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Standards Project

Customer Lifetime Value (CE) for Frequently Purchased Brands

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MASB **Marketing Accountability Standards Board**
of the Marketing Accountability Foundation

Customer Equity (CE)

- Definition
  - Σ Customer Lifetime Value (CLV)
  - Value ultimately comes from customers!
- Paradigm shift from the product to the customer
  - Customer: a valuable asset (Blattberg and Deighton 1996)
  - Relationship-oriented and customer-centric
- A new metric
  - Long-term profit
  - Firm valuation
  - Resource allocation (customer/product portfolio)

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CE and Product Marketing

- The CE perspective has been mainly applied to the relationship-marketing (RM) domain (e.g., banking, telecommunication)
- Academic research tends to focus on the RM domain as well.
  - Insurance (Donkers, Verhoef, De Jong 2007)
  - B2B high-tech manufacturer (Reinartz, Thomas, Kumar 2005)
  - Newspapers (Thomas, Blattberg, Fox 2004)
  - Interactive TV entertainment service (Lemon, White, Winer 2002)
  - Airline pilot membership (Thomas 2001)
- CE is also an important metric to manage in conventional product-marketing industries (e.g., consumer packaged goods, consumer durables)

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Difficulty Arises

- Measurement
  - CE-related metrics (e.g., retention rate) are not easily observed in product-centered sales data (e.g., scanner panel data)
  - For example, customer attrition occurs silently
- Marketing activities (e.g., price promotions) and CE
  - Dynamic relationship
  - Dual causality
  - Indirect impact of marketing on CE (e.g., through WOM)
- Managers often rely on flow metrics (e.g. units sold, market share) and ignore possibly important stock metrics (e.g. customer equity)

Research Questions

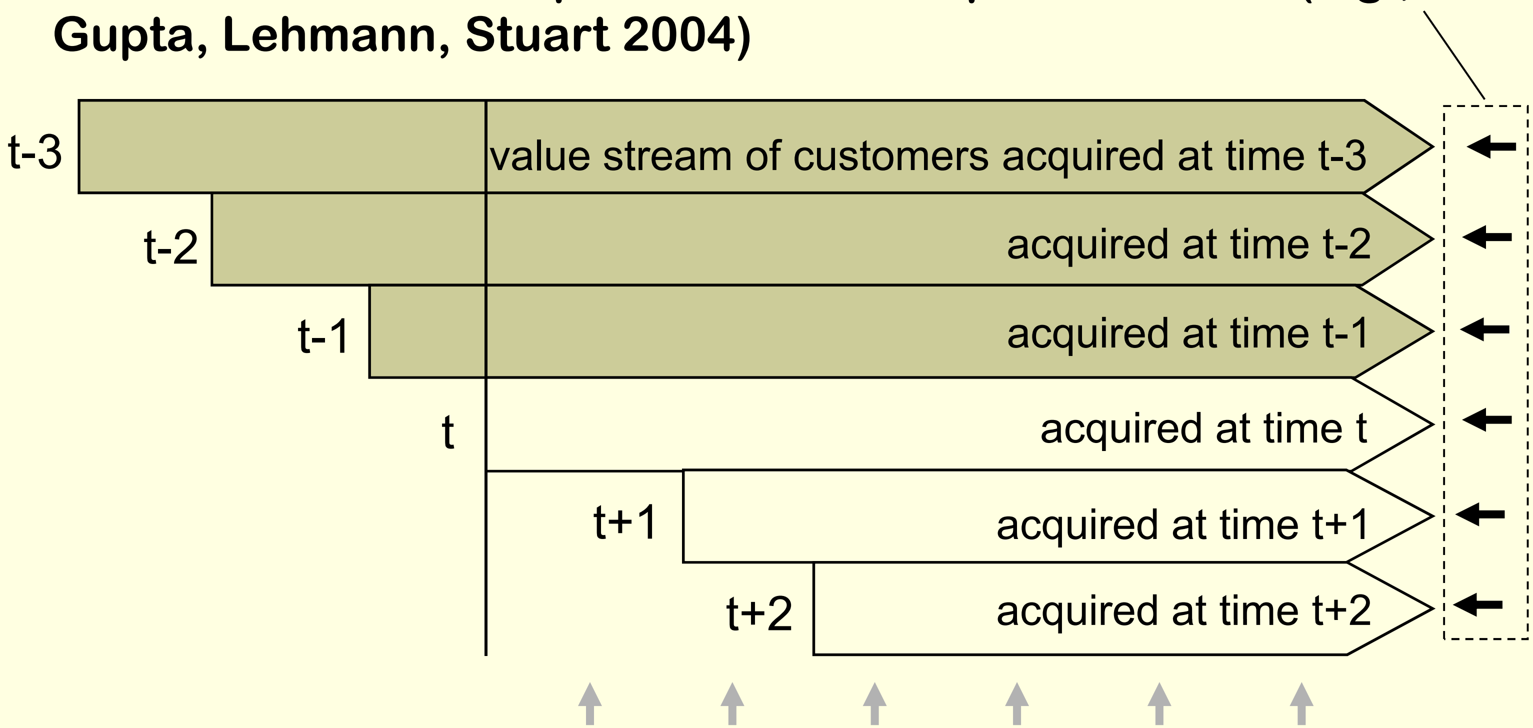
- How do we measure CE in consumer packaged goods industries, which is typically a mass-marketing and non-contractual transaction environment?

