ERRATUM

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Multi-profile welfarism: a generalization

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The proof of Theorem 2 in Blackorby, Bossert and Donaldson (2005) is incorrect, due to the erroneous substitution of an earlier version in the production process. Here is the correct proof along with a statement of the result.

Theorem 2 Suppose F satisfies unlimited domain. F satisfies Pareto indifference and binary independence of irrelevant alternatives if and only if F satisfies strong neutrality.

Proof First, suppose that F satisfies strong neutrality. That binary independence of irrelevant alternatives is satisfied follows from setting $x=z$ and $y=w$ in the definition of strong neutrality. To show that Pareto indifference is implied, let $U = \bar{U}$ and $y=z=w$. Strong neutrality implies that $xR_{\Gamma}y$ if and only $yR_{\Gamma}y$ whenever $U(x)=U(y)$. Because R_{Γ} is reflexive, this implies $xI_{\Gamma}y$.

Now suppose that F satisfies unlimited domain, Pareto indifference and binary independence of irrelevant alternatives. Consider two profiles $\Gamma, \bar{\Gamma} \in D$ and four (not necessarily distinct) alternatives $x, y, z, w \in X$ such that $U(x) = \bar{U}(z) = u$ and $U(y) = \bar{U}(w) = v$.

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By unlimited domain, there exist profiles $\Upsilon^1, \Upsilon^2, \Upsilon^3, \Upsilon^4 \in D$ such that $U^1(x)=u, U^1(y)=v, U^1(w)=v, U^2(x)=u, U^2(y)=v, U^2(w)=v, U^3(x)=u, U^3(y)=v, U^3(z)=u, U^4(y)=v, U^4(z)=u$ and $U^4(w)=v$.

By binary independence of irrelevant alternatives,

$$xR_{\Upsilon^1}y \Leftrightarrow xR_{\Upsilon^1}y.$$

By Pareto indifference, $yI_{\Upsilon^1}w$ and, therefore,

$$xR_{\Upsilon^1}y \Leftrightarrow xR_{\Upsilon^1}w.$$

Using binary independence of irrelevant alternatives again, we obtain

$$xR_{\Upsilon^1}w \Leftrightarrow xR_{\Upsilon^2}w.$$

By Pareto indifference, $wI_{\Upsilon^2}y$ and, therefore,

$$xR_{\Upsilon^2}w \Leftrightarrow xR_{\Upsilon^2}y.$$

By binary independence of irrelevant alternatives,

$$xR_{\Upsilon^2}y \Leftrightarrow xR_{\Upsilon^3}y.$$

By Pareto indifference, $xI_{\Upsilon^3}z$ and, therefore,

$$xR_{\Upsilon^3}y \Leftrightarrow zR_{\Upsilon^3}y.$$

By binary independence of irrelevant alternatives,

$$zR_{\Upsilon^3}y \Leftrightarrow zR_{\Upsilon^4}y.$$

By Pareto indifference, $yI_{\Upsilon^4}w$ and, therefore,

$$zR_{\Upsilon^4}y \Leftrightarrow zR_{\Upsilon^4}w.$$

Using binary independence of irrelevant alternatives once more, we obtain

$$zR_{\Upsilon^4}w \Leftrightarrow zR_{\overline{\Upsilon}}w.$$

Combining the above equivalences, we obtain

$$xR_{\Upsilon}y \Leftrightarrow zR_{\overline{\Upsilon}}w,$$

and strong neutrality is satisfied.