Erratum

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Scitovsky reversals in benefit-cost analysis with normal goods

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Our recent paper in this journal (Just, Schmitz, and Zerbe, 2012) claims to show that a Scitovsky reversal cannot occur with a static production possibilities frontier except when an inferior good is present. A Scitovsky reversal occurs when the Kaldor-Hicks potential compensation criterion supports a change from State 1 to State 2, but after making the change to State 2 the same test supports a move back to State 1 (Hicks, 1940; Kaldor, 1939; Scitovsky, 1941). While our paper makes valid points about the impracticality of reversals under changing production possibilities when technologies are divisible, the point about inferior goods must be qualified and corrected because our proof depends on a relationship of willingness to pay (WTP) and willingness to accept (WTA) that is valid only in the pure consumer model.

The possibility of a reversal with a static production possibilities frontier PP when only normal goods are present is illustrated in Figure 1. In State 1, production at $O_B$ is initially distributed between individuals $A$ and $B$ at point $a$ with Scitovsky indifference curve (SIC) $C_1$. In State 2, production at $O_B'$ is distributed at point $b$ with SIC $C_2$. Both of these states are second-best states (SIC’s are not tangent to $PP$ and cross inside of $PP$ as is necessary for a reversal). Individual $A$ has indifference curves $U^A_1$ in State 1 and $U^A_2$ in State 2. Individual $B$’s indifference curves in the respective states are $U^B_1$ and $U^B_2$ relative to origin $O_B$, which are identical to indifference curves $U^B_1'$ and $U^B_2'$ relative to origin $O_B'$ ($B$’s map is simply shifted right by $\Delta q_1$ and down by $\Delta q_2$). Each of these indifference maps are consistent with all normal goods, which requires the slope of indifference curves to become more (less) steep when moving vertically (horizontally) away from the relevant origin.
To demonstrate a reversal, following a move from point $a$ to point $b$, the bundle $O_B'$ can be potentially redistributed at point $c$ where individual $A$ is better off than with distribution of $O_B$ at point $a$, and individual $B$ is better off because point $c$ is above indifference curve $U_1^{B*}$, which is the same indifference curve relative to origin $O_B'$ as is $U_1^B$ relative to origin $O_B$. Thus, distribution of $O_B'$ at point $b$ is potentially Pareto preferred to distribution of $O_B$ at point $a$, which satisfies the Kaldor-Hicks potential compensation criterion.

However, after moving to production at $O_B'$ with distribution at point $b$, the move to production at $O_B$ with distribution at point $a$ is also potentially Pareto preferred, which raises the Scitovsky paradox. That is, both individuals can be made actually better off by a move from production at $O_B'$ with distribution at point $b$ to production at $O_B$ with distribution at point $d$ because point $d$ is above indifference curve $U_2^A$ for individual $A$ and point $d$ is also above indifference curve $U_2^B$, which is the same indifference curve relative to origin $O_B'$ as is $U_2^{B*}$ relative to origin $O_B'$. Point $a$ is merely a potential redistribution of the output bundle $O_B$ at point $d$. Thus, a move from production bundle $O_B'$ distributed at point $b$ to production bundle $O_B$ distributed at point $a$ is potentially Pareto preferred because point $a$ represents a potential redistribution of point $d$. Thus, Figure 1 proves graphically that an inferior good is not necessary to have a Scitovsky reversal with a static production possibilities frontier.

While Figure 1 shows that reversals are possible with normal goods, it uncovers a strong alternative reason why reversals are virtually never encountered in
empirical practice. Figure 1 shows that a necessary condition for a reversal is that the marginal rate of transformation (MRT) between $O_b$ and $O^*_b$ is both less than the marginal rate of substitution (MRS) at point $a$ with production $O^*_b$ and greater than the MRS at point $b$ with production $O_b$. This excludes the possibility of homothetic preferences for both individuals. These conditions not only limit the curvature of indifference curves so that both SICs remain below PP between $O_b$ and $O^*_b$ depending on the magnitude of change, but require the preferences of the two individuals to be essentially opposite of one another with respect to changes in income. Although this model does not include prices and individual utility maximization, we make this point unambiguously by defining an increase in the quantity of both goods allocated to an individual as an increase in income. A reversal requires that an increase in income tilts the MRS for individual $A$ toward $q_2$ while an increase in income tilts the MRS for individual $B$ toward $q_1$ as necessary for the MRSs at points $a$ and $b$ to bound the MRT between $O_b$ and $O^*_b$. In other words, relative to the MRT between $O_b$ and $O^*_b$, a reversal requires the luxury good for one individual to be the necessity good for the other individual and vice versa. We regard these conditions as highly unlikely in reality, and suggest that this requirement explains why the Scitovsky paradox is rarely if ever encountered in empirical benefit-cost studies as found by Schmitz and Zerbe (2008).

**References**


