Comparing DVs across format

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Data Management

Procedure:

- Download aggregated data (a summation of weekly sales of each product SKU)
- Select categories of interest
- We are interested in PLs including ICA, ICA Basic, ICA I Love Eco, ICA Gott Liv, ICA Selection and ICA Skona
- We report market structure first and then treat non-PL as competitive national brands.
- We manually generate a aggregate price-related variables and line-length (aka assortment).

```
## % of obs. maintain for category  Bottled water in format  hypermarket : 99.9442948658435

## % of obs. maintain for category  Bottled water in format  supermarket : 99.7348091779085

## % of obs. maintain for category  Bottled water in format  convenience : 100

## % of obs. maintain for category  Bottled water in format  online : 84.6236559139785
```

Market Structure (Before and After treating another brand as NBs)

Consider all brands:

Brand	Sales(Volume)	Share(Volume)	Share(Value)	ListPrice	Final Price	Discount (%)	Format
Läckö	2	0.044	0.024	5.90	5.00	15.25	convenience
Pripps	5	0.106	0.063	5.74	5.73	0.09	convenience
Spendrups	6	0.094	0.064	6.90	6.52	5.56	convenience
Vichy	6	0.108	0.076	6.90	6.65	3.60	convenience
ICA	11	0.195	0.221	12.86	12.28	4.78	convenience
Ramlösa	17	0.308	0.355	11.46	11.33	1.30	convenience
Loka	21	0.372	0.341	9.39	9.19	2.43	convenience
San Pellegrino	2	0.007	0.008	15.18	15.05	0.83	hypermarket
Imsdal	2	0.008	0.008	13.69	13.63	0.44	hypermarket
LIVINE	2	0.005	0.007	16.95	16.95	0.00	hypermarket
Aqua d'or	2	0.009	0.007	9.95	9.95	0.00	hypermarket
Vichy	3	0.012	0.005	6.50	6.21	4.43	hypermarket
KRÖNLEINS	4	0.014	0.006	5.55	5.53	0.39	hypermarket
Evian	5	0.018	0.016	12.13	12.05	0.61	hypermarket
Läckö	6	0.022	0.009	5.85	5.55	5.06	hypermarket
Vatten	11	0.038	0.061	24.13	24.04	0.62	hypermarket
Spendrups	13	0.046	0.021	6.91	6.22	9.90	hypermarket
bonaqua silver	17	0.059	0.046	10.95	10.46	4.48	hypermarket
ICA	36	0.125	0.083	8.87	8.74	1.42	hypermarket
Ramlösa	76	0.254	0.226	13.85	13.62	1.90	hypermarket
Loka	130	0.444	0.537	18.27	18.04	2.03	hypermarket
Badoit	1	0.005	0.007	18.90	18.90	0.00	supermarket
San Pellegrino	2	0.013	0.014	15.42	15.39	0.24	supermarket
Aquador	2	0.009	0.008	11.90	11.90	0.00	supermarket
Imsdal	3	0.015	0.014	13.47	13.44	0.17	supermarket
Evian	3	0.019	0.023	16.99	16.74	1.29	supermarket
Aqua d'or	3	0.014	0.011	10.42	10.40	0.10	supermarket
bonaqua silver	4	0.019	0.017	12.22	12.09	1.03	supermarket
Vichy	6	0.033	0.015	6.90	6.23	9.76	supermarket
Spendrups	13	0.070	0.030	6.90	6.20	10.21	supermarket
ICA	21	0.120	0.090	11.60	11.37	2.02	supermarket
Ramlösa	49	0.278	0.242	14.42	14.14	2.40	supermarket
Loka	85	0.477	0.588	18.13	17.90	2.07	supermarket

Only PLs and NBs:

Brand	Sales(Volume)	Share(Volume)	Share(Value)	ListPrice	Final Price	Discount (%)	Format
ICA	11	0.195	0.221	12.86	12.28	4.78	convenience
NB	46	0.805	0.779	10.18	10.00	2.05	convenience
ICA	36	0.125	0.083	8.87	8.74	1.42	hypermarket
NB	257	0.875	0.917	16.26	16.03	2.16	hypermarket
ICA	21	0.120	0.090	11.60	11.37	2.02	supermarket
NB	157	0.880	0.910	16.10	15.83	2.46	supermarket

Working on variables and model

Unit :

$$\Delta(S_{i,t}) = f(ListPrice_{it}, Discount_{it})$$

log(Unit) :

$$\Delta ln(S_{i,t}) = f(ListPrice_{it}, NonDiscountDepth_{it})$$

Market Share :