- How do we link readily-available scanner panel data to the CE framework?

- How do we model the impact of marketing activities on CE ?

Modeling Strategy I: Measurement of CE in CPG Industries

Literature: CLVs are calculated and summed across customer cohorts acquired at different points of time (e.g., Gupta, Lehmann, Stuart 2004)



We use a product-consumption point of view (or time-series view) in calculating values from customer acquisition and retention

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Algebraically...

literature

$$CLV_t = V_t + \frac{V_{t+1}}{(1+\delta)} + \frac{V_{t+2}}{(1+\delta)^2} + \cdots$$
$$= a_t N_t \pi_t q_t + \frac{a_t N_t \pi_{t+1} q_{t+1} r_{t+1}}{(1+\delta)} + \frac{a_t N_t \pi_{t+2} q_{t+2} r_{t+1} r_{t+2}}{(1+\delta)^2} + \cdots$$

LV of customers acquired at t

$$CE_t = \sum_{j=t}^{\infty} \frac{\sum_{i=1}^{h(j)} CLV_j^i}{(1+\delta)^{j-t}}$$

CE: sum of CLVs of all existing and expected customers

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our model

$$\boxed{CE_t = \underbrace{\sum_{j=t}^{\infty} \frac{N_j^a \pi_j^a q_j^a}{(1+\delta)^{j-t}}}_{\text{value from acquisition}} + \underbrace{\sum_{j=t}^{\infty} \frac{N_j^r \pi_j^r q_j^r}{(1+\delta)^{j-t}}}_{\text{value from retention}}}$$

CE: sum of CE values from "acquisition" sales and "retention" sales

$N^{a(r)}$: # of buyers from the prospect (existing-customer) pool

$\pi^{a(r)}$: contribution margin in acquisition (retention)

$q^{a(r)}$: average purchase quantity in acquisition (retention)

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Modeling Strategy II: Measuring Retention / Attrition

- In CPG, transaction frequency is heterogeneous across consumers, which makes measuring the incidence of retention challenging
- A lost-for-good scenario is not appropriate since a customer may stockpile a brand and therefore be out of the market for a while

- Calculating Pr (active) for each individual for each brand at each point in time based on his/her purchase history (Schmittlein, Morrison, Colombo 1987; Fader, Hardie, Lee 2005)
- If Pr (active) > cutoff → own customer, otherwise prospect
- Always-a-share buyer-seller relationship

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Modeling Strategy III: Impact of Marketing on CE

Marketing Activities (e.g., price promotion)

feedback

- Number of buyers (*incidence effect*)
- Purchase quantity (*volume effect*)
- Contribution margin (*margin effect*)

Customer Equity

Due to the (possibly) negative effect of marketing on future contribution margin (i.e., decision inertia), the CE effects of marketing may be negative in the long run.

Data

- Categories analyzed in the pilot test include:
  - Sports Drinks
  - Diapers/Training Pants
  - Baby Wipes
  - Carbonated Beverages
  - Canned Pasta
- Panel Data Sets used were formed as a 10/12 Static Panel
  - Households included in the data had to be panelists who reported regularly (10 of 12 months in each of the 3 years of the time frame spanned by the transactions data).
  - Our data showed household level purchase transactions from 8/2007 – 7/2010

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Market Share and Customer Equity

Brand A

While brand A occupies a smaller share of the CE for the category, it is stable.

Brand B

Brand B's predicted customer equity has lost 16 share points over time based on panel data transaction patterns.

