Impact of Features and Display Ads on the Demand for Orange Juice: An Extension of the Rotterdam Demand Model

Kim, Hyeyoung
University of Florida kim1978@ufl.edu
Ward, Ronald W.
University of Florida rward@ufl.edu
Lee, Jong-ying
University of Florida jonqying@ufl.edu

Selected paper prepared for presentation at the American Agricultural Economics Association Annual Meeting, Orlando, FL, July 27-29, 2008

Copyright 2008 by [Kim, Hyeyoung; Ward, Ronald W.; Lee, Jong-ying]. All right reserved. Readers may take verbatim copies of this document for non-commercial purposes by any means, provided that this copyright notice appears on all such copies.

Does a region in U.S. have different consumption behaviors for the various types of OJ (Orange Juice)? Major types of OJ are FCOJ (Frozen Concentrated OJ), NFC (refrigerated Not Form Concentrated OJ), and Recon (refrigerated Recon OJ). The four regions, Northeast, West, South and North Central, show different prices and consumption patterns by OJ types. The region denotes East as Northeast and North as North Central on this paper. The West has the highest NFC price and the lowest FCOJ price; the East has the lowest price of NFC and Recon. The difference of NFC price between East and West is $0.80/gal. The East and South regions consume almost 40% and 30% of total NFC and West respectively and North regions consume approximately 40% and 28% of total FCOJ. In South and North, Recon has been consumed 40% and 27% of total.

AIDS (Almost Ideal Demand System) of Deaton and Muellbauer and Rotterdam are frequently used demand specifications. Those two are easy to imposed and test of theoretical restrictions and useful to estimate without relying on nonlinear estimating procedures. Barnett compared both demand models using Monte Carlo techniques and concluded that both models perform well when substitution among goods is low, but the Rotterdam model appears better to recover the true elasticities, when we implement exact aggregation within weakly separable branches of utility tree. The AIDS model often classifies substitutes as complements or overestimates the elasticities of substitution among goods within weakly separable branches of the utility tree. By following the results of Barnett, the Rotterdam demand model is used to estimate OJ demand.

Brown and Lee and Duffy studied the impacts of advertising using the Rotterdam

model. Duffy used the expenditure for advertising while Brown and Lee used the coverage, indicating percentages of grocery store sales on all commodities where print media and display ads were present by using %ACV (percent All Commodities Volume). In this study also, %ACV was used to estimate the impacts of two different types of advertising.

Seemingly Unrelated regression (SUR) is employed to estimate this demand system. To use SUR model, I assume that the price is predetermined. One of the equations is eliminated to satisfy the adding–up restriction. When the demand system is estimated, the linear homogeneity and symmetry restrictions are imposed. In addition, I assume that the demand for OJ is satisfied weak separability of the utility tree.

For the further step of the estimation, the simulation using parameters estimated shows the change of the OJ demand by different levels of prices and advertising.

The Rotterdam Model with Advertising variables

A system of OJ demand equations is estimated using the absolute price version of the Rotterdam model:

(1) $\overline{w_{it}} d\ln q_{it} = \mu_i DQ_t + \sum_{j=1}^{n} \pi_{ij} d\ln p_{jt} + \sum_{j=1}^{n} \sum_{k=1}^{m} \gamma_{ij}^{\ k} da_{jt}^{\ k}$,

Where $\varpi_{it} = \frac{1}{2}(\omega_{i,t} + \omega_{i,t-52})$ is the average budget share for good i; μ_i is the marginal propensity to consume; $DQ_t = \sum_i w_i d\ln q_i$ is the Divisia volume index; π_{ij} is the Slutsky coefficient; $\gamma_{ij}^{\ k}$ are the kth advertising effect in promoting product *j* on the demand for product *i*.

Equation (1) is the demand equation of the absolute version of the Rotterdam Model with an average budget share, $\varpi_{it} = \frac{1}{2}(\omega_{i,t} + \omega_{i,t-52})$. The demand model (1) is estimated with restrictions Engel aggregation, $\sum_{i=1}^{n} \mu_i = 1$ and $\sum_{i=1}^{n} \gamma_{ik} = 0$, linear homogeneity, $\sum_{j=1}^{n} \pi_{ij} = 0$, and symmetric $\pi_{ij} = \pi_{ji}$. Imposing advertising variables in a demand system, only adding up restriction involves the impact of advertising must be offset by demand decreases for other products to satisfy the budget condition as a result of demand increase for some products.

This system can be estimated with one equation deleted after adding Engel aggregation and symmetry restrictions. The expenditure elasticity is $\eta_i = \frac{\mu_i}{\overline{\omega_i}}$. Compensated price elasticity is $e_{ij}^{\ C} = \frac{\pi_{ij}}{\overline{\omega_i}}$ and uncompensated price elasticity is $e_{ij}^{\ U} = e_{ij}^{\ C} - \overline{\omega_j}\eta_i$. The advertising elasticity is $e^{S}{}_{ik} = \frac{\gamma_{ik}}{\overline{w_i}}$.

In order to check the restriction on symmetry and the negative semi-definiteness, the Slutsky matrix may be checked at the point of approximation. Since we imposed the linear homogeneity, the rank of Slutsky matrix is n-1. In case of Rotterdam model, the Slutsky matrix is $\lfloor \pi_{ij} \rfloor$.

Simulating of demand system is a efficient way to answer demand changes for different types of OJ within a region and for a particular type of OJ across regions at a given level of budget. To use the models for simulation purpose, the Rotterdam model is transposed from the differentiated log terms to the differentiated terms based on the

average values of the expenditures, prices, and quantities. The range of variation is from 60% to 140% of the average value of prices and ads. At the first simulation, the changed demands come from only the price change at a given levels of ads. The second part of simulation changed both types of ads at given levels of prices.

$$2)\ dq_i = \frac{\overline{m}}{p_i}\left\{\mu_i\left[\frac{1}{m}dm - \sum_{j=1}^{n}\frac{\overline{q_j}}{m}dp_j\right] + \sum_{j=1}^{n}\pi_{ij}\frac{1}{p_j}dp_j + \sum_{j=1}^{n}\sum_{k=1}^{m}\gamma_{ij}{}^{k}da_j\right\}$$

Where $\overline{m}$ is an expectation of the total expenditure; $\overline{p_i}$ is a price expectation for the *i*th commodity; $\overline{q_j}$ is a quantity expectation for the *j*th commodity.

Data

The data used in the paper comes from Nielsen from 9/11/2004 to 6/2/2007 by week. The number of total observations is 143 per region. Supermarkets with annual sales of at least $2 million were used.

To be considered fruit juice demand, the model includes not only three types of OJ but also grape fruit juice (GJ), orange juice blended (OJ BL), and orange juice drink (OJ Dr) which have great proportions in fruit juice consumption. The expenditure share of OJ Dr dominated more than FCOJ in US.

The percentages of ACV (All commodity Volume), the total dollar sales for the stores, were measured for the two major different types of ads; print media (A and B type ads on newspapers) and displays in stores. Print media A and B ads are considered major ads on BFD ad, store flyers, etc: type 'A' ads are the most prominent (generally have a picture) and type 'B' ads are secondary in size. Displays include special effort to sell and in a

secondary location of the store etc. For example, a 90% ACV for NFC's print media ad in East means that 90% of ACV comes from the print media ad for enhancing NFC sales during that period in the East region. Twelve ad variables by types of OJ were included in each demand equation.

In the West and North regions, the %ACV of print media and display ads for FCOJ is greater than total U.S. For NFC, the %ACV of print media ads is greater than total U.S in the East region and the %ACV of display ads is greater than total U.S. in the East and North. For Recon, the West region has greater the %ACV of print media ads and the North region has greater the %ACV display ads than total U.S. (Table 1)

Prices differ among four regions and by OJ types. Usually, the average price of NFC is the highest as $5.68/gal, the price of Recon is $4.15/gal, and the price of FCOJ is the $3.70/gal for sample periods. However, in the East region, the price of FCOJ is $4.00/gal which is greater than the price of Recon $3.83/gal. The price gap among OJ types is $2.62/gal between NFC and FCOJ and $1.15/gal between Recon and FCOJ in the West. The East region has the smallest price gap by OJ types. The price gap is $1.60/gal between NFC and Recon. The East region and West have higher price than U.S average for FCOJ and Recon respectively. (Table 1)

About 63% of FCOJ was consumed in the West and North and 67% of NFC was consumed in the East and South regions. The South region consumed about 37% of Recon and the North region consumed 28% of Recon. The consumption of OJ was over 52% as NFC, 39% as Recon and 9% as FCOJ in overall U.S. (Table 1)

The patterns of expenditure share show more likely the consumption of FCOJ in the

West and North, NFC in the East and South and Recon in the South. The West and North regions have over 60% of expenditure share for FCOJ and the East and South regions have 65% of expenditure share for NFC. These regions have lower or similar price levels of U.S. Even though the average price of Recon is greater than the U.S in the West region, the expenditure share of Recon is similar to the North region. (Table 1)

The consumption of Recon is greater than NFC in the region of the West and North for the total sample period. The consumption proportion of NFC is overwhelming 76% compare to other types of OJ in the East region. In the South region, the consumption of Recon is greater than the NFC in 2005 but the consumption of NFC turned upside done in 2006. Both the West and North regions, even though the consumption proportion of Recon is still the greatest the portion decreased in 2006. The consumption proportion of NFC increased in 2006 for the both regions.

By following the studies of Brown, season of the year effect for juice demand was corrected using 52nd differences (the number of weeks in a year being 52) in transforming the data as required for the Rotterdam model ($d \log q_t = \log q_t^{2006} - \log q_t^{2005}$).

Table 1. Basic statistics by region – 9/11/2004 though 6/2/2007

	Weekly Average					Region / US			
	US	East	South	West	North	East	South	West	North
	Price ($/gal.)					Price Ratio (%)			
FCOJ	3.698	4.004	3.747	3.612	3.627	1.083	1.013	0.977	0.981
NFC	5.685	5.426	5.750	6.226	5.622	0.954	1.012	1.095	0.989
Recon	4.149	3.826	3.946	4.764	4.046	0.922	0.951	1.148	0.975
GJ	6.350	6.798	6.006	6.861	6.080	1.071	0.946	1.080	0.957
OJ BL	5.192	5.467	5.058	5.439	4.878	1.053	0.974	1.048	0.940
OJ Dr	3.158	3.597	2.837	3.640	3.168	1.139	0.898	1.152	1.003
	Quantity (1000 SSE gallons)					Quantity Share (%)			
FCOJ	989	127	240	315	307	0.129	0.243	0.319	0.310
NFC	5950	2117	1829	958	1043	0.356	0.307	0.161	0.175
Recon	4512	526	1669	1062	1253	0.117	0.370	0.235	0.278
GJ	343	73	142	66	61	0.214	0.415	0.192	0.179

OJ BL	525	103	166	141	115	0.196	0.317	0.269	0.219
OJ Dr	1476	273	669	217	316	0.185	0.453	0.147	0.214
	Expenditure (1000 dollars)					Expenditure Share (%)			
FCOJ	3,617	504	893	1,122	1,098	0.139	0.247	0.310	0.303
NFC	33,610	11,390	10,458	5,933	5,821	0.339	0.311	0.177	0.173
Recon	18,425	1,983	6,463	4,993	4,987	0.108	0.351	0.271	0.271
GJ	2,155	493	846	448	370	0.229	0.392	0.208	0.171
OJ BL	2,729	561	843	766	560	0.206	0.309	0.281	0.205
OJ Dr	4,640	977	1,898	767	997	0.211	0.409	0.165	0.215
	Print media Ad (%)					Print media Ad Share (%)			
FCOJ	16	13	10	21	23	0.818	0.608	1.330	1.451
NFC	73	90	69	70	64	1.240	0.950	0.967	0.887
Recon	54	40	51	69	57	0.735	0.942	1.281	1.044
GJ	11	12	11	10	13	1.072	0.965	0.852	1.146
OJ BL	23	30	19	25	23	1.268	0.807	1.075	0.975
OJ Dr	21	35	18	19	17	1.621	0.840	0.903	0.773
	In store Display Ad (%)					In store Display Ad Share (%)			
FCOJ	3	1	2	4	5	0.362	0.563	1.488	1.679
NFC	24	28	22	19	31	1.155	0.890	0.759	1.278
Recon	20	11	17	19	33	0.560	0.850	0.984	1.668
GJ	3	4	3	2	4	1.189	0.883	0.590	1.351
OJ BL	5	5	4	4	9	0.918	0.718	0.741	1.811
OJ Dr	40	42	44	26	47	1.049	1.098	0.650	1.162

Source: Nielsen.

Empirical Results

Results of estimated models are in Table A1 though Table A5 at the appendix. Most of the parameters are significant and the Slutsky coefficients satisfy negative semi-definition.

