where .

\* Objective function

subject to

If we let

where

\* KKT conditions

1) Stationary

2) Complementary slackness

and

3) Dual feasibility

for

The *Stationary* condition can be expressed as follows,

The left hand side (LHS) is the function of *h*2, denoted . The *Complementary slackness* condition is equivalent to

Since and , cannot be satisfied simultaneously, will be , or . Of them, and are related to the *Dual feasibility* condition. If we assume and , then

and it will be non-positive if the assumptions are met by the *Dual feasibility* condition.

Similarly, when and are assumed,

and it will be non-negative if the assumptions are satisfied. If none of them are met, and are automatically zero, and the constraints have no meaning since .

S**core statistics**

What we want to derive :

By variance decomposition

Hmm…….

Since liabilities between families are independent,

1. variance of score : 뒷부분 삭제해서 돌리기
2. 2000 bootstrap sample 뽑고, 거기서 2000개의score, 하나의 variance
3. score boundary problem일때,

**Likelihood Ratio Test (LRT)**

- Hypothesis: vs

- Parameters:

- Likelihood ratio test statistic

Note that,

under ,

under ,

&