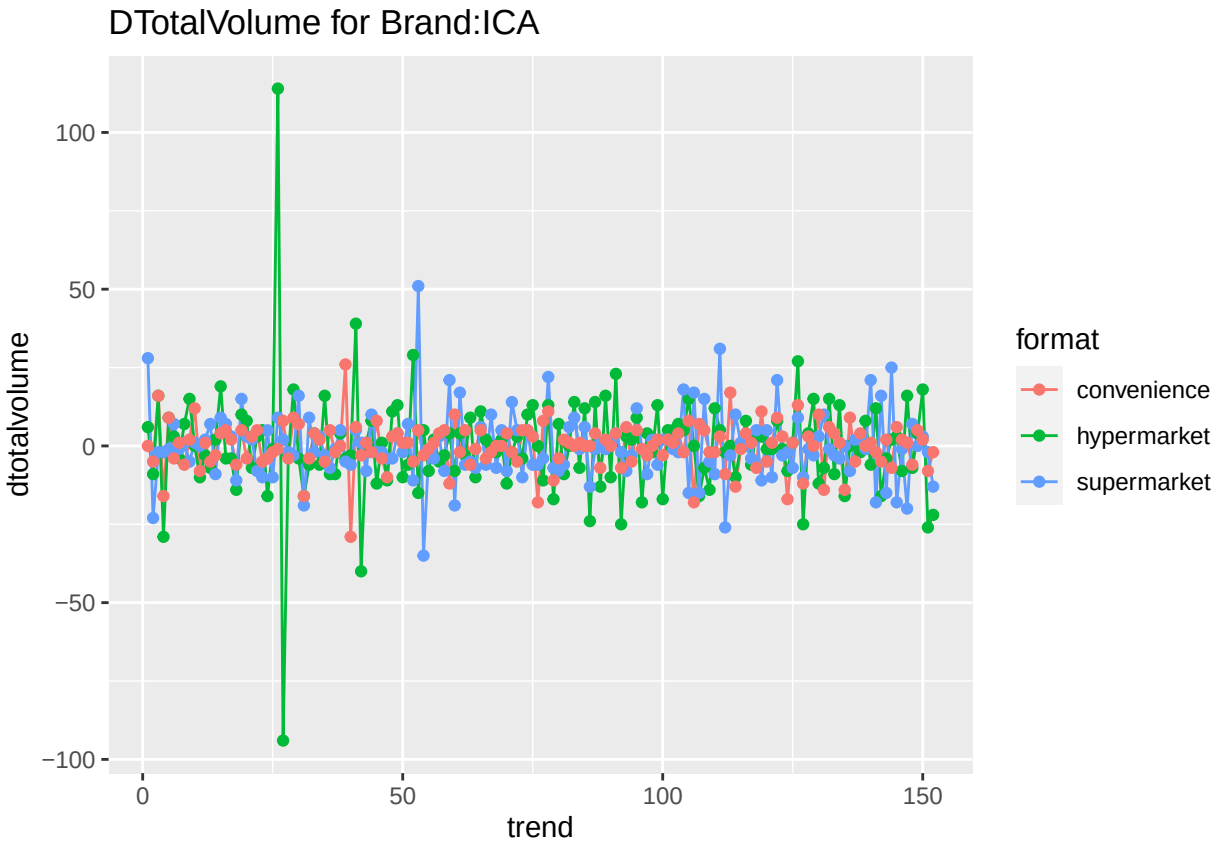
$$\Delta(Share_{i,t}) = f(ListPrice_{it}, Discount_{it})$$

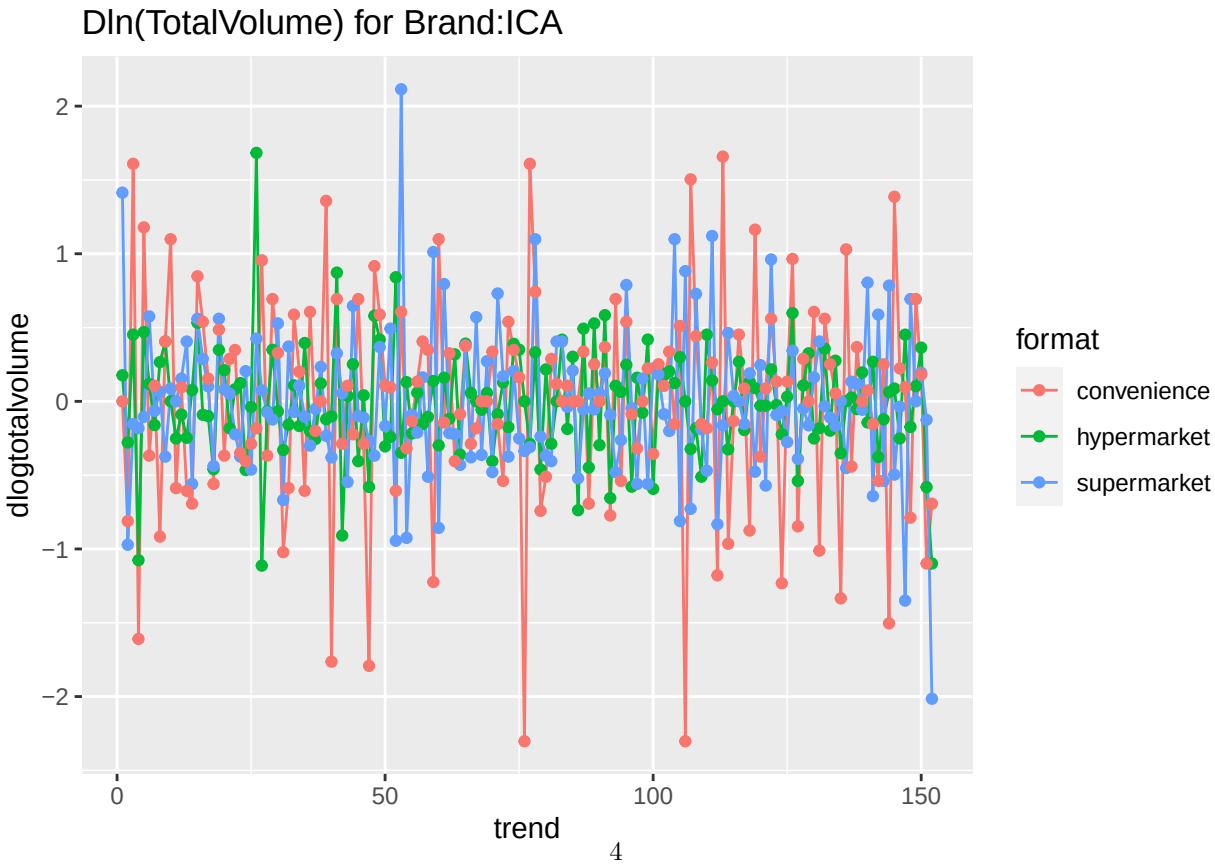
log(Market Share) :