Table 2 shows expenditure and own price elasticity. All of the expenditure elasticities are positive and significant. Thus, fruit juices are normal goods with respect to fruit juice expenditure. For three types of OJ, expenditure elasticities of U.S are all less than one which means that the consumption of OJ will be increased less than 1% by increasing 1% of expenditure whereas expenditure elasticities for NFC in the East region, Recon in the West region and FCOJ and NFC in the North region have greater than one. Expenditure elasticities of FCOJ in the West region and of Recon in East region are extremely small compared to other regions (Figure 1).

All of the own price elasticities have negative signs and significantly different from zero. For compensated elasticities, the elasticity of FCOJ is the smallest among three types of OJ in US. When the own price increases, FCOJ consumption will be decreased smaller amounts compared to NFC and Recon. In the East region, even though the price of NFC increases more than 1%, the consumption will be decreased less than 0.5%. Four regions have elasticities less than one for FCOJ and greater than one for Recon for own compensated elasticities.

By increasing OJ price, OJ consumption will decrease by more than the relative price increases since all price elasticities are greater than one except for FCOJ in the East and South regions. For uncompensated price elasticity which includes the income (expenditure) elasticity, Recon has high price elasticity compare to FCOJ and NFC which means that when the price goes up, the consumption of Recon will be decreased proportionally more. If the price of Recon increases by 1%, then the quantity of Recon will be decreased by 1.872% in the East region and 1.571% in the West region.

The price elasticity for FCOJ is a slighter greater than the results of Ward and less than the result of Thilley(1980). Ward(1976)'s estimate showed that FCOJ elasticity was -0.5228 on a quarterly basis. The retail price elasticities for FCOJ were estimated to be -1.33 on a monthly basis.

Most elasticities of the print media and display ads have positive signs. The advertising enhances demands. Even though some of responses have negative signs, they are not statistically significant. The impact of ad is not big for the demand of that good but the magnitudes of elasticity do not indicate that the advertising is ineffective. The

insignificant elasticities indicate that the advertising does not affect demand in selected regions and orange juices type. Print media ads affect the demand of three types of OJ in the North region and display ads in the West region and have significant effects on all three types of OJ. In the East region, both print media and display ads significantly affect the demand for Recon.

Variations of own price and ad elasticities are shown in figure 1. FCOJ in the North region and Recon in the East region are located far from the others although the range for three types of OJ are not very different among regions; 0.433 for FCOJ, 0.421 for NFC, and 0.476 for Recon. Elasticities of print media and display ads for FCOJ have small distribution; its range is 0.028 for print media ads and 0.026 for display ads while elasticties of Recon have large distribution whose range is 0.205 for print media ads and 0.168 for display ads.

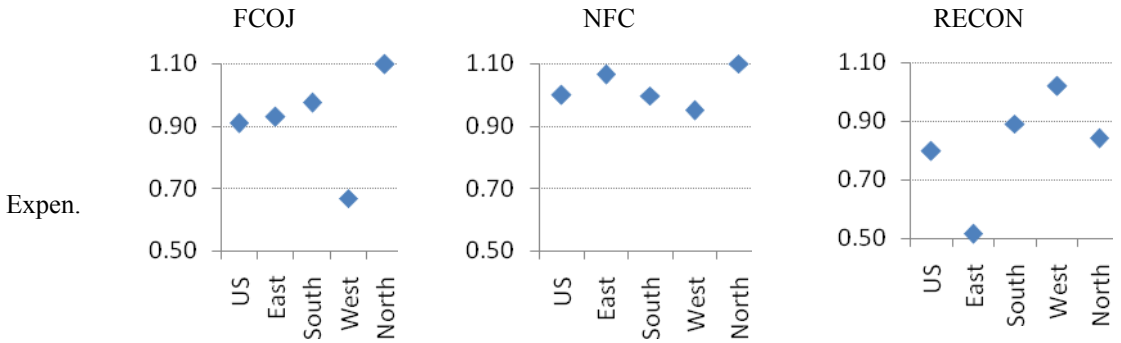
Comparing the elasticity change between the beginning and the ending weeks of sample periods, most of region increased the expenditure and uncompensated elasticities for FCOJ and Recon but decreased for NFC except for the East region (Table 3). Only in the East region, uncompensated elasticity of NFC was slightly increased from 1.199 to 1.226. Elasticities of print media and display ads for FCOJ were slightly increased in U.S., West and North. For NFC, both print media and display ads were not changed in most regions but elasticity of print media ads in the North region was decreased from 0.077 to 0.068. For Recon, elasticities for two different types of advertising were slightly increased in most regions except for the East region in which elasticities of print media and display ads were decreased from 0.161 to 0.122 and from 0.120 to 0.091

respectively.

Table 2. Expenditure and own price elasticity by region – 9/11/2004 through 6/2/2007

		US	East	South	West	North
Expenditure Elasticity	FCOJ	0.907** (0.08)	0.930** (0.095)	0.974** (0.127)	0.668** (0.124)	1.097** (0.08)
	NFC	0.999** (0.031)	1.064** (0.025)	0.997** (0.049)	0.949** (0.053)	1.099** (0.043)
	Recon	0.797** (0.051)	0.516** (0.14)	0.892** (0.107)	1.018** (0.056)	0.842** (0.059)
Compensated Price Elasticity	FCOJ	-0.792** (0.129)	-0.868** (0.149)	-0.929** (0.166)	-0.953** (0.13)	-1.243** (0.149)
	NFC	-0.882** (0.066)	-0.451** (0.037)	-1.029** (0.058)	-0.956** (0.081)	-1.170** (0.064)
	Recon	-1.236** (0.081)	-1.808** (0.183)	-1.128** (0.099)	-1.208** (0.073)	-1.243** (0.087)
Uncompensated Price Elasticity	FCOJ	-0.842** (0.129)	-0.897** (0.15)	-0.969** (0.167)	-1.006** (0.132)	-1.330** (0.147)
	NFC	-1.397** (0.065)	-1.212** (0.041)	-1.516** (0.062)	-1.358** (0.082)	-1.633** (0.07)
	Recon	-1.461** (0.079)	-1.872** (0.179)	-1.396** (0.083)	-1.571** (0.071)	-1.546** (0.081)
Print media Ad Elasticity	FCOJ	0.029** (0.009)	0.004 (0.011)	0.018** (0.009)	0.019** (0.009)	0.032** (0.009)
	NFC	0.031* (0.018)	0.022 (0.027)	0.004 (0.012)	0.005 (0.022)	0.083** (0.022)
	Recon	0.012 (0.02)	0.184** (0.046)	0.047** (0.02)	-0.021 (0.013)	0.085** (0.023)
In store Display Ad Elasticity	FCOJ	0.056** (0.01)	0.032 (0.02)	0.045** (0.015)	0.034** (0.006)	0.019** (0.009)
	NFC	-0.010 (0.017)	0.016 (0.017)	0.004 (0.015)	0.049* (0.026)	-0.003 (0.019)
	Recon	0.059** (0.023)	0.183** (0.063)	0.022 (0.027)	0.078** (0.019)	0.015 (0.017)

*(**) Statistically different form zero at α=0.1(0.05)
The numbers in parentheses are standard errors.



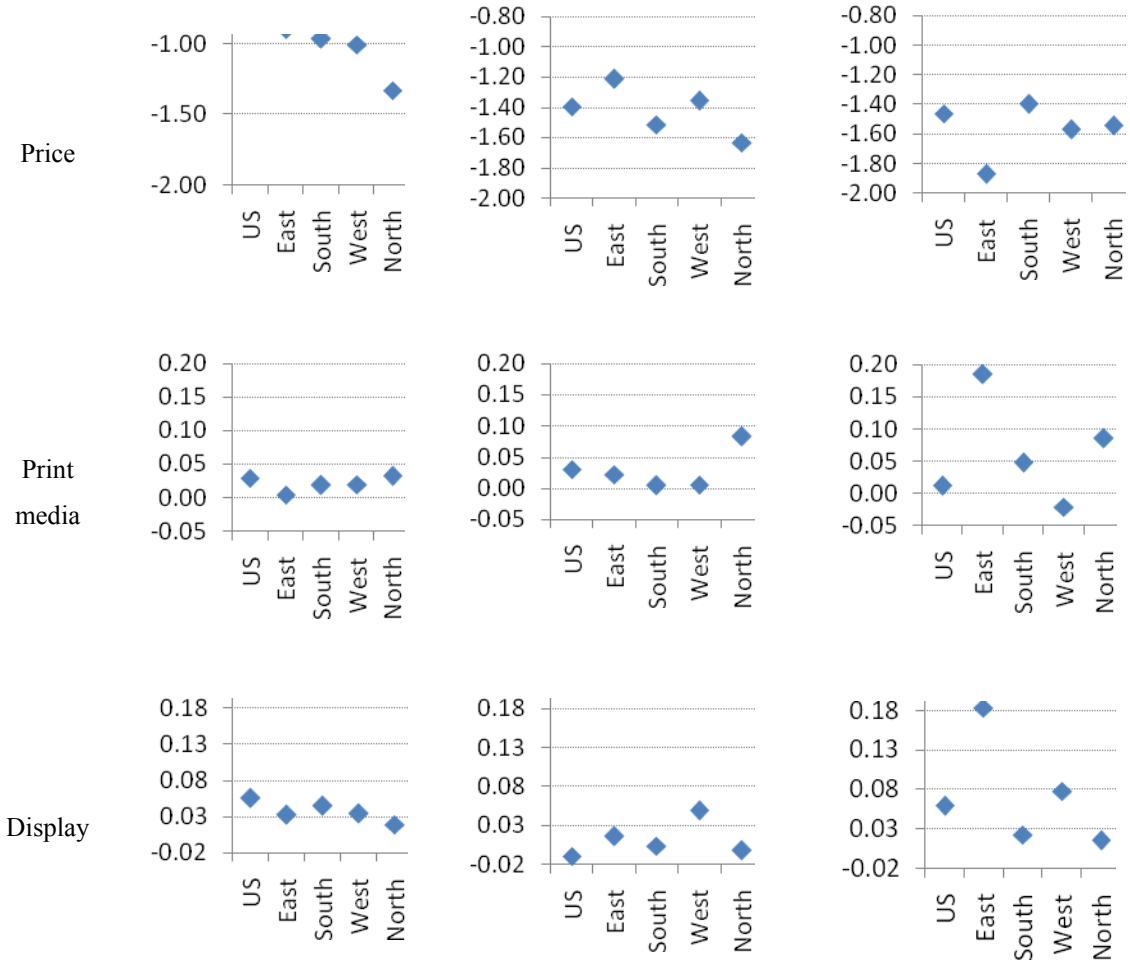


Figure 1. Elasticities variation

Table 3. Comparing own Elasticities between beginning and ending week

Region	OJ Types	Compensated elasticity		expenditure elasticity		Uncompensated elasticity		Print media elasticity		Display elasticity	
		Begin	End	Begin	End	Begin	End	Begin	End	Begin	End
US	FCOJ	-0.712	-0.780	0.816	0.894	-0.762	-0.830	0.025	0.028	0.049	0.054
	NFC	-0.882	-0.862	0.999	0.977	-1.397	-1.377	0.030	0.030	-0.010	-0.009
	Recon	-1.231	-1.341	0.794	0.865	-1.456	-1.566	0.011	0.013	0.058	0.063
East	FCOJ	-0.839	-0.849	0.899	0.910	-0.868	-0.878	0.003	0.003	0.011	0.011
	NFC	-0.437	-0.465	1.031	1.095	-1.199	-1.226	0.027	0.028	0.018	0.019
	Recon	-2.148	-1.626	0.612	0.464	-2.212	-1.690	0.161	0.122	0.120	0.091
South	FCOJ	-0.793	-0.827	0.831	0.867	-0.833	-0.867	0.009	0.009	0.021	0.022
	NFC	-1.048	-1.001	1.016	0.970	-1.536	-1.489	0.004	0.004	0.003	0.003
	Recon	-1.085	-1.238	0.858	0.979	-1.354	-1.506	0.043	0.049	0.018	0.020
West	FCOJ	-0.866	-1.002	0.607	0.702	-0.919	-1.056	0.022	0.026	0.045	0.052
	NFC	-0.987	-0.903	0.980	0.896	-1.389	-1.304	0.005	0.005	0.038	0.035
	Recon	-1.166	-1.353	0.983	1.140	-1.529	-1.715	-0.026	-0.030	0.073	0.085
North	FCOJ	-1.084	-1.242	0.956	1.095	-1.170	-1.328	0.039	0.045	0.027	0.031
	NFC	-1.233	-1.092	1.158	1.025	-1.696	-1.554	0.077	0.068	-0.003	-0.003
	Recon	-1.196	-1.391	0.810	0.942	-1.499	-1.694	0.085	0.099	0.024	0.028

Simulations of demand changes

Most of the simulation results on figures are based on the changes of quantity or dollar sales a range from 60% to 140% of average levels of prices, print media ad and in store display ad.

