Online Appendices

for

"Advertising, Consumer Awareness, and Choice: Evidence from the U.S. Banking Industry"

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A Additional Tables

Table A.1: Demographics for Initial and Final Samples

This table compares the demographics of the respondents in the final sample with the demographics of all the survey respondents (with valid zip codes). The columns "All Respondents" and "Final Sample" report the percentage of respondents in each of the demographic groups for all of the survey respondents and for the respondents in the final sample, respectively.

		ata set
	All Respondents	Final Sample
	(n = 4, 246)	(n=2,214)
	%	%
ender		
male	60.0	61.5
ale	40.0	38.5
ge		
-29	17.0	17.9
-44	30.4	31.8
-59	34.0	32.7
+	18.7	17.6
ousehold Income		
der \$49,999	36.5	36.4
0,000-\$99,999	38.0	37.5
00,000 and over	25.5	26.1
ace		
Thite	81.3	78.5
ack	5.0	5.5
ian	7.5	9.1
spanic	3.9	4.9
her	2.3	2.1
ucation		
gh school or less	8.5	7.5
me College	32.2	31.4
llege graduate	29.4	31.1
stgraduate	29.9	29.9
arital Status		
ngle/Divorced	33.4	33.1
rried/Partner	63.7	64.6
idowed	2.9	2.3
egion		
ew England	5.6	6.1
idAtlantic	22.9	27.1
idwest	10.5	6.8
orth Central	10.9	8.6
utheast	8.1	8.6
uth Central	4.1	3.3
cas	4.1	4.7
orida	8.8	10.6
uthwest	6.3	6.0
orthwest	4.3	4.7
alifornia	12.8	12.5
her	1.6	0.9

Table A.2: DMA-level Advertising Expenditures and Placements by Bank

This table shows average advertising expenditures (dols000) and the average number of placements (also called "units") by bank. It includes the categories Spot TV, Newspapers, National Spot Radio, Internet Display, and Outdoor at the DMA-level. The averages are taken by dividing total advertising expenditures or total advertising placements at the DMA-level over the entire reference period by the number of DMAs in which each bank had some advertising activity.

	Average per	Number of	
Institution	Expenditure	Units	DMAs
Bank of America	162.7	901.2	206
BB&T	144.6	136.8	33
Capital One	293.7	654.9	150
Chase/WaMu	688.4	1107.8	152
Citibank	356.1	186.5	182
Citizens Bank	184.5	178.5	140
Comerica Bank	284.2	238.5	19
Fifth Third Bank	687.5	1378.7	35
HSBC	156.4	226.8	130
Keybank	336.6	1216.5	36
M&T	364.3	576.6	15
PNC/National City Bank	363.0	564.1	145
Regions Bank	167.4	254.7	67
Sovereign Bank	108.8	150.5	70
Suntrust Bank	269.7	437.9	106
TD Bank	717.3	705.3	51
U.S. Bank	84.2	141.0	152
Wells Fargo/Wachovia	230.1	638.4	197

Table A.3: Respondents with Bank Branches within 5 Miles of their Home (Shoppers only)

This table reports the percentage of shoppers in the final sample with bank branches within 5 miles of their home conditional on having considered or chosen each of the institutions listed.

Institution	Considered	Chosen
Bank of America	84.44	84.75
BB&T	83.72	83.56
Capital One	67.36	63.89
Chase/WaMu	86.76	89.83
Citibank	67.36	75.82
Citizens Bank	58.97	59.77
Comerica Bank	87.80	89.47
Fifth Third Bank	78.62	85.29
HSBC	41.03	45.00
Keybank	85.25	91.23
M&T	83.53	82.22
PNC/National City Bank	84.96	88.51
Regions Bank	86.92	89.06
Sovereign Bank	78.95	80.95
Suntrust Bank	86.11	88.12
TD Bank	89.36	92.77
U.S. Bank	81.16	87.72
Wells Fargo/Wachovia	88.32	91.67
Average	81.12	83.66

B Further Details on Survey Sample and Sampling Weights

In this Appendix, we provide further details regarding the sample of respondents that constitutes our main data and on the sampling weights used to ensure that our model results are representative of U.S. consumers' banking behavior.

In the main text, we make the distinction between two types of survey respondents: shoppers and non-shoppers. Shoppers are consumers who shopped and opened one or more new accounts and non-shoppers are consumers who neither shopped nor opened new accounts during the reference period." Shoppers include three different types of consumers. Namely, they include consumers that a) moved to a new primary bank, b) opened (an) additional account(s) with their primary bank, or c) opened (an) additional account(s) with another bank but kept their primary bank.

The survey conducted by the marketing research company which provided us with the data focuses mostly on shoppers. We correct for the over-sampling of shoppers by using weights in the model estimations so that the results are representative and accurately reflect the search and switching behavior of the overall U.S. population of retail banking consumers.

We calculate these sampling weights using information from another survey conducted by the same marketing research company, which they shared with us. This "screener" survey does not contain the same level of detail as the data described in Section 3 (Consumer-Level Data subsection) but has a much larger scale (around 100,000 respondents) and a sampling design that ensures U.S. population representativeness.