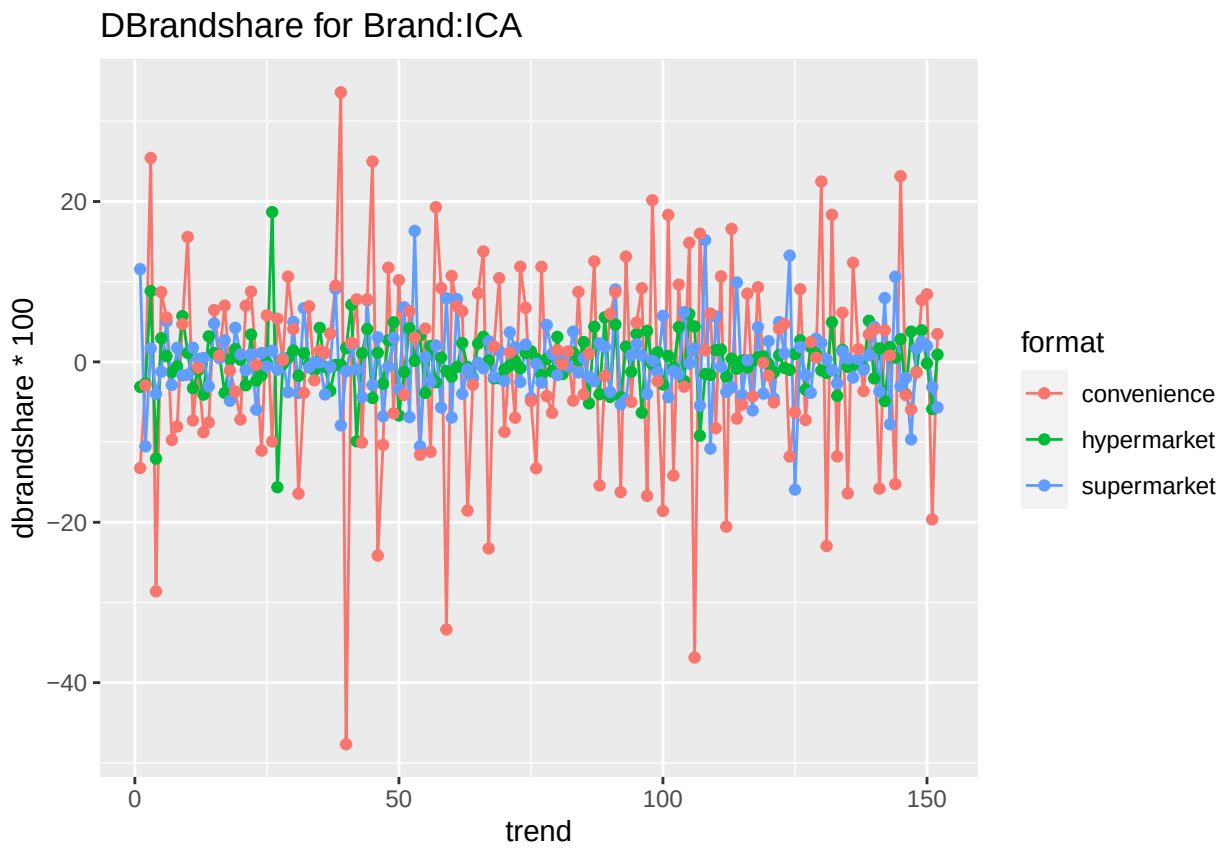
$$\Delta ln(Share_{i,t}) = f(ListPrice_{it}, NonDiscountDepth_{it})$$