The prices decrease from 140% to 60% levels of the average price increase OJ demand. Consumptions of NFC increase 6,621 thousand gallons and Recon increase 5,193 thousand gallons in U.S. Demand responses are similar for the East and South regions and the West and North regions. In the East and South, the quantity changes of NFC are over 2,000 thousand gallons compared to the West and North. The quantity change of Recon is the greatest in the South in which the price elasticity is relatively in-elastic but the consumption of Recon is about 40%. Price cutting does not impact on

enhancing dollar sales of FCOJ for the most of regions except for the North. The dollar sale of NFC is higher than Recon in North but the quantity change of Recon is greater than NFC because NFC has more elastic price. Decreasing price returns more sales for FCOJ in the North, Recon in the West and NFC (Figure 2)

Visualized advertising has more effect on stimulating consumers to purchase FCOJ in U.S. The effect of display ad is double of print media for FCOJ. Display in store increases the consumption of Recon 206 thousand gallons a week by ad range from 60% to 140% of average. Whereas print media spurs increasing demand 143 thousand gallons a week. The display for NFC and print media for Recon do not statistically significant.

Figures from 4 to 6 show the average weekly gains in dollar sales and dollar sales per media unit across regions by media range $\pm 40\%$ of the average level by types. For FCOJ, display in store more impacts on increasing demand in the South and West while print media increases demand in North. The effect of display unit is absolutely greater than print media.

Most of the ad effects on demand of NFC are not statistically significant. Display in store enhances the demand of NFC in West and print media stimulates the demand of NFC to increase in the North. The effect of display unit is 12 thousand dollars in the West and the effect of print media unit is 7 thousand dollars.

The display in store impacts on increasing Recon demand in the East and the West and the print media affects increasing demand in the East, South and North. In the East, the change of dollar sales is 159 thousand dollars from the display in store and 214 thousand dollars from the print media.

Display in store has generally more effects on increasing demand than print media in most of regions and types of OJ but the print media has strong effects to enhancing demand of Recon in North in figure 7.