CE from Retention and Acquisition Households

Brand A

Brand B

Both brands show normal declines in acquisition of panelist households over time.

Brand B is expected to lose more retention households based on the panel data transaction trends.

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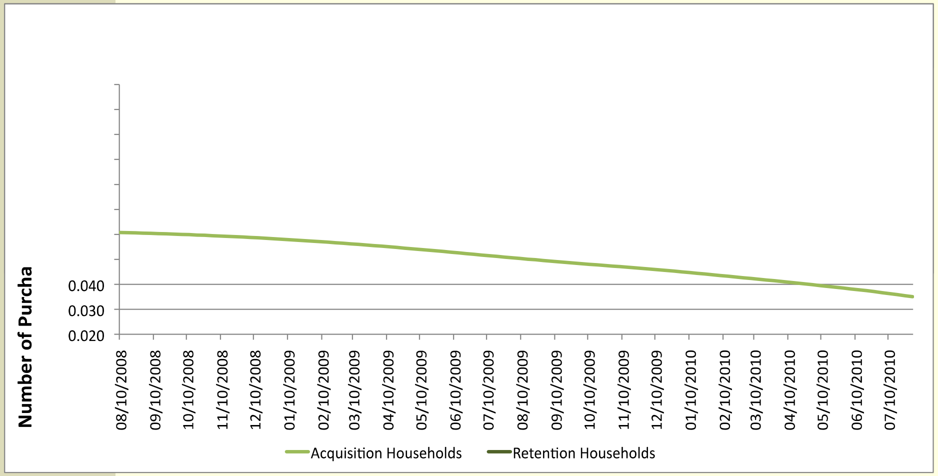
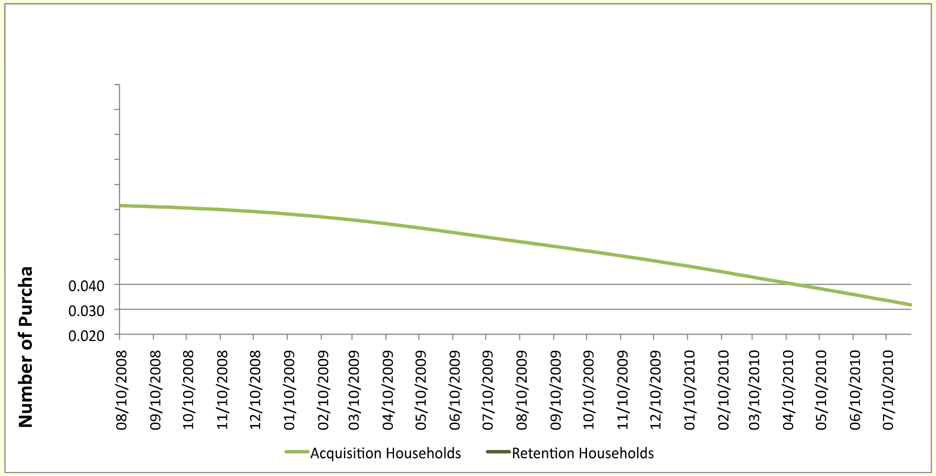
CE Component: Expected Numbers of Transactions

Brand A



Brand B



Brand B's trend has a faster decline in expected transactions based on panel data patterns.