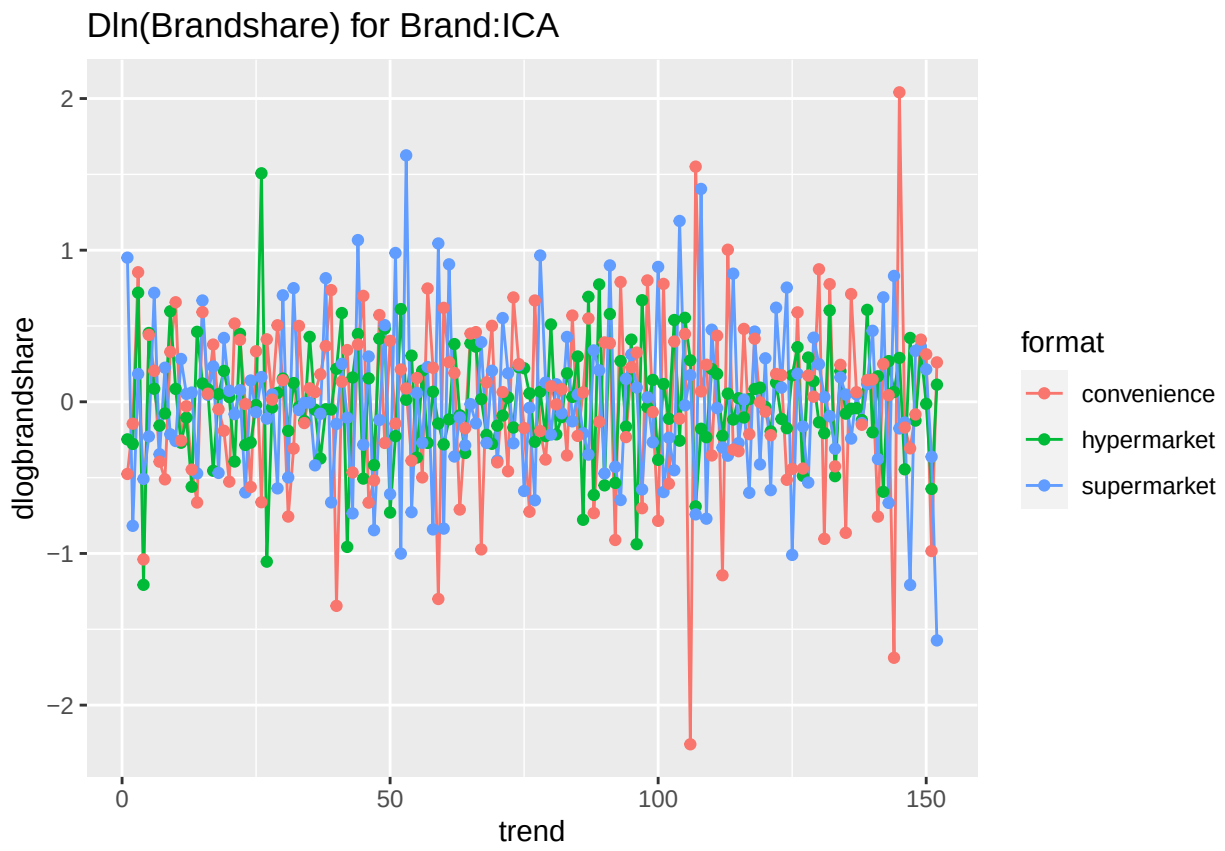
Note that i is Private label i and t is week t

