Measuring Conspicuous Consumption: a cross-country comparison

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Motivation

- Signaling with consumption
  - Why do people buy expensive watches?
  - This paper: to signal well-being.
- Well-being (wealth) is unobservable
  - In this paper, your social circle judges your well-being based on your consumption of a single good.
  - Example: iPad in one social circle, brand-name clothing in another, vacations to exotic locales in another.
- Why do people care about social beliefs?
  - Maybe they just do–ex: post-mortem donations.
  - Maybe social beliefs are a stepping stone.
  - If first, this is a structural model. If second, this is a reduced form model.

Preview of Results

- Estimation of utility parameters
  - The utility function will loosely look like this:

$$(1-\alpha)u(C)+\alpha E(u|C)$$

    The first term is fundamental utility, and the second is social belief.
  - Americans care about utils of social belief about 1/6 as much as they care about utils of consumption ($\alpha = .1458$).
  - Chinese care about utils of social belief about 1/4 as much as they care about utils of consumption ($\alpha = .2$).
- Taxes on visible goods
  - I propose a tax on visible goods which dramatically increases social welfare.
  - Median welfare increase is XX%.
  - Almost pareto efficient - only XX% harmed.

Recent Related literature

- Theory of consumption signaling:
  - Ireland(1994,JPubEcon),
  - Heffetz(2007,mimeo)
- Empirical studies of consumption signaling:
  - Charles, Hurst, and Roussanov(2009,QJE),
  - Heffetz(2012,REStat)
- Relative consumption and social status
  - Luttmer(2004,mimeo),
  - Arrow and Dasgupta(2009,TheEconJrnl),
  - Clark, Frijters, and Shield(2008,JEL)
- Chinese Conspicuous Consumption

Environment

- Wealth is exogenous.
- There are I goods, and no saving.
- The price vector P is exogenous.
- Consumers choose a consumption vector C.
- Preferences differ across consumers, but are known within the social circle.
- Within each social circle, only expenditures on a single good category are observable.

Preferences

- Social beliefs are described by the I functions $g_i : c_i, \Theta \to C$
- Following Ireland(1994) and Heffetz(2007), utilty has the following form:

$$U(C, \theta, i) = (1 - \alpha)u(C, \theta) + \alpha u(g_i(c_i, \theta), \theta)$$

- u is called the fundamental utility function.
- θ is the preference heterogeneity.

Equilibrium concept

- An equilibrium is a set of I belief functions $\{g_i\}$ and a set of I consumption functions $\{C^i\}$ such that:
  1. For all i, θ, $C^i(\theta)$ solves the consumer's problem given g_i.
  2. For all i, θ, $g_i(c_i^i(\theta), \theta) = C^i(\theta)$
- This is a standard "separating equilbrium" ala Spence.

Solving the Model

- Substituting optimal unobserved expenditures into the individual's problem, with some manipulation we can write:

$$U(C,\theta) = \theta_v \ln C_v + (1-\alpha)\,\hat{\theta}\ln(W - P_v C_v) + \alpha\hat{\theta}\ln\left((h_v(C_v,\theta)\right) + \psi$$

$\hat{\theta}$ and ψ are known functions of θ. h_v is belief about $W - P_v C_v$.

- The FOC is then:

$$h_v'(C_v,\theta) = \frac{1}{\alpha}\left((1-\alpha)\,P_v - \frac{\theta_v}{\hat{\theta}}\frac{h(C_v)}{C_V}\right)$$

- The solution to this differential equation is:

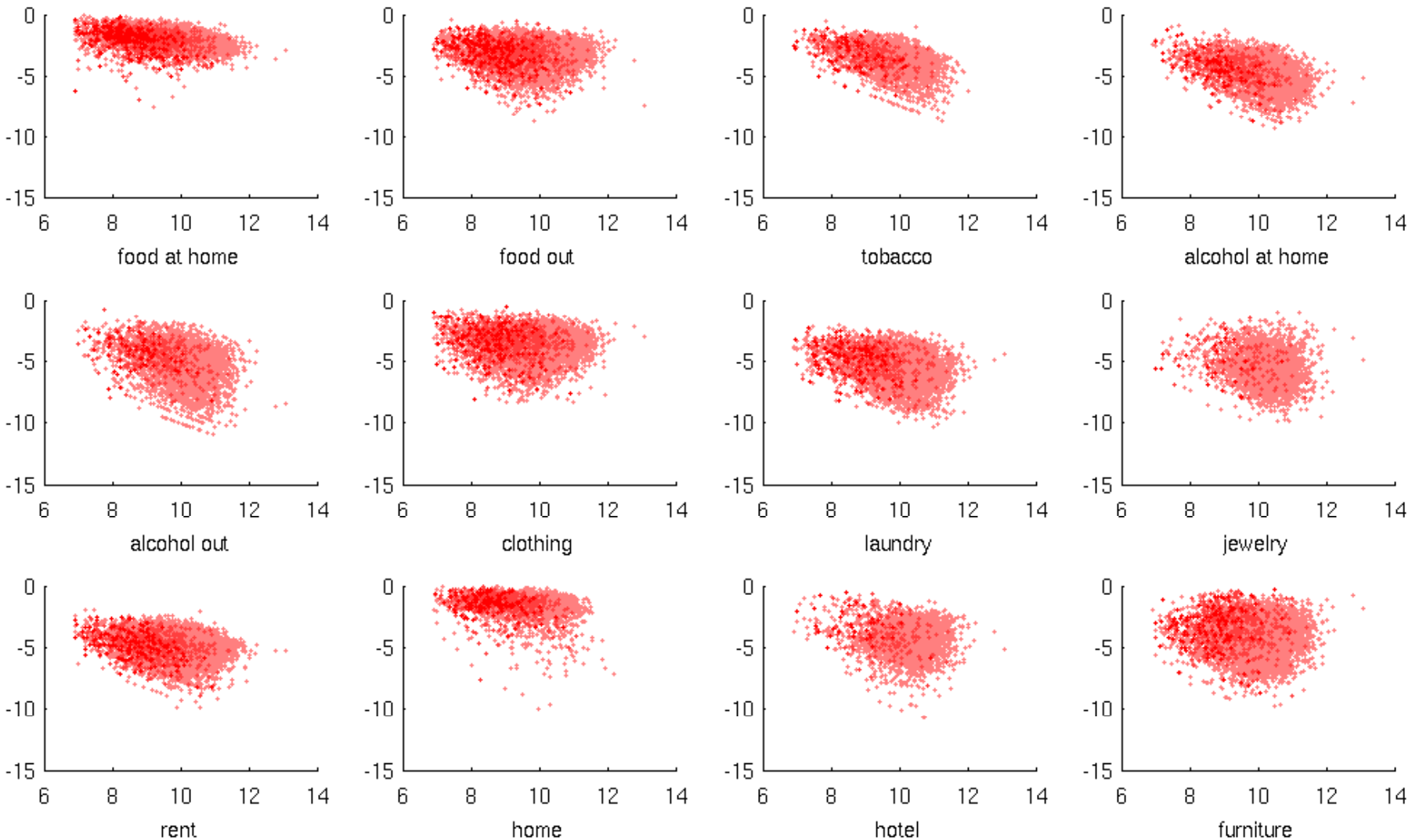
$$h(C_v) = \frac{\hat{\theta}(1-\alpha)}{\theta_v + \alpha\hat{\theta}} P_v C_v + K C_v^{\frac{\theta_v}{\alpha\hat{\theta}}}$$

- K is pinned down by lowest possible wealth level.

American Data

- Three types of data.
  1. NBER Consumer Expenditure Extracts.
     - Annual cross-section of consumer expenditures.
     - Expenditures broken into categories.
     - Demographic information.
  2. BLS Relative Price Data
     - Broken down by year and good category.
     - Categories intentionally correspond with consumer expenditure data.
  3. Heffetz Vindex data
     - A telephone survey conducted by Ori Heffetz.
     - How "visible" are different types of consumption. FLAG survey question
     - A single year, broken down by demographics.
- Unit of observation is the household.

Log Expenditure Shares on Log Expenditure by Category



Vindex for blacks under 40

Cig (cigarettes)	0.81		
Clo (clothing)	0.80	Hom (rent/home)	0.56
Brb (barbers etc)	0.80	Cha (charities)	0.55
Car (cars)	0.78	Htl (hotels etc)	0.55
Ot1 (recreation 1)	0.78	Air (air travel)	0.52
Jwl (jewelry)	0.74	CMn (car repair)	0.52
Fur (furniture)	0.73	Lry (laundry)	0.51
FdO (food out)	0.66	Med (health care)	0.48
Bus (public trans.)	0.64	Utl (home utilities)	0.46
Edu (education)	0.63	Gas (gasoline)	0.44
AlO (alcohol out)	0.63	Tel (home phone)	0.44
FdH (food home)	0.63	CIn (car insur.)	0.38
AlH (alcohol home)	0.62	HIn (home insur.)	0.33
Bks (books etc)	0.61	LIn (life insur.)	0.31
Ot2 (recreation 2)	0.61	Fee (legal fees)	0.30
Cel (cell phone)	0.58	Und (underwear)	0.28

Chinese Data

- Two types of data:
  1. Chinese Household Income Project expenditure data.
     - Academic survey, publicly available from University of Michigan.
     - Urban consumption expenditure survey for 1995 and 2002.
     - Consumption broken into categories.
  2. Relative Price data from the China Statistical Yearbook.
     - Prices broken down into categories with rural/urban distinction.
- We will use the American visibility survey in the Chinese estimation.