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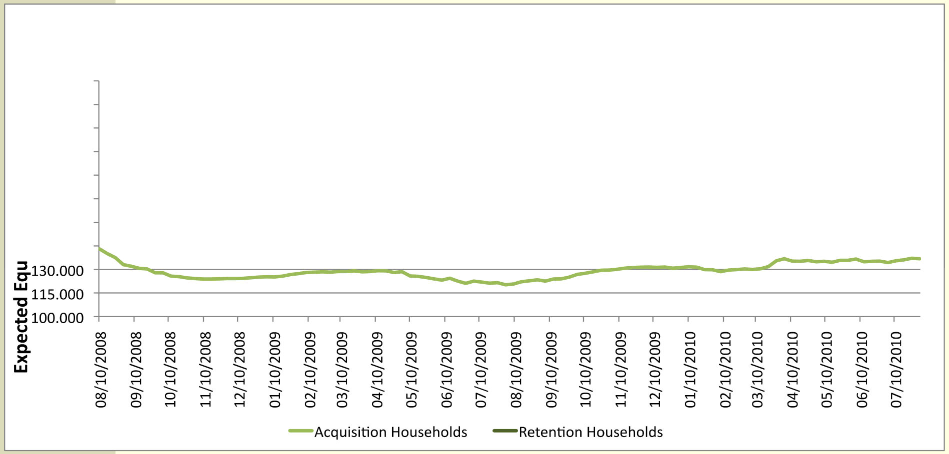
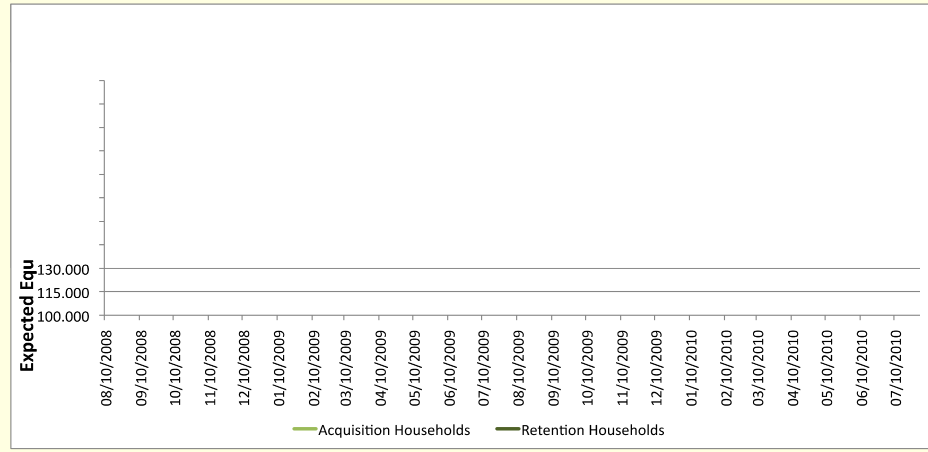
CE Component: Size of Purchase (Equivalized Units)

Brand A



Brand B



Brand A's size of purchase is growing for all households.

Brand B's size of purchase has dipped for the retained households in the panel data.

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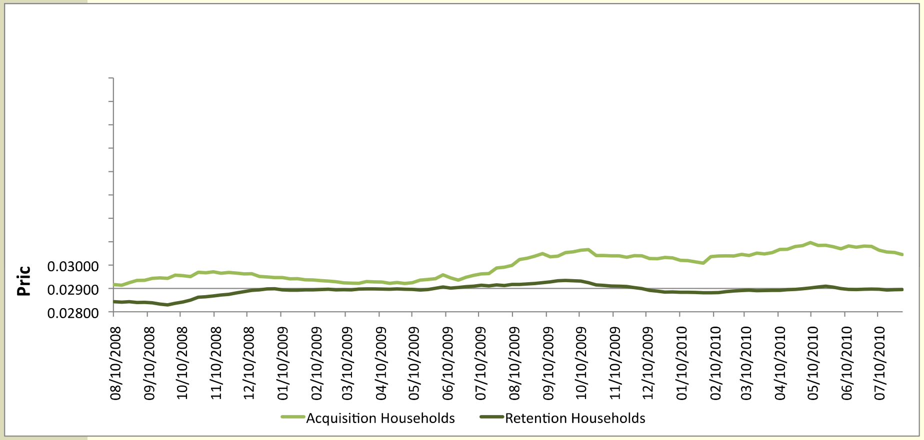
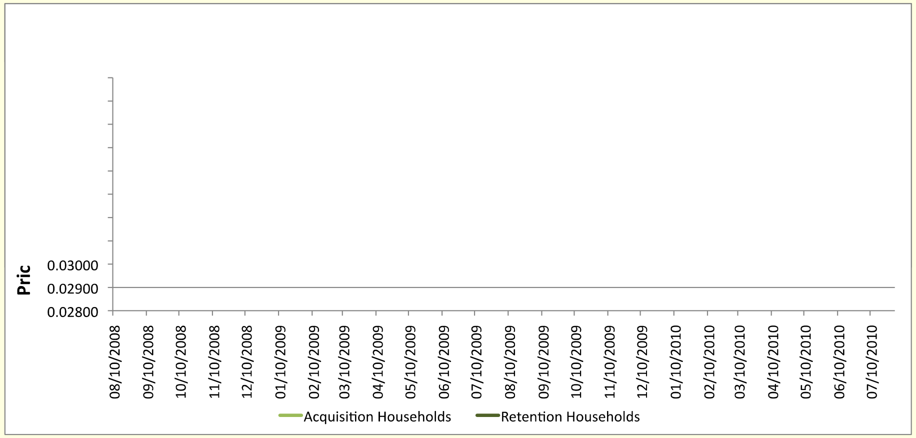
CE Component: Price of an Equivalized Unit

Brand A



Brand B



Brand A's price per unit is relatively stable over the panel time frame for retained households, but they are leveraging a high price when they acquire a household.

