

The Evolution of Brand Preferences

Evidence from Consumer Migration

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Motivation

- *Where do brand preferences come from?*

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- Theory: Evolve endogenously as a function of consumer experience
 - Habit (Becker & Murphy 1988)
 - Learning (Schmalensee 1982)
 - Advertising (Doraszelski & Markovich 2007)
 - Peer effects (Ellison & Fudenberg 1995)

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Suggests important source of economic rents

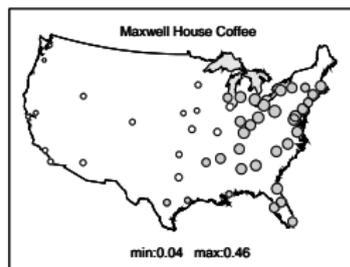
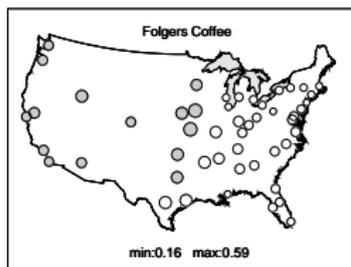
“The advantage to established sellers accruing from buyer preferences for their products... is on average larger and more frequent... than any other barrier to entry” (Bain 1959).

Motivation

- *Where do brand preferences come from?*
- Empirics: Little evidence that past experience can have durable impact on preferences
 - Advertising effects weak & dissipate in 6 months at most (Bagwell 2007)
 - Habit / switching costs estimated using short consumer panels (Erdem 1996, Keane 1997, Dubé, Hitsch and Rossi 2010)

This Paper

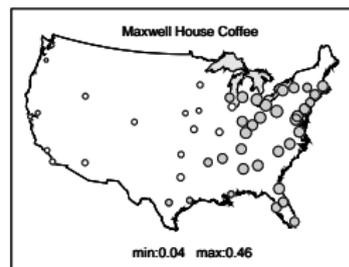
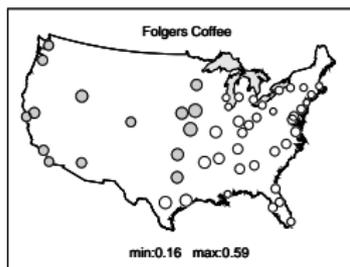
- Starting point



(source: Bronnenberg, Dhar & Dubé 2009, *JPE*)

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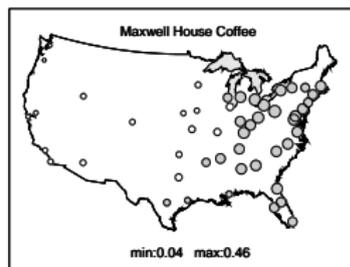
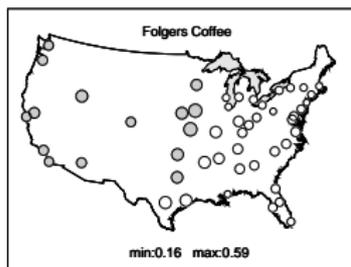


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- New data: History of migration for 48k households in the 2007-8 Nielsen Homescan panel matched to purchases in 260 categories

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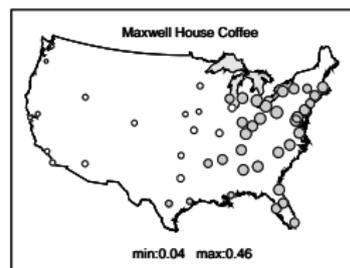
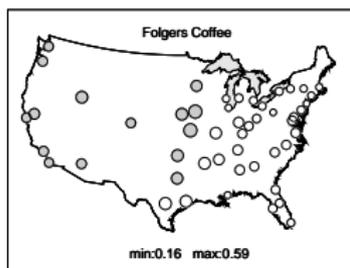


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- Identification: Holding constant where you live now, how does consumption depend on where you lived in the past?