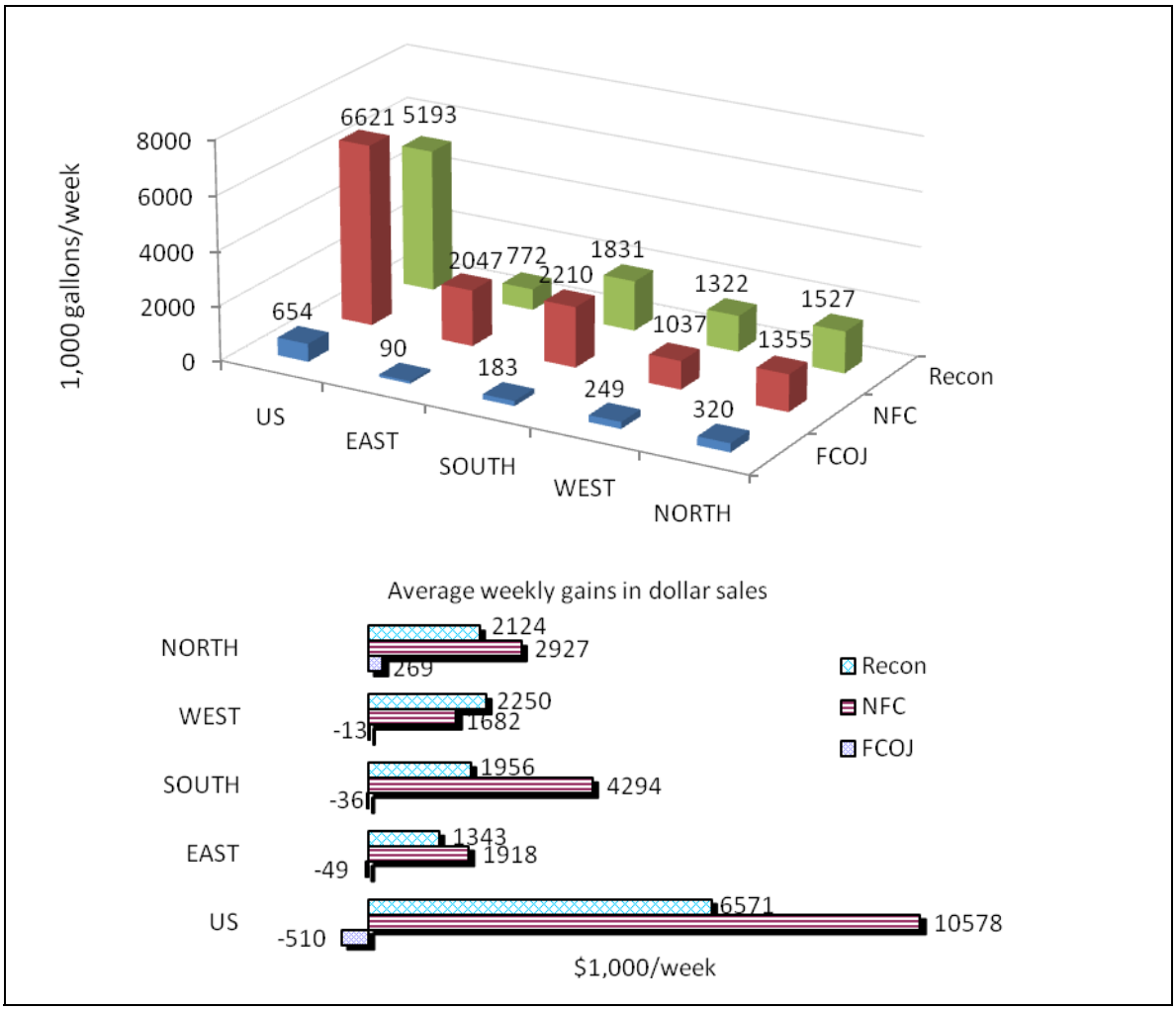


Figure 2. Impact of Price change

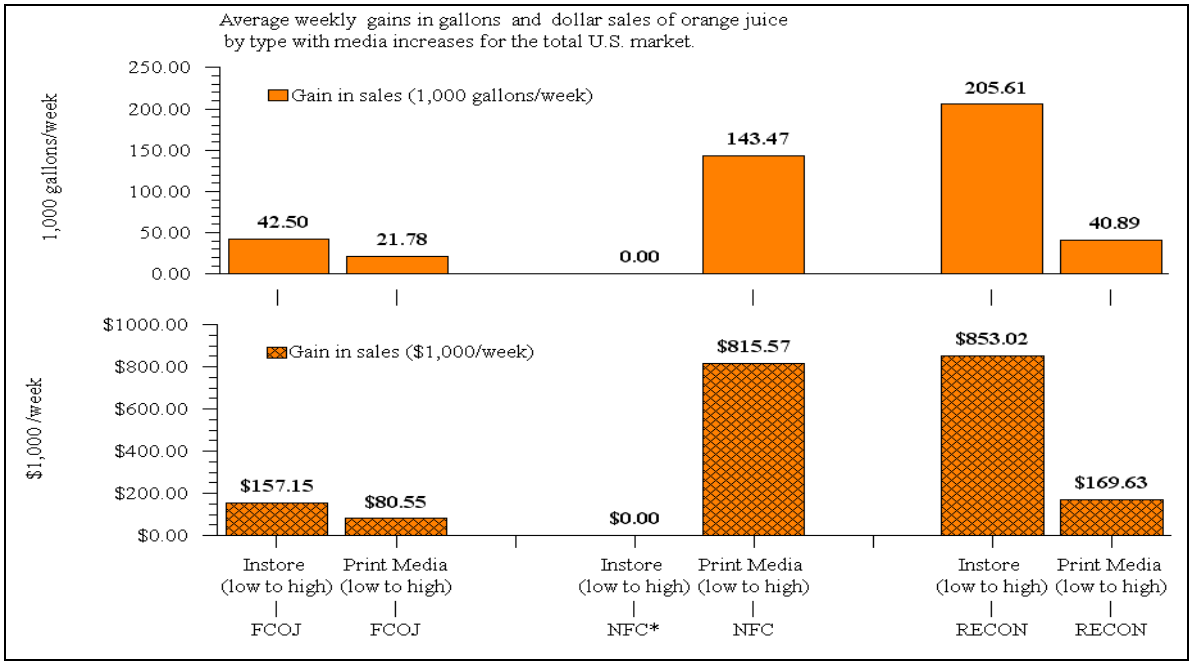


Figure 3. Impact of Ads on FCOJ in US

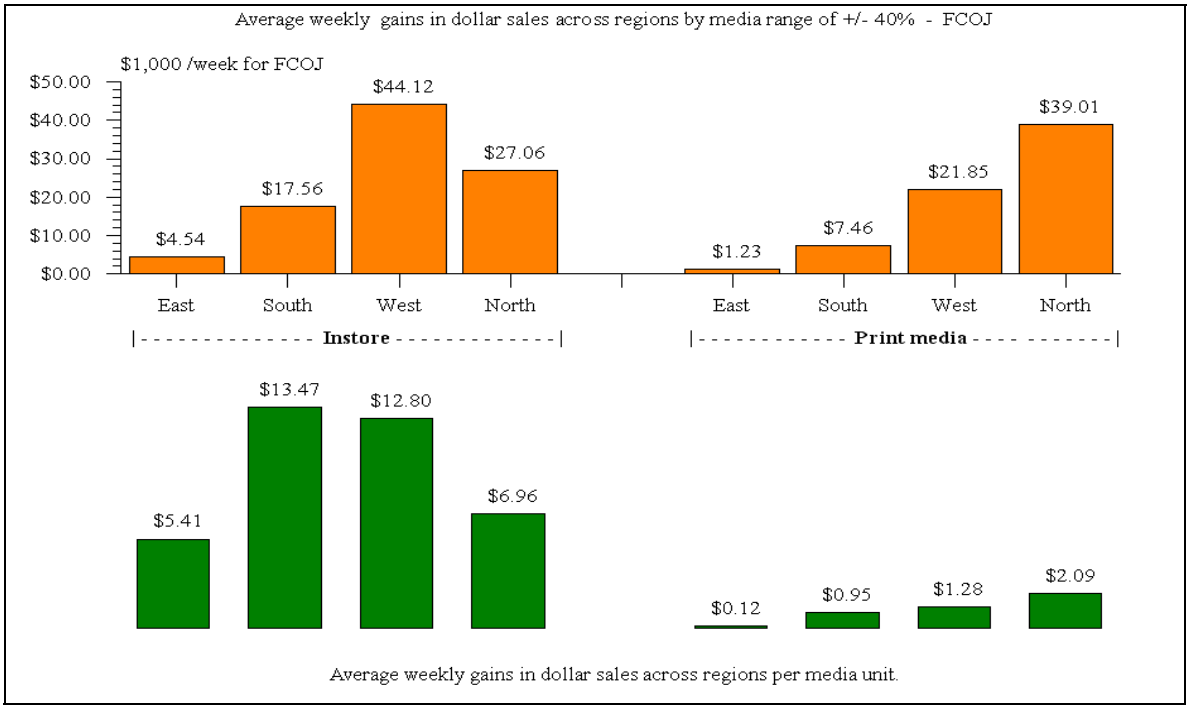


Figure 4. Impact of Ads on FCOJ across regions

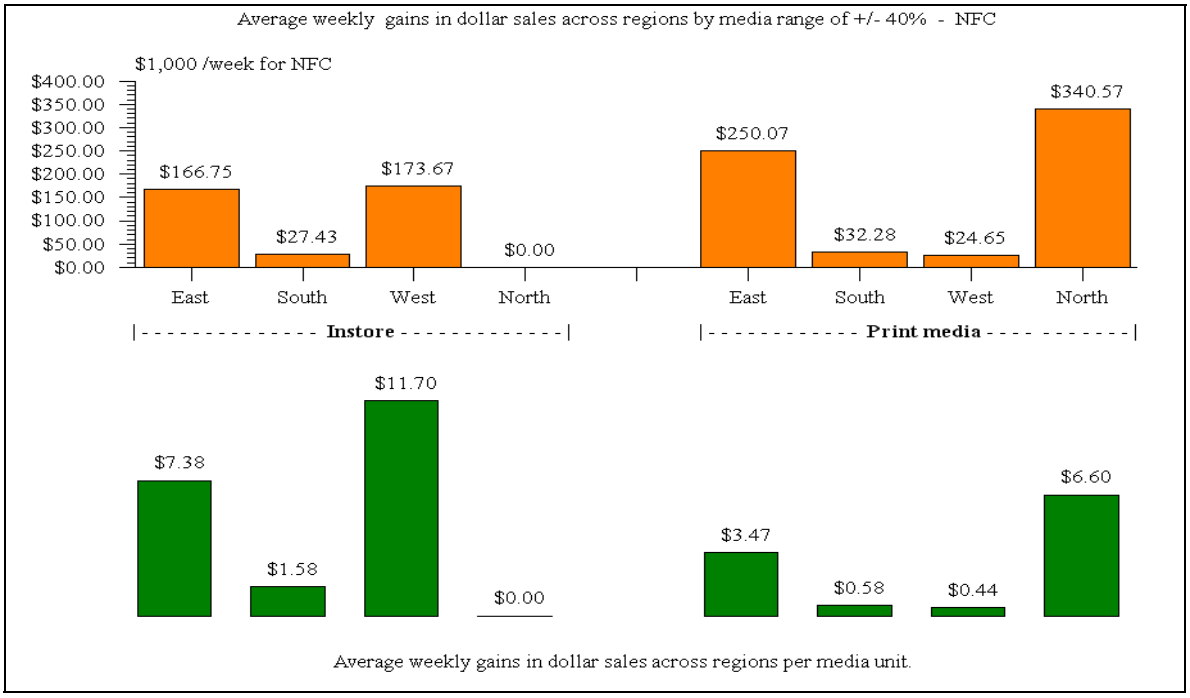


Figure 5. Impact of Ads on NFC across regions

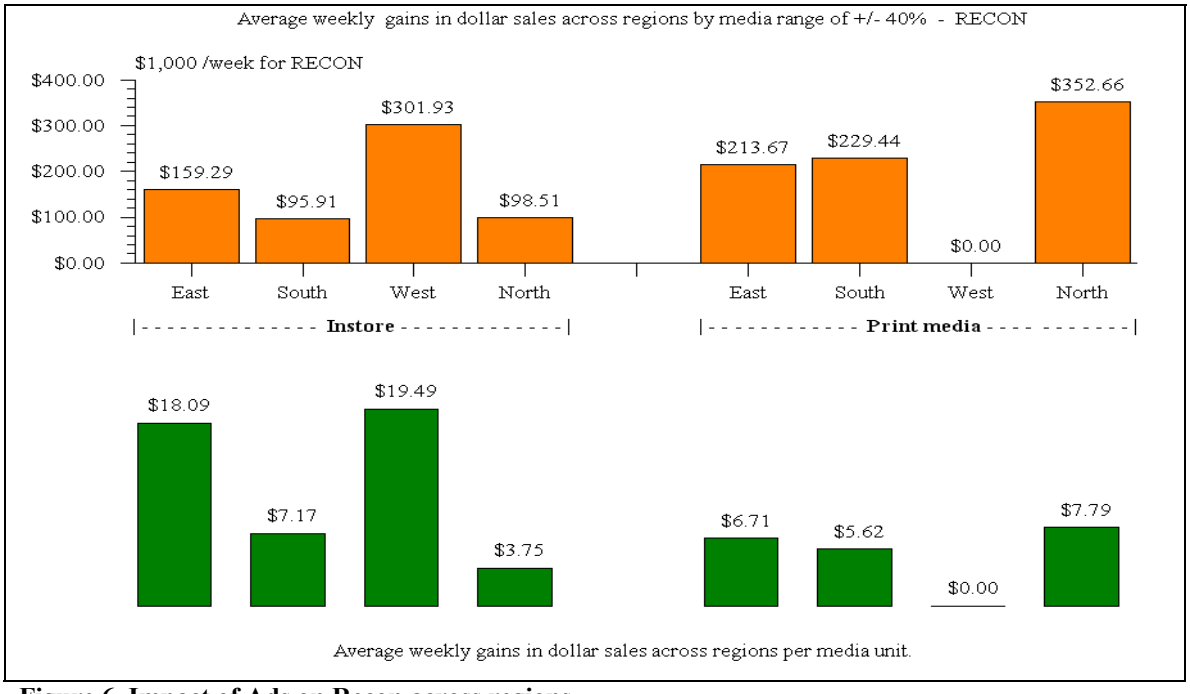


Figure 6. Impact of Ads on Recon across regions

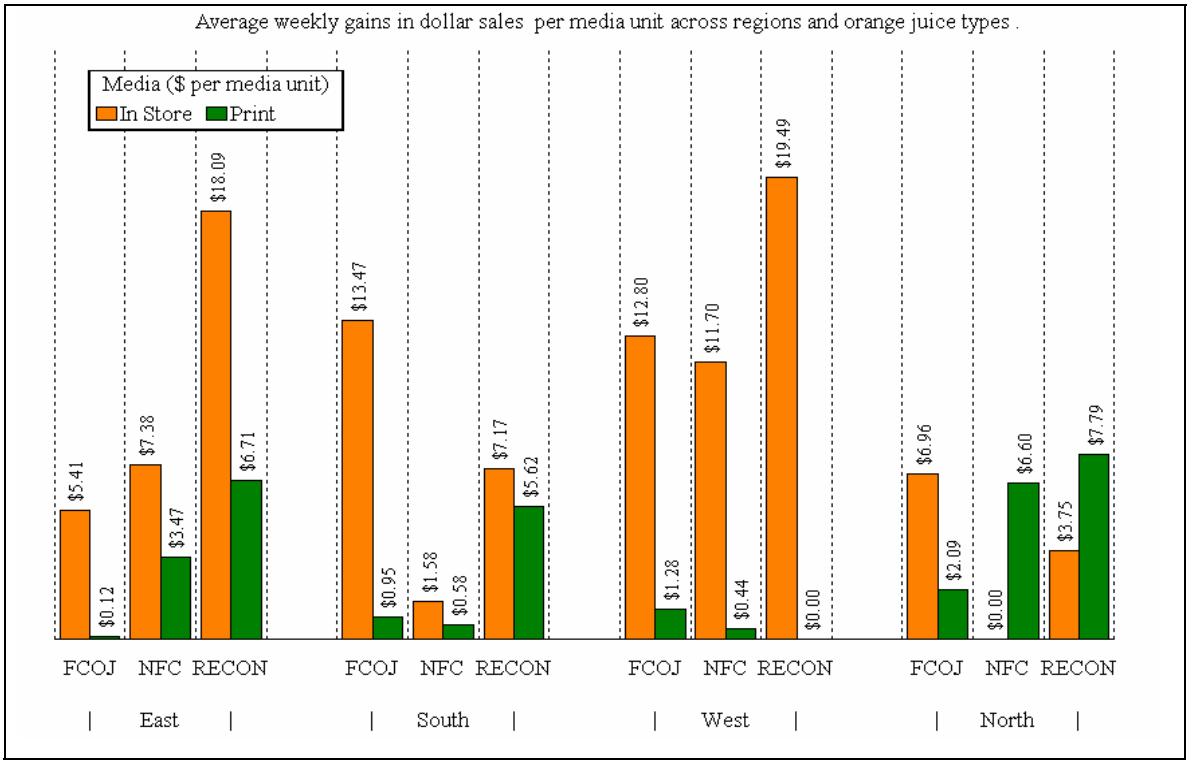


Figure 7. Average gains in dollar sales per media unit

Summary and Conclusion

The Rotterdam model with an advertising specification was used to estimate the different consumption patterns of various types of OJ by U.S region. The four regions are: East, South, West, and North. The study examined the demand relationship among three types of pure OJ (FCOJ, NFC, and Recon), three other fruit juice (GJ, OJ BL, and OJ drinks). Juice demand seasonality was corrected by 52nd differencing of weekly using scan track data provided by Nielsen for the periods from 9/11/2004 through 6/2/2007.

Results show that the three different types of OJ are normal goods and they are all substitute in the four regions. It has high own price elasticities since there exists various substitutes. When the price increased, NFC and Recon consumption will be decreased

more than the amount of price increase because most of the own price elasticity are greater than 1. Uncompensated elasticity for NFC is more price elastic than FCOJ with having income effect. Elasticities of advertising gave positive impacts for OJ demand. Especially, both types of ad highly affect the demand for Recon in East region. Print media and display ad significantly affect the OJ demand in the North and West regions respectively. The different types of advertising, print media and display, have been affected in the same direction of demand changes as a results of comparing to the elasticities between a beginning and ending points.

OJ demand will be increased from 249 gallons to 10,895 gallons by 10% increase advertising. Demand effect from two types of advertisings indicates various by types and regions. Display ads have more impact on FCOJ demand increase in the West and South regions and print ads have more impact on FCOJ demand increase in the North region, Recon demand increase in the East region. Advertising effect between print media and display ads may depend on the degree of marketing or sale strategy.

For the orange juice industry it is clear that the effects of in-store compared with print media shows substantial differences between the two advertising media as well as by product form and among regions. From these estimates considerable gains can be realized through a more micro-designed marketing strategy, focusing on both the product category and regions. This draft of the paper shows the differences, recognizing that these specific gains through reallocation of funds among regions and products is now shown.

References

Brown, M. “Demand of fruit juices: Market participation and quantity demanded.” Western Journal of Agricultural Economics 11 (1986):179 - 183.

Deaton A, Muellbauer J. “An Almost Ideal Demand System.” American Economic Review 70 (1980a): 312-26.

Mark G. Brown, and Jonq-Ying Lee “Alternative Specifications of Advertising in the Rotterdam model” European Review of Agricultural Economics 20 (1993): 419 - 436

Martyn H. Duffy. “Advertising and The Inter-Product Distribution of Demand; A Rotterdam Model Approach” European Economic Review 31 (1987): 1051 - 1070. North-Holland

____. “Measuring the Contribution of Advertising to Growth in Demand: An Econometric-Accounting Framework” International journal of Advertising 8 (1989): 95 - 110

Theil, H. “The Information Approach to Demand Analysis.” Econometrica 33 (1965): 67 - 87

William A. Barnett and Ousmane Seck. “Rotterdam vs Almost Ideal models: Will the Best Demand Specification Please Stand Up?” MPRA paper 417, University Library of Munich, Germany, 2006

Ward, Ronald W. and Daniel S. Tilley. “Time Varying Parameters with Random Components: The Orange Juice Industry.” Southern Journal of Agricultural Economics 12 (December 1980):5 - 13.

Ward, Ronald W. and Marsha Tilley. “Industry Concentration: A Case Study of Florida Citrus Processors.” Florida Dept. Citrus, Econ., unpublished paper. University of Florida, 1976

