Research Plan

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I would like to apply heavy tail modeling to the Bayesian model using the Student t-distribution. The main issues are as follows.

(1) Robust Bayesian CART (joint research with Dr. Gagnon and Dr. Sugasawa)

We are considering applying this method to Bayesian CART. In regression tree analysis, it is known that results do not perform well when the data are biased. Bootstrap-based methods such as random forests are used as a solution to this problem. On the other hand, these methods are computationally heavy. Our study aims to derive sufficient conditions to solve this problem by applying heavy tail modeling with the Student t-distribution to Bayesian CART.

(2) Empirical Local Bayes Correction for Bayesian modeling

The James-Stein estimator has attracted as a estimator that yields better estimates than the maximum likelihood estimator. In contrast, however, it leads to a mixture distribution with means that are not considered close enough for the problem being handled with large data sets. Therefore, it is not appropriate to apply the James-Stein estimator. There is a local empirical Bayes correction proposed by Efron that yields better estimates for problems involving such large data set. In this study, we adapt the local empirical Bayes correction to Bayesian modeling and propose a local empirical Bayes correction that is robust to outliers using a hierarchical Bayesian model based on heavy tail modeling.

(3) Analysis of Changes in University Students' Consumption Behavior During Inflationary Periods (Joint work with Ms. Nguyen Ngoc Mai)

The Japanese inflation rate has remarkably increased in the last year after we experienced long deflation periods for decades.Burke and Ozdagli (2023) noted that higher inflation expectations stimulate spending on current durables for people with a college education, but not those without a college education. In addition, inflation expectations have no clear effect on non-durables for all people. In this paper, we investigate whether inflation stimulates college students' consumption in Japan. We compare two different colleges to find out what kind of education has some impact on consumer behavior. Our purpose is how college education influences household consumption.