Comparing the proportions of each of the groups of respondents in the main survey and in the screener survey, we find that non-shoppers are under-represented (12% in our survey vs. 73% in screener survey), shoppers that moved to a new primary bank are over-represented (59% in our survey vs. 8.4% in screener survey), shoppers that opened (an) account(s) with another bank but kept their primary bank are over-represented (30% in our survey vs. 14% in screener survey). The sampling weights are thus calculated as ratios of the proportions of each of the groups of respondents in the main survey and in the screener survey. Note that shoppers that opened an additional account with their primary bank are not in our survey data (they were "terminated"). Fortunately, these only correspond to 5% of the U.S. population (based on the screener survey).

To further validate our sampling weights we compare them to the only other sources that we were able to locate that mention statistics on bank search and switching behavior. Specifically, a study conducted by TD Bank in 2013 says that "12% of the study respondents switched primary bank during the last two years." Further, a NY Times article published in 2010 mentions that "Roughly 10 to 15 percent of households move their checking account from one bank to another each year, a figure that hasn't changed substantially in recent years, according to several industry

¹Note that we use the term "shop" interchangeably with "search" throughout the paper. Thus shoppers are consumers who searched, i.e. actively investigated at least one bank, and opened one or more new accounts and non-shoppers are consumers who did search, i.e. did not actively investigate any bank, and did not open any new bank accounts.

²https://mediaroom.tdbank.com/download/Infograph-Checking+Experience.pdf,http://thefinancialbrand.com/33346/bank-checking-account-customers-research/

consultants and market researchers." $^{3}\,$

According to the screener survey, 8.4% of the population (or 31.3% of shoppers) switched primary bank in the last 12 months. This number (and thus our sampling weights) is consistent with the statistics given by the secondary data sources mentioned above.

 $^{^3} http://www.nytimes.com/2010/03/25/your-money/brokerage-and-bank-accounts/25BANK.html?_r=3$

C Estimation of Consideration Set and Conditional Purchase Probabilities

We use simulated maximum likelihood (SMLE) to estimate the model. The probability that a consumer picks consideration S_i conditional on his awareness set is given by

$$P_{iS_{i}|A_{i},\epsilon} = \Pr\left(\min_{j \in S_{i}} \left(E\left[u_{ijm}\right]\right) \ge \max_{j' \notin S_{i}} \left(E\left[u_{ij'm}\right]\right) \quad \cap \quad \Gamma_{ik} \ge \Gamma_{ik'} \qquad \forall k \ne k'\right)$$
(C.1)

and a consumer's purchase probability conditional on his consideration set is given by

$$P_{ij|S_i,\epsilon} = \begin{pmatrix} u_{ijm} \ge u_{ij'm} & \forall j \ne j', \quad j,j' \in S_i \end{pmatrix}.$$
 (C.2)

Both probabilities do not have a closed-form solution and are non-smooth. Because common optimization routines require smoothness, the non-smooth probabilities would either require using non-gradient based optimization methods or taking a very large number of draws (simple frequency simulator, McFadden 1989). Instead, we choose to smooth the probabilities using a scaled multivariate logistic CDF (Gumbel 1961):

$$F(w_1, \dots, w_T; s_1, \dots, s_T) = \frac{1}{1 + \sum_{t=1}^T \exp(-s_t w_t)} \qquad \forall t = 1, \dots, T$$
 (C.3)

in which s_1, \ldots, s_T are scaling parameters. McFadden (1989) suggests this kernel-smoothed frequency simulator which satisfies the summing-up condition, i.e. that probabilities sum up to 1, and is asymptotically unbiased.

We now describe the step-by-step implementation of the kernel-smoothed frequency simulator.

- 1. Take q = 1, ..., Q draws from ϵ_{ij} (for each consumer/bank combination)
- 2. For each ϵ_{ij} draw, calculate w_{qt} for the
 - (a) Conditional consideration set probabilities:
 - i. Consumers who searched at least once

$$w_{1|A_{i},\epsilon}^{q} = \min_{j \in S_{i}} \left(E\left[u_{ijm}\right] \right) - \max_{j' \notin S_{i}} \left(E\left[u_{ij'm}\right] \right)$$
$$w_{2|A_{i},\epsilon}^{q} = \Gamma_{ik} - \max\left(\Gamma_{ik'}\right)$$

i. Consumers who did not search

$$w_{1|A_{i},\epsilon}^{q} = -\max\left(\Gamma_{ik'}\right)$$

(b) Conditional purchase probabilities:

$$w_{1|S_{i,\ell}}^q = u_{ijm} - u_{ij'm} \qquad \forall j \neq j', \ \forall j, j' \in S_i$$

- 3. Calculate the smoothed conditional consideration set and conditional purchase probabilities using the scaled logistic CDF (Gumbel 1961)
 - (a) Conditional consideration set probabilities:

i. Consumers who searched at least once

$$P^{q}_{iS_{i}|A_{i},\epsilon} = \frac{1}{1 + \exp\left(-s_{1}w^{q}_{1|A_{i},\epsilon}\right) + \exp\left(-s_{2}w^{q}_{2|A_{i},\epsilon}\right)}$$

i. Consumers who did not search

$$P^q_{iS_i|A_i,\epsilon} = \frac{1}{1 + \exp\left(-s_1 w^q_{1|A_i,\epsilon}\right)}$$

