Tohoku-UEA joint workshop

Program and Abstracts

March 5-6, 2019

Large meeting room on 4F

Graduate School of Economics and Management

Tohoku University

Program

March 5, 2019

<div align="center">Session1.Econometrics</div>

9:30-10:30   **Peter Moffatt (UEA):**
Using Supermarket Loyalty Card Data to predict
the Differential Impact of the UK Sugar Tax on
Buyer Behaviour

10:45-12:15

Midori Wakabayashi (Tohoku U.):
Commitment Device and Marriage and Undersavings
Yoshimasa Uematsu (Tohoku U.):
Estimation of weak factor models
Yuta Kuroda (Tohoku U.):
The effect of a partial relaxation of the school-district
system on land prices and academic performance: An
empirical analysis in Japan

12:15-14:00   Lunch

<div align="center">Session2.Environmental Economics</div>

14:00-15:00   **Corrado Di Maria (UEA):**
Electoral Incentives and Firm Behavior: Evidence
from U.S. Power Plant Pollution Abatement

15:15-16:45

Akira Hibiki (Tohoku U.):
Impacts of Indoor and Outdoor Air Pollution on
Child Health in Bangladesh
Gabriel Fuentes (Tohoku U.):
Long-term Effects of Civil War on Political Beliefs
and Preferences: Evidence from Guatemala

18:00-   banquet

March 6, 2019

Session 3. Marketing

9:30-10:30   **Michael Kummer (UEA)**:
Market Concentration and Privacy in Online
Markets - Evidence from the Mobile App Industry

10:45-12:15

Tsukasa Ishigaki (Tohoku U.):
Personalized Smart Marketing for a Wide Set of
Customers and Products
Linh Nguyen (Tohoku U.):
Domain-to-domain Translation Model for
Recommender System
Mirai Igarashi (Tohoku U.):
A model for community detection considering
user-generated-contents and allowing the mixed
membership

Abstracts

Peter Moffatt: University of East Anglia
Using Supermarket Loyalty Card Data to predict the Differential Impact of the UK Sugar Tax on Buyer Behaviour

Abstract:
We investigate the potential use of UK supermarket loyalty card data for a better understanding of purchase behaviour of different geo-demographic consumer segments. In particular, we focus on the UK soft drinks market and the expected impact of the sugar levy introduced in April 2018. Fot this we analyse some of the most purchased Sugar Sweetened Drinks (SSD) affected by the levy, which we treat as a composite good. The dependent variables under analysis are the number of customers purchasing the composite good in each week, and the volume (in litres) of composite good purchased. The explanatory variables are the prices of the individual SSDs. The estimation results are then used to predict the effect of the sugar levy. We predict total mean weekly volume to fall by 33% and number of customers to fall by 24%. We also find that geo-demographic segments who are highest consumers of SSDs are the most responsive to the tax. We validate this by looking at the first 5 months post-levy and observing a 33% decrease in volume and a 20% decrease in customers. A strong conclusion is that the sugar levy seems to have the desired effect of reducing the purchasing of SSDs. Also loyalty card data provides helpful insights into both aggregate and individual segments' behaviour with respect to the sugar levy and could give valuable inputs for the design of future policy interventions in the UK food market.

Midori Wakabayashi, Tohoku University
Commitment Device and Marriage and Undersavings

Abstract:
We empirically test the hypothesis that, for married individuals with time-inconsistent preferences, leaving the management of family budgets to their spouse functions as a commitment device for savings.

We conduct a cross-sectional analysis based on the micro-data of married Japanese couples obtained from waves 2009 and 2010 of Osaka University's Preference Parameters Study.

Our results show that when wives have time-inconsistent preferences, their household savings are more likely to go as planned if they leave household budgets to their husbands in comparison to when they make these decisions themselves. However, time-inconsistent individuals do not actively use leaving the management of family budgets to their spouse as a commitment device for savings.

Considering these, we conclude that individuals do not recognize the benefits of leaving the management of family budgets to their spouse, but it can work as a commitment device.