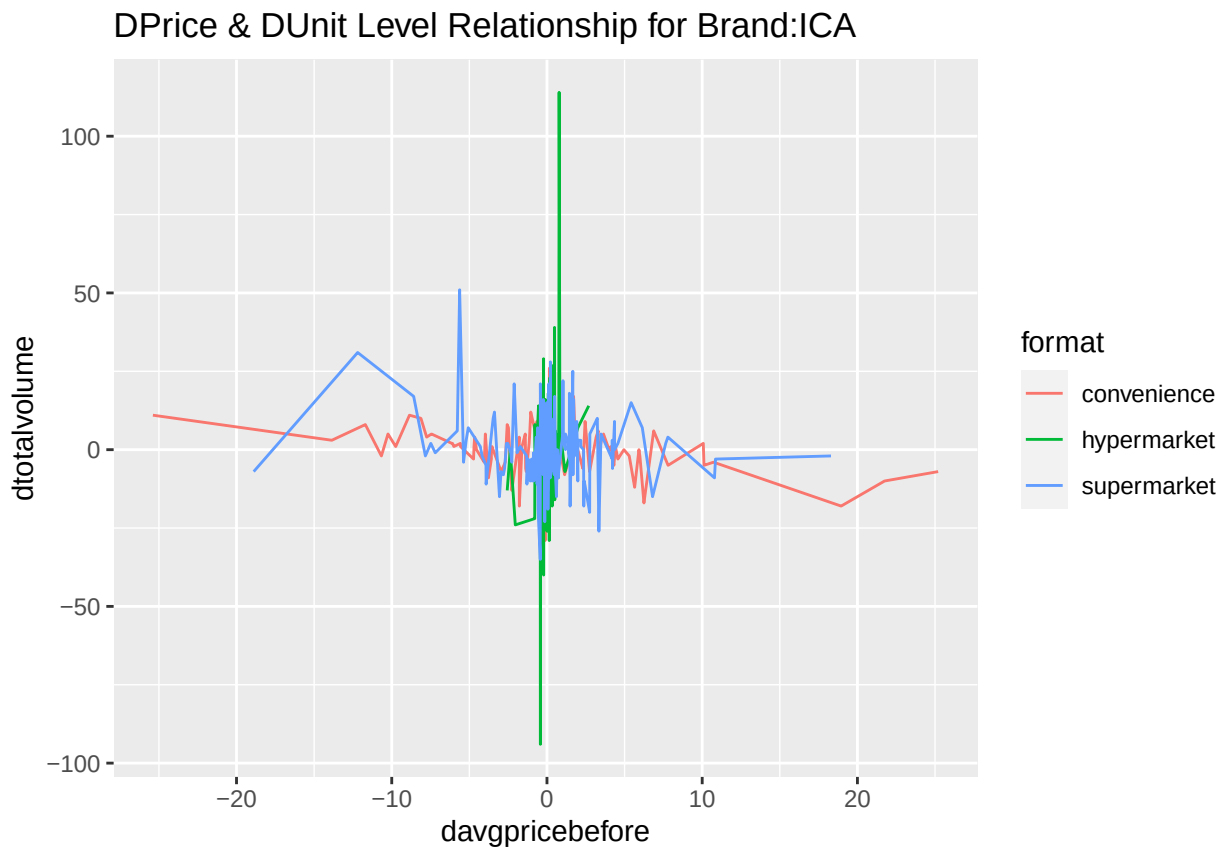
Explore the DV across formats

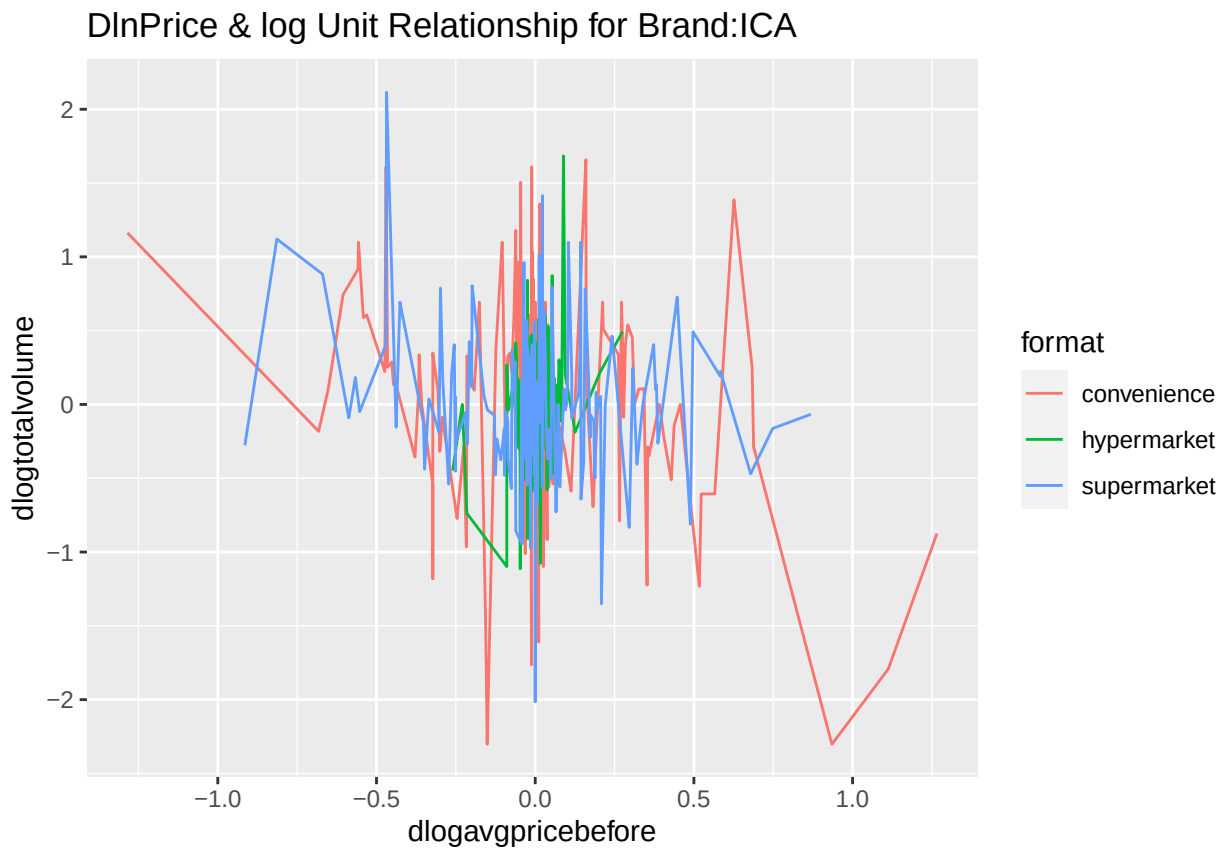


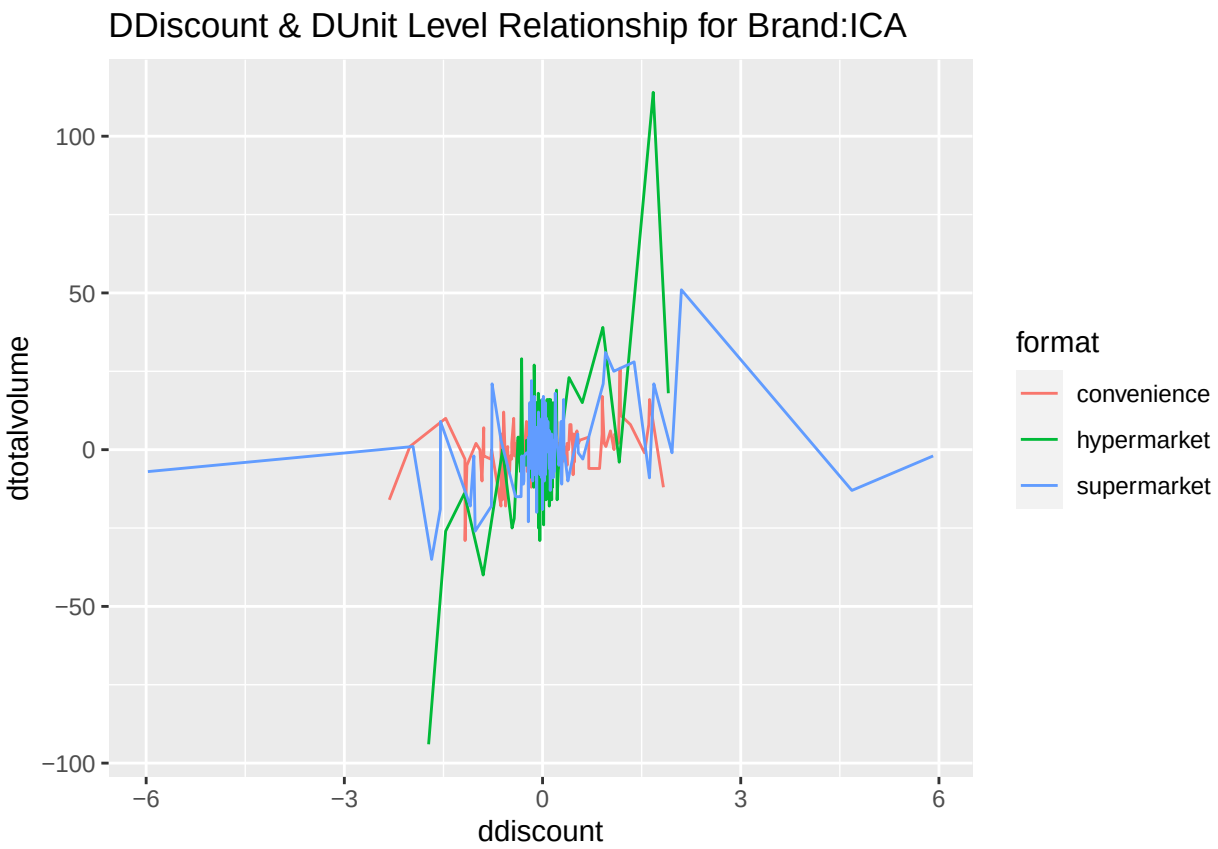


