



NATIONAL RESEARCH  
UNIVERSITY



## Workshop for PhD students

Higher School of Economics  
Indian Statistical Institute  
October 28 - 29, 2021

### Programme

October 28, 16:00 Moscow and 18:30 Delhi:

Choice by rejection

by Kriti Manocha, ISI

October 28, 17:00 Moscow and 19:30 Delhi:

Data envelopment analysis methods under interval estimates and their applications

by Sergey Demin, HSE

October 29, 12:00 Moscow and 14:30 Delhi:

Graded halfspaces with application to expected utility theory

by Siddharth Chatterjee, ISI

October 29, 13:00 Moscow and 15:30 Delhi:

Stochastic frontier analysis in case of truncated data

by Georgy Bronitsky, HSE

## *Abstracts*

### [Choice by rejection](#)

We propose a boundedly rational model of choice where agents eliminate dominated alternatives using a transitive rationale before making a choice using a complete rationale. This model is related to the seminal two-stage model of Manzini and Mariotti (2007), the Rational Shortlist Method (RSM). We analyze the model through reversals in choice and provide its behavioral characterization. The procedure satisfies a weaker version of the Weak Axiom of Revealed Preference (WARP) allowing for at most two reversals in choice in terms of set inclusion for any pair of alternatives. We show that the underlying rationales can be identified from the observable reversals in the choice. We also characterize a variant of this model in which both the rationales are transitive.

### [Data envelopment analysis methods under interval estimates and their applications](#)

The majority of Data Envelopment Analysis (DEA) models need precise data for the efficiency assessment. While there are many examples when the evaluation of input and output parameters used in the model cannot be made accurately. We propose new modifications of DEA for the case of interval data. Using the Oxford COVID-19 Government Response Tracker's data, we also provide a systematic way to measure and compare government responses to COVID-19 across countries by the evaluation of quarantine measures' efficiency using constructed DEA methods.

### [Graded halfspaces with application to expected utility theory](#)

A structure theorem for Euclidean spaces is furnished which characterizes certain partitions of the space. The notion of a graded halfspace is introduced: a graded halfspace is the union of slices of a list where the first slice is an open halfspace of the ambient space and, for each slice in the list, the next slice is an open halfspace of the boundary of the present slice. The theorem asserts: a pair of mutually reflecting convex cones and a subspace form a partition of the ambient space, if and only if, there exists a unique list of orthonormal vectors

such that the graded halfspaces generated by these vectors are the cones and the subspace is orthogonal to these vectors. This is the decomposition theorem. It is then used to characterize preferences over lotteries that satisfy the Independence axiom, due to von Neumann & Morgenstern (1943), as those which admit a lexicographic expected utility representation. Further, the decomposition theorem is used to characterize the lexicographic extension of generalized utilitarianism, from the welfarist approach to social choice theory, via an axiom on interpersonal comparison of utilities. Characterizations for generalized utilitarianism and serial dictatorships readily obtain.

### [Stochastic frontier analysis in case of truncated data](#)

Stochastic Frontier Analysis has wide applications in the field of efficiency analysis. The model involves parameters of production capabilities (labor, capital) and output parameters of production. In this paper, we consider the case of truncated data with a known initial distribution. The parameters of the initial distribution are estimated using the known data. Then the SFA parameters are estimated using the reconstructed total distributions.