Assumptions

- Primary goal is to get α, the importance of signaling in utility.
- Assume that Cobb-Douglas parameters θ are distributed independent log-normal with a mass-point at zero.
  - The mass-point is necessary because data is quite sparse.
  - The log-normal assumption is due to shape of the data.

▸ data-sparse ▸ data-logn

- Assume that the observed good is drawn in proportion to Heffetz relative visibilities, which differ demographically.
  - For technical reasons which simplify estimation, I assume that food at home is never the observed good.
- This specification leads 85 free parameters to be estimated.

EM Procedure

- Since the observation type of each household's social circle is an unobservable latent variable, we use an EM estimation proceedure.
- Estimation proceeds in two steps:
  1. Given a vector of observation types, solve for the most likely utility parameters.
  2. Given utility parameters, solve for the most likely observation types.
- Continue this process until step 2 does not change the list of observation types.

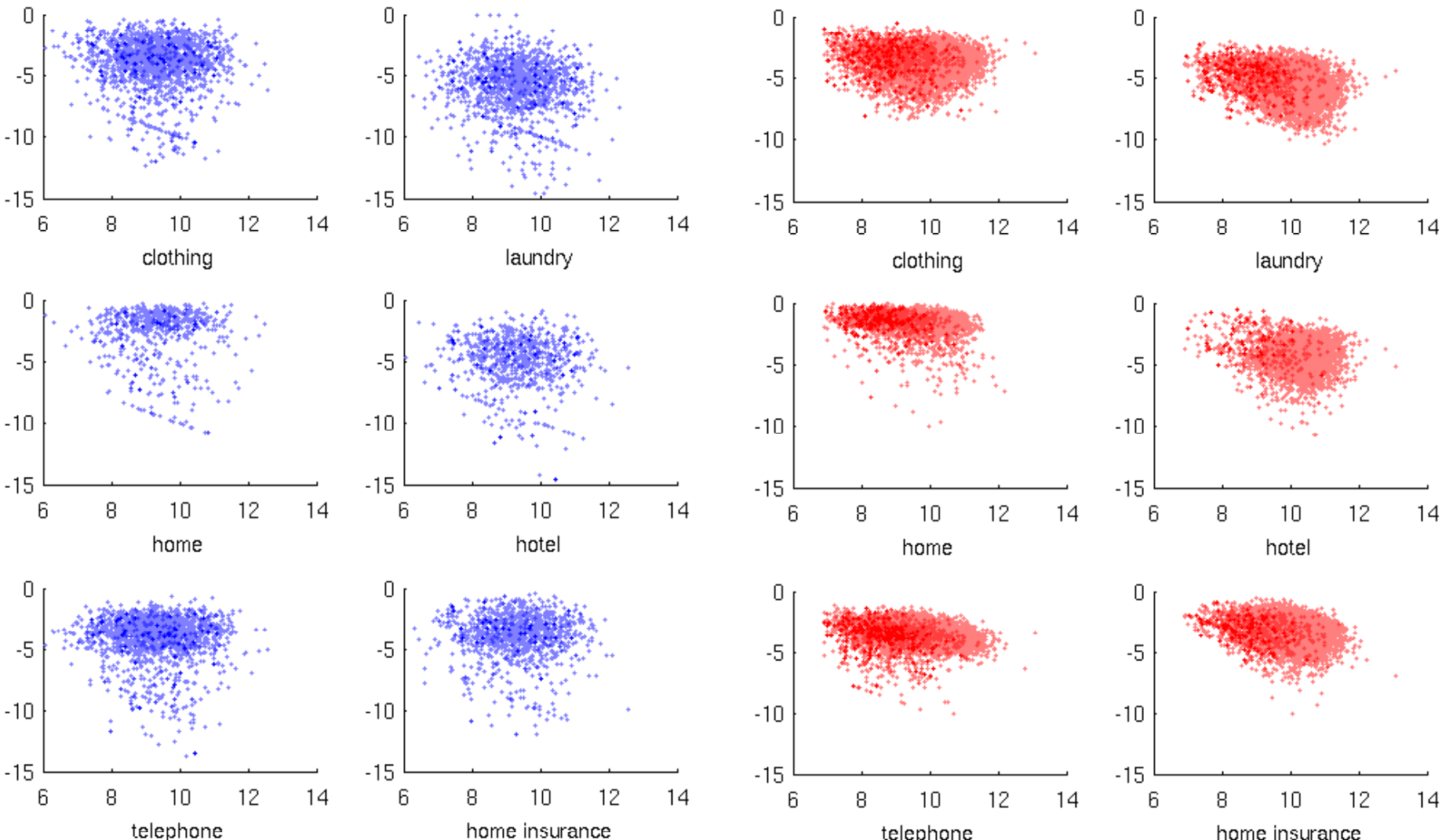
Identification

- No formal results on identification.
- We have price variation over time in both data sets.
- Regardless of demographic, all households draw utility parameters from the same distribution.
- Differences in consumption between demographics are what pins down α.
- Since we do not have demographic variation in China, identification of α is off of functional form assumptions.