Table A1. Estimated results of US

	Marginal Share	Slutsky Coefficients						Print media ad Coefficients						Display ad Coefficients					
	μ_i	π_{i1}	π_{i2}	π_{i3}	π_{i4}	π_{i5}	π_{i6}	γ_{i1}	γ_{i2}	γ_{i3}	γ_{i4}	γ_{i5}	γ_{i6}	τ_{i1}	τ_{i2}	τ_{i3}	τ_{i4}	τ_{i5}	τ_{i6}
FCOJ	0.050^{**}	-0.044	0.007	0.032^{**}	-0.011^{**}	0.018^{**}	-0.003	$9.6\times10^{-}$	$-1.3\times10^{-4**}$	1.8×10^{-5}	2.1×10^{-5}	9.9×10^{-6}	$6.3\times10^{-5**}$	$1.0\times10^{-}$	3.0×10^{-5}	$-1.9\times10^{-4**}$	8.6×10^{-5}	$-2.4\times10^{-4*}$	$-3.5\times10^{-4**}$
	(0.004)	(0.007)	(0.008)	(0.007)	(0.003)	(0.005)	(0.003)	$(3.1\times10^{-}$	(2.9×10^{-5})	(2.5×10^{-5})	(2.8×10^{-5})	(2.2×10^{-5})	(1.9×10^{-5})	$(1.9\times10^{-}$	(8.1×10^{-5})	(8.2×10^{-5})	(1.4×10^{-4})	(1.4×10^{-4})	(5.1×10^{-5})
NFC	0.515^{**}		-0.455	0.269^{**}	0.023^{**}	0.031^{**}	0.125^{**}	-2.1×10^{-4}	$2.2\times10^{-}$	-3.5×10^{-5}	$3.5\times10^{-4**}$	7.0×10^{-5}	7.3×10^{-5}	$-2.2\times10^{-3**}$	$-2.0\times10^{-}$	$-1.2\times10^{-3**}$	4.8×10^{-4}	2.5×10^{-4}	8.0×10^{-5}
	(0.016)		(0.034)	(0.025)	(0.005)	(0.008)	(0.013)	(1.3×10^{-4})	$(1.3\times10^{-}$	(1.1×10^{-4})	(1.2×10^{-4})	(9.5×10^{-5})	(8.4×10^{-5})	(8.3×10^{-4})	$(3.5\times10^{-}$	(3.6×10^{-4})	(6.1×10^{-4})	(6.2×10^{-4})	(2.1×10^{-4})
Recon	0.225^{**}			-0.349	0.011^{**}	0.028^{**}	0.008	5.0×10^{-5}	$-3.2\times10^{-4**}$	$6.0\times10^{-}$	$-2.9\times10^{-4**}$	-2.0×10^{-5}	-7.6×10^{-5}	$3.9\times10^{-3**}$	-3.2×10^{-4}	$8.3\times10^{-}$	-1.6×10^{-4}	-6.6×10^{-4}	$-7.6\times10^{-4**}$
	(0.014)			(0.023)	(0.004)	(0.006)	(0.011)	(1.2×10^{-4})	(1.2×10^{-4})	$(1.0\times10^{-}$	(1.1×10^{-4})	(8.6×10^{-5})	(7.6×10^{-5})	(7.5×10^{-4})	(3.1×10^{-4})	$(3.2\times10^{-}$	(5.5×10^{-4})	(5.6×10^{-4})	(1.9×10^{-4})
GJ	0.043^{**}				-0.042	0.012^{**}	0.006^{**}	1.8×10^{-5}	-1.3×10^{-5}	1.7×10^{-6}	$4.7\times10^{-}$	-3.0×10^{-6}	4.0×10^{-7}	2.0×10^{-4}	$1.2\times10^{-4**}$	$8.1\times10^{-5*}$	2.4×10	7.7×10^{-5}	$-9.5\times10^{-5**}$
	(0.003)				(0.003)	(0.003)	(0.002)	(1.8×10^{-5})	(1.7×10^{-5})	(1.5×10^{-5})	$(1.7\times10^{-}$	(1.3×10^{-5})	(1.1×10^{-5})	(1.3×10^{-4})	(4.8×10^{-5})	(4.9×10^{-5})	$(9.2\times10^{-}$	(8.5×10^{-5})	(3.3×10^{-5})
OJ BL	0.037^{**}					-0.090	0.000	5.4×10^{-6}	-7.1×10^{-6}	-1.8×10^{-5}	-3.9×10^{-5}	$1.4\times10^{-}$	-1.0×10^{-5}	$5.3\times10^{-4**}$	1.0×10^{-4}	$1.8\times10^{-4**}$	1.0×10^{-4}	$4.1\times10^{-}$	-6.7×10^{-5}
	(0.005)					(0.007)	(0.003)	(2.8×10^{-5})	(2.7×10^{-5})	(2.3×10^{-5})	(2.5×10^{-5})	$(2.0\times10^{-}$	(1.7×10^{-5})	(1.8×10^{-4})	(7.4×10^{-5})	(7.4×10^{-5})	(1.3×10^{-4})	$(1.3\times10^{-}$	(4.7×10^{-5})
OJ Dr	0.130^{**}						-0.157	4.0×10^{-5}	$2.5\times10^{-4**}$	-2.6×10^{-5}	-8.9×10^{-5}	-7.1×10^{-5}	$-5.0\times10^{-}$	$-3.5\times10^{-3**}$	2.7×10^{-4}	3.1×10^{-4}	$-7.5\times10^{-4*}$	1.6×10^{-4}	$1.2\times10^{-}$
	(0.011)						(0.01)	(9.1×10^{-5})	(9.0×10^{-5})	(7.9×10^{-5})	(8.8×10^{-5})	(6.8×10^{-5})	$(6.0\times10^{-}$	(5.6×10^{-4})	(2.5×10^{-4})	(2.6×10^{-4})	(4.3×10^{-4})	(4.4×10^{-4})	$(1.5\times10^{-}$

*(**) Statistically different form zero at α=0.1(0.05)
The numbers in parentheses are standard errors.

Table A2. Estimated results of East

	Marginal Share	Slutsky Coefficients	Print media ad Coefficients	Display ad Coefficients

	μ_i	π_{i1}	π_{i2}	π_{i3}	π_{i4}	π_{i5}	π_{i6}	γ_{i1}	γ_{i2}	γ_{i3}	γ_{i4}	γ_{i5}	γ_{i6}	τ_{i1}	τ_{i2}	τ_{i3}	τ_{i4}	τ_{i5}	τ_{i6}
FCOJ	0.029**	-0.027	0.024**	0.002	-0.006**	0.004	0.004	7.3×10^{-5}	4.4×10^{-6}	5.7×10^{-6}	1.7×10^{-5}	1.3×10^{-5}	4.1×10^{-6}	3.4×10^{-3}	-1.0×10^{-4}	-1.7×10^{-5}	$1.8\times10^{-4**}$	$-1.7\times10^{-4**}$	$-5.4\times10^{-5*}$
	(0.003)	(0.005)	(0.005)	(0.004)	(0.002)	(0.003)	(0.004)	(2.0×10^{-4})	(3.8×10^{-5})	(1.6×10^{-5})	(1.9×10^{-5})	(1.5×10^{-5})	(1.4×10^{-5})	(2.1×10^{-3})	(7.0×10^{-5})	(5.7×10^{-5})	(7.4×10^{-5})	(8.5×10^{-5})	(3.2×10^{-5})
NFC	0.761**		-0.323	0.180**	0.024**	0.050**	0.045**	-2.1×10^{-4}	2.2×10^{-4}	$-3.9\times10^{-4**}$	1.6×10^{-4}	-5.1×10^{-5}	$-1.6\times10^{-4*}$	1.0×10^{-3}	4.6×10^{-4}	$-9.0\times10^{-4**}$	3.2×10^{-5}	-4.2×10^{-4}	$-3.8\times10^{-4*}$
	(0.018)		(0.026)	(0.022)	(0.004)	(0.005)	(0.012)	(1.4×10^{-4})	(2.7×10^{-4})	(1.1×10^{-4})	(1.2×10^{-4})	(1.0×10^{-4})	(9.9×10^{-5})	(1.4×10^{-3})	(4.8×10^{-4})	(4.0×10^{-4})	(4.9×10^{-4})	(5.9×10-04)	(2.0×10^{-4})
Recon	0.064**			-0.274	0.003	0.007*	0.033**	8.0×10^{-5}	-2.7×10^{-4}	4.2×10^{-4}	-1.8×10^{-5}	3.5×10^{-5}	$2.2\times10^{-4**}$	-4.1×10^{-4}	-3.8×10^{-4}	1.1×10^{-4}	-1.8×10^{-5}	-2.2×10^{-4}	-2.8×10^{-4}
	(0.017)			(0.023)	(0.003)	(0.004)	(0.01)	(1.4×10^{-4})	(2.6×10^{-4})	(1.1×10^{-4})	(1.2×10^{-4})	(9.8×10^{-5})	(9.7×10^{-5})	(1.4×10^{-3})	(4.7×10^{-4})	(3.9×10^{-4})	(4.8×10^{-4})	(5.8×10^{-4})	(2.0×10^{-4})
GJ	0.037**				-0.042	0.007**	0.015**	-1.6×10^{-5}	3.0×10^{-5}	-8.4×10^{-6}	2.4×10^{-4}	-1.2×10^{-5}	-6.8×10^{-4}	1.9×10^{-5}	-1.1×10^{-5}	5.3×10^{-5}	8.4×10^{-4}	9.8×10^{-5}	3.0×10^{-5}
	(0.002)				(0.002)	(0.002)	(0.003)	(1.6×10^{-5})	(3.1×10^{-5})	(1.3×10^{-5})	(1.8×10^{-4})	(1.2×10^{-5})	(1.2×10^{-5})	(1.7×10^{-4})	(5.6×10^{-5})	(4.6×10^{-5})	(6.1×10^{-4})	(6.9×10^{-5})	(2.7×10^{-5})
OJ BL	0.047**					-0.079	0.012**	8.9×10^{-6}	2.9×10^{-5}	-7.4×10^{-6}	-4.1×10^{-6}	5.0×10^{-4}	$-3.2\times10^{-5**}$	-7.3×10^{-5}	$-1.4\times10^{-4*}$	3.5×10^{-5}	$1.5\times10^{-4*}$	9.1×10^{-4}	$1.6\times10^{-4**}$
	(0.003)					(0.004)	(0.004)	(2.2×10^{-5})	(4.1×10^{-5})	(1.7×10^{-5})	(2.1×10^{-5})	(1.8×10^{-4})	(1.6×10^{-5})	(2.3×10^{-4})	(7.5×10^{-5})	(6.2×10^{-5})	(7.9×10^{-5})	(9.4×10^{-4})	(3.6×10^{-5})
OJ Dr	0.062**						-0.109	$1.3\times10^{-4**}$	-1.2×10^{-5}	-2.1×10^{-5}	$-1.8\times10^{-4**}$	-3.6×10^{-5}	-2.3×10^{-4}	-9.1×10^{-4}	1.7×10^{-4}	$-3.0\times10^{-4*}$	$-4.3\times10^{-4**}$	$6.2\times10^{-4**}$	5.3×10^{-4}
	(0.009)						(0.012)	(6.1×10^{-5})	(1.2×10^{-4})	(4.8×10^{-5})	(5.6×10^{-5})	(4.4×10^{-5})	(4.3×10^{-4})	(6.4×10^{-4})	(2.1×10^{-4})	(1.7×10^{-4})	(2.2×10^{-4})	(2.6×10^{-4})	(9.1×10^{-4})

*(**) Statistically different form zero at α=0.1(0.05)
The numbers in parentheses are standard errors.

Table A3. Estimated results of South

	Marginal Share	Slutsky Coefficients						Print media ad Coefficients						Display ad Coefficients					
	μ_i	π_{i1}	π_{i2}	π_{i3}	π_{i4}	π_{i5}	π_{i6}	γ_{i1}	γ_{i2}	γ_{i3}	γ_{i4}	γ_{i5}	γ_{i6}	τ_{i1}	τ_{i2}	τ_{i3}	τ_{i4}	τ_{i5}	τ_{i6}
FCOJ	0.040**	-0.038	0.028**	0.023**	-0.016**	0.011**	-0.008*	4.3×10^{-4}	-9.2×10^{-6}	-5.1×10^{-6}	1.7×10^{-5}	$2.6\times10^{-5*}$	$3.3\times10^{-5**}$	6.3×10^{-3}	$-1.0\times10^{-4*}$	2.1×10^{-5}	$2.9\times10^{-4**}$	-8.2×10^{-5}	$-2.3\times10^{-4**}$
	(0.005)	(0.007)	(0.006)	(0.006)	(0.003)	(0.004)	(0.004)	(2.2×10^{-4})	(1.5×10^{-5})	(1.5×10^{-5})	(1.9×10^{-5})	(1.5×10^{-5})	(1.3×10^{-5})	(2.1×10^{-3})	(5.5×10^{-5})	(5.6×10^{-5})	(1.0×10^{-4})	(1.2×10^{-4})	(3.5×10^{-5})

