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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_1^A in State 1 and U_2^A in State 2. Individual *B*'s indifference curves in the respective states are U_1^B and U_2^B relative to origin O_B, which are identical to indifference curves U_1^{B*} and U_2^{B*} relative to origin O_B^* (*B*'s map is simply shifted right by Δq_1 and down by Δq_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.

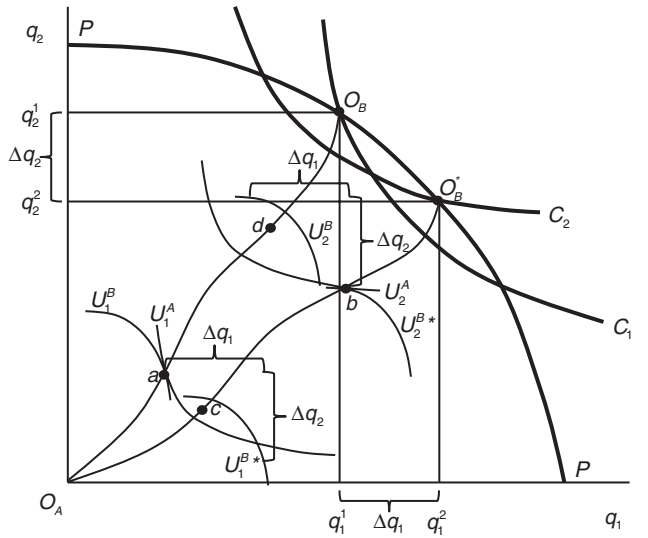

Figure 1 Scitovsky reversal with normal goods and static production possibilities.

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

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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).

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