Evaluation of welfare effect of tax reform through compensating variation consistent with fairness

Laurence Jacquet[1], Zhiyang Jia[2], Thor O. Thoresen[2,3]

[1]CY Cergy Paris Université and THEMA [2]Statistics Norway [3]University of Oslo

9th Microsimulation Congress 2024

Background

- The standard Mirrleesian approach to optimal tax challenged when there is heterogeneity in preferences for leisure
  - Should taxpayers be compensated for characteristics that they control – preferences?
- The fair allocation approach of Fleurbaey and Maniquet (2011) focuses on unfair and fair inequalities
  - Distinction between individual circumstances or constraints (requiring compensation) and individual responsibilities (not subject to compensation).
  - Demonstrate social ordering that satisfy fairness properties

Contribution of the paper

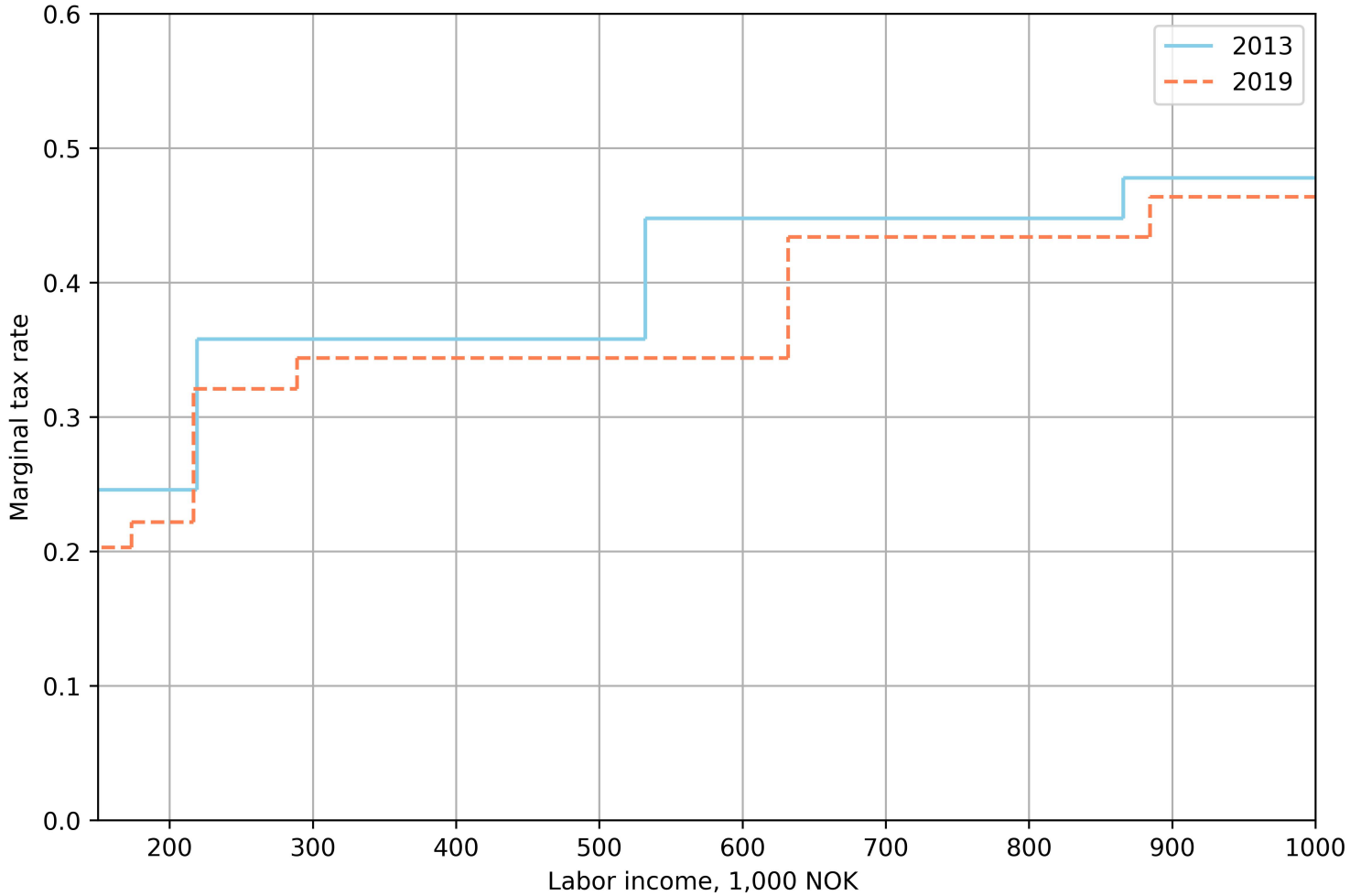
- Not so many empirical illustrations of tax policy implications of the fairness approach
  - Provide empirical evidence consistent with the “fairness” perspective
- Description of distribution of welfare effects of tax reform
  - Use labor supply model to simulate welfare effects of tax reform when individual heterogeneity in preferences are neutralized
- Fairness literature calls for a revival of measuring welfare by money metric utility
  - Welfare effects of tax reform by by compensating variation (CV)
- Distributional effects of the bracket tax of the Norwegian tax reform 2013–2019 used for illustration