(b) Conditional purchase probabilities:

$$P_{ij|S_i,\epsilon}^q = \frac{1}{1 + \exp\left(-s_1 w_{1|S_i,\epsilon}^q\right)}$$

4. Calculate the joint consideration and purchase probabilities conditional on awareness by multiplying the conditional consideration set and conditional purchase probabilities (see equation 12) and averaging them across all Q draws, i.e.

$$P_{ij} = \frac{1}{Q} \sum_{q=1}^{Q} P_{iS_i|A_i,\epsilon}^q P_{ij|S_i,\epsilon}^q$$

In the estimation, we use a scaling factor of $s_1 = s_2 = 4$ and take Q = 50 draws from the error distribution.

D Pre and Post Control Function Model Results

In this appendix, we provide a comparison of the estimates pre and post control function (CF) for the main models in the paper.

Table D.1: Results from Awareness Stage

	(A) Pre-CF		(A) Post-CF				
	Advertising		nk Presence >1 Branch	Advertising		nk Presence	Advertising
		1 Branch			1 Branch	>1 Branch	Residual
Bank of America	0.060	0.191	0.519	0.029	0.250	0.616	0.126
	(0.129)	(0.988)	(0.544)	(0.153)	(0.943)	(0.559)	(0.205)
BB&T	1.500	3.007**	3.150**	4.945**	2.628**	2.691**	-4.829**
	(1.208)	(0.493)	(0.518)	(1.896)	(0.508)	(0.579)	(2.127)
Citibank	0.353**	1.236**	1.607**	0.539**	1.057	1.315**	-0.752**
	(0.079)	(0.620)	(0.397)	(0.149)	(0.647)	(0.402)	(0.277)
Citizens Bank	1.610**	0.831	1.563**	2.287**	0.330	0.967*	-1.605**
	(0.448)	(0.543)	(0.423)	(0.486)	(0.736)	(0.554)	(0.673)
Comerica	1.753*	2.152**	3.502**	6.199**	1.093	2.369**	-7.136**
	(0.922)	(0.631)	(0.597)	(1.688)	(0.876)	(0.807)	(2.216)
Fifth Third	1.174	2.151*	2.850**	1.514*	1.919*	2.075**	-0.985**
	(1.280)	(1.273)	(0.731)	(0.864)	(0.992)	(0.639)	(0.451)
HSBC	0.705**	0.552	0.662	0.864**	0.358	0.331	-0.584**
	(0.133)	(0.601)	(0.434)	(0.163)	(0.572)	(0.464)	(0.218)
Chase/WaMu	0.019	1.237**	0.950**	0.052	1.193**	0.888**	-0.060
,	(0.072)	(0.596)	(0.362)	(0.083)	(0.607)	(0.384)	(0.104)
Keybank	0.445	1.922**	3.881**	0.682*	1.388**	3.546**	-0.601**
v	(0.565)	(0.612)	(0.680)	(0.402)	(0.664)	(0.632)	(0.266)
M&T	0.712	2.382**	3.899**	2.938**	1.847**	2.608**	-3.202**
	(1.238)	(0.798)	(0.630)	(1.296)	(0.805)	(0.792)	(0.767)
PNC/N. City Bank	0.252**	0.941**	1.863**	0.247**	0.942**	1.870**	0.015
Tivo/iv eloj Balli	(0.055)	(0.463)	(0.303)	(0.083)	(0.462)	(0.308)	(0.201)
Regions	2.764**	2.823**	3.054**	2.677**	2.797**	2.964**	-1.006
O	(0.590)	(0.641)	(0.545)	(0.641)	(0.653)	(0.584)	(2.128)
Sovereign	0.192	4.238**	4.060**	1.066**	3.701**	3.371**	-1.728*
	(0.201)	(1.069)	(0.543)	(0.478)	(1.416)	(0.649)	(0.983)
SunTrust	1.234**	2.659	3.052**	1.258**	2.610	3.006**	-0.118
	(0.386)	(3.104)	(0.550)	(0.609)	(2.891)	(0.610)	(1.196)
TD	0.602**	3.354**	2.155**	0.863**	3.183**	1.402**	-0.466**
	(0.170)	(0.812)	(0.678)	(0.168)	(0.831)	(0.662)	(0.132)
US Bank	1.698**	3.107**	2.917**	1.976**	2.994**	2.766**	-0.489
OD Dank	(0.785)	(0.762)	(0.438)	(0.828)	(0.799)	(0.507)	(0.923)
Wells Fargo/Wachovia	0.005	2.376**	0.119	-0.034	2.440**	0.212	0.147
	(0.085)	(0.506)	(0.431)	(0.111)	(0.540)	(0.502)	(0.280)
Capital One	0.046**	4.911**	2.638**	0.056**	4.834**	2.503**	-0.050
	(0.020)	(0.727)	(0.641)	(0.025)	(0.750)	(0.706)	(0.065)

