

PERCEPTIONS OF AD-VALOREM CONSUMPTION TAXES

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 1. hidden consumption taxes may be preferable to the explicit ones because they generate a lower deadweight loss
 2. the mix of various taxes should move toward hidden consumption taxes
 3. in terms of the revenue-efficiency trade-off, it may be optimal to increase small hidden consumption taxes

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- Overall, the marketing literature (Morwitz et al. 2009) concludes that for relatively small surcharges (10 to 20 percent of the base price), price partitioning leads to higher demand/lower price recall compared to all-inclusive pricing.
- For higher surcharges, however, price partitioning might have no effect or even the opposite effect (Sheng et al. 2007).

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 3. Special cases proposed in the literature:
 - “anchoring and adjustment” heuristic (Morwitz et al. 1998)
 - low salience of hidden taxes (Chetty et al. 2009)
 4. Consumers are not aware of the tax or its rate (Chetty et al. (2009) provide evidence to the contrary, however).

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- Marketing literature:
 - Many experiments in price recall are not properly incentivized.
- How important are the welfare consequences?

RESEARCH QUESTIONS

- In a controlled laboratory environment, with subjects that are used to seeing prices quoted both with and without a consumption tax, with full incentivization, do the results of Chetty et al. (2009) extend to various ad-valorem tax rates (ranging from 5 to 23 percent)?

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- How do consumers allocate their cognitive effort when purchasing goods in several tax rate categories and face purchase tasks with different amounts of available consumer surplus?
- If consumers estimate the after-tax price incorrectly, what are the resulting welfare consequences?

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 2. decides on the quantity $q \in \{0, \dots, 10\}$ of the good to buy; the default quantity is 0; the purchase quantity identifies a range for the effective after-tax price, and hence also the tax rate, used by the subject

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- In each round, a subject is given 120 seconds to make his decisions on 6 purchase tasks. He is paid a bonus of 1 experimental currency unit (ECU) for each second of saved time if he finishes earlier.

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 2. a medium-surplus task with an achievable consumer surplus of 60

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 3. a high-surplus task with an achievable consumer surplus of 150

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- Among the 3 tasks, there is:
 1. a low-surplus task with an achievable consumer surplus of 15
 2. a medium-surplus task with an achievable consumer surplus of 60
 3. a high-surplus task with an achievable consumer surplus of 150
- Treatments and the number of subjects in each treatment:

Low Tax Rate (%)	High Tax Rate (%)		
	14	16	23
5	5_14(10)	5_16 (10)	5_23 (9)
6.5	6_14(9)	6_16 (10)	6_23 (12)
8	8_14(10)	8_16 (9)	8_23 (11)

EXPERIMENTAL DESIGN: TAX INFORMATION SCREEN

The tax rates for the next several rounds will be 6.5 and 23.0 percent.
You will be informed of the tax rate applied to each purchase.

EXPERIMENTAL DESIGN: TASK SELECTION MENU (1)

Remaining time [sec]: 1:20

Round 1

	Quantity			Quantity			Quantity		
	0	Marginal valuation:	Cumulative valuation:	0	Marginal valuation:	Cumulative valuation:	0	Marginal valuation:	Cumulative valuation:
Tax rate: 6.8%	0		0	0		0	0		0
	1	215	215	1	77	77	1	825	825
	2	212	427	2	76	153	2	806	1231
	3	209	635	3	75	227	3	589	1819
	4	205	841	4	73	301	4	583	2383
	5	202	1043	5	72	373	5	559	2938
	6	199	1242	6	71	444	6	531	3489
	7	196	1438	7	70	514	7	513	3981
	8	192	1630	8	69	583	8	494	4475
	9	189	1819	9	66	651	9	475	4950
	10	186	2005	10	67	717	10	458	5408
	Continue to Task 1			Continue to Task 2			Continue to Task 3		
Tax rate: 23.0%	0		0	0		0	0		0
	1	43	43	1	811	811	1	174	174
	2	42	86	2	663	1674	2	189	343
	3	40	128	3	758	2372	3	182	504
	4	38	165	4	748	3110	4	155	659
	5	38	203	5	734	3851	5	151	810
	6	37	243	6	705	4557	6	148	958
	7	36	279	7	641	5197	7	144	1102
	8	35	313	8	568	5765	8	138	1243
	9	33	344	9	486	6261	9	133	1375
	10	32	375	10	385	6646	10	127	1502
	Continue to Task 4			Continue to Task 5			Continue to Task 6		