Empirical strategy in brief

- Use a labor supply model to simulate labor supply choices before and after a tax change
  - Bracket tax of the Norwegian tax reform (2013–2019)
- Measure welfare effects of the reform by CV
- Two versions of a labor supply model used to simulate welfare effects of the reform
  - Conventional vs preference-adjusted (no individual heterogeneity in preferences) models
- Identify difference in evaluation of reform between CV and CV^{circ}
  - CV^{circ} is welfare effects when preference heterogeneity has been eliminated – only circumstances remain

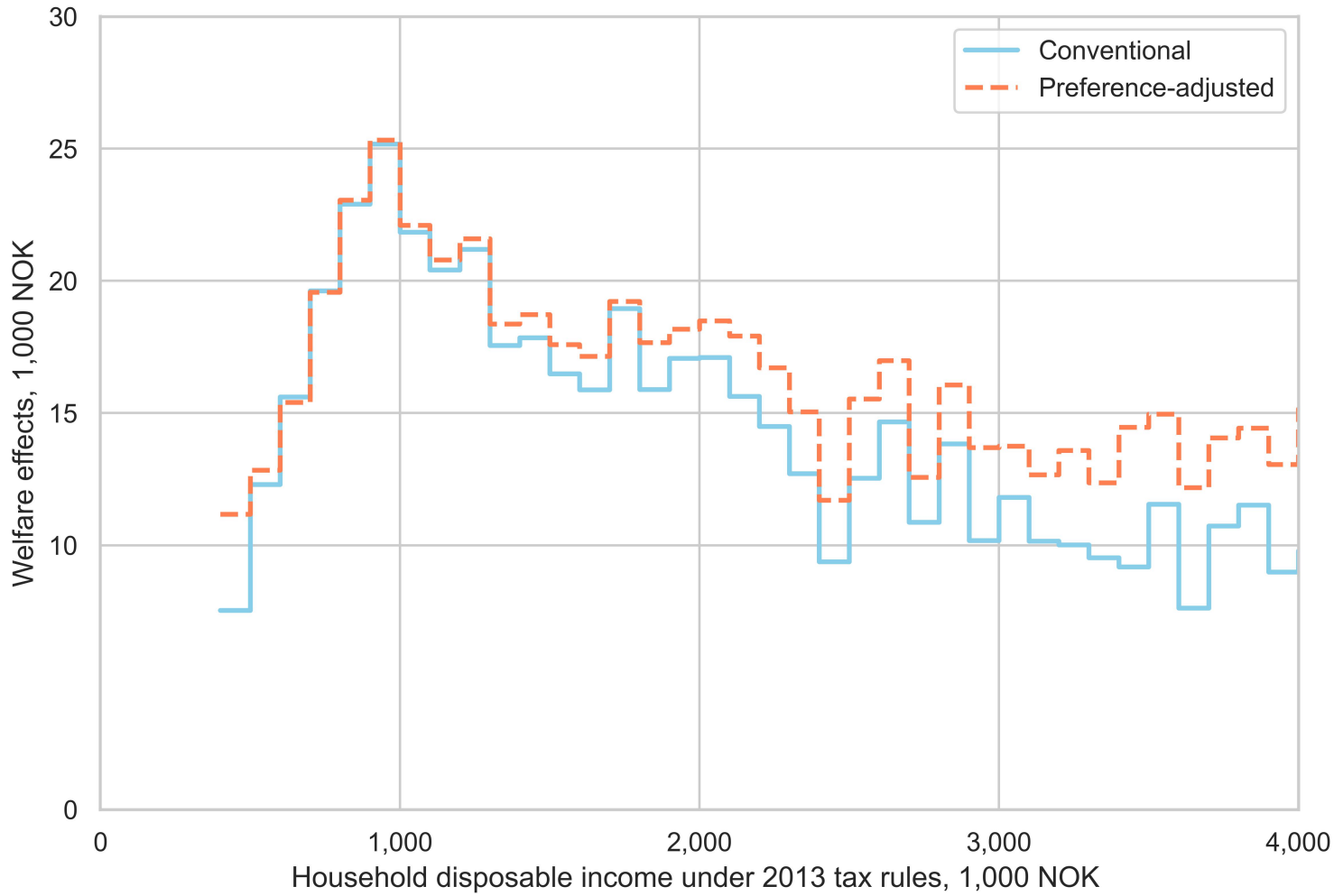
Bracket tax

Figure: Marginal tax rates on labor income, 2013 and 2019



View of results

Figure: Distribution of welfare effects (-*CV*) of introduction of bracket tax on disposable income: conventional vs preference-adjusted methods



Employing a particular discrete choice labor supply model

- A discrete choice random utility model based on "job choice" (Dagsvik, Jia, Kornstad, and Thoresen, 2014; Dagsvik and Jia, 2016)
  - Discrete choice of working hours, such as $\langle 0-5, 5-10, 10-15, \ldots, 50-55 \rangle$
- Individuals choose a job z within a discrete alternative
  - Individual preferences $U(C,h,z) = u(C,h) + \varepsilon(z)$ where u is the deterministic part and $\varepsilon(z)$ is a random variable
