On Measuring Comparative Advantage: Further Comments

By

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Ballance, Forstner and Murray's (BFM) recent remarks suggest confusion on their part about *(i)* the motivation for constructing an index of comparative advantage and *(ii)* the relation between the NCA concept and the definition of comparative advantage upon which my indices are based. As is often the case, much of the confusion can be traced to semantics. Nonetheless, this confusion leads BFM to erroneously question whether the NCA concept is useful for inferring comparative advantages and also to conduct an improper analysis of the bias in a "production intensity" index. The following remarks are intended to point out and resolve these areas of confusion.

I believe that most of the recent debate over the NCA concept can be traced to differences in the interpretation of the word "index". Anyone wishing to conduct an empirical study of comparative advantage immediately confronts two questions: How is comparative advantage to be defined and what variable is to be chosen to represent it. Assuming that the answer to these questions leads to the use of trade data, one quickly discovers that a direct comparison of trade *volumes* is likely to be misleading since both countries and goods differ in their importance in world markets. This leads one to choose a variable that can be used to scale the variable representing comparative advantage. The number that results when the variable chosen to represent comparative advantage is divided by the "scale variable" is what I have called an "index of comparative advantage". In contrast, I think BFM take the word "index" to be synonymous with the word "proxy" and therefore interpret the phrase "index of comparative advantage" to mean the variable representing comparative advantage.

The central issue addressed in Bowen [1983; 1985] was the choice of a theoretically consistent scale variable and not the choice of a variable to *represent* comparative advantage. In particular, both the "net trade" and "production" indices were derived in a model of net trade and thus net trade was necessarily the variable chosen to represent comparative advantage. Within that model, the scale variable $S_{ik} = Y_i(Q_{wk}/Y_w)$ was derived under the assumption of identical and homothetic preference (IHP). Seeking an interpretation of this variable that was consistent with the interpretation given to previous scale variables, the NCA concept was invoked to demonstrate that S_{ik} could be interpreted as the production that would exist in a

NCA world. Thus, the NCA concept is not used to define comparative advantage, it only permits an interpretation of the scale variable that is implied by the assumption of identical and homothetic preferences.

BFM's use of the word "index" leads them to believe that the NCA concept is central to the definition of comparative advantage and to therefore erroneously question the basis for my indices as measures of comparative advantage. Their confusion on this point is illustrated by the fact that they first doubt that my indices can provide a useful foundation for measuring comparative advantages but then go on to suggest that Deardorff's [1980] analysis, which demonstrates a (weak) association between autarky prices and *net trade*, could serve as the basis for further work. Given that an "index" is constructed to permit comparisons of the data across either commodities or countries, it is clear that BFM's analysis of the bias in a production intensity index is improper since they fail to consider a scaling of their "index" (net trade) that would permit international comparisons. If BFM had considered the issue of scaling, then their index would have reduced to a variant of the "net trade intensity" index. Specifically, BFM seem willing to assume homothetic, but not identical, preferences. This assumption implies that the appropriate scale variable is $S_{ik} = Y_i c_{ik}$ where $c_{ik} = C_{ik}/Y_i$ is country i's average propensity to consume commodity k, and therefore that the production and net trade intensity indices are $T_{ik}/Y_i c_{ik}$ and $P_{ik}/Y_i c_{ik}$, respectively. Clearly, in this case, the scale variable admits no interpretation of the NCA variety.

As the above suggests, a general implication of my 1983 paper was that if net trade is taken to represent comparative advantage, then the level of consumption is a theoretically consistent scale variable[1]. How consumption is measured, however, depends on the assumption one makes about preferences. In this regard, the Table lists the variables for scaling net trade that are implied by alternative assumptions about preferences, and with respect to the type of comparison one wants to make: by commodity across countries, by country across commodities or both.

Alternative Variables for Scaling Net Trade

Comparison	Preference assumption		
	identical and homothetic	homothetic	none
by commodity across countries	Y_i	Y_i	C_{ik}
by country across commodities	Q_{wk}	c_{ik}	C_{ik}
across countries and comodities	$Y_i Q_{wk}/Y_w$	$c_{ik} Y_i$	C_{ik}

Note: Y_i = country i's GNP. - Q_{wk} = world output of commodity k. - C_{ik} = country i's consumption of commodity k. - $c_{ik} = C_{ik}/Y_i$.

[1] Production is equally consistent.

The only reason to make any assumption about preferences is to minimize data requirements. In particular, consumption data are not usually available at the level of detail of the trade data. The IHP assumption allows one to compute consumption using only the data on GNP and the world production of each commodity. Dropping the assumption of identical preferences requires data on GNP and each country's average propensity to consume each commodity.

To summarize, an "index of comparative advantage" is constructed in order to account for differences in the importance of countries and goods in world markets when making international comparisons of a variable that represents comparative advantage. If net trade is taken to represent comparative advantage, then consumption is the theoretically consistent scaling variable. The exact expression for consumption, and thus the scale variable, depends upon the assumption made about preferences. And, if preferences are assumed to be identical and homothetic, then the concept of a NCA world can be used to provide an interpretation of the indices derived under this assumption.

Finally, my indices use net trade to represent the concept of comparative advantage. Whether this is an appropriate assumption is, of course, open to question, and I would agree with BFM that the choice of a variable to represent the concept of comparative advantage is an issue that demands further study. And for this reason, I also agree with BFM that, unless one is