

# The Preferred Tax Type: Comment on Herbener

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**A** standard theorem in neoclassical public finance holds that income taxes are preferred to equal revenue excise taxes.<sup>1</sup> Herbener (1988) rejects this theorem because the proof is (a) based upon methodologically suspect indifference curves and (b) must follow a certain conceptual ordering—namely the excise tax must first be placed upon consumers who are then given the option of facing an equal-revenue income tax and not vice versa. This comment demonstrates that indifference curves are not required to prove the theorem nor must the proof of the theorem follow a specific order.

It is an easy job to prove the theorem without using indifference curves, as has been done many times.<sup>2</sup> The proof requires only the idea of revealed (or demonstrated) preference. Consider figure 1: there are two goods, money ( $M$ ) and a good  $X$ ;  $AA$  represents the initial budget line,  $AC$  is the new budget line after an excise tax has been placed on good  $X$ .<sup>3</sup> Let us say that the consumer chooses the consumption bundle at point  $D$  which is on his budget constraint  $AC$ .<sup>4</sup> The budget constraint when an equal revenue income tax is imposed must pass through point  $D$  and is labelled  $BB$ . The consumer now has the option of staying at  $D$  (his most preferred position under the excise tax) or consuming anywhere along  $BB$ . If the consumer switches, this demonstrates his utility has increased and proves the theorem. We now show that the consumer will switch.

Consider line segment  $BD$ . The consumer had enough income to

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<sup>1</sup>See Herbener's note 8 for numerous references to different versions of this theorem.

<sup>2</sup>In fact, the originator of indifference curves and one of the earliest economists to prove the theorem, J. R. Hicks (1946, p. 41), uses a revealed preference approach.

<sup>3</sup>We are following the traditional ordering for this part of the proof. See below.

<sup>4</sup>The proof does not depend on where point  $D$  is so long as it is on the budget constraint  $AC$ . This is guaranteed by the praxeological law that more of a good is preferred to less.

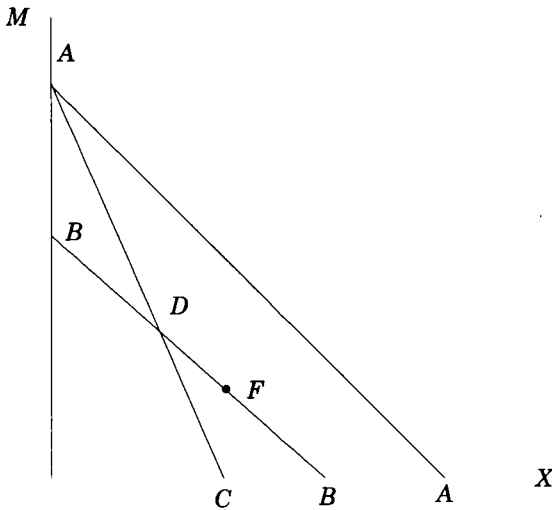


Figure 1.

consume anywhere along  $BD$  before the income tax was introduced. In fact, the consumption bundles along line segment  $AD$  contain more of both types of goods than those along  $BD$  and the consumer could have chosen any of these bundles. By choosing not to consume along  $AD$  the consumer has demonstrated that he prefers bundle  $D$  to any other point along line segment  $AD$  and a *fortiori* line segment  $BD$ . Now compare line segment  $DB$  with  $DC$ . More of both types of goods are available to the consumer along line segment  $DB$  than  $DC$ . Since more of a good is preferred to less we can state with assurance that the consumer will choose to change his consumption from  $D$  to a point somewhere along  $DB$  such as  $F$ .<sup>5</sup> The fact that the consumer voluntarily changes his consumption bundle demonstrates that his utility increases.

It has now been shown that following the traditional sequence the preferred tax theorem can be proven without the concept of indifference. We have needed only the idea of revealed/demonstrated preference and the law that more is preferred to less.<sup>6</sup>

<sup>5</sup>It is possible for the consumer to continue to prefer  $D$  to any other point along  $DB$  but this requires  $X$  to be a non-good at point  $D$ .

<sup>6</sup>Rothbard (1956) has criticized Samuelson's (1948) concept of revealed preference because it assumes constancy of tastes through time. However, his critique was made in the context of Samuelson's attempt to map out the "preference function." No such attempt has been made here. The only constancy that is assumed is that the assumptions with which the analysis begins—in particular that money and  $X$  are both goods—remain true at the end of the analysis. This sort of constancy is required by any deductive theory.

Herbener's second critique of the preferred tax theorem is that the proof requires a certain sequence of events: (1) the excise tax is placed on good  $X$ , (2) the amount of tax revenue is measured, (3) an equal-revenue income tax is levied. He argues that the sequence cannot begin with an income tax followed by an equal-revenue excise tax because the government does not know the preferences of individuals and therefore cannot compute the equal-revenue excise tax. According to Herbener the first scheme is the one that is presented "because only it allows the government to conduct the postulated experiment." But as Herbener himself notes, the neoclassical method (at least the part required to prove the theorem) is axiomatic and deductive. The theorem is a conclusion of theory and not a description of how to conduct an experiment.<sup>7</sup>

For a theory to be correct it need not be experimentally testable. But it must have true premises and sound reasoning. The preferred tax theory is presented the way it is because this is the only method which guarantees that one of the implied premises is true. The implied premise which must be true for the theory to hold is that there exists an excise tax capable of generating revenue equal to that of an income tax. The sequence of the first proof guarantees that this premise is true because the excise tax is placed first followed by an equal-revenue income tax.<sup>8</sup> The alternate sequence, proposed by Herbener, cannot guarantee that this statement is true. No excise tax on toothpicks could raise the same amount of revenue as does the present income tax of the United States. This is the problem which the first sequence avoids.

If we make the implied premise explicit, then the proof follows as before. Referring to figure 1,  $AA$  is the original budget constraint,  $BB$  is the budget constraint after an income tax. Let us assume, so as not to clutter the diagram, that the consumer chooses bundle  $F$ . We now assume that an excise tax exists which raises revenue equal to that of the income tax. In general we do not know exactly how high this tax must be but this is irrelevant as far as the theory is concerned.<sup>9</sup> We do know by assumption that such a tax exists; assume that it is  $AC$ . If  $AC$  is the equal revenue excise tax then we know that the

<sup>7</sup>There is no reason it could not be both, but this is unimportant for present purposes.

<sup>8</sup>As a matter of logic, *ceteris paribus*, it must be true that an income tax can always raise as much money as an excise tax.

<sup>9</sup>The situation is equivalent to knowing that demand curves slope downward yet being unable to *a priori* predict by how much quantity demand increases when price falls by 10 percent.

consumer must be consuming at point *D* (any other point along *AC* would raise to much or to little revenue). But point *D* was available to our consumer before the excise tax was imposed and he chose not to consume at that point. His action demonstrated that he preferred to consume at point *F*. We therefore know that this consumer's utility has been unambiguously decreased by the switch from an income tax to an excise tax.

### **Concluding Comments**

It has been shown without the use of indifference curves and using either sequence that an income tax is preferred to an equal-revenue excise tax. As Herbener notes, and is widely recognized, this type of analysis is only partial in nature. Taxes also have effects on the production side of the economy.

### **References**

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