  - Job opportunities $M(h)$, $h > 0$,
  - Economic budget constraint $C = wh + y - T(wh,y) \equiv f(wh,y)$

The job choice model, cont'd

- The probability $\varphi(h)$ of choosing a job with hours of work equal to h becomes

$$\varphi(h) = P\left(V(h,y) = \max_{x\in D} V(x,y)\right) = \frac{M(h)\exp(u(f(wh,y),h))}{\sum_{x\in D} M(x)\exp(u(f(wx,y),x))},$$

Neutralization of preferences in practice

- Variation in taste-modifying variables eliminated by adjusting the deterministic part of the utility function

$$\log u(C,h) = \beta_1 \frac{(C - C_0)^{\alpha_1} - 1}{\alpha_1} + \beta_2 \frac{\left(\bar{h} - h\right)^{\alpha_2} - 1}{\alpha_2},$$

  where β_2 represents taste-modifying variables
- Taste-modifying variables no longer individual – everybody gets the median
- Error term also common

Estimates of *CV* by the simulation approach of McFadden (1999)

The conventional CV for household i:

$$\max_{h\in D}\left(u_i(f_0(w_ih,y_i),h)+\log(M_i(h))+\eta_i(h)\right)$$

$$=\max_{h\in D}\left(u_i(f_1(w_ih,y_i)+CV_i,h)+\log(M_i(h))+\eta_i(h)\right),$$

Obtaining CV_i^{circ} for the preference-adjusted alternative:

$$\max_{h\in D}\left(u_{ref}(f_0(w_ih,y_i),h)+\log(M_i(h))+\eta_{ref}(h)\right)$$

$$=\max_{h\in D}\left(u_{ref}(f_1(w_ih,y_i)+CV_i^{circ},h)+\log(M_i(h))+\eta_{ref}(h)\right)$$

