001	0.005	0.000	0.001
Control variables									
Price per volume unit	-0.717	0.000	0.015	-0.823	0.000	0.013	-0.062	0.000	0.014
Promotion depth	0.352	0.000	0.001	0.329	0.000	0.001	0.253	0.000	0.001
Brand promotion depth	0.053	0.000	0.000	0.050	0.000	0.000	0.041	0.000	0.000
Brand size assortment	-0.007	0.000	0.001	-0.006	0.000	0.001	-0.007	0.000	0.001
Competitor price per volume unit	0.0960	0.000	0.015	0.101	0.000	0.013	0.097	0.000	0.016
Competitor promotion depth	-0.003	0.000	0.000	-0.003	0.000	0.000	-0.003	0.000	0.000
Competitor size assortment	-0.078	0.000	0.006	-0.079	0.000	0.005	-0.078	0.000	0.006
Shrinkflations prev year	-0.005	0.000	0.001	-0.004	0.000	0.001	-0.006	0.000	0.001
Overlap	0.025	0.000	0.003	0.032	0.000	0.002	0.070	0.000	0.003
Fixed effects									
Case-store		✓			✓			✓	
Category-week		✓			✓			✓	
Chain		✓			✓			✓	
Observations		15,089,508			15,089,508			15,089,508	
S.E. clustered by		Case-store			Case-store			Case-store	
R-squared		0.4203			0.6783			0.3889	
Within R-squared		0.0358			0.0496			0.0172	

Results

- Shrinkflation increases sales AND value!
  - 15.7% more units
  - 4.8% more volume
  - 7.8% more value

- How to implement shrinkflation (in terms of value):
  - A small decrease in volume
  - A small increase in SKU price
  - No decrease in SKU price

- Thresholds for consumers to notice changes in price and changes in size (Weber's law)
  - Average decrease in volume: 13%
  - Average increase in SKU price: 12%
  - Average decrease in SKU price: 11%



For which brands and categories?

- Habitual behavior:
  - Expensiveness category (+)
  - Usage frequency category (-)

- Likelihood to notice the shrinkflation:
  - Original package size (+)
  - Private label (-)
  - Brand size assortment (+)
  - Number of shrinkflations in the category (+)

Discussion

Shrinkflation = effective price increase tactic

- Increase in sales (unit and volume) and value

Effectiveness depends on case, brand, category characteristics

- Consumer awareness
- Habits

Consumer welfare

- Pay more for less without realizing
- Shrinkflation warning labels

KU LEUVEN

Thank you!