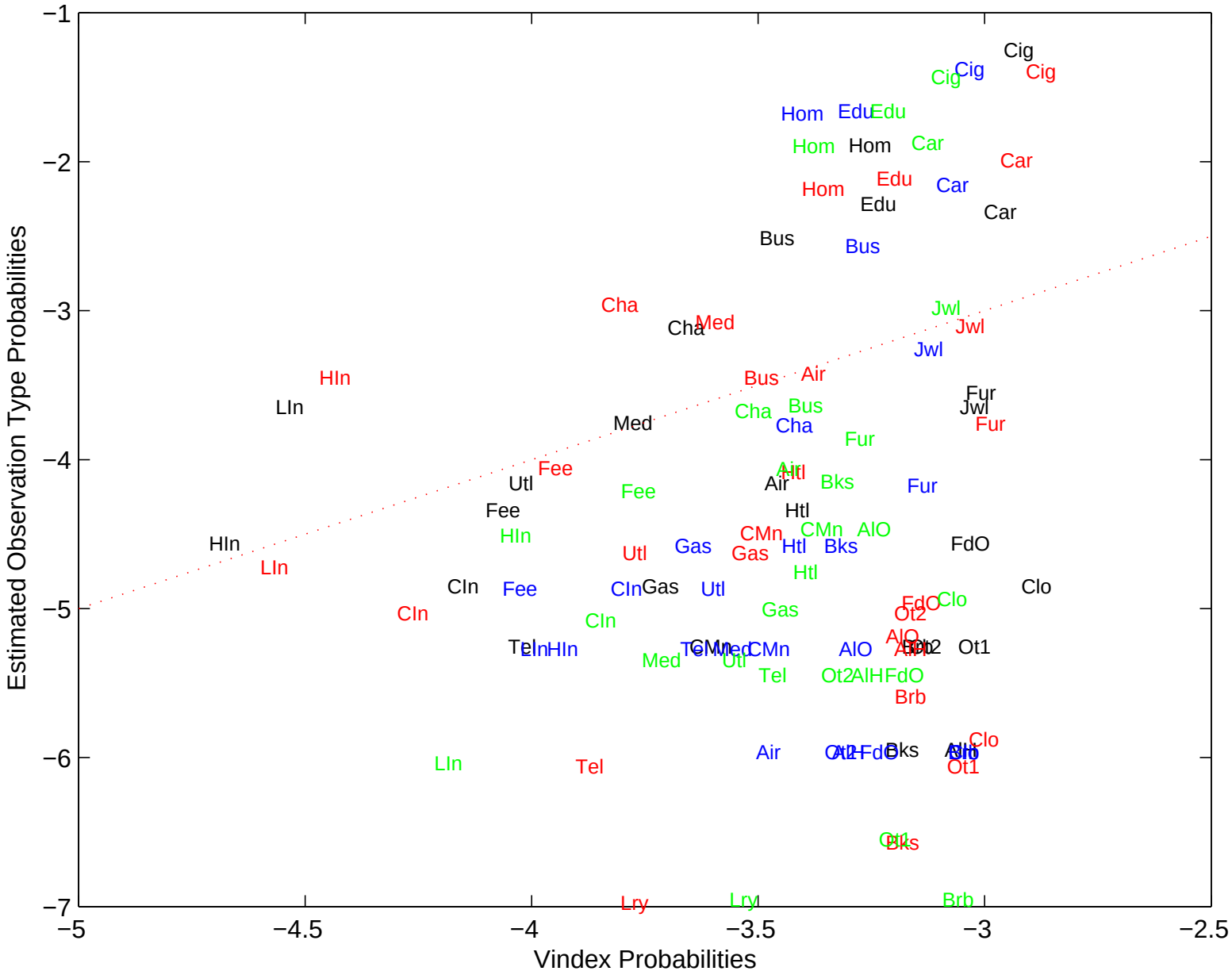
American Parameter Estimates

Good Cat	μ	std err	σ	std err	$pr(\gamma_j = 0)$	std err
FdO	-1.2106	(0.0002)	1.1823	(0.0005)	0.0836	(0.0038)
Cig	-6.1907	(0.0022)	11.4001	(0.0512)	0.8274	(0.0054)
AlH	-2.7418	(0.0002)	1.2418	(0.0006)	0.4760	(0.0070)
AlO	-3.0832	(0.0003)	1.6011	(0.0010)	0.5032	(0.0070)
Clo	-1.4358	(0.0002)	1.1580	(0.0005)	0.0938	(0.0040)
Lry	-3.3559	(0.0002)	1.3826	(0.0007)	0.3102	(0.0065)
Jwl	-5.3608	(0.0015)	8.1810	(0.0228)	0.6604	(0.0067)
Brb	-2.6958	(0.0002)	1.0096	(0.0004)	0.1530	(0.0050)
Hom	0.3824	(0.0002)	0.8689	(0.0004)	0.7046	(0.0065)
Htl	-2.4135	(0.0002)	1.3596	(0.0007)	0.6360	(0.0068)
Fur	-1.9858	(0.0002)	1.4964	(0.0008)	0.2570	(0.0061)
Utl	-0.8731	(0.0001)	0.7561	(0.0002)	0.0960	(0.0041)
Tel	-1.6308	(0.0001)	0.9058	(0.0003)	0.0360	(0.0025)
Hln	-1.5132	(0.0002)	1.1389	(0.0005)	0.4102	(0.0069)
α	0.1459	(0.0071)				