* p < 0.10; ** p < 0.05

Table D.2: Results from Consideration and Choice Stages

$\begin{array}{c ccccccccccccccccccccccccccccccccccc$		(CC	(CC-FI)		(CC-LI)		
Bank of America $-0.122 \\ 0.134 \\ 0.0134 \\ 0.0170 \\ 0.0130 \\ 0.0170 \\ 0.0170 \\ 0.0170 \\ 0.0170 \\ 0.0170 \\ 0.0170 \\ 0.0170 \\ 0.0170 \\ 0.0170 \\ 0.0170 \\ 0.0210 \\ $							
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	Brand						
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	Bank of America						
Citibank 0.054 (0.231) 0.086 (0.271) 3.916^{**} 4.037^{**} Citizens Bank -0.045 -0.032 -3.603^{**} -3.601^{**} 0.081^{**} 0.021^{**} 0.021^{**} 0.021^{**} 0.021^{**} 0.021^{**} 0.021^{**} 0.081^{*	BB&T	-0.508**	-0.486*	` /	, ,		
Citizens Bank $-0.045 - 0.032 - 3.603** -3.681** \\ -0.045 - 0.032 - 3.603** -3.681** \\ -0.045 - 0.032 - 3.603** -3.681** \\ -0.085 - 0.0285 - 0.0189 - 0.0189 - 0.0162 \\ -0.085 - 0.0285 - 0.0285 - 0.0189 - 0.0475 - 0.0278 - 0.0278 - 0.281 - 3.921** - 4.505** \\ -0.023 - 0.0215 - 0.0189 - 0.0189 - 0.0189 - 0.0189 - 0.0278 - 0.021 - 0.0223 - 0.0215 - 0.0189 - 0.018$	Ciril 1	, ,	, ,	, ,	, ,		
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	Citibank						
$ \begin{array}{c} \text{Comerica} & -1.012^{**} & -1.003^{**} & -4.398^{**} & -4.505^{**} \\ (0.313) & (0.419) & (0.475) & (0.261) \\ (0.223) & (0.215) & (0.189) & (0.142) \\ \text{HSBC} & 0.261 & 0.285 & -3.160^{**} & -3.285^{**} \\ (0.194) & (0.254) & (0.160) & (0.188) \\ (0.194) & (0.254) & (0.160) & (0.188) \\ (0.108) & (0.078) & -3.741^{**} & -3.829^{**} \\ (0.194) & (0.249) & (0.086) & (0.181) \\ \text{Chase/WaMu} & -0.520^{**} & -0.527 & -4.020^{**} & -4.124^{**} \\ (0.180) & (0.078) & (0.086) & (0.181) \\ \text{M&T} & -0.435^{**} & -0.410^{**} & -3.347^{**} & -3.437^{**} \\ (0.219) & (0.205) & (0.237) & (0.189) \\ \text{PNC/N. City Bank} & -0.650^{**} & -0.642^{**} & -3.925^{**} & -4.043^{**} \\ (0.182) & (0.245) & (0.160) & (0.105) \\ \text{Covereign} & -0.630^{**} & -0.612^{**} & -4.032^{**} & -4.130^{**} \\ \text{Covereign} & -0.306 & -0.642^{**} & -3.925^{**} & -4.130^{**} \\ \text{Covereign} & -0.306 & -0.264 & -3.753^{**} & -3.841^{**} \\ \text{Covereign} & -0.306 & -0.264 & -3.753^{**} & -3.841^{**} \\ \text{Covereign} & -0.306 & -0.264 & -3.753^{**} & -3.841^{**} \\ \text{Covereign} & -0.306 & -0.264 & -3.753^{**} & -3.541^{**} \\ \text{Covereign} & -0.306 & -0.264 & -3.753^{**} & -3.541^{**} \\ \text{Covereign} & -0.306 & -0.264 & -3.753^{**} & -3.541^{**} \\ \text{Covereign} & -0.306 & -0.264 & -3.753^{**} & -3.841^{**} \\ \text{Covereign} & -0.306 & -0.264 & -3.753^{**} & -3.841^{**} \\ \text{Covereign} & -0.306 & -0.264 & -3.753^{**} & -3.841^{**} \\ \text{Covereign} & -0.306 & -0.264 & -3.753^{**} & -3.841^{**} \\ \text{Covereign} & -0.306 & -0.600 & (0.129) & (0.189) \\ \text{Covereign} & -0.012 & 0.128 & -3.437^{**} & -3.536^{**} \\ \text{Covereign} & -0.306 & -0.668^{**} & -0.612^{**} & -0.612^{**} \\ \text{Covereign} & -0.306 & -0.668^{**} & -0.612^{**} & -0.612^{**} \\ \text{Covereign} & -0.306 & -0.668^{**} & -0.612^{**} & -0.612^{**} \\ \text{Covereign} & -0.306 & -0.668^{**} & -0.612^{**} & -0.612^{**} \\ \text{Covereign} & -0.306 & -0.668^{**} & -0.612^{**} & -0.612^{**} \\ \text{Covereign} & -0.306 & -0.668^{**} & -0.612^{**} & -0.612^{**} \\ \text{Covereign} & -0.306 & -0.668^{**} & -0.612^{**} & -0.612^{**} \\ \text{Covereign} &$	Citizens Bank			-,			