Brand B's price per unit is rising for both retention purchases and acquisition purchases.

Is Brand B pricing itself out of the market?

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Key Insights

- CE is a slow-moving metric, shows “direction of brand health”
- As such, is important for setting strategy (e.g. advertising, promotion strategy)
  - Stable CE: assuming the brand is profitable, then continued future profitability may be expected under the status quo.
  - Higher profitability if CE is rising.
  - Declining CE: is a leading indicator of deteriorating profitability. Change course.

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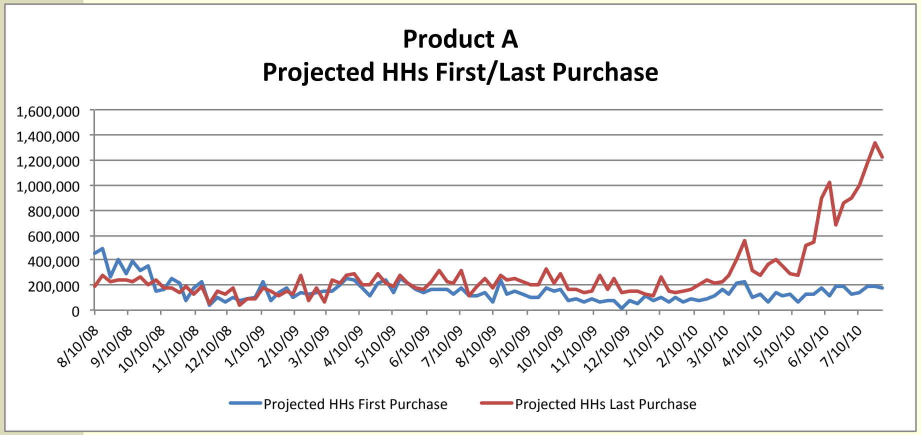
Conclusions and Further Research

- Incorporating marketing mix effects on customer equity. Show how marketing has affected CE trends.
- Explore data sources for customer rejuvenation, add to mathematics for CE prediction.
- Declines in households can act as an indicator of how many new customers a brand will need.
- Results are the most interesting in a relative sense; compare brands to each other or to category to see differences in brand health trends
- Panel results should eventually be ‘translated’ to market level results

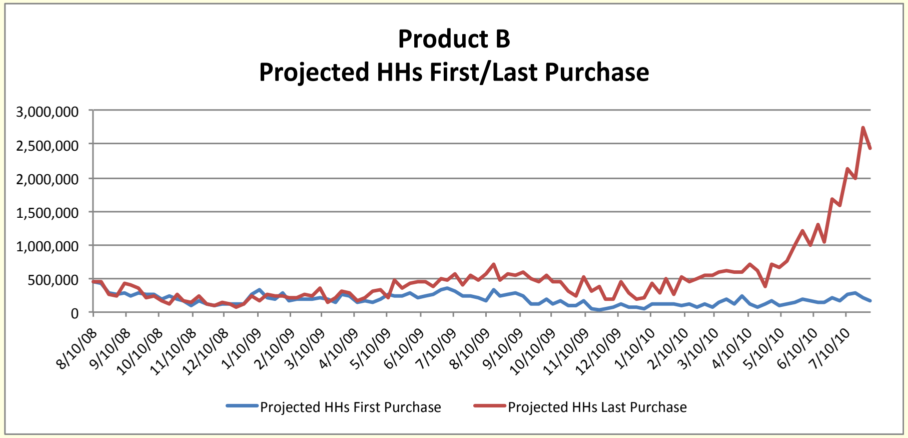
Static Panel Set Declines

Brand A



When less time remains in the panel data set, we see a decline in the number of households purchasing and the CE prediction declines accordingly.

Brand B



Brand B has an earlier and wider gap between households making a first purchase and those who make their last purchase.

Value?
Knowing how many customers you need to attract.
Relative comparsion to how your competitors gain and loose households.

CE calculations could be enhanced to estimate incoming new households through the end of the time frame based on other known brand trends.

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Thank-you!