



The World of Decisions

Research Proposal

Quantitative Psychology and Economics

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Presentation plan

Introduction

Discrete Choice Models

Valuation of Non-market Goods

- Taboo
- Environment

Trading and Finance

Machine Learning



Utility



The main goal

Find the **rationale** behind the **observed choices**



How?

The theory of Discrete Choice by McFadden

Compare and enhance classical DC models with

- Hybrid extensions
- Machine Learning (ML)

Research goal



Revealed Preferences (RP) vs Stated Preferences (SP)



Psychological heuristics

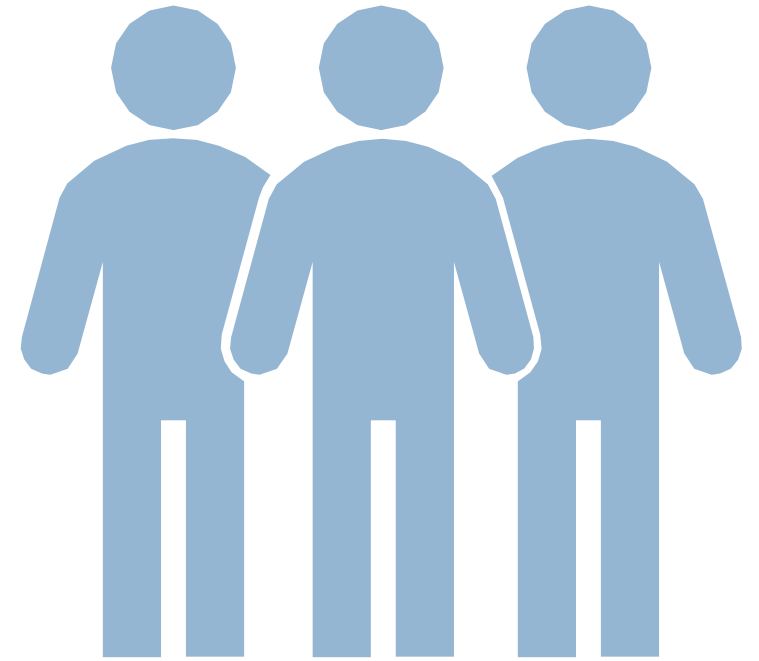


Thorough understanding of the model from theoretical perspective


Discrete Choice

Valuation of non-market goods: Taboo

- **Taboo trade-offs – from sacred to secular**
 - Evaluate human life or friendship (A.P. Fiske, P.E. Tetlock 1997).
 - Modelled in a DC literature only recently (Chorus et al. 2018).



Enhance logit models by directional penalties
for taboo trade-offs



Crossroads of Psychology and Finance

insider trading

sustainable investing

Valuation of non-market goods:
Taboo



Valuation of non-market goods: Environment

- **Environmental economics** is increasingly popular
 - Carson (2012)
- **Are people willing to pay extra to use renewable energy sources?**
 - Recent papers suggested positive willingness-to-pay for green products (Zorić 2012, Gossling 2004, Bigerna and Polinori 2014, Bollino 2009)

Multinomial logit model in green energy project



Additional research about Poland would be beneficial

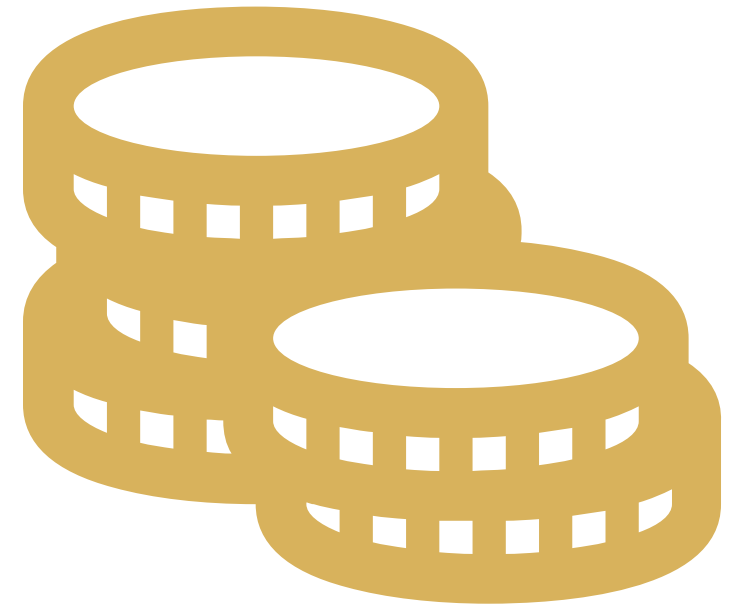
need to move away from coal
dependence

limited empirical evidence
(e.g. Bartczak et al. 2017)

Valuation of non-market goods:
Environment

Trading and Finance in Discrete Choice

- **SP in 'trading game'** – do money have constant marginal utility?
- **DC extensions in trading**
 - continuous-discrete choices
 - hybrid DC (e.g. Robin and Bierlaire 2012) - binary logit model with latent classes
 - comparison with ML and Community Detection algorithms (e.g. Bohlin and Rosvall 2014)
- **Quantitative Researcher** international experience





Machine Learning in Economics and Psychology

- ML is **increasingly** more **popular** in modern research
 - Eg. detection of insider trading can be improved by using neural networks (Islam et al. 2018).
- **Comparison of classical and ML methods**
 - Non-parametric ML vs standard Multinomial Logit model Lh  ritier et al. (2018)
 - More accurate and quicker with less effort
 - Do off-the-shelf algorithms give comparable results to DC in WTP for green energy?

Research plan summary

Focus on

focus on DC models and their various applications in Economics and Psychology

Study

study how different heuristics introduce bias in SP versus RP

Use

use DC methods to value non-market goods (taboo, environment)

Explore

explore hybrid DCMs and other models in finance

Compare

compare and highlight advantages of ML vs DC



Thank you for
your attention

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Bibliography



Thank you for your attention

Question time