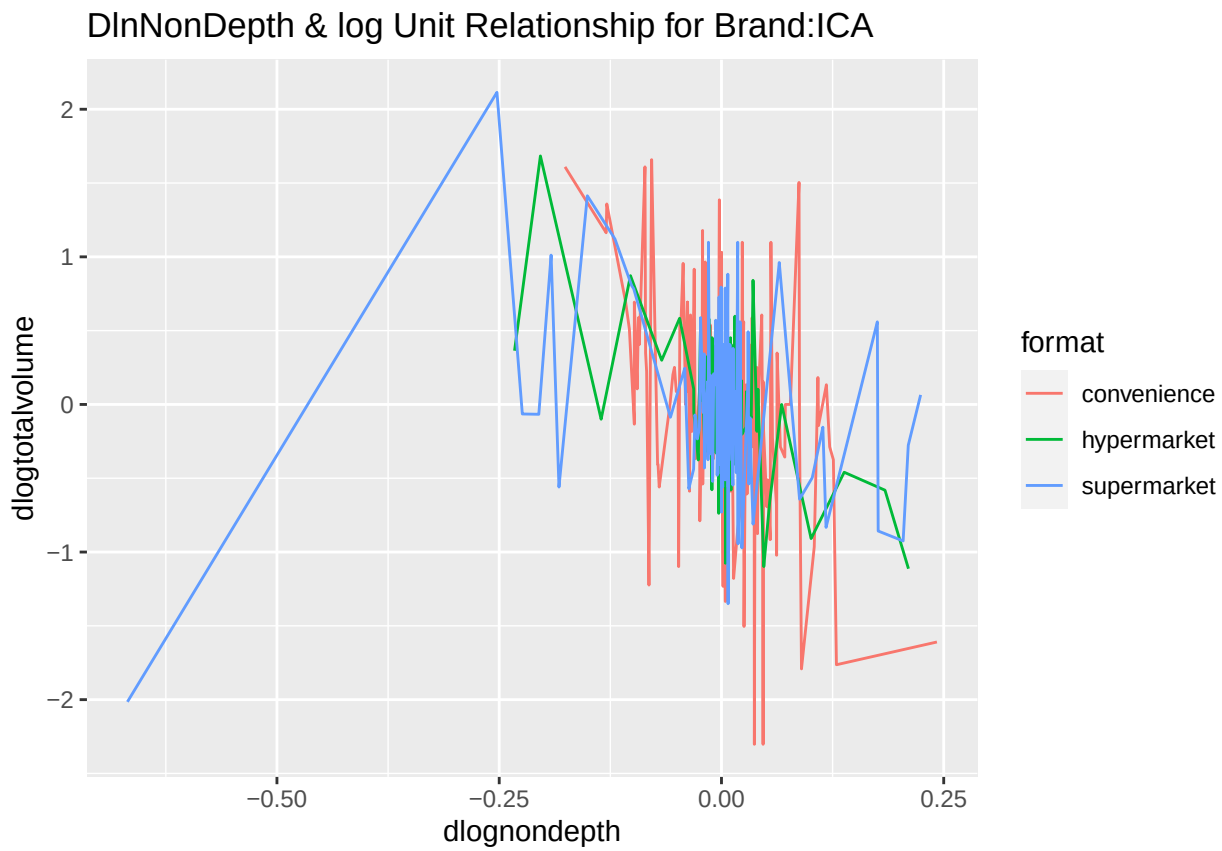

DBrandshare for Brand:ICA
dbrandshare * 100
20
0
−20
−40
0
50
100
150
trend
format
convenience
hypermarket
supermarket