Fifth Third $ \begin{array}{c} (0.313) & (0.419) & (0.475) & (0.261) \\ -0.278 & -0.281 & -3.921^{**} & -4.051^{**} \\ (0.223) & (0.215) & (0.189) & (0.142) \\ (0.189) & (0.142) & (0.160) & (0.189) \\ (0.160) & (0.189) & (0.160) & (0.188) \\ (0.194) & (0.254) & (0.160) & (0.188) \\ (0.108) & (0.078) & (0.078) \\ (0.078) & (0.078) & (0.078) \\ (0.078) & (0.078) & (0.078) \\ (0.078) & (0.078) & (0.078) \\ (0.078) & (0.078) & (0.078) \\ (0.078) & (0.078) & (0.078) \\ (0.078) & (0.078) & (0.078) \\ (0.078) & (0.078) & (0.078) \\ (0.078) & (0.078) & (0.078) \\ (0.078) & (0.078) & (0.078) \\ (0.078) & (0.078) & (0.078) \\ (0.078) & (0.078) & (0.078) \\ (0.078) & (0.078) & (0.078) \\ (0.078) & (0.078) & (0.078) \\ (0.021) & (0.025) & (0.249) & (0.235) \\ (0.0226) & (0.149) & (0.026) \\ (0.028) & (0.028) & (0.028) \\ (0.028) & (0.028) & (0.028) \\ (0.028) & (0.028) & (0.028) \\ (0.028) & (0.028) & (0.028) \\ (0.028) & (0.028) & (0.028) \\ (0.028) & (0.028) & (0.028) \\ (0.028) & (0.028) & (0.028) \\ (0.028) & (0.028) & (0.028) \\ (0.029) & (0.013) & (0.013) \\ (0.028) & (0.028) & (0.028) \\ (0.029) & (0.013) & (0.013) \\ (0.028) & (0.028) & (0.028) \\ (0.029) & (0.013) & (0.013) \\ (0.008) & (0.009) & (0.001) \\ (0.009) & (0.001) & (0.009) \\ (0.001) & (0.001) & (0.001) \\ (0.002) & (0.001) & (0.001) \\ (0.002) & (0.001) & (0.001) \\ (0.003) & (0.001) & (0.001) \\ (0.003) & (0.001) & (0.001) \\ (0.003) & (0.001) & (0.001) \\ (0.003) & (0.001) & (0.001) \\ (0.003) & (0.001) & (0.001) \\ (0.004) & (0.001) & (0.001) \\ (0.001) & (0.001) & (0.001) \\ (0.001) & (0.001) & (0.001) \\ (0.001) & (0.001) & (0.001) \\ (0.001) & (0.001) & (0.001) \\ (0.001) & (0.001) & (0.001) \\ (0.000) & (0.000) & (0.000) \\ (0.000) &$	Comerica	,	, ,		` /		
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$		(0.313)	(0.419)	(0.475)	(0.261)		
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	Fifth Third			0.00			
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	HSBC	0.261	0.285	-3.160**	-3.285**		
$ \begin{array}{c} {\rm Keybank} & -0.520^{**} & -0.527 & -4.020^{**} & -4.124^{**} \\ (0.219) & (0.343) & (0.186) & (0.161) \\ (0.181) & (0.205) & (0.237) & (0.189) \\ (0.207) & (0.205) & (0.237) & (0.189) \\ (0.207) & (0.205) & (0.237) & (0.189) \\ (0.207) & (0.237) & (0.189) \\ (0.182) & (0.245) & (0.160) & (0.105) \\ (0.235) & (0.249) & (0.224) & (0.248) \\ (0.235) & (0.249) & (0.225) & (0.140) \\ (0.235) & (0.249) & (0.225) & (0.140) \\ (0.235) & (0.249) & (0.226) & (0.143) \\ (0.235) & (0.249) & (0.225) & (0.120) \\ (0.185) & (0.160) & (0.159) & (0.112) \\ (0.185) & (0.160) & (0.159) & (0.112) \\ (0.185) & (0.160) & (0.159) & (0.112) \\ (0.248) & (0.266) & (0.209) & (0.143) \\ (0.248) & (0.266) & (0.209) & (0.143) \\ (0.248) & (0.266) & (0.209) & (0.143) \\ (0.248) & (0.266) & (0.209) & (0.113) & (0.086) \\ (0.249) & (0.248) & (0.266) & (0.209) & (0.113) \\ (0.161) & (0.161) & (0.164) & (0.161) & (0.161) \\ (0.162) & (0.161) & (0.164) & (0.111) & (0.185) \\ (0.248) & (0.25) & (0.150) & (0.113) & (0.086) \\ (0.249) & (0.266) & (0.209) & (0.231) \\ (0.248) & (0.266) & (0.209) & (0.231) \\ (0.248) & (0.266) & (0.209) & (0.231) \\ (0.248) & (0.266) & (0.209) & (0.231) \\ (0.248) & (0.266) & (0.209) & (0.231) \\ (0.248) & (0.266) & (0.209) & (0.231) \\ (0.25) & (0.150) & (0.113) & (0.086) \\ (0.229) & (0.052) & (0.600) & (0.203) \\ (0.231) & (0.231) & (0.231) \\ (0.231) & (0.231) & (0.231) \\ (0.221) & (0.203) & (0.231) \\ (0.223) & (0.223) & (0.231) \\ (0.223) & (0.223) & (0.223) & (0.231) \\ (0.223) & (0.223) & (0.223) & (0.231) \\ (0.223) & (0.223) & (0.223) & (0.231) \\ (0.223) & (0.223) & (0.223) & (0.223) \\ (0.223) & (0.223) & (0.223) & (0.223) \\ (0.223) & (0.223) & (0.223) & (0.223) \\ (0.223) & (0.223) & (0.223) & (0.223) \\ (0.223) & (0.223) & (0.223) & (0.223) \\ (0.223) & (0.223) & (0.223) & (0.223) \\ (0.223) & (0.223) & (0.223) & (0.223) \\ (0.223) & (0.223) & (0.223) & (0.223) \\ (0.223) & (0.223) & (0.223) & (0.223) \\ (0.223) & (0.223) & (0.223) & (0.223) \\ (0.225) & (0.226) & (0.241) & (0.226) \\ (0.220) & (0.223) & (0.225) & (0.226) & (0.226) \\ (0.22$	Chase/WaMu	(0.194)	(0.254)	, ,			
$\begin{array}{c} (0.219) & (0.343) & (0.186) & (0.161) \\ (0.219) & (0.205) & (0.237) & (0.189) \\ (0.219) & (0.205) & (0.237) & (0.189) \\ (0.182) & (0.245) & (0.160) & (0.105) \\ (0.182) & (0.245) & (0.160) & (0.105) \\ (0.235) & (0.249) & (0.226) & (0.149) \\ (0.226) & (0.149) & (0.226) & (0.149) \\ (0.230) & (0.235) & (0.249) & (0.226) & (0.149) \\ (0.230) & (0.235) & (0.249) & (0.226) & (0.149) \\ (0.230) & (0.235) & (0.235) & (0.120) & (0.188) \\ (0.185) & (0.160) & (0.159) & (0.188) \\ (0.185) & (0.160) & (0.159) & (0.112) \\ (0.185) & (0.160) & (0.159) & (0.112) \\ (0.185) & (0.160) & (0.159) & (0.112) \\ (0.185) & (0.160) & (0.159) & (0.112) \\ (0.248) & (0.266) & (0.209) & (0.143) \\ (0.266) & (0.209) & (0.143) \\ (0.266) & (0.209) & (0.143) \\ (0.161) & (0.164) & (0.161) & (0.161) \\ (0.161) & (0.164) & (0.161) & (0.161) \\ (0.161) & (0.164) & (0.161) & (0.161) \\ (0.161) & (0.164) & (0.161) & (0.161) \\ (0.161) & (0.164) & (0.161) & (0.188) \\ (0.265) & (0.150) & (0.113) & (0.086) \\ (0.203) & (0.231) \\ (0.203) & (0.203) \\ (0.203) &$	Chase, want				(0.078)		
$\begin{array}{c} \text{M\&T} & -0.435^{**} & -0.410^{**} & -3.347^{**} & -3.437^{**} \\ (0.219) & (0.205) & (0.237) & (0.189) \\ (0.237) & (0.189) & (0.245) & (0.160) & (0.105) \\ (0.182) & (0.245) & (0.160) & (0.105) \\ (0.160) & (0.105) & (0.245) & (0.160) & (0.105) \\ (0.125) & (0.249) & (0.226) & (0.149) \\ (0.235) & (0.249) & (0.226) & (0.149) \\ (0.230) & (0.235) & (0.249) & (0.226) & (0.149) \\ (0.230) & (0.235) & (0.120) & (0.188) \\ (0.230) & (0.235) & (0.120) & (0.188) \\ (0.230) & (0.235) & (0.120) & (0.188) \\ (0.121) & (0.185) & (0.160) & (0.159) & (0.112) \\ (0.185) & (0.160) & (0.159) & (0.112) \\ (0.185) & (0.160) & (0.159) & (0.112) \\ (0.185) & (0.248) & (0.266) & (0.209) & (0.143) \\ (0.248) & (0.266) & (0.209) & (0.143) \\ (0.248) & (0.266) & (0.209) & (0.143) \\ (0.248) & (0.266) & (0.209) & (0.143) \\ (0.161) & (0.164) & (0.161) & (0.115) \\ (0.161) & (0.164) & (0.161) & (0.113) & (0.086) \\ (0.248) & (0.266) & (0.203) & (0.231) \\ (0.29) & (0.113) & (0.086) \\ (0.215) & (0.150) & (0.113) & (0.086) \\ (0.215) & (0.150) & (0.013) & (0.231) \\ (0.203) & (0.231) \\ (0.203) & (0.231) \\ (0.203) & (0.231) \\ (0.203) & (0.231) \\ (0.203) & (0.231) \\ (0.203) & (0.231) \\ (0.203) & (0.231) \\ (0.203) & (0.231) \\ (0.203) & (0.231) \\ (0.203) & (0.231) \\ (0.203) & (0.231) \\ (0.203) & (0.231) \\ (0.203) & (0.231) \\ (0.203) & (0.231) \\ (0.203) & (0.231) \\ (0.203) & (0.203) \\ (0.20$	Keybank						