NFC	0.487**		-0.303	0.300**	0.017**	0.047**	0.111**	3.3×10^{-5}	2.7×10^{-5}	-9.7×10^{-5}	-7.2×10^{-6}	$1.5\times10^{-4**}$	-9.1×10^{-5}	-5.5×10^{-4}	7.4×10^{-5}	-2.8×10^{-4}	$8.7\times10^{-4*}$	9.9×10^{-4}	2.9×10^{-4}
	(0.024)		(0.028)	(0.024)	(0.005)	(0.007)	(0.016)	(1.2×10^{-4})	(8.1×10^{-5})	(8.3×10^{-5})	(1.0×10^{-4})	(8.2×10^{-5})	(7.0×10^{-5})	(1.1×10^{-4})	(5.0×10^{-5})	(3.1×10^{-4})	(5.1×10^{-4})	(6.2×10^{-4})	(1.8×10^{-4})
Recon	0.268**			-0.339	0.017**	0.002	-0.003	2.4×10^{-5}	9.2×10^{-5}	2.6×10^{-5}	-2.2×10^{-4}	-1.3×10^{-4}	7.3×10^{-5}	$4.6\times10^{-3**}$	$-1.1\times10^{-3**}$	3.4×10^{-5}	9.8×10^{-4}	4.1×10^{-5}	$-1.0\times10^{-3**}$
	(0.032)			(0.03)	(0.004)	(0.005)	(0.019)	(1.6×10^{-4})	(1.1×10^{-4})	(1.1×10^{-4})	(1.3×10^{-4})	(1.1×10^{-4})	(9.2×10^{-5})	(1.4×10^{-3})	(4.0×10^{-4})	(4.1×10^{-5})	(6.7×10^{-4})	(8.2×10^{-4})	(2.3×10^{-4})
GJ	0.044**				-0.046	0.022**	0.005	$3.4\times10^{-5*}$	$-2.4\times10^{-5*}$	1.9×10^{-5}	4.3×10^{-5}	$2.3\times10^{-5*}$	1.5×10^{-5}	$7.1\times10^{-4**}$	2.7×10^{-5}	6.6×10^{-5}	2.3×10^{-5}	3.0×10^{-6}	$-1.4\times10^{-4**}$
	(0.005)				(0.003)	(0.003)	(0.004)	(1.9×10^{-5})	(1.3×10^{-5})	(1.3×10^{-5})	(1.7×10^{-5})	(1.3×10^{-5})	(1.1×10^{-5})	(1.9×10^{-4})	(4.8×10^{-5})	(4.9×10^{-5})	(9.3×10^{-5})	(1.0×10-04)	(3.2×10^{-5})
OJ BL	0.035**					-0.083	0.000	2.3×10^{-5}	1.1×10^{-6}	$-5.3\times10^{-5**}$	$5.0\times10^{-5**}$	-9.9×10^{-6}	$-2.3\times10^{-5*}$	$-8.2\times10^{-4**}$	$1.0\times10^{-4*}$	$1.0\times10^{-4*}$	2.6×10^{-5}	4.9×10^{-6}	-5.2×10^{-5}
	(0.006)					(0.006)	(0.004)	(2.4×10^{-5})	(1.7×10^{-5})	(1.7×10^{-5})	(2.1×10^{-5})	(1.7×10^{-5})	(1.4×10^{-5})	(2.3×10^{-4})	(6.1×10^{-5})	(6.1×10^{-5})	(1.1×10^{-4})	(1.3×10^{-5})	(3.8×10^{-5})
OJ Dr	0.125**						-0.106	-1.6×10^{-4}	-8.7×10^{-5}	-1.3×10^{-4}	1.2×10^{-4}	-6.4×10^{-5}	-7.4×10^{-5}	$-4.6\times10^{-3**}$	$9.8\times10^{-4**}$	-2.5×10^{-4}	$-2.4\times10^{-3**}$	$-1.4\times10^{-3**}$	1.2×10^{-4}
	(0.026)						(0.018)	(1.2×10^{-4})	(8.3×10^{-5})	(8.4×10^{-5})	(1.0×10^{-4})	(8.3×10^{-5})	(7.2×10^{-5})	(1.1×10^{-3})	(3.1×10^{-4})	(3.2×10^{-4})	(5.3×10^{-4})	(6.4×10^{-4})	(1.8×10^{-4})

*(**) Statistically different form zero at α=0.1(0.05)
The numbers in parentheses are standard errors.

Table A4. Estimated results of West

	Marginal Share	Slutsky Coefficients						Print media ad Coefficients						Display ad Coefficients					
	μ_i	π_{i1}	π_{i2}	π_{i3}	π_{i4}	π_{i5}	π_{i6}	γ_{i1}	γ_{i2}	γ_{i3}	γ_{i4}	γ_{i5}	γ_{i6}	τ_{i1}	τ_{i2}	τ_{i3}	τ_{i4}	τ_{i5}	τ_{i6}
FCOJ	0.053**	-0.076	0.003	0.032**	0.003	0.032**	0.006	9.1×10^{-6}	$-9.2\times10^{-5*}$	3.4×10^{-5}	5.5×10^{-5}	2.0×10^{-5}	2.2×10^{-5}	9.1×10^{-6}	-4.6×10^{-6}	$-2.7\times10^{-4**}$	-1.0×10^{-4}	1.1×10^{-4}	$-2.9\times10^{-4**}$
	(0.01)	(0.01)	(0.013)	(0.011)	(0.004)	(0.005)	(0.004)	(4.1×10^{-5})	(5.3×10^{-5})	(3.9×10^{-5})	(4.9×10^{-5})	(3.3×10^{-5})	(2.9×10^{-5})	(1.7×10^{-5})	(1.8×10^{-4})	(1.6×10^{-4})	(2.4×10^{-4})	(2.7×10^{-4})	(8.4×10^{-5})
NFC	0.401**		-0.404	0.304**	-0.006	0.024**	0.079**	-1.6×10^{-4}	3.1×10^{-5}	3.6×10^{-5}	$2.5\times10^{-4**}$	-2.6×10^{-5}	1.0×10^{-4}	$-2.5\times10^{-3**}$	8.3×10^{-5}	$-7.9\times10^{-4**}$	$-1.3\times10^{-3**}$	6.0×10^{-4}	$1.0\times10^{-3**}$
	(0.022)		(0.034)	(0.027)	(0.006)	(0.008)	(0.008)	(9.5×10^{-5})	(1.3×10^{-5})	(9.6×10^{-5})	(1.2×10^{-4})	(8.0×10^{-5})	(7.2×10^{-5})	(4.1×10^{-4})	(4.4×10^{-5})	(3.9×10^{-4})	(5.8×10^{-4})	(6.5×10^{-4})	(2.0×10^{-4})
Recon	0.363**			-0.430	0.026**	0.039**	0.030**	9.0×10^{-5}	-3.1×10^{-6}	-1.4×10^{-4}	$-2.7\times10^{-4**}$	1.4×10^{-5}	$-1.6\times10^{-4**}$	$1.3\times10^{-3**}$	-3.3×10^{-4}	1.4×10^{-4}	$1.7\times10^{-3**}$	$-9.9\times10^{-4*}$	$-1.0\times10^{-3**}$

	(0.02)			(0.028)	(0.005)	(0.007)	(0.007)	(8.5×10^{-5})	(1.1×10^{-4})	(8.3×10^{-5})	(1.0×10^{-4})	(7.1×10^{-5})	(6.4×10^{-5})	(3.6×10^{-4})	(3.9×10^{-4})	(3.3×10^{-5})	(5.1×10^{-4})	(5.8×10^{-4})	(1.8×10^{-4})
GJ	0.046**				-0.038	0.008**	0.006**	-8.4×10^{-7}	1.3×10^{-5}	2.3×10^{-5}	1.9×10^{-5}	1.4×10^{-6}	9.0×10^{-6}	$1.6\times10^{-4**}$	-5.8×10^{-5}	4.7×10^{-8}	2.4×10^{-5}	1.2×10^{-4}	$-1.0\times10^{-4**}$
	(0.004)				(0.004)	(0.003)	(0.002)	(1.5×10^{-5})	(1.9×10^{-5})	(1.4×10^{-5})	(1.8×10^{-5})	(1.2×10^{-5})	(1.0×10^{-5})	(6.5×10^{-5})	(6.5×10^{-5})	(5.9×10^{-5})	(9.3×10^{-5})	(9.7×10^{-5})	(3.3×10^{-5})
OJ BL	0.032**					-0.102	-0.001	-3.3×10^{-5}	$-6.4\times10^{-5**}$	2.2×10^{-5}	2.5×10^{-5}	3.3×10^{-5}	5.9×10^{-7}	$5.6\times10^{-4**}$	-1.2×10^{-4}	$-2.6\times10^{-4**}$	$-4.5\times10^{-4**}$	2.8×10^{-5}	$-1.1\times10^{-4**}$
	(0.006)					(0.006)	(0.003)	(2.4×10^{-5})	(3.2×10^{-5})	(2.3×10^{-5})	(2.9×10^{-5})	(2.1×10^{-5})	(1.8×10^{-5})	(1.0×10^{-4})	(1.1×10^{-4})	(9.8×10^{-5})	(1.5×10^{-4})	(1.6×10^{-5})	(5.1×10^{-5})
OJ Dr	0.105**						-0.120	9.4×10^{-6}	$1.2\times10^{-4**}$	2.3×10^{-5}	$-8.1\times10^{-5*}$	-4.3×10^{-5}	2.6×10^{-5}	$-4.4\times10^{-4**}$	$-3.2\times10^{-4**}$	-6.8×10^{-5}	-1.3×10^{-4}	-9.2×10^{-5}	5.2×10^{-5}
	(0.008)						(0.004)	(3.5×10^{-5})	(4.7×10^{-5})	(3.5×10^{-5})	(4.3×10^{-5})	(2.9×10^{-5})	(2.6×10^{-5})	(1.5×10^{-4})	(1.6×10^{-4})	(1.4×10^{-4})	(2.1×10^{-4})	(2.4×10^{-4})	(7.3×10^{-5})

*(**) Statistically different form zero at α=0.1(0.05)
The numbers in parentheses are standard errors.

Table A5. Estimated results of North

	Marginal Share	Slutsky Coefficients						Print media ad Coefficients						Display ad Coefficients					
	μ_i	π_{i1}	π_{i2}	π_{i3}	π_{i4}	π_{i5}	π_{i6}	γ_{i1}	γ_{i2}	γ_{i3}	γ_{i4}	γ_{i5}	γ_{i6}	τ_{i1}	τ_{i2}	τ_{i3}	τ_{i4}	τ_{i5}	τ_{i6}
FCOJ	0.086**	-0.098	0.047**	0.065**	-0.019**	0.004	0.000	1.5×10^{-5}	$-1.3\times10^{-4**}$	5.8×10^{-5}	-3.9×10^{-5}	3.3×10^{-5}	4.6×10^{-5}	5.0×10^{-5}	1.5×10^{-4}	-1.0×10^{-4}	$3.2\times10^{-4**}$	$-5.5\times10^{-4**}$	$-1.8\times10^{-4**}$
	(0.006)	(0.012)	(0.01)	(0.009)	(0.004)	(0.006)	(0.007)	(4.2×10^{-5})	(3.8×10^{-5})	(3.9×10^{-5})	(4.7×10^{-5})	(2.7×10^{-5})	(3.0×10^{-5})	(2.4×10^{-5})	(9.7×10^{-5})	(8.2×10^{-5})	(1.6×10^{-4})	(1.4×10^{-4})	(6.6×10^{-5})
NFC	0.462**		-0.492	0.297**	0.034**	0.027**	0.087**	-1.5×10^{-4}	4.8×10^{-5}	$-4.3\times10^{-4**}$	-7.2×10^{-5}	3.3×10^{-5}	$1.7\times10^{-4*}$	$-2.4\times10^{-3**}$	-4.3×10^{-5}	$-6.3\times10^{-4**}$	$1.4\times10^{-3**}$	-4.4×10^{-4}	1.3×10^{-4}
	(0.018)		(0.027)	(0.027)	(0.004)	(0.006)	(0.013)	(1.4×10^{-4})	(1.3×10^{-5})	(1.3×10^{-4})	(1.6×10^{-4})	(9.1×10^{-5})	(1.0×10^{-4})	(7.8×10^{-4})	(3.2×10^{-5})	(2.7×10^{-4})	(4.8×10^{-4})	(4.6×10^{-4})	(2.0×10^{-4})
Recon	0.303**			-0.447	0.012**	0.040**	0.033**	1.7×10^{-5}	$-4.2\times10^{-4**}$	5.6×10^{-5}	-3.5×10^{-5}	-4.1×10^{-5}	$-2.0\times10^{-4*}$	$1.9\times10^{-3**}$	-4.4×10^{-4}	2.7×10^{-5}	$-9.2\times10^{-4*}$	-2.0×10^{-4}	$-6.6\times10^{-4**}$
	(0.021)			(0.031)	(0.004)	(0.005)	(0.014)	(1.6×10^{-4})	(1.5×10^{-4})	(1.5×10^{-5})	(1.8×10^{-4})	(1.1×10^{-4})	(1.2×10^{-4})	(9.0×10^{-4})	(3.7×10^{-4})	(3.1×10^{-5})	(5.6×10^{-4})	(5.3×10^{-4})	(2.3×10^{-4})
GJ	0.036**				-0.042	-0.001	0.016**	-1.3×10^{-5}	-1.3×10^{-5}	$-2.7\times10^{-5*}$	1.3×10^{-5}	-8.5×10^{-6}	-8.2×10^{-6}	1.2×10^{-4}	$1.1\times10^{-4**}$	$1.2\times10^{-4**}$	2.4×10^{-5}	6.6×10^{-5}	1.9×10^{-5}
	(0.003)				(0.002)	(0.003)	(0.003)	(1.7×10^{-5})	(1.5×10^{-5})	(1.6×10^{-5})	(1.9×10^{-5})	(1.1×10^{-5})	(1.2×10^{-5})	(9.5×10^{-5})	(3.9×10^{-5})	(3.3×10^{-5})	(7.1×10^{-5})	(5.9×10^{-5})	(2.9×10^{-5})

OJ BL	0.037**					-0.085	0.015**	-3.8×10-5	-4.7×10-5**	-6.7×10-6	-7.0×10-5**	5.7×10	-5.7×10-6	1.9×10-4	1.1×10-4*	1.4×10-4**	2.4×10-4**	2.0×10	6.2×10-5
	(0.004)					(0.006)	(0.004)	(2.5×10-5)	(2.3×10-5)	(2.4×10-5)	(2.9×10-5)	(1.7×10-)	(1.8×10-5)	(1.4×10-4)	(5.9×10-5)	(5.0×10-5)	(9.7×10-5)	(8.7×10-)	(4.3×10-5)
OJ Dr	0.075**						-0.152	2.8×10-5	1.3×10-4*	-1.5×10-4**	2.0×10-4**	-7.3×10-5	-5.4×10	-2.9×10-4	1.1×10-4	2.0×10-4	-1.3×10-3**	9.3×10-4**	6.4×10
	(0.012)						(0.012)	(8.3×10-5)	(7.6×10-5)	(7.7×10-5)	(9.4×10-5)	(5.4×10-5)	(6.0×10-)	(4.6×10-4)	(1.9×10-4)	(1.6×10-4)	(2.9×10-4)	(2.7×10-4)	(1.3×10-)

*(**) Statistically different form zero at α=0.1(0.05)
The numbers in parentheses are standard errors.