Stop Deciding Now (irreversible)

EXPERIMENTAL DESIGN: TASK

Remaining time [sec]: 00

Purchase Task #1 (Round 1)

	Quantity:	Marginal valuation:	Cumulative valuation:
	0		0
	1	216.05	216.05
	2	211.83	426.88
	3	208.60	635.48
	4	205.38	840.86
	5	202.15	1043.01
	6	198.92	1241.94
	7	195.70	1437.63
	8	192.47	1630.11
	9	189.25	1819.36
	10	186.02	2005.38

Quantity chosen:

0

1

2

3

4

5

6

7

8

9

10

Per unit price of the good: 194.97

Tax rate on the good: 6.5 percent

Please make your quantity selection by clicking the appropriate quantity button.

[Back to the Task Selection Menu](#)

EXPERIMENTAL DESIGN: TASK SELECTION MENU (2)

Remaining time [sec] 67

Round 1

Tax rate: 6.0%	Quantity	Marginal valuation:	Cumulative valuation:	Quantity	Marginal valuation:	Cumulative valuation:	Quantity	Marginal valuation:	Cumulative valuation:
	0		0	0	0	0	0	0	0
1	215	215	215	1	77	77	1	825	825
2	212	427	427	2	76	153	2	888	1221
3	209	635	635	3	75	227	3	588	1819
4	205	841	841	4	73	301	4	583	2388
5	202	1043	1043	5	72	373	5	550	2938
6	199	1242	1242	6	71	444	6	531	3489
7	196	1438	1438	7	70	514	7	513	3881
8	192	1630	1630	8	69	583	8	494	4475
9	189	1819	1819	9	68	651	9	475	4850
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Continue to Task 1			Continue to Task 2			Continue to Task 3			

Tax rate: 23.0%	Quantity	Marginal valuation:	Cumulative valuation:	Quantity	Marginal valuation:	Cumulative valuation:	Quantity	Marginal valuation:	Cumulative valuation:
	0		0	0	0	0	0	0	0
1	43	43	43	1	811	811	1	174	174
2	42	86	86	2	663	1674	2	189	343
3	40	128	128	3	758	2372	3	182	504
4	38	165	165	4	748	3110	4	155	659
5	36	203	203	5	734	3851	5	151	810
6	37	243	243	6	705	4557	6	148	958
7	36	278	278	7	641	5197	7	144	1102
8	35	313	313	8	588	5785	8	138	1243
9	33	344	344	9	488	6281	9	133	1375
10	32	375	375	10	385	6666	10	127	1502
Continue to Task 4			Continue to Task 5			Continue to Task 6			

[Stop Deciding Now \(irreversible\)](#)

EXPERIMENTAL DESIGN: ROUND FEEDBACK

Remaining time (min): 25

Feedback for Round 1

Task	Quantity choice	Net price	Tax-inclusive price	Payment	Gross surplus	Net surplus
1	6	184.57	195.93	1181.94	1241.94	88.00
2	5	67.24	71.82	358.88	373.06	15.00
3	4	525.23	559.30	2237.50	2397.50	150.00
4	5	30.51	37.82	187.81	202.61	15.00
5	4	683.16	741.99	2867.57	3117.57	150.00
6	6	132.02	150.09	893.82	956.26	57.74
Total				7833.21	8200.95	447.74

Time bonus: 13
Total net earnings for the round: 461

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EXTERNAL VALIDITY OF THE EXPERIMENTAL TASK



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- Idea: we want to focus only on the additional price misperception introduced by hidden ad-valorem taxes, we want to control for “baseline” price misperception.
- Out of 95 subjects, there are 41 subjects that always buy the optimal quantity when the tax rate = 0%.
- There are additional 19 subjects for whom the correlation between actual and optimal quantity when the tax rate = 0% is over 0.9 and the average deviation from the optimal quantity is less than 1.