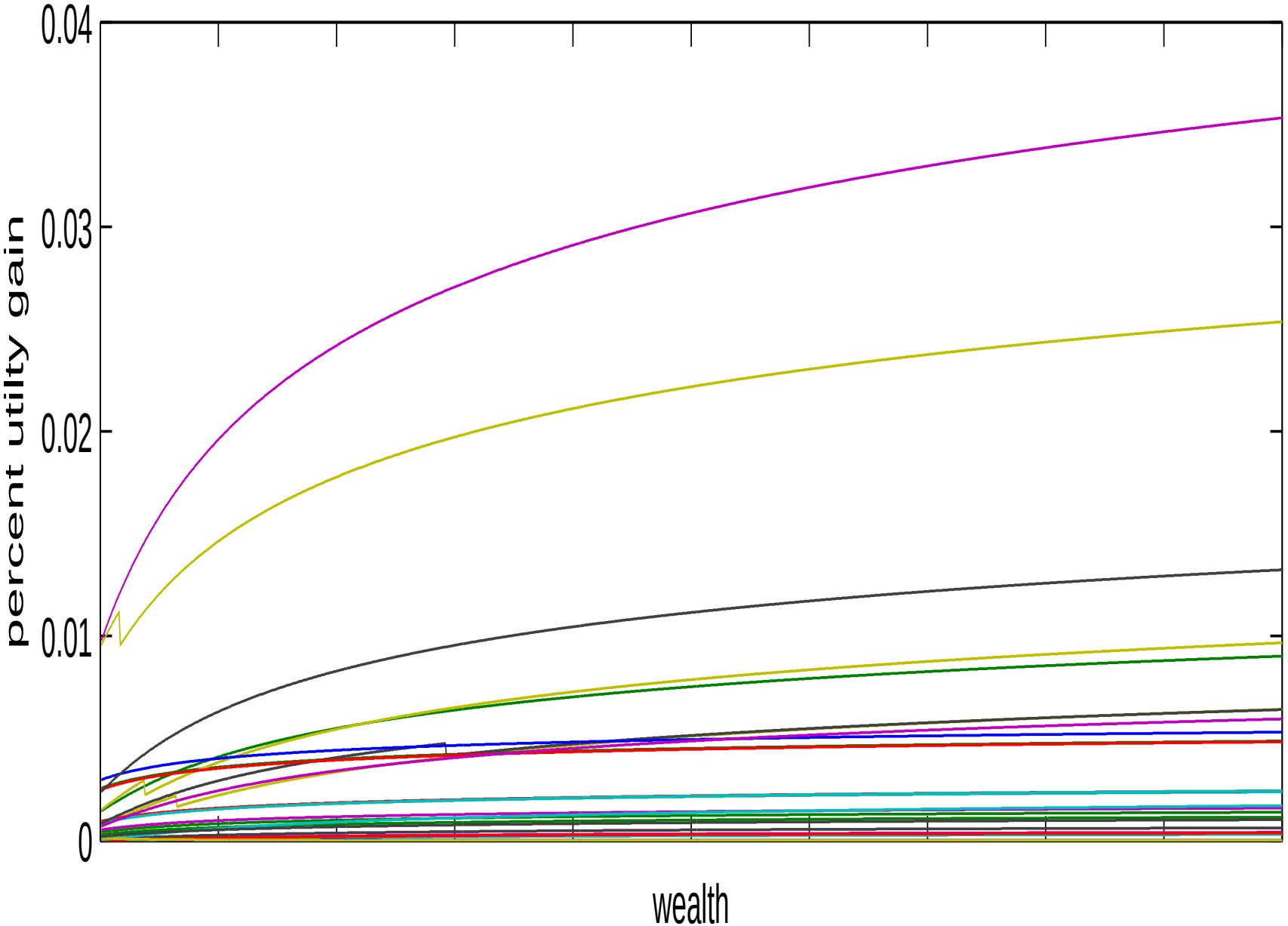
Simulated vs Actual Expenditure Shares by Category