Table A6. Elasticities of US

	Expenditure	Compensated price elasticity						Uncompensated price elasticity						Print media ad elasticity						Display ad elasticity					
	η_i	e_{i1}^C	e_{i2}^C	e_{i3}^C	e_{i4}^C	e_{i5}^C	e_{i6}^C	e_{i1}^U	e_{i2}^U	e_{i3}^U	e_{i4}^U	e_{i5}^U	e_{i6}^U	e_{i1}^A	e_{i2}^A	e_{i3}^A	e_{i4}^A	e_{i5}^A	e_{i6}^A	e_{i1}^D	e_{i2}^D	e_{i3}^D	e_{i4}^D	e_{i5}^D	e_{i6}^D
FCOJ	0.907**	-0.797	0.122	0.580**	-0.193**	0.334**	-0.051	-0.842	-0.346**	0.324**	-0.222**	0.297**	-0.117**	0.029	-0.170**	0.017	0.004	0.004	0.056**	0.056	0.014	-0.068**	0.005	-0.023*	-0.252**
	(0.08)	(0.129)	(0.138)	(0.13)	(0.059)	(0.086)	(0.058)	(0.129)	(0.132)	(0.128)	(0.06)	(0.088)	(0.059)	(0.009)	(0.039)	(0.025)	(0.006)	(0.01)	(0.017)	(0.01)	(0.037)	(0.03)	(0.008)	(0.014)	(0.037)
NFC	0.999**	0.013	-0.882	0.522**	0.044**	0.060**	0.242**	-0.042**	-1.397	0.240**	0.012	0.018	0.170**	-0.007	0.051	-0.004	0.008**	0.003	0.007	-0.013**	-0.010	-0.047**	0.003	0.003	0.006
	(0.031)	(0.015)	(0.066)	(0.049)	(0.01)	(0.016)	(0.025)	(0.015)	(0.065)	(0.049)	(0.01)	(0.017)	(0.026)	(0.004)	(0.018)	(0.012)	(0.003)	(0.004)	(0.008)	(0.005)	(0.017)	(0.014)	(0.004)	(0.006)	(0.016)
Recon	0.797**	0.113**	0.954**	-1.736	0.040**	0.101**	0.028	0.069**	0.542**	-1.461	0.014	0.067**	-0.030	0.003	-0.082**	0.017	-0.012**	-0.002	-0.013	0.041**	-0.028	0.059	-0.002	-0.012	-0.108**
	(0.051)	(0.025)	(0.089)	(0.081)	(0.014)	(0.022)	(0.039)	(0.025)	(0.093)	(0.079)	(0.015)	(0.022)	(0.04)	(0.007)	(0.03)	(0.02)	(0.005)	(0.007)	(0.013)	(0.008)	(0.028)	(0.023)	(0.006)	(0.01)	(0.027)
GJ	1.306**	-0.321**	0.695**	0.345**	-1.269	0.356**	0.194**	-0.393**	0.022	-0.024	-1.313	0.302**	0.099	0.009	-0.030	0.003	0.016	-0.002	0.001	0.018	0.089**	0.049*	0.023	0.012	-0.114**
	(0.088)	(0.098)	(0.151)	(0.123)	(0.085)	(0.1)	(0.063)	(0.098)	(0.139)	(0.123)	(0.086)	(0.101)	(0.063)	(0.009)	(0.038)	(0.025)	(0.006)	(0.01)	(0.017)	(0.011)	(0.036)	(0.03)	(0.009)	(0.013)	(0.039)
OJ BL	0.883**	0.442**	0.743**	0.683**	0.283**	-2.139	0.008	0.394**	0.288	0.434**	0.254**	-2.196	-0.056	0.002	-0.012	-0.024	-0.011	0.008	-0.012	0.037**	0.061	0.085**	0.008	0.052	-0.064
	(0.113)	(0.114)	(0.2)	(0.147)	(0.079)	(0.157)	(0.076)	(0.114)	(0.179)	(0.15)	(0.08)	(0.16)	(0.076)	(0.011)	(0.047)	(0.03)	(0.007)	(0.012)	(0.02)	(0.013)	(0.044)	(0.035)	(0.01)	(0.017)	(0.045)
OJ Dr	1.794**	-0.039	1.720**	0.110	0.088**	0.004	-1.883	-0.137**	0.795**	-0.396**	0.029	-0.070	-2.013	0.009	0.251**	-0.019	-0.014	-0.023	-0.034	-0.141**	0.092	0.084	-0.032*	0.012	0.053

	(0.155)	(0.044)	(0.175)	(0.15)	(0.029)	(0.044)	(0.139)	(0.043)	(0.181)	(0.145)	(0.03)	(0.045)	(0.144)	(0.021)	(0.09)	(0.059)	(0.014)	(0.022)	(0.04)	(0.023)	(0.084)	(0.07)	(0.018)	(0.032)	(0.082)

*(**) Statistically different form zero at α=0.1(0.05)
The numbers in parentheses are standard errors.

Table A7. Elasticities of North East

	Expenditure	Compensated price elasticity						Uncompensated price elasticity						Print media ad elasticity						Display ad elasticity					
	η_i	e_{i1}^C	e_{i2}^C	e_{i3}^C	e_{i4}^C	e_{i5}^C	e_{i6}^C	e_{i1}^U	e_{i2}^U	e_{i3}^U	e_{i4}^U	e_{i5}^U	e_{i6}^U	e_{i1}^A	e_{i2}^A	e_{i3}^A	e_{i4}^A	e_{i5}^A	e_{i6}^A	e_{i1}^D	e_{i2}^D	e_{i3}^D	e_{i4}^D	e_{i5}^D	e_{i6}^D
FCOJ	0.930**	-0.866	0.771**	0.063	-0.198**	0.115	0.116	-0.897	0.106	-0.052	-0.226**	0.082	0.058	0.004	0.010	0.010	0.006	0.010	0.006	0.032	-0.079	-0.011	0.018**	-0.029**	-0.069*
	(0.095)	(0.149)	(0.153)	(0.127)	(0.07)	(0.085)	(0.123)	(0.13)	(0.147)	(0.123)	(0.071)	(0.086)	(0.125)	(0.011)	(0.089)	(0.027)	(0.007)	(0.011)	(0.022)	(0.07)	(0.055)	(0.036)	(0.007)	(0.014)	(0.041)
NFC	1.064**	0.034**	-0.451	0.251**	0.033**	0.070**	0.063**	0.000	-1.217	0.119**	0.000	0.033**	-0.003	-0.005	0.027	-0.030**	0.003	-0.002	-0.011*	0.004	0.016	-0.025**	0.000	-0.003	-0.021*
	(0.025)	(0.007)	(0.037)	(0.031)	(0.005)	(0.007)	(0.017)	(0.007)	(0.041)	(0.031)	(0.005)	(0.007)	(0.017)	(0.003)	(0.027)	(0.008)	(0.002)	(0.003)	(0.007)	(0.006)	(0.017)	(0.011)	(0.002)	(0.004)	(0.011)
Recon	0.516**	0.016	1.450**	-1.858	0.024	0.055*	0.264**	0.000	1.081**	-1.857	0.008	0.037	0.231**	0.011	-0.160	0.184	-0.002	0.007	0.087**	-0.010	-0.076	0.183	0.000	-0.009	-0.091
	(0.14)	(0.032)	(0.18)	(0.183)	(0.025)	(0.031)	(0.078)	(0.032)	(0.218)	(0.179)	(0.026)	(0.032)	(0.08)	(0.019)	(0.154)	(0.046)	(0.011)	(0.019)	(0.038)	(0.034)	(0.094)	(0.063)	(0.012)	(0.024)	(0.063)
GJ	1.187**	-0.201**	0.764**	0.096	-1.370	0.215**	0.496**	-0.238**	-0.085	-0.051	-1.407	0.173**	0.421**	-0.009	0.072	-0.015	0.009	-0.009	-0.011	0.002	-0.009	0.034	0.008	0.017	0.038
	(0.079)	(0.071)	(0.121)	(0.099)	(0.071)	(0.071)	(0.099)	(0.072)	(0.117)	(0.096)	(0.072)	(0.071)	(0.1)	(0.009)	(0.074)	(0.023)	(0.006)	(0.009)	(0.018)	(0.016)	(0.045)	(0.03)	(0.006)	(0.012)	(0.035)
OJ BL	1.336**	0.103	1.426**	0.193*	0.189**	-2.239	0.328**	0.061	0.470**	0.028	0.148**	-2.286	0.244**	0.004	0.061	-0.011	-0.001	0.034	-0.044**	-0.006	-0.100*	0.020	0.014*	0.014	0.177**
	(0.094)	(0.076)	(0.146)	(0.111)	(0.062)	(0.106)	(0.118)	(0.076)	(0.139)	(0.107)	(0.063)	(0.107)	(0.12)	(0.01)	(0.086)	(0.027)	(0.007)	(0.011)	(0.022)	(0.019)	(0.053)	(0.035)	(0.007)	(0.014)	(0.04)
OJ Dr	0.986**	0.058	0.723**	0.520**	0.244**	0.184**	-1.729	0.027	0.017	0.398**	0.213**	0.149**	-1.791	0.036**	-0.014	-0.018	-0.033**	-0.014	-0.018	-0.043	0.067	-0.096*	-0.021**	0.052**	0.338
	(0.14)	(0.062)	(0.19)	(0.153)	(0.049)	(0.066)	(0.187)	(0.061)	(0.194)	(0.149)	(0.049)	(0.067)	(0.191)	(0.016)	(0.134)	(0.042)	(0.01)	(0.017)	(0.033)	(0.03)	(0.084)	(0.055)	(0.011)	(0.021)	(0.057)

*(**) Statistically different form zero at α=0.1(0.05)
The numbers in parentheses are standard errors.