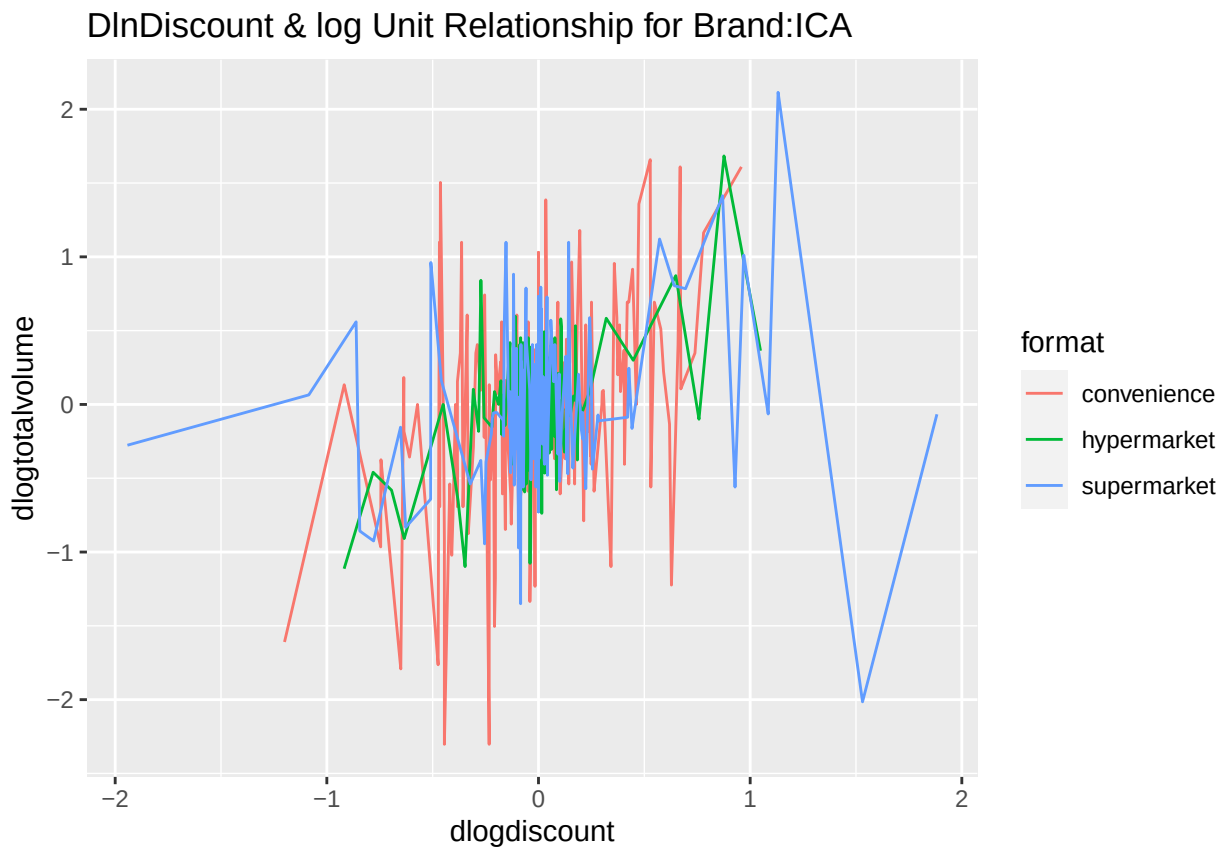

Dln(Brandshare) for Brand:ICA
dlogbrandshare
2
1
0
−1
−2
0
50
100
150
trend
format
convenience
hypermarket
supermarket


DPrice & DUnit Level Relationship for Brand:ICA
dtotalvolume
100
50
0
−50
−100
−20
−10
0
10
20
davgpricebefore
format
convenience
hypermarket
supermarket


DlnPrice & log Unit Relationship for Brand:ICA
dlogtotalvolume
2
1
0
−1
−2
−1.0
−0.5
0.0
0.5
1.0
dlogavgpricebefore
format
convenience
hypermarket
supermarket


DDiscount & DUnit Level Relationship for Brand:ICA
dtotalvolume
100
50
0
−50
−100
−6
−3
0
3
6
ddiscount
format
convenience
hypermarket
supermarket


DlnNonDepth & log Unit Relationship for Brand:ICA
dlogtotalvolume
2
1
0
−1
−2
−0.50
−0.25
0.00
0.25
dlognondepth
format
convenience
hypermarket
supermarket



Testing coefficient of price before VS discount.

- We wrote the function of testing coefficient of price before VS discount. This function will return the estimated coefficients of price before, discount and whether these coefficients are statistically significant.