Vindex vs Estimated Observation Type Proportions



Welfare Loss Due to Signaling Motive by Obs. Type



Chinese Parameter Estimates

TO BE ADDED

Discussion of Chinese vs American estimates

TO BE ADDED

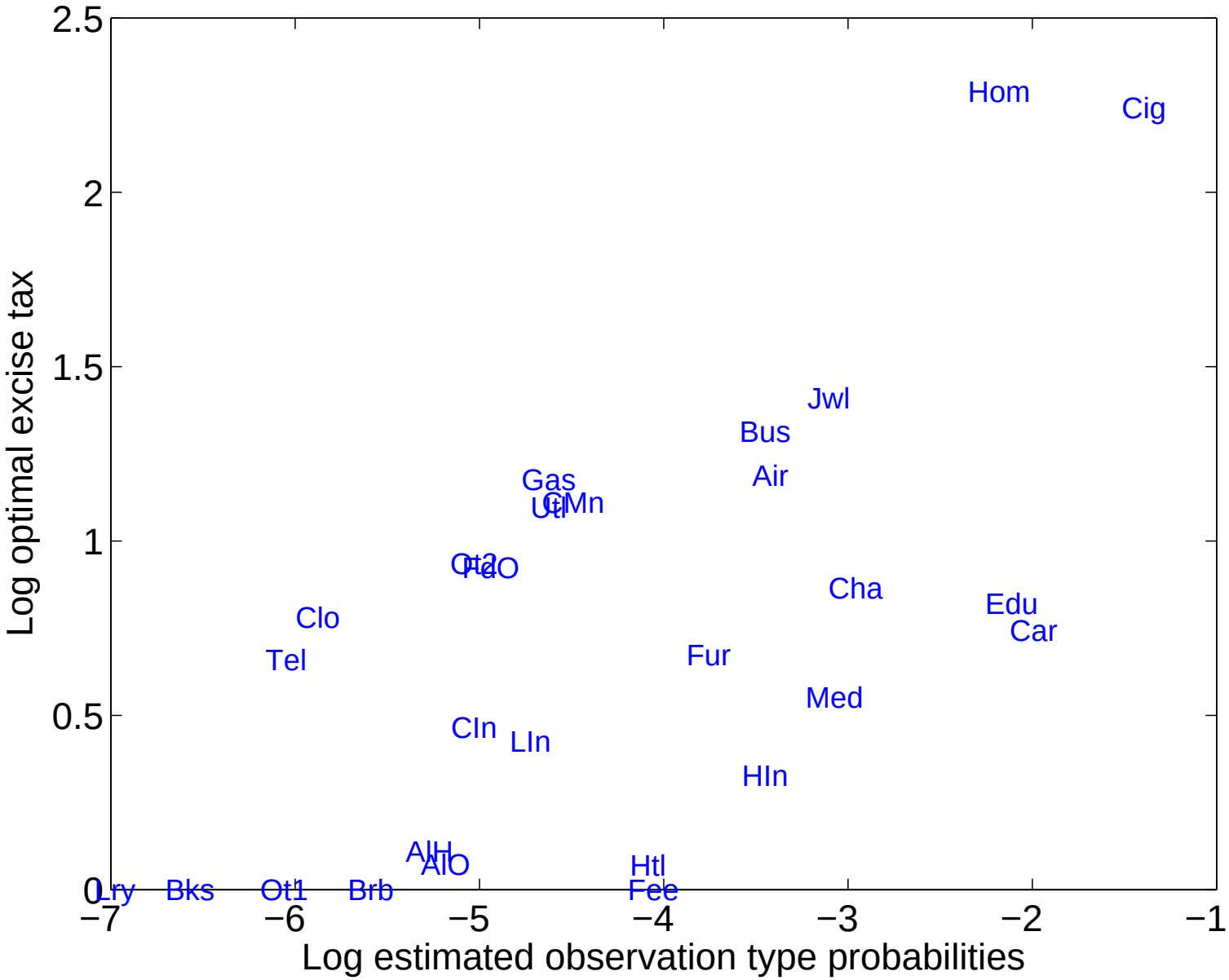
Tax Scheme

- The basic idea is an excise tax on each good.
- Gov't revenue is passed back to households in proportion to wealth.
- Intuitively, households overconsume visible goods. The tax raises the price of visible goods, but wealth unaffected $\rightarrow$ less distortion.
- In the exercise that follows, prices and wages are fixed (think perfect competition).
- In the paper, I show that this tax scheme will not affect household budget share decisions.
- To find optimal taxes, I define the social welfare function to be the sum of all individual utilities.

