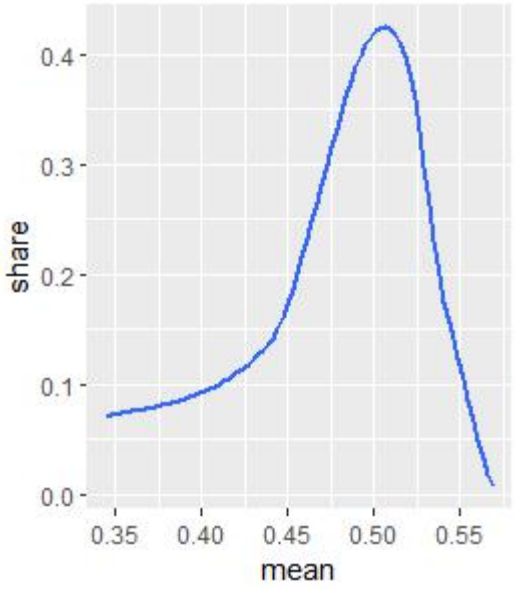
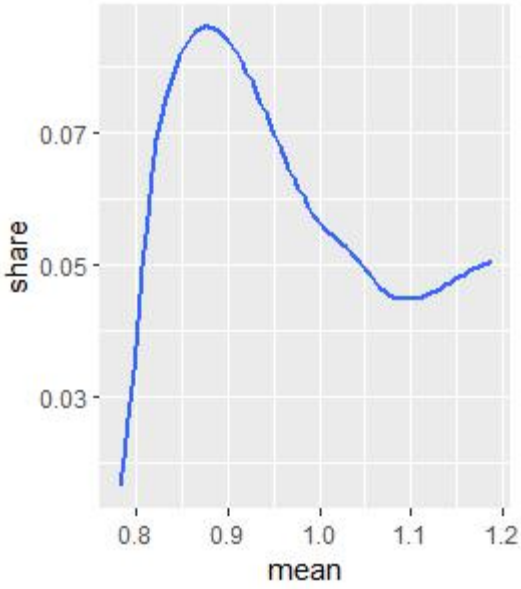
Exercise 1

```
> mean
  PPk_Stk   PBB_Stk   PFl_Stk  PHse_Stk
0.5184362 0.5432103 1.0150201 0.4371477
 PGen_Stk  PImp_Stk   PSS_Tub   PPk_Tub
0.3452819 0.7807785 0.8250895 1.0774094
  PFl_Tub  PHse_Tub
1.1893758 0.5686734
> var
     PPk_Stk      PBB_Stk      PFl_Stk
0.0226554865 0.0144797566 0.0018399974
    PHse_Stk     PGen_Stk     PImp_Stk
0.0141208621 0.0012366513 0.0131437214
     PSS_Tub      PPk_Tub      PFl_Tub
0.0037468593 0.0008836431 0.0001975293
    PHse_Tub
0.0052497277
```





	choice	Income	Fs3_4	Fs5.	Fam_Size	college	whtcollar
1	1	26.71291	0.5107588	0.13703284	3.174972	0.3176670	0.5702152
2	2	26.06581	0.5150215	0.11158798	3.101574	0.3133047	0.5436338
3	3	30.70988	0.2551440	0.08230453	2.481481	0.4526749	0.5432099
4	4	27.64334	0.5025295	0.19898820	3.470489	0.2934233	0.5919056

	choice	Income	Fs3_4	Fs5.	Fam_Size	college	whtcollar
5	5	26.44444	0.5936508	0.20000000	3.692063	0.2730159	0.7142857
6	6	39.15541	0.2432432	0.31081081	3.175676	0.4324324	0.5675676
7	7	25.32132	0.4921630	0.06269592	2.890282	0.3228840	0.5768025
8	8	34.24877	0.6009852	0.05418719	3.093596	0.2561576	0.5714286
9	9	31.90000	0.3022222	0.04888889	2.386667	0.2755556	0.5777778
10	10	29.46970	0.3636364	0.54545455	4.424242	0.4545455	0.9393939

Showing 1 to 10 of 10 entries, 7 total columns

Exercise 2, 3, 4

I use conditional logit model to build the association between price and demand. beta=-2.428201, increase in price will decrease the demand of stick and tub ceteris paribus, marginal effect=-0.288312.

use multinomial logit model to build the association between family income and demand, and I find that increase in family income will decrease the demand of stick and tub.

alpha for different choices:

2.5131249 1.5822821 -0.0982038 1.1309081 0.8362109 -1.2326746 0.9147475 1.8785466 0.3087046 -0.3448824

beta for different choices:

-4.9142813 -4.9240848 -4.8558465 -4.8927522 -4.9162019 -4.8609748 -4.9226228 -4.9302601 -4.8717102 -5.4285383

Exercise 5

MTT=-43601.75 based on chisq(df=19) test, IIA is violated