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- In what follows, we only use data from the 41 subjects.

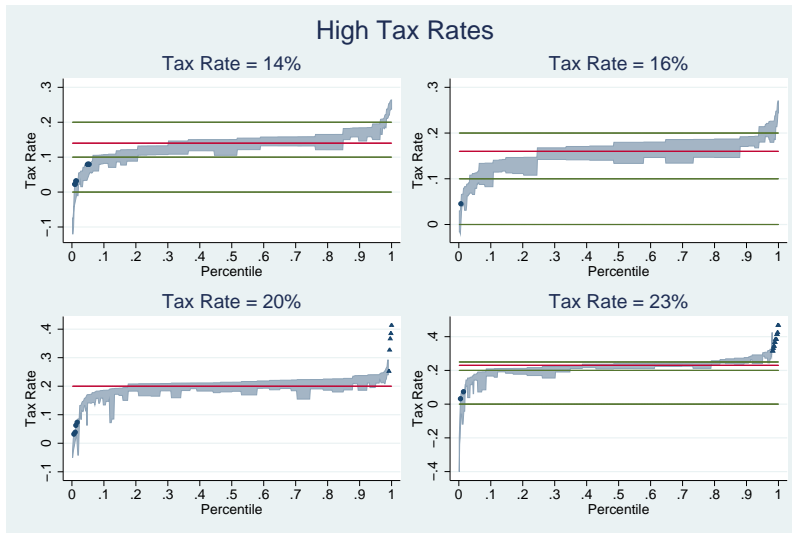
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- In what follows, we only use data from the 41 subjects.
- Selection pattern: men and econ majors are more likely to be among the 41 subjects.

EFFECTIVE TAX RATES FOR LOW NOMINAL RATES



EFFECTIVE TAX RATES FOR HIGH NOMINAL RATES



OBSERVATIONS

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- Among the remaining cases, underestimation of the tax rate is slightly more prevalent than overestimation.
- For non-round tax rates (6.5%, 8%, 14%, 16%), subjects correctly impute the tax in about 50 to 65 percent of cases.
- Again, among the remaining cases, underestimation of the tax rate is more prevalent than overestimation.

WELFARE ANALYSIS (1)

- Within subject, we difference consumer surplus, tax revenue and overall welfare (sum of the two) when one of the two tax rates is changed to a round number (0%, 10%, 20%, 25%).

GOING FROM 8% TO 10% TAX RATE

	Consumer surplus	Tax revenue	Overall welfare
Absolute change	-21.7 (3.33)***	8.49 (2.84)**	-13.21 (4.51)**
Change relative to theory	1.91 (3.44)	11.0 (2.46)***	12.9 (4.20)**

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 - from 16% to 20%
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- Message: because of potential “nearby” upward rounding of non-round tax rates by consumers, the overall welfare may be improved by increasing the tax rate to a “nearby higher round number.”
- Results for other tax shifts are more in line with traditional theory.

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- This finding is less prevalent (30 percent of purchasing decisions or less) under round tax rates (5%, 10%, 20%), and more prevalent (up to 45 percent of purchasing decisions) under non-round tax rates (6.5%, 8%, 14%, 16%).

CONCLUSION

- Subjects who only make optimal purchasing decisions under the zero tax rate sometimes incorrectly impute non-zero tax rates.
- This finding is less prevalent (30 percent of purchasing decisions or less) under round tax rates (5%, 10%, 20%), and more prevalent (up to 45 percent of purchasing decisions) under non-round tax rates (6.5%, 8%, 14%, 16%).
- In case a tax rate is “nearby” a “higher round” number, welfare losses from the potential tax increase are smaller than suggested by traditional theory. This suggests that many subjects may already be using the higher tax rate in their imputations and so it may be desirable from a policy perspective to increase the tax rate to the round number.