Unit :

$$\Delta(S_{i,t}) = \beta_{0i} + \beta_{1i}\Delta(Linelength_{it}) + \beta_{2i}\Delta(RegPrice_{it}) - \beta_{2'i}\Delta(Discount_{i,t})$$
$$+\beta_{3i}\Delta(CompLinelength_{it}) + \beta_{4i}\Delta(CompPrice_{it})$$
$$+\gamma_i[S_{i,t-1} - \beta_{5i}Linelength_{i,t-1} - \beta_{6i}RegPrice_{i,t-1} - \beta_{6'i}Discount_{i,t-1}]$$
$$+\beta_{8i}Holiday_t$$

Brand	Co Price	Sd Price	Co Discount	Sd Discount	p coef test	R2 of model	Format
ICA	0.4439052	1.9658980	24.960320	3.1758572	0.0000	0.6919	hypermarket
ICA	-0.6219984	0.1626155	2.746078	0.6522462	0.0000	0.7982	supermarket
ICA	-0.1934250	0.0724785	1.405428	0.5719265	0.0067	0.7893	convenience

log(Unit)

$$\Delta ln(S_{ijk,t}) = \beta_{0ijk} + \beta_{1ijk,t}\Delta ln(Linelength_{it}) + \beta_{2ijk}(\Delta ln(ListPrice_{ijk,t}) + \beta_{2'ijk}\Delta(ln(1 - Depth_{ijk,t}))$$
$$+\beta_{3ijk}\Delta ln(CompLinelength_{ijk,t}) + \beta_{4ijk}\Delta ln(CompPrice_{ijk,t})$$
$$+\gamma_i[S_{ijk,t-1} - \beta_{5ijk}ln(Linelength_{ijk,t-1}) - \beta_{6ijk}(\Delta ln(ListPrice_{ijk,t-1}) - \beta_{6'ijk}(ln(1 - Depth_{ijk,t-1})))]$$
$$+\beta_{8ijk}Holiday_t$$

Brand	Co Price	Sd Price	Co NonDiscountDept	Sd Discount	p coef test	R2 of model	Format
ICA	0.4122287	0.4539492	-3.2560167	0.6493144	0.0000	0.6275	hypermarket
ICA	-0.2795995	0.0985298	-0.3383397	0.3112114	0.8546	0.8118	supermarket
ICA	-0.3498083	0.0982397	-1.7587315	0.5445957	0.0132	0.8515	convenience

Market Share :

$$\Delta(Share_{i,t}) = \beta_{0i} + \beta_{1i}\Delta(Linelength_{it}) + \beta_{2i}\Delta(RegPrice_{it}) - \beta_{2'i}\Delta(Discount_{i,t})$$
$$+\beta_{3i}\Delta(CompLinelength_{it}) + \beta_{4i}\Delta(CompPrice_{it})$$
$$+\gamma_i[S_{i,t-1} - \beta_{5i}Linelength_{i,t-1} - \beta_{6i}RegPrice_{i,t-1} - \beta_{6'i}Discount_{i,t-1}]$$
$$+\beta_{8i}Holiday_t$$

Brand	Co Price	Sd Price	Co Discount	Sd Discount	p coef test	R2 of model	Format
ICA	0.0069024	0.0053260	0.0320621	0.0086041	0.0174	0.5307	hypermarket
ICA	0.0047422	0.0008453	0.0066108	0.0033903	0.6230	0.7236	supermarket
ICA	0.0061812	0.0014400	0.0037912	0.0113633	0.8364	0.7150	convenience

log(Market Share)

$$\Delta ln(Share_{ijk,t}) = \beta_{0ijk} + \beta_{1ijk,t}\Delta ln(Linelength_{it}) + \beta_{2ijk}(\Delta ln(ListPrice_{ijk,t}) + \beta_{2'ijk}\Delta(ln(1 - Depth_{ijk,t}))$$
$$+\beta_{3ijk}\Delta ln(CompLinelength_{ijk,t}) + \beta_{4ijk}\Delta ln(CompPrice_{ijk,t})$$
$$+\gamma_i[S_{ijk,t-1} - \beta_{5ijk}ln(Linelength_{ijk,t-1}) - \beta_{6ijk}(\Delta ln(ListPrice_{ijk,t-1}) - \beta_{6'ijk}(ln(1 - Depth_{ijk,t-1})))]$$
$$+\beta_{8ijk}Holiday_t$$

Brand	Co Price	Sd Price	Co NonDiscountDept	Sd Discount	p coef test	R2 of model	Format
ICA	1.4087346	0.5318922	-1.8990363	0.7608016	0.0003	0.5197	hypermarket
ICA	0.7206067	0.1151509	0.2404272	0.3637099	0.2011	0.7503	supermarket
ICA	0.5309711	0.0970208	0.4677583	0.5378388	0.9094	0.7809	convenience

Testing coefficient of price gap VS discount

Unit :

$\Delta(S_{i,t}) = f(ListPrice_{it}, Discount_{it}, ListPriceHistGap_{it}, DiscountHistGap_{it}, ListPriceCompGap_{it}, DiscountCompGap_{it})$

log(Unit) :

$\Delta ln(S_{i,t}) = f(ListPrice_{it}, NonDiscountDepth_{it}, ListPriceHistGap_{it}, NonDiscHistGap_{it}, ListPriceCompGap_{it}, NonDisc$

Market Share :

$\Delta(Share_{i,t}) = f(ListPrice_{it}, Discount_{it}, ListPriceHistGap_{it}, DiscountHistGap_{it}, ListPriceCompGap_{it}, DiscountCompG$

log(Market Share) :

$\Delta ln(Share_{i,t}) = f(ListPrice_{it}, NonDiscountDepth_{it}, ListPriceHistGap_{it}, NonDiscHistGap_{it}, ListPriceCompGap_{it}, Non$