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**The Effects of Media Coverage of the 2009 Cookie Dough Recall on the Demand for the Brand and the Close Substitutes**

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# The Effects of Media Coverage on the Demand for the Brand and the Close Substitutes

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## Method

- The study adopts a demand system approach, a differential demand system called Barten's Synthetic Model (BSM). BSM nests four demand systems viz. Rotterdam, CBS, NBR, and AIDS.
- The structural change of demand for cookie dough was determined by comparing price elasticities from the pre-recall (77 weeks) and post-recall (72 weeks) period.
- The models with different autoregressive orders and lags of sentiment index were tested. A Likelihood Ratio hypothesis test was conducted to identify the appropriate lag length for the model.
- The final model chosen for the study was AR(2) model with the first lag of the sentiment index.

## Model

Barten's Synthetic Model:

$$w_i d_i \log q_i = (\beta_i + \lambda w_{ij}) d \log Q + \sum_j (\gamma_{ij} - \mu w_i (\delta_{ij} - w_j)) d \log p_j + \varepsilon_i, i = 1, \dots, n$$

Divisia Volume Index:

$$d \log Q = \sum_i w_i d \log q_i$$

Adding up:

$$\sum_{i=1}^n \beta_i = 1 - \lambda_i \text{ and } \sum_{i=1}^n \gamma_{ij} = 0, j = 1, \dots, n.$$

Homogeneity:

$$\sum_{i=1}^n \gamma_{ij} = 0, \quad j = 1, \dots, n.$$

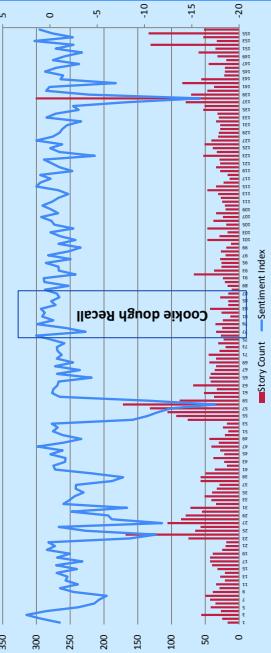
Symmetry:

$$\gamma_{ij} = \gamma_{ji}, \quad i, j = 1, \dots, n, i \neq j$$

## Results

- The study used Nielsen HomeScan data from years 2008, 2009 and 2010 to identify consumer purchases. The data was aggregated on weekly basis across the households.
- Recall period: 19<sup>th</sup> June 2009–18<sup>th</sup> Aug 2009
- Media tracking and Sentiment Analysis
  - The media stories were collected from major media sources (*national and local newspapers, network and cable TV, radio, news magazines, and the internet*) using keywords identifying referring to the food safety incidence.
  - We used a natural word processing algorithm to identify the tone (positive or negative) of the articles using certain keywords and assigned a sentiment score, between +2 to -2.
  - Sentiment scores were aggregated over each week by taking net differences. The score was reversed and moved to a base value of 100.

## Sentiment Index and Media Stories



## Conclusion

- By using BSM, the study finds the 2009 cookie dough recall of Brand1 had an effect on the demand of refrigerated cookie dough brands.
- We found a strong substitution effect between Brand1 and Brand2, suggesting a significant spillover effect in this market.
- Even though the study did not find a direct effect of media sentiment on Brand1 itself, media sentiment did boost the consumption of its substitute, Brand2.

## References

- Barten, A. (1993). Consumer allocation models: Choice of functional form. *Empirical Economics* 18(1): 129-158.
- Balkhavaryan, R., Capps Jr., O., & Salina, V. (2012). Impact of Food Contamination on Brands: A demand Systems Estimation of Peanut Butter. *Agricultural and Resource Economics Review* 41(3): 1-13.
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