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- New data: History of migration for 48k households in the 2007-8 Nielsen Homescan panel matched to purchases in 260 categories
- Identification: Holding constant where you live now, how does consumption depend on where you lived in the past?
- Model: Current preferences depend on stock of past consumption

Preview of Results

- Past experience significant driver of current preferences ($\approx 40\%$ of cross-state variation)
- Highly persistent ($\delta = .94$)
- Implies large barriers to entry / first-mover advantage
- Preliminary results on advertising / social visibility

Data

Data Sources

- Nielsen Homescan
 - 2007-2008
 - 260 product categories (≥ 500 hhs)
- Custom Survey
 - State of birth, state of current residence
 - Age at time of move & years lived
- Other data sources
 - Demographics: Education, Ethnicity, Age, Income, etc.
 - Consolidated Consumer Analysis (1946-1968)
 - Subjective coding of ad intensity & social visibility

Sample Selection

- “Gap” = (year moved to current state) - (year left birth state)
 - Drop if $\text{gap} > 5$
 - If $\text{gap} \leq 5$, assume $\text{gap} = 0$
- Final Sample
 - 38,152 households
 - 10,456 state born \neq current state

Descriptive Evidence

Purchase Shares (y_{ij})

- Focus on top two brands
- Let q_{ij1} and q_{ij2} be number of times consumer i purchases #1 and #2 brand in category j
- *Purchase Share:*

$$y_{ij} = \frac{q_{ij1}}{q_{ij1} + q_{ij2}}$$

Relative Shares (β_{ij})

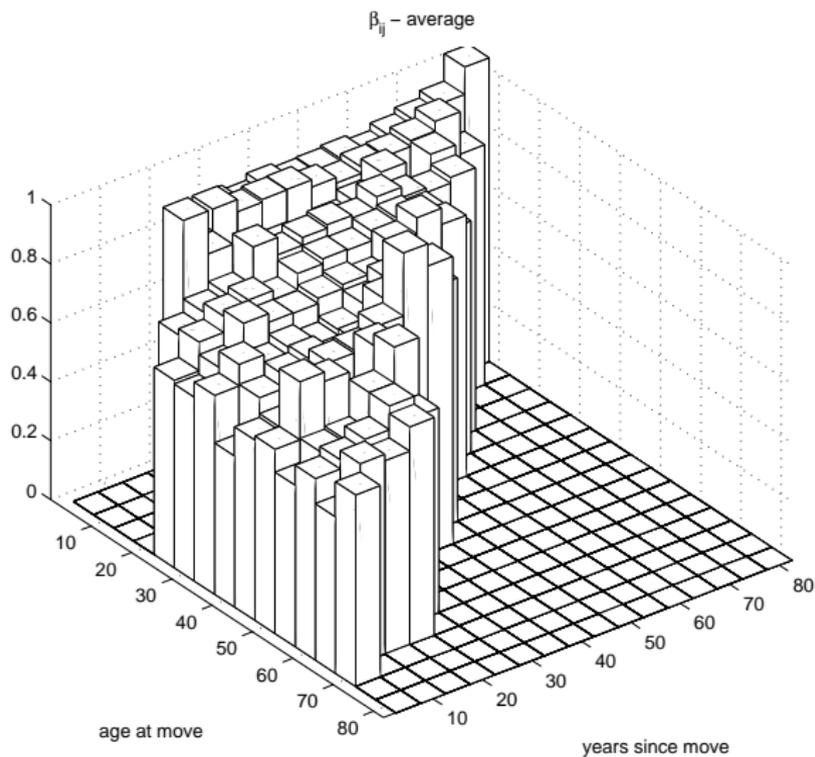
- Let μ_{jr} be average y_{ij} among non-migrant consumers in state r
- For migrant i born in r now living in r' ...
- *Relative share*:

$$\beta_{ij} \equiv \frac{y_{ij} - \mu_{jr}}{\mu_{jr'} - \mu_{jr}}$$

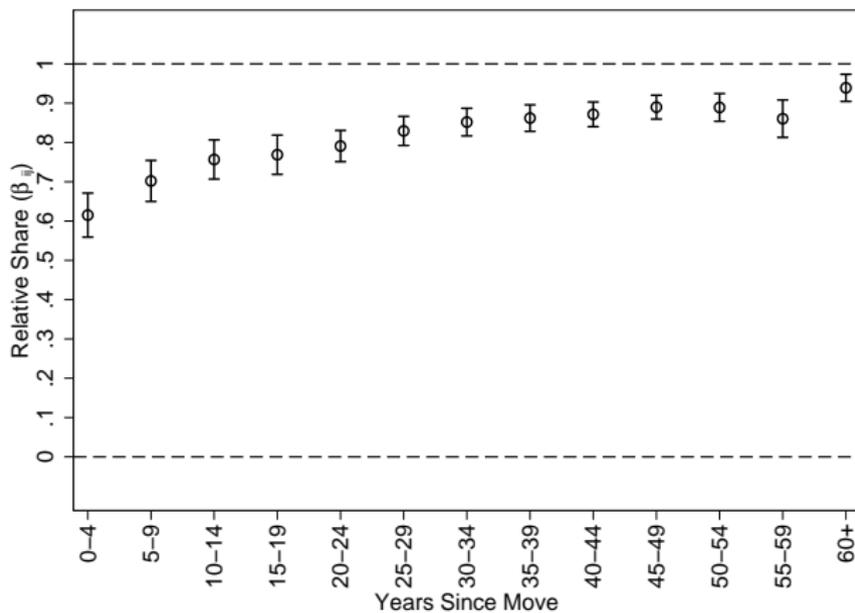
Predictions

- All that matters is contemporaneous supply-side variables: $\beta_{ij} = 1$ everywhere
- All that matters is what your parents did: $\beta_{ij} = 0$ everywhere
- Brand capital model: β_{ij} depends on years lived & age when moved