Yoshimasa Uematsu, Tohoku University
Estimation of weak factor models

Abstract:
In this presentation, we propose a novel consistent estimation method for the approximate factor model of Chamberlain and Rothschild (1983), with large cross-sectional and time-series dimensions (N and T, respectively). Their model assumes that the r (<< N) largest eigenvalues of data covariance matrix grow as N rises without specifying each diverging rate. This is weaker than the typical assumption on the recent factor models, in which all the r largest eigenvalues diverge proportionally to N, and is frequently referred to as the weak factor models. We extend the sparse orthogonal factor regression (SOFAR) proposed by Uematsu et al. (2018) to consistently estimate the weak factors structure, where the k-th largest eigenvalue grows proportionally to N^{α_k} with some unknown $0 < \alpha_k <= 1$ for $k = 1, \ldots, r$. Importantly, our method enables us to consistently estimate α_k as well. The finite sample evidence suggests that our method works well. In our experiment, the performance of the new estimator dominates that of the principal component estimators in terms of

mean absolute loss, and its superiority gets larger as the factor components become weaker. We apply our method to analyze S&P500 firm security monthly returns, and the results show that the largest eigenvalue grows proportional to N, whilst the second and third much less slowly diverge.

Yuta Kuroda, Tohoku University
The effect of a partial relaxation of the school-district system on land prices and academic performance: An empirical analysis in Japan

Abstract:
This study investigates the extent to which gradual and partial relaxation of the school-district system for public high schools impacts land prices and student academic achievement. In Matsue City, Japan, students from outside the school district were strictly prohibited from enrolling in general public schools. For many years, students who lived beyond the district boundary were unable to attend the most academic high school that prepared students to apply to high-status universities. In 2008, however, the school-district system was eliminated in the top academic track, where students were preparing to apply to prestigious universities. In the general track, up to 5% of all prospective candidates were allowed to enroll from outside the school district. Since 2016, the percentage of students allowed to enroll from outside the school district has risen to 20%. The present study applies hedonic land-price models using the fixed-effect approach, together with panel data from 2003 to 2018 and a regression discontinuity approach focusing on the boundary of the school district. The findings show that relaxing the school-district system significantly reduced land-prices within school districts with high-quality high schools. This suggests that relaxing the school-district system may reduce the value attributed to living in a high-quality school district. The impact of this change on the number of candidates successfully applying to universities is also analyzed. Although partial relaxation of the school-district system will expand the disparity of the ratio of successful applicants attending prestigious universities, the ratio of students attending national universities or all universities does not change. This implies that a

partial relaxation of the system may affect only highly academic students.

Corrado Di Maria, University of East Anglia
Electoral Incentives and Firm Behavior: Evidence from U.S. Power Plant Pollution Abatement

Abstract:
Researchers have utilized the fact that many states have term limits (as opposed to being eligible for re-election) for governors to determine how changes in electoral incentives alter state regulatory agency behavior. This paper asks whether these impacts spill over into private sector decision-making. Using data from gubernatorial elections in the U.S., we find strong evidence that power plants spend less in water pollution abatement if the governor of the state where the plant is located is a term-limited democrat. We also show that the decrease in spending has environmental impacts as it leads to increased pollution.

Akira Hibiki, Tohoku University
Impacts of Indoor and Outdoor Air Pollution on Child Health in Bangladesh

Abstract:
Indoor air pollution (IAP) and outdoor air pollution (OAP) are recognized as critical risk factors for child health, especially in developing countries. However, most previous studies have focused on the effect of either IAP or OAP without considering the timing of prenatal and postnatal exposure. This article evaluates the impacts of IAP and OAP on child health in Bangladesh, one of the most air-polluted countries in the world. By combining individual-level data from a nationally representative survey and satellite-based high-resolution data on ambient PM2.5 concentrations, we estimate individual prenatal and postnatal exposure to PM2.5 and examine

their adverse impacts on child underdevelopment (stunting and underweight) and respiratory illness. Our study finds that the use of solid fuels for cooking, a proxy variable of IAP, is associated with respiratory illness in girls, but not in boys. Prenatal exposure to ambient PM2.5 adversely affects only child underdevelopment, while postnatal exposure consistently increases the risk of both child underdevelopment and respiratory illness.