Table A8. Elasticities of South

	Expenditure	Compensated price elasticity						Uncompensated price elasticity						Print media ad elasticity						Display ad elasticity					
	η_i	e_{i1}^C	e_{i2}^C	e_{i3}^C	e_{i4}^C	e_{i5}^C	e_{i6}^C	e_{i1}^U	e_{i2}^U	e_{i3}^U	e_{i4}^U	e_{i5}^U	e_{i6}^U	e_{i1}^A	e_{i2}^A	e_{i3}^A	e_{i4}^A	e_{i5}^A	e_{i6}^A	e_{i1}^D	e_{i2}^D	e_{i3}^D	e_{i4}^D	e_{i5}^D	e_{i6}^D
FCOJ	0.974**	-0.929	0.689**	0.554**	-0.387**	0.264**	-0.191*	-0.969	0.213	0.261**	-0.425**	0.226**	-0.279**	0.018	-0.016	-0.007	0.005	0.015*	0.039**	0.045	-0.062*	0.010	0.022**	-0.010	-0.225**
	(0.127)	(0.166)	(0.154)	(0.135)	(0.082)	(0.108)	(0.098)	(0.167)	(0.146)	(0.129)	(0.084)	(0.11)	(0.1)	(0.009)	(0.027)	(0.02)	(0.005)	(0.009)	(0.015)	(0.015)	(0.033)	(0.027)	(0.008)	(0.015)	(0.034)
NFC	0.997**	0.058**	-1.029	0.614**	0.034**	0.095**	0.228**	0.017	-1.516	0.314**	-0.005	0.056**	0.138**	0.001	0.004	-0.011	0.000	0.007*	-0.009	-0.003	0.004	-0.011	0.006*	0.011	0.024
	(0.049)	(0.013)	(0.058)	(0.049)	(0.01)	(0.014)	(0.033)	(0.013)	(0.062)	(0.045)	(0.011)	(0.015)	(0.035)	(0.004)	(0.012)	(0.009)	(0.002)	(0.004)	(0.007)	(0.006)	(0.015)	(0.013)	(0.003)	(0.007)	(0.014)
Recon	0.892**	0.076**	0.996**	-1.128	0.057**	0.008	-0.010	0.039**	0.561**	-1.396	0.021	-0.027	-0.090	0.001	0.022	0.047	-0.008*	-0.010	0.012	0.046**	-0.090**	0.022	0.010	0.001	-0.136**
	(0.107)	(0.019)	(0.079)	(0.099)	(0.014)	(0.017)	(0.062)	(0.018)	(0.105)	(0.083)	(0.014)	(0.019)	(0.068)	(0.009)	(0.026)	(0.02)	(0.005)	(0.009)	(0.015)	(0.014)	(0.033)	(0.027)	(0.007)	(0.014)	(0.031)
GJ	1.123**	-0.403**	0.422**	0.431**	-1.151	0.568**	0.132	-0.449**	-0.127	0.093	-1.196	0.524**	0.031	0.014*	-0.045*	0.026	0.013	0.014*	0.019	0.053**	0.017	0.033	0.018	0.000	-0.142**
	(0.116)	(0.086)	(0.127)	(0.103)	(0.083)	(0.085)	(0.095)	(0.086)	(0.123)	(0.097)	(0.084)	(0.087)	(0.097)	(0.008)	(0.025)	(0.018)	(0.005)	(0.008)	(0.014)	(0.014)	(0.03)	(0.025)	(0.007)	(0.014)	(0.032)
OJ BL	0.886**	0.277**	1.187**	0.062	0.572**	-2.109	0.011	0.240**	0.753**	-0.204	0.537**	-2.144	-0.069	0.010	0.002	-0.073**	0.014**	-0.006	-0.029*	-0.062**	0.066*	0.053*	0.002	0.065	-0.053
	(0.154)	(0.114)	(0.177)	(0.132)	(0.086)	(0.15)	(0.111)	(0.114)	(0.162)	(0.128)	(0.087)	(0.133)	(0.113)	(0.01)	(0.031)	(0.023)	(0.006)	(0.01)	(0.017)	(0.017)	(0.038)	(0.031)	(0.009)	(0.017)	(0.039)
OJ Dr	1.387**	-0.087*	1.233**	-0.032	0.058	0.005	-1.177	-0.144**	0.555**	-0.449**	0.003	-0.050	-1.302	-0.029	-0.071	-0.076	0.015	-0.017	-0.004	-0.151**	0.271**	-0.055	-0.083**	-0.083**	0.215
	(0.286)	(0.045)	(0.177)	(0.206)	(0.042)	(0.048)	(0.2)	(0.044)	(0.219)	(0.17)	(0.042)	(0.052)	(0.218)	(0.023)	(0.068)	(0.051)	(0.013)	(0.022)	(0.039)	(0.035)	(0.084)	(0.07)	(0.018)	(0.037)	(0.08)

*(**) Statistically different form zero at α=0.1(0.05)
The numbers in parentheses are standard errors.

Table A9. Elasticities of West

	Expenditure	Compensated price elasticity						Uncompensated price elasticity						Print media ad elasticity						Display ad elasticity					
	η_i	e_{i1}^C	e_{i2}^C	e_{i3}^C	e_{i4}^C	e_{i5}^C	e_{i6}^C	e_{i1}^U	e_{i2}^U	e_{i3}^U	e_{i4}^U	e_{i5}^U	e_{i6}^U	e_{i1}^A	e_{i2}^A	e_{i3}^A	e_{i4}^A	e_{i5}^A	e_{i6}^A	e_{i1}^D	e_{i2}^D	e_{i3}^D	e_{i4}^D	e_{i5}^D	e_{i6}^D
FCOJ	0.668**	-0.955	0.034	0.397**	0.039	0.409**	0.074	-1.006	-0.248	0.159	0.018	0.373**	0.037	0.019	-0.085*	0.023	0.008	0.006	0.014	0.034	-0.001	-0.068*	-0.004	0.007	-0.146**
	(0.124)	(0.13)	(0.163)	(0.139)	(0.052)	(0.068)	(0.052)	(0.132)	(0.162)	(0.135)	(0.053)	(0.07)	(0.053)	(0.009)	(0.049)	(0.027)	(0.007)	(0.01)	(0.018)	(0.006)	(0.057)	(0.041)	(0.01)	(0.018)	(0.042)
NFC	0.949**	0.006	-0.956	0.719**	-0.013	0.057**	0.187**	-0.069**	-1.356	0.381**	-0.043**	0.006	0.134**	-0.006	0.005	0.005	0.007**	-0.001	0.012	-0.017**	0.049	-0.037**	-0.009**	0.007	0.097**
	(0.053)	(0.031)	(0.081)	(0.063)	(0.013)	(0.02)	(0.02)	(0.031)	(0.082)	(0.064)	(0.013)	(0.021)	(0.02)	(0.004)	(0.022)	(0.012)	(0.003)	(0.005)	(0.008)	(0.003)	(0.026)	(0.019)	(0.004)	(0.008)	(0.019)
Recon	1.018**	0.089**	0.853**	-1.208	0.074**	0.109**	0.084**	0.008	0.423**	-1.371	0.041**	0.054**	0.027	0.004	-0.001	-0.021	-0.009**	0.001	-0.022**	0.011**	-0.023	0.078	0.015**	-0.015*	-0.117**
	(0.056)	(0.031)	(0.075)	(0.073)	(0.013)	(0.02)	(0.02)	(0.032)	(0.079)	(0.071)	(0.014)	(0.021)	(0.021)	(0.004)	(0.023)	(0.013)	(0.003)	(0.005)	(0.009)	(0.003)	(0.027)	(0.019)	(0.004)	(0.009)	(0.02)
GJ	1.453**	0.097	-0.173	0.823**	-1.184	0.247**	0.190**	-0.018	-0.787**	0.305**	-1.230	0.169*	0.109**	0.000	0.030	0.039	0.007	0.001	0.014	0.015**	-0.046	0.000	0.024	0.020	-0.124**
	(0.139)	(0.129)	(0.174)	(0.148)	(0.122)	(0.098)	(0.05)	(0.133)	(0.16)	(0.136)	(0.124)	(0.099)	(0.05)	(0.008)	(0.044)	(0.024)	(0.006)	(0.009)	(0.016)	(0.006)	(0.051)	(0.037)	(0.009)	(0.016)	(0.042)
OJ BL	0.592**	0.605**	0.447**	0.722**	0.146**	-1.897	-0.024	0.558**	0.197	0.511**	0.128**	-1.979	-0.057	-0.010	-0.088**	0.022	0.005	0.013	0.001	0.031**	-0.055	-0.096**	-0.026**	0.025	-0.084**
	(0.12)	(0.101)	(0.156)	(0.132)	(0.058)	(0.105)	(0.047)	(0.103)	(0.151)	(0.127)	(0.059)	(0.108)	(0.048)	(0.008)	(0.044)	(0.024)	(0.006)	(0.01)	(0.016)	(0.006)	(0.05)	(0.036)	(0.008)	(0.016)	(0.038)
OJ Dr	1.872**	0.105	1.415**	0.535**	0.108**	-0.023	-2.141	-0.044	0.623**	-0.132	0.049*	-0.123**	-2.243	0.003	0.151**	0.022	-0.016*	-0.018	0.023	-0.023**	-0.142**	-0.024	-0.007	-0.009	0.269
	(0.144)	(0.074)	(0.148)	(0.128)	(0.029)	(0.045)	(0.071)	(0.075)	(0.157)	(0.132)	(0.029)	(0.047)	(0.072)	(0.011)	(0.061)	(0.034)	(0.009)	(0.012)	(0.023)	(0.008)	(0.072)	(0.05)	(0.012)	(0.022)	(0.053)

*(**) Statistically different form zero at α=0.1(0.05)
The numbers in parentheses are standard errors.

Table A10. Elasticities of North

	Expenditure	Compensated price elasticity						Uncompensated price elasticity						Print media ad elasticity						Display ad elasticity					
	η_i	e_{i1}^C	e_{i2}^C	e_{i3}^C	e_{i4}^C	e_{i5}^C	e_{i6}^C	e_{i1}^U	e_{i2}^U	e_{i3}^U	e_{i4}^U	e_{i5}^U	e_{i6}^U	e_{i1}^A	e_{i2}^A	e_{i3}^A	e_{i4}^A	e_{i5}^A	e_{i6}^A	e_{i1}^D	e_{i2}^D	e_{i3}^D	e_{i4}^D	e_{i5}^D	e_{i6}^D
FCOJ	1.097**	-1.243	0.598**	0.831**	-0.242**	0.053	0.004	-1.330	0.137	0.436**	-0.271**	0.008	-0.077	0.052	-0.121**	0.040	-0.006	0.010	0.028	0.019	0.048	-0.026	0.013**	-0.037**	-0.093**
	(0.08)	(0.149)	(0.127)	(0.116)	(0.049)	(0.074)	(0.085)	(0.147)	(0.131)	(0.113)	(0.049)	(0.075)	(0.087)	(0.009)	(0.035)	(0.027)	(0.007)	(0.008)	(0.019)	(0.009)	(0.031)	(0.021)	(0.006)	(0.009)	(0.034)
NFC	1.099**	0.112**	-1.170	0.705**	0.082**	0.064**	0.207**	0.025	-1.633	0.310**	0.053**	0.020	0.126**	-0.006	0.083	-0.056**	-0.002	0.002	0.020*	-0.017**	-0.003	-0.030**	0.010**	-0.005	0.012
	(0.043)	(0.024)	(0.064)	(0.063)	(0.01)	(0.015)	(0.031)	(0.023)	(0.07)	(0.06)	(0.01)	(0.015)	(0.033)	(0.005)	(0.022)	(0.017)	(0.004)	(0.005)	(0.012)	(0.005)	(0.019)	(0.013)	(0.004)	(0.006)	(0.019)
Recon	0.842**	0.182**	0.825**	-1.243	0.034**	0.112**	0.091**	0.115**	0.470**	-1.546	0.011	0.078**	0.029	0.001	-0.085**	0.083	-0.001	-0.003	-0.027*	0.016**	-0.030	0.013	-0.008*	-0.003	-0.073**
	(0.059)	(0.025)	(0.074)	(0.087)	(0.01)	(0.015)	(0.04)	(0.025)	(0.085)	(0.081)	(0.01)	(0.015)	(0.042)	(0.007)	(0.03)	(0.023)	(0.006)	(0.007)	(0.016)	(0.007)	(0.025)	(0.017)	(0.005)	(0.008)	(0.025)
GJ	1.359**	-0.716**	1.295**	0.457**	-1.593	-0.051	0.609**	-0.823**	0.723**	-0.032	-1.629	-0.106	0.509**	-0.008	-0.035	-0.055*	0.006	-0.008	-0.015	0.013	0.101**	0.093**	0.028	0.013	0.028
	(0.095)	(0.145)	(0.159)	(0.135)	(0.093)	(0.101)	(0.102)	(0.144)	(0.159)	(0.129)	(0.094)	(0.102)	(0.105)	(0.011)	(0.042)	(0.032)	(0.008)	(0.01)	(0.022)	(0.011)	(0.036)	(0.025)	(0.008)	(0.012)	(0.043)
OJ BL	0.914**	0.103	0.671**	1.001**	-0.034	-2.117	0.376**	0.031	0.286*	0.672**	-0.058	-2.154	0.308**	-0.016	-0.086**	-0.009	-0.020**	0.034	-0.007	0.014	0.070*	0.067**	0.018**	0.026	0.061
	(0.098)	(0.144)	(0.159)	(0.134)	(0.067)	(0.144)	(0.106)	(0.143)	(0.158)	(0.128)	(0.067)	(0.145)	(0.108)	(0.01)	(0.042)	(0.032)	(0.008)	(0.01)	(0.022)	(0.011)	(0.036)	(0.025)	(0.007)	(0.011)	(0.042)
OJ Dr	1.020**	0.005	1.181**	0.444**	0.220**	0.205**	-2.055	-0.076	0.752**	0.077	0.193**	0.164**	-2.130	0.006	0.130*	-0.113**	0.031**	-0.024	-0.002	-0.011	0.037	0.054	-0.054**	0.066**	0.344
	(0.162)	(0.09)	(0.178)	(0.193)	(0.037)	(0.058)	(0.168)	(0.087)	(0.194)	(0.177)	(0.038)	(0.058)	(0.175)	(0.019)	(0.075)	(0.057)	(0.015)	(0.017)	(0.04)	(0.018)	(0.064)	(0.044)	(0.012)	(0.019)	(0.068)

*(**) Statistically different form zero at α=0.1(0.05)
The numbers in parentheses are standard errors.