$\begin{array}{c} \text{PNC/N. City Bank} & -0.650^{**} & -0.642^{**} & -3.925^{**} & -4.043^{**} \\ (0.182) & (0.245) & (0.160) & (0.160) \\ (0.160) & (0.165) & (0.160) & (0.160) \\ (0.235) & (0.249) & (0.226) & (0.149) \\ (0.230) & (0.235) & (0.249) & (0.226) & (0.149) \\ (0.230) & (0.235) & (0.120) & (0.188) \\ (0.120) & (0.188) & (0.120) & (0.188) \\ (0.185) & (0.160) & (0.159) & (0.112) \\ (0.185) & (0.160) & (0.159) & (0.112) \\ (0.185) & (0.160) & (0.159) & (0.112) \\ (0.185) & (0.160) & (0.159) & (0.112) \\ (0.185) & (0.160) & (0.159) & (0.112) \\ (0.185) & (0.160) & (0.159) & (0.112) \\ (0.185) & (0.160) & (0.159) & (0.112) \\ (0.185) & (0.160) & (0.159) & (0.113) \\ (0.2948) & (0.266) & (0.209) & (0.143) \\ (0.161) & (0.164) & (0.161) & (0.161) \\ (0.161) & (0.164) & (0.161) & (0.161) \\ (0.1125) & (0.150) & (0.113) & (0.086) \\ (0.125) & (0.150) & (0.130) & (0.133) & (0.086) \\ (0.125) & (0.600) & (0.203) & (0.231) \\ (0.125) & (0.600) & (0.203) & (0.231) \\ (0.127) & (0.154) & (0.072) & (0.039) \\ (0.039) & (0.041) & (0.072) & (0.039) \\ (0.0414) & (0.055) & (0.526) & (0.414) & (0.053) \\ (0.011) & (0.015) & (0.001) & (0.072) & (0.039) \\ (0.011) & (0.015) & (0.001) & (0.072) & (0.009) \\ (0.011) & (0.015) & (0.015) & (0.001) & (0.072) \\ (0.039) & (0.001) & (0.001) & (0.001) \\ (0.022) & (0.039) & (0.001) & (0.001) \\ (0.022) & (0.039) & (0.001) & (0.001) \\ (0.022) & (0.039) & (0.001) & (0.001) \\ (0.022) & (0.031) & (0.163) & (0.110) & (0.081) \\ (0.011) & (0.015) & (0.130) & (0.175) & (0.132) & (0.081) \\ (0.081) & (0.180) & (0.180) & (0.110) & (0.083) \\ (0.081) & (0.103) & (0.163) & (0.110) & (0.083) \\ (0.081) & (0.081) & (0.094) \\ (0.081) & (0.000) & (0.000) \\ (0.000) $	M&T		, ,				
Regions $ \begin{array}{c} (0.182) & (0.245) & (0.160) & (0.105) \\ -0.630** & -0.612** & -4.032** & -4.130** \\ -0.255) & (0.249) & (0.226) & (0.149)* \\ -0.255) & (0.249) & (0.226) & (0.149)* \\ -0.264 & -3.753** & -3.841** \\ -0.230) & (0.235) & (0.120) & (0.188) \\ -0.121 & 0.128 & -3.497** & -3.594** \\ -0.128 & (0.160) & (0.159) & (0.112) \\ -0.786** & -0.768** & -0.768** & -3.413** & -3.536** \\ -0.248) & (0.266) & (0.209) & (0.143) \\ -0.786** & -0.768** & -3.413** & -3.536** \\ -0.248) & (0.266) & (0.209) & (0.143) \\ -0.161) & (0.161) & (0.164) & (0.161) & (0.161) \\ -0.161) & (0.164) & (0.161) & (0.113) & (0.088) \\ -0.126 & 0.152 & -3.820** & -3.929** \\ -3.820** & -3.929** & -3.929** \\ -3.820** & -3.929** & -3.929** \\ -3.820** & -3.929** & -3.929** \\ -4.088** & (0.125) & (0.150) & (0.113) & (0.086) \\ -2.048 & (0.059) & (0.061) & (0.072) & (0.230) \\ -2.048 & (0.059) & (0.061) & (0.072) & (0.330) \\ -2.048 & (0.059) & (0.061) & (0.072) & (0.030) \\ -2.048 & (0.059) & (0.061) & (0.072) & (0.030) \\ -2.043 & (0.039) & (0.001) & (0.0072) \\ -2.043 & (0.039) & (0.001) & (0.0072) \\ -2.043 & (0.039) & (0.001) & (0.0072) \\ -2.043 & (0.039) & (0.001) & (0.0093) \\ -2.048 & (0.039) & (0.001) & (0.001) \\ -2.048 & (0.030) & (0.001) & (0.0$	DNC/N Ctr. David	, ,			` /		
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	PNC/N. City Bank						
Fowereign -0.306 -0.264 $-3.753**$ $-3.841**$ $-3.841**$ $-3.2536*$ $-3.2536*$ $-3.2536*$ $-3.2536*$ $-3.2536*$ $-3.2536**$ $-3.2536*$ -3	Regions	0.000					