Gabriel Fuentes, Tohoku University
Long-term Effects of Civil War on Political Beliefs and Preferences: Evidence from Guatemala

Abstract:
Does exposure to civil conflicts during childhood changes political beliefs and preferences? I combine data from the distribution of the number of human rights violations during Guatemala's civil war with nationally representative data on political beliefs and behaviors from 2003 to 2017. Preliminary results suggest that exposure to conflicts during youth have little impact on later preference for democracy, trust, and confidence in institutions.

Michael Kummer, University of East Anglia
Market Concentration and Privacy in Online Markets - Evidence from the Mobile App Industry

Abstract:
We analyze whether higher market concentration implies intensified collection of private user data in the market for mobile smartphone applications. Market power in digital markets and app developers' strategies of collecting personal user data have raised considerable concern by policy makers and regulators. This concern is aggravated by the fact that app

developers are frequently sharing data with outside parties. We tracked more than 1.5 million smartphone applications in over 5,000 submarkets for over two years and combine data about their data collection with information about the concentration in their app-specific market. We show both cross-sectional correlations, and a fixed-effects panel analysis that exploits variation in market concentration within markets over time. To identify the effect of market concentration we employ an IV-approach which exploits exogenous variation in the importance of network effects in submarkets. Given an apps marketshare we find that more concentrated markets are associated with greater data collection. Within such markets apps having a higher market share collect more data.

Tsukasa Ishigaki, Tohoku University
Personalized Smart Marketing for a Wide Set of Customers and Products

Abstract:
Personalized marketing is a key strategy of modern database marketing. This paper describes a personalized market response estimation method for a wide set of customers and products from sparse data. The method compresses a sparse transaction data with information related to response to marketing variables into a reduced-dimensional space for feasible parameter estimation. We do not make a priori assumptions about substitute and complementary goods in the spirit of machine learning or data mining. Our model takes an exploratory approach to analysis. It does not test assumptions of the form of the utility function across hundreds of offerings. However, our model does include marketing variables so that their effects on choice can be measured and used for prediction.

Linh Nguyen, Tohoku University
Domain-to-domain Translation Model for Recommender System

Abstract:
Recently multi-domain recommender systems have received much attention from researchers because they can solve cold-start problem as well as

support for cross-selling. However, when applying into multi-domain items, although algorithms specifically addressing a single domain have many difficulties in capturing the specific characteristics of each domain, multi-domain algorithms have less opportunity to obtain similar features among domains. Because both similarities and differences exist among domains, multi-domain models must capture both to achieve good performance. Other studies of multi-domain systems merely transfer knowledge from the source domain to the target domain, so the source domain usually comes from external factors such as the search query or social network, which is sometimes impossible to obtain. To handle the two problems, we propose a model that can extract both homogeneous and divergent features among domains by only using user interaction history: a so-called Domain-to-Domain Translation Model (D2D-TM). It is based on generative adversarial networks (GANs) and Variational Autoencoders (VAEs). Moreover, the relationship among domains is constraint by domain cycle consistency (CC). Experiments underscore the effectiveness of the proposed system over state-of-the-art methods by a large margin.

Mirai Igarashi, Tohoku University
A model for community detection considering user-generated-contents and allowing the mixed membership

Abstract:
In modern social media development, the influence of interaction between consumers on their behavior is getting bigger and it is important for companies to know the relationship between consumers through understanding the community structure on social network. Many methods for detecting the community structure on the network have been proposed, but most of them consider only the network information. However, not all people who are well-connected on the network have the same interest, for example, even if students belong to a school community, they have various hobbies such as music, books, and sports. In addition, people belong to multiple communities and it is needed to be considered in community detection task. Therefore, we propose a model for community detection considering user-generated-contents which reflects interests of people and

allowing people to have the mixed membership of communities.   We emphasize the features of the proposed model through simulation experiments and show a example of application to real-world data by analysis of Twitter data.

List of Participants

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