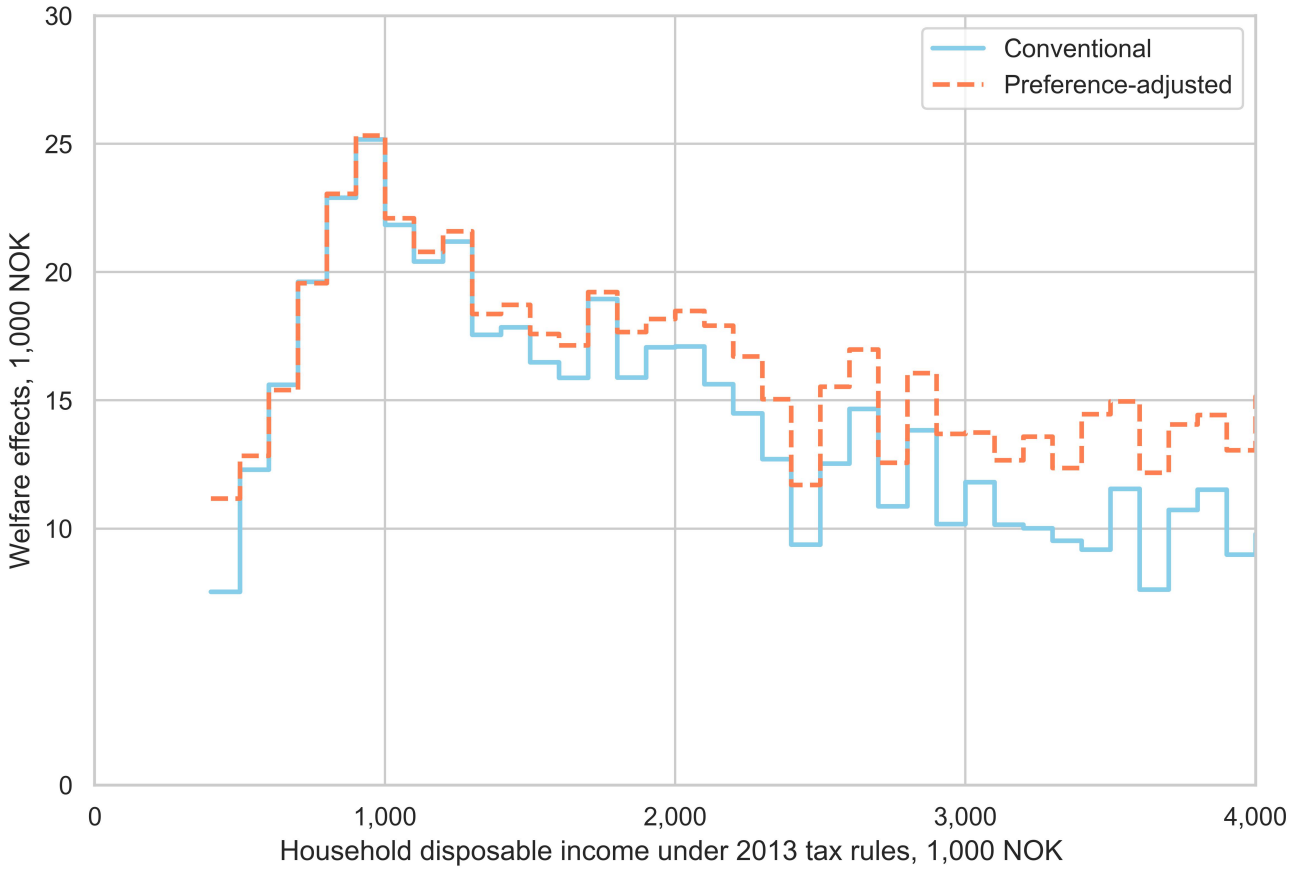
Comparison of *CV*: conventional method vs preference-adjusted method

Table: Summary statistics for simulation results, welfare effects (-*CV*) of introduction of the bracket tax

Simulation	Welfare effect (NOK)	Standard deviation (NOK)
Conventional	18,407	5,417
Preference-adjusted	18,573	5,189

Difference between the conventional and the preference-adjusted methods

Figure: Distribution of welfare effects (-*CV*) of introduction of bracket tax on disposable income, conventional and preference-adjusted methods



Mechanisms behind preference-neutrality leading to larger welfare effects at the high end

- Preference neutralization leads to a more compressed working hours distribution
  - This moves people into income levels where the economic gain of the reform is large
  - Movements correlate positively with household income

Summary

- Suggest an empirical approach corresponding to theoretical contributions by Fleurbaey and Maniquet (2011)
  - Responding to distinction between circumstances (requiring compensation) and individual responsibilities (not subject to compensation).
- Describe “fair” distributional welfare effects of a reform
  - Individual differences in preferences for leisure eliminated
- Compare distribution of welfare effects of reform under conventional and preference-adjusted methods
  - Policy-makers should address the latter(?)