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	Sovereign	` /	, ,				
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	<u> </u>	(0.230)	(0.235)	(0.120)	(0.188)		
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	SunTrust						
US Bank	TD	-0.786**	-0.768**	-3.413**	-3.536**		
Wells Fargo/Wachovia $ \begin{array}{ccccccccccccccccccccccccccccccccccc$	US Bank	, ,	, ,				
Capital One $ \begin{array}{c} (0.125) & (0.150) & (0.113) & (0.086) \\ -0.094 & -0.141 & -4.111^{**} & -4.390^{**} \\ (0.625) & (0.600) & (0.600) & (0.203) & (0.231) \\ \hline Other parameters \\ Primary Bank & 3.024^{**} & 3.020^{**} & 0.385^{**} & 0.382^{**} \\ (0.059) & (0.061) & (0.072) & (0.030) \\ (0.525) & (0.526) & (0.526) & (0.414) & (0.553) \\ \hline Advertising & 0.023^{**} & 0.038^{**} & 0.012 & 0.015^{**} \\ (0.011) & (0.015) & (0.007) & (0.009) \\ \hline Advertising Residual & -0.043 & -0.015 \\ \hline Bank Branches, N=1 (Y/N) & 1.987^{**} & 1.972^{**} & 0.499^{**} & 0.504^{**} \\ (0.127) & (0.154) & (0.086) & (0.091) \\ \hline Bank Branches, 3 \geq N \geq 2 (Y/N) & 1.964^{**} & 1.949^{**} & 0.652^{**} & 0.655^{**} \\ (0.130) & (0.175) & (0.132) & (0.081) \\ \hline Bank Branches, N > 7 (Y/N) & 2.246^{**} & 2.225^{**} & 0.787^{**} & 0.796^{**} \\ (0.133) & (0.163) & (0.110) & (0.083) \\ \hline Bank Branches, N > 7 (Y/N) & 2.774^{**} & 2.747^{**} & 1.024^{**} & 1.034^{**} \\ (0.153) & (0.205) & (0.118) & (0.094) \\ \hline Bearch Cost Constant & 0.001^{**} & 0.001^{**} \\ \hline \end{array}$	OS Bain			(0.161)	(0.115)		
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	Wells Fargo/Wachovia						
$\begin{array}{c} Other\ parameters\\ Primary\ Bank\\ Primary\ Bank\\ & 3.024^{**}\\ (0.059)\\ (0.061)\\ (0.061)\\ (0.072)\\ (0.030)\\ (0.030)\\ (0.072)\\ (0.030)\\ (0.030)\\ (0.030)\\ (0.030)\\ (0.0525)\\ (0.526)\\ (0.526)\\ (0.526)\\ (0.526)\\ (0.414)\\ (0.553)\\ (0.012)\\ (0.012)\\ (0.007)\\ (0.009)\\ (0.009)\\ (0.009)\\ (0.002)\\ (0.001)\\ (0.0039)\\ (0.0039)\\ (0.0039)\\ (0.0022)\\ (0.0039)\\ (0.0022)\\ (0.0039)\\ ($	Capital One	, ,	, ,	, ,	, ,		
Primary Bank $ \begin{array}{ccccccccccccccccccccccccccccccccccc$	-	(0.625)	(0.600)	(0.203)	(0.231)		
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	*	3 024**	3 020**	0.385**	0.382**		
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	Timery Dank						
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	Interest Rates						
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	Advertising	, ,		, ,	` /		
Bank Branches, N=1 (Y/N) $ \begin{array}{ccccccccccccccccccccccccccccccccccc$		(0.011)	` /	(0.007)	, ,		
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	Advertising Residual						
$\begin{array}{llllllllllllllllllllllllllllllllllll$	Bank Branches, N=1 (Y/N)						
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	Bank Branches, $3 > N > 2 (Y/N)$,	,	` .'.	` /		
$\begin{array}{cccccccccccccccccccccccccccccccccccc$		(0.130)	(0.175)	(0.132)	(0.081)		
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	Bank Branches, $7 \ge N \ge 4 \text{ (Y/N)}$						
Gearch Cost Constant (0.153) (0.205) (0.118) (0.094) 0.001^{**} (0.000) (0.000)	Bank Branches, $N > 7$ (Y/N)						
(0.000) (0.000)		(0.153)	(0.205)	(0.118)	(0.094)		
• • • • • • • • • • • • • • • • • • • •	Search Cost Constant						
	LL	-2,215.620	-2,214.800		-3,091.700		

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