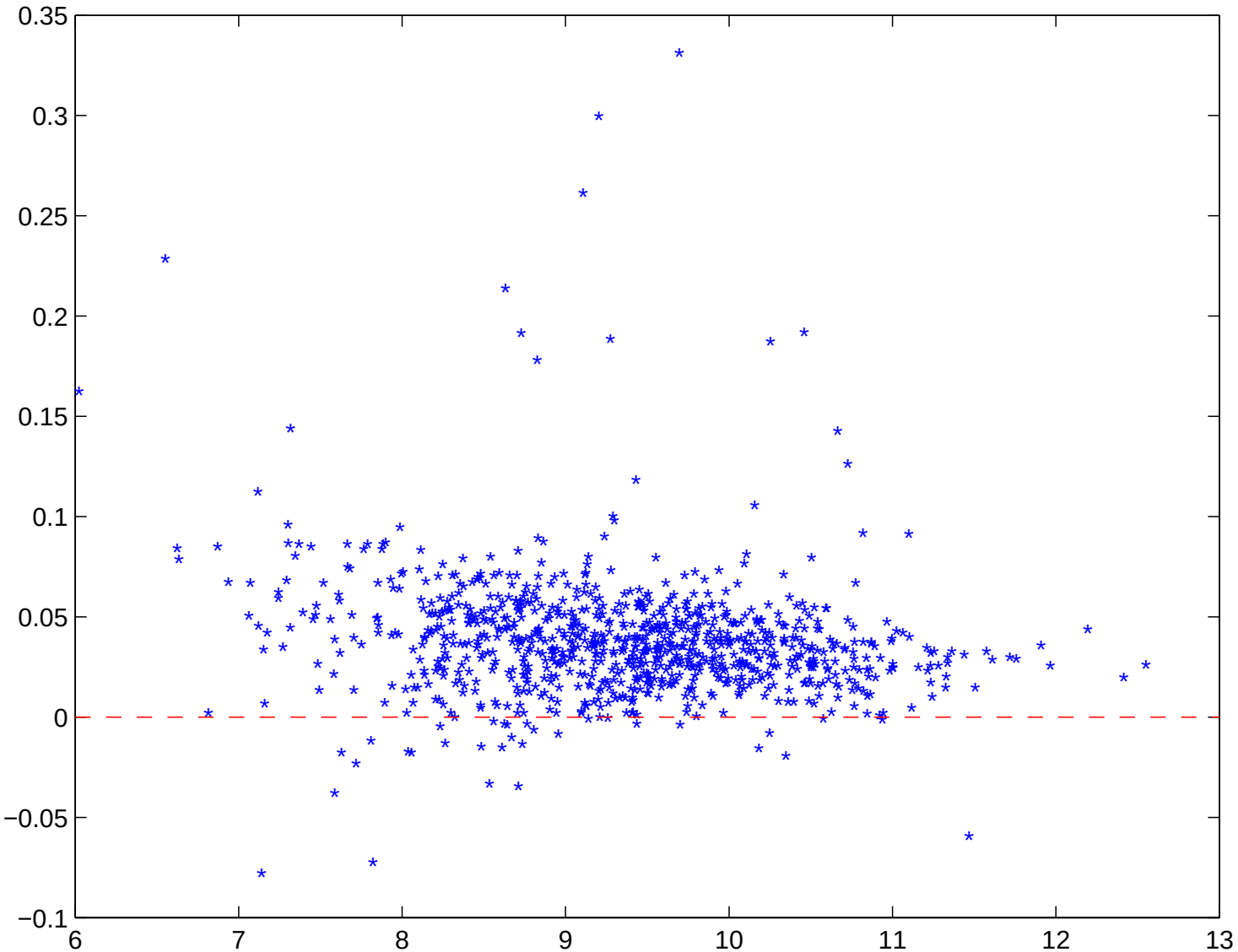
Optimal Taxes

Good Cat	Tax	Good Cat	Tax
FdH	3.7860	HIn	0.3863
FdO	1.5188	Med	0.7386
Cig	8.4272	Fee	0.0000
AlH	2.1151	LIn	0.5304
AlO	0.0761	Car	1.1046
Clo	1.1873	CMn	2.0361
Lry	0.0000	Gas	2.2456
Jwl	3.1023	CIn	0.5941
Brb	0.0000	Bus	2.7202
Hom	8.8748	Air	2.2799
Htl	0.0733	Bks	0.0000
Fur	0.9623	Ot1	0.0000
Utl	1.9966	Ot2	1.5486
Tel	0.9322	Edu	1.2739
HIn	0.3863	Cha	1.3754

Correlation of Optimal Taxes with Obs Type Proportion



Utility Change after Tax Implementation



Taxes: Bottom Line

- There are significant welfare gains from the proposed tax scheme.
- Tax scheme is largely in line with what is implemented in the real world.
- Largest optimal taxes are on property, cigarettes, and jewelry.

Conclusion

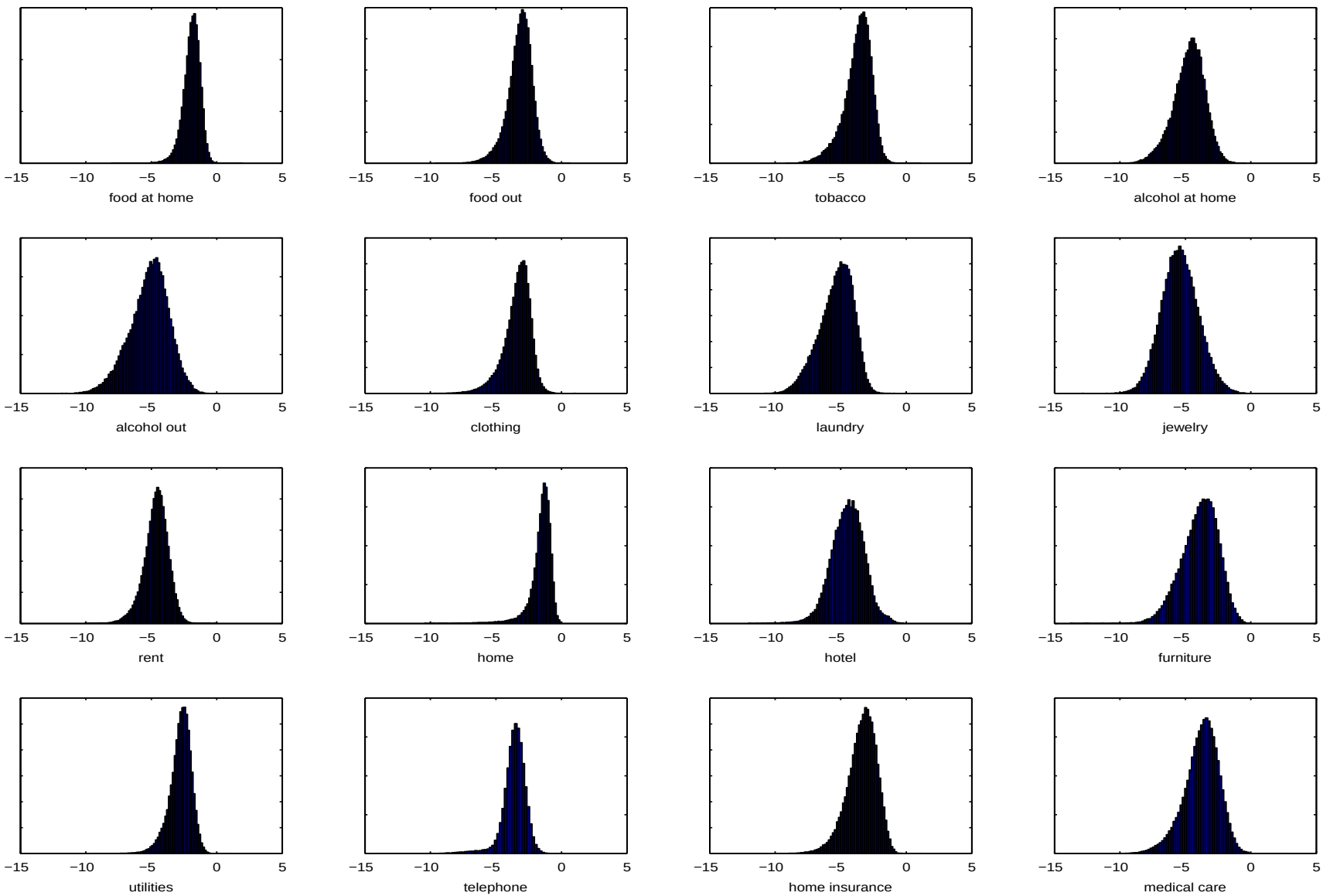
TO BE ADDED

Expenditures Data is Sparse

Category	Zero Expenditure	Category	Zero Expenditure
Clo (clothing)	0.11	Edu (education)	0.70
Cig (cigarettes)	0.60	Hom (rent/home)	0.57
Car (cars)	0.47	FdH (food home)	0.02
Fur (furniture)	0.26	Htl (hotels etc)	0.62
Ot1 (recreation 1)	0.16	Air (air travel)	0.67
Jwl (jewelry)	0.64	Bus (public trans.)	0.73
FdO (food out)	0.10	CMn (car repair)	0.24
AlH (alcohol home)	0.49	Cha (charities)	0.58
AlO (alcohol out)	0.51	Gas (gasoline)	0.11
Ot2 (recreation 2)	0.10	Lry (laundry)	0.33
Brb (barbers etc)	0.17	Med (health care)	0.25
Bks (books etc)	0.48	Tel (home phone)	0.06
Edu (education)	0.70	Utl (home utilities)	0.12
Hom (rent/home)	0.57	Fee (legal fees)	0.36
FdH (food home)	0.02	CIn (car insur.)	0.35
Htl (hotels etc)	0.62	LIn (life insur.)	0.54
Air (air travel)	0.67	HIn (home insur.)	0.41

▸ go back

Histogram of Log Expenditure Shares by Category



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