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

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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
- 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

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

where \( \beta_2 \) 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 $i$:

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

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

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

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

$$= \max_{h \in D} (u_{ref}(f_1(w_ih,y_i) + CV_i^{circ},h) + \log(M_i(h)) + \eta_{ref}(h))$$
Comparison of CV: conventional method vs preference-adjusted method

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

<table>
<thead>
<tr>
<th>Simulation</th>
<th>Welfare effect (NOK)</th>
<th>Standard deviation (NOK)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Conventional</td>
<td>18,407</td>
<td>5,417</td>
</tr>
<tr>
<td>Preference-adjusted</td>
<td>18,573</td>
<td>5,189</td>
</tr>
</tbody>
</table>
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(?)