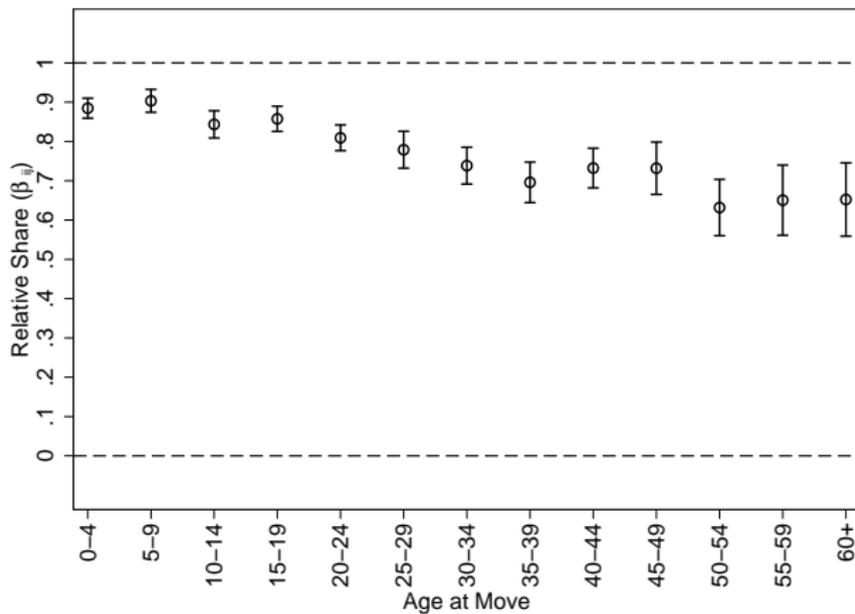
Cross-Sectional Evidence



Slice by Years



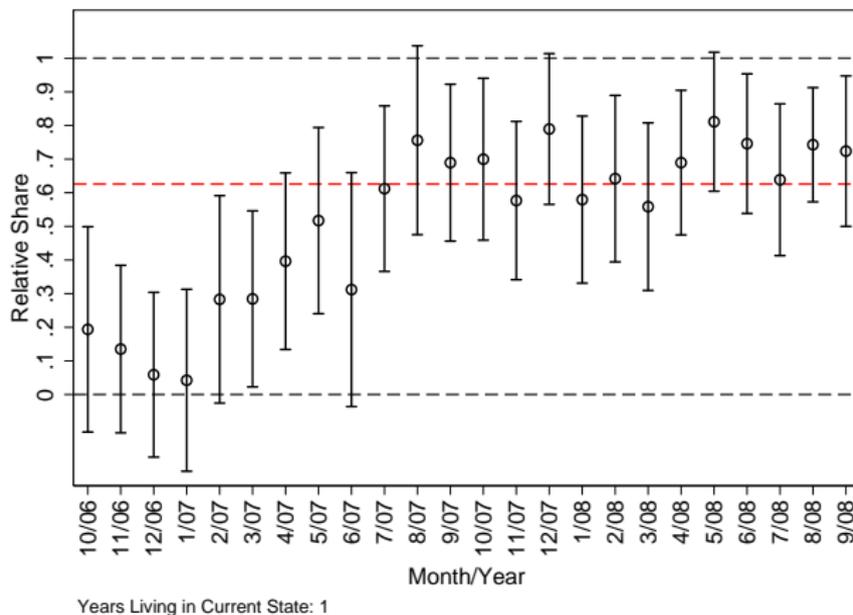
Slice by Age



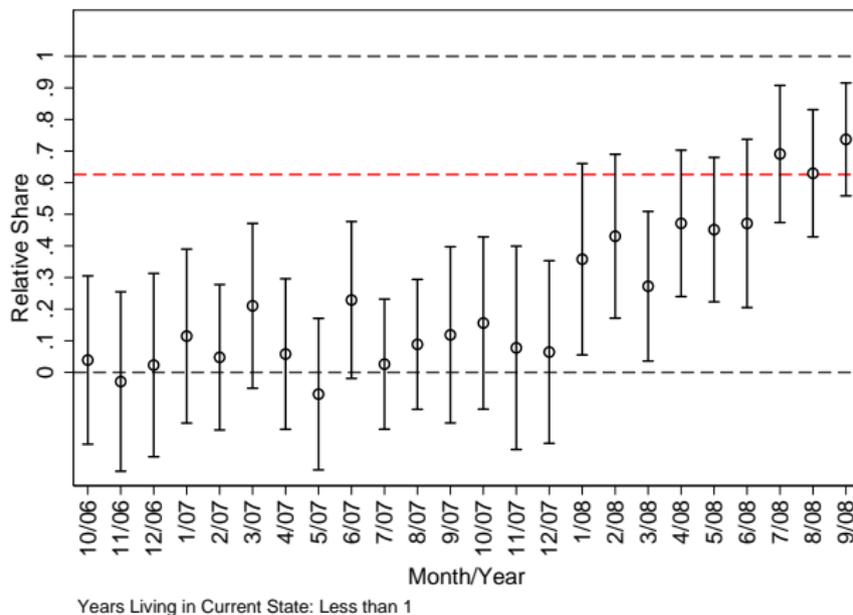
Panel Evidence

- 221 HHs report moving to their current state during the two years of our sample
- Cross sectional data predicts β_{ij} should jump from zero to $\approx .6$ at move
- Coarse data on timing
 - Lived <1 year
 - Lived 1-2 years

Lived in Current State 1-2 Years



Lived in Current State <1 Year



Summary

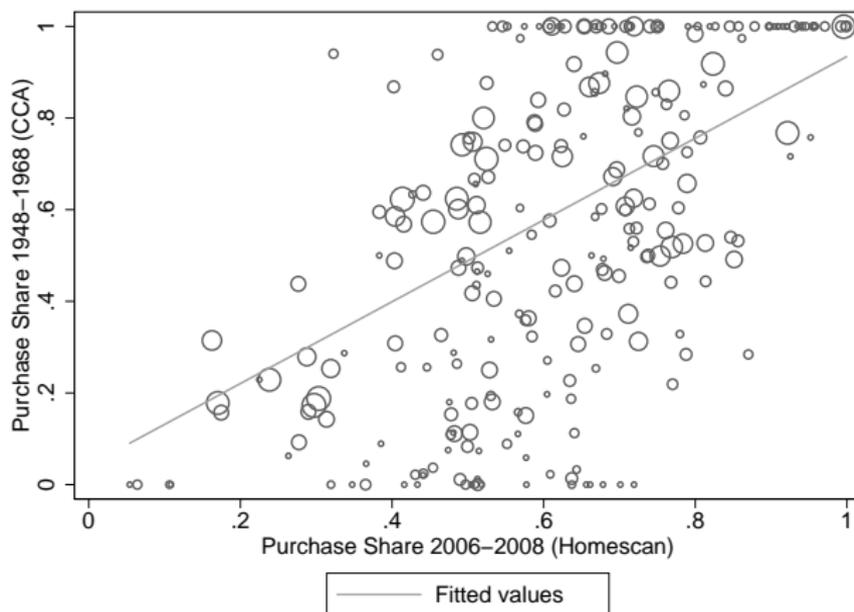
- Jump to $\beta_{ij} = .6$ immediately on moving
- Remaining gap in consumption closes slowly
 - 20+ years to reach $\beta_{ij} = .8$
 - After 50+ years, β_{ij} still significantly < 1
- Older migrants experience the same jump, but remaining gap closes more slowly
- Migrants look similar to non-migrants before they move (no evidence of selection)

Model

Assumption 1

- Expectation of past purchase shares = current purchase shares
- Evidence
 - Confirm using historical data

Assumption 1



- coefficient = 1.04 (.15)
- constant = -0.11 (.10)

Assumption 2

- Unobservable preferences uncorrelated with migration status
- Evidence
 - Match between panel and cross-section
 - β_{ij} pre-move uncorrelated with age at move
 - preliminary results on recently-launched brands

Baseline Demand

- $\mu_{jr} \in [0, 1]$ is the probability an inexperienced consumer in state r and category j buys brand 1
 - Could depend on advertising, promotion, shelf space, relative prices, peer effects, etc.
 - Will also allow it to depend on consumer observables X_i

Stock of Brand Capital

$$k_{ij} = \frac{\sum_{s=1}^{a-1} \delta^{a-s} \hat{y}_{ijs}}{\sum_{s=1}^{a-1} \delta^{a-s}},$$

where

- households i , categories j
- $\hat{y}_{ijs} \in [0, 1]$ is i 's purchase share at age s
- a is consumer i 's age,
- δ is the rate at which brand capital persists

Demand

$$y_{ij} = \alpha \mu_{jr} + (1 - \alpha) k_{ij}$$

where

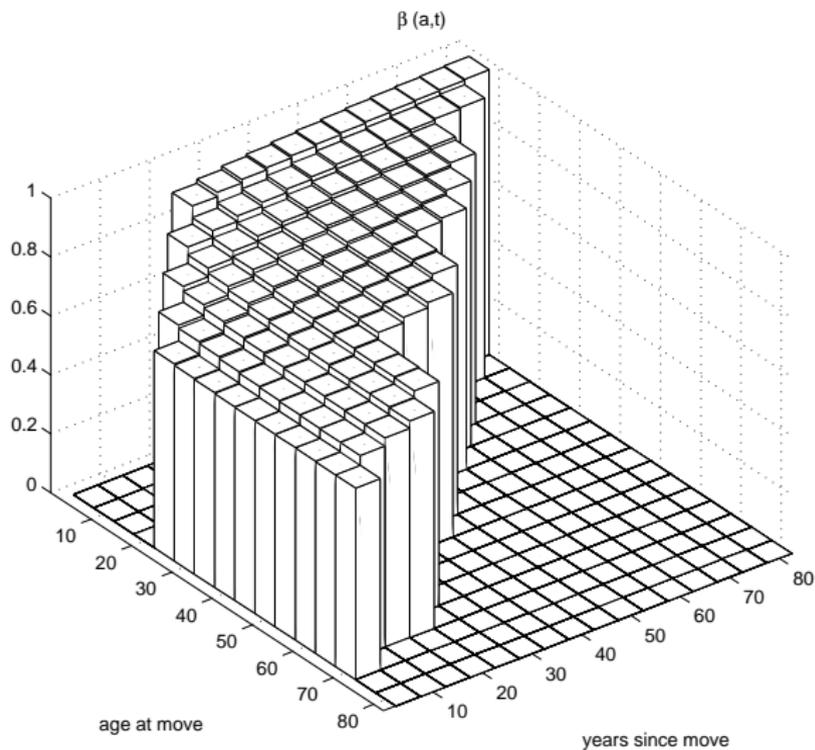
- y_{ij} is probability of purchasing brand 1 (conditional on purchasing 1 or 2)

Results and Implications

Parameter Estimates

α	0.618 (0.032)
δ	0.975 (0.011)
Implied half-life of brand capital stock	26.9 years

Fitted Values



Other Results

- Brand capital relatively more important in high-advertising categories
- Brand capital relatively more important in socially visible categories

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- Brand capital relatively more important in socially visible categories
- Implies significant first mover advantage
 - If A has 1 year head start, B would need to discount price by 60% for 5 years or by 20% for 15 years
 - If A has 10 year head start, B would need to discount price by 40% for 25 years

Other Results

- Brand capital relatively more important in high-advertising categories
- Brand capital relatively more important in socially visible categories
- Implies significant first mover advantage
 - If A has 1 year head start, B would need to discount price by 60% for 5 years or by 20% for 15 years
 - If A has 10 year head start, B would need to discount price by 40% for 25 years
- Long-term persistence even in the face of shocks

Conclusions

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- Past experience significant driver of current preferences ($\approx 40\%$ of cross-state variation)
- Highly persistent ($\delta = .975$)
- Implies large barriers to entry / first-mover advantage
- Brand capital more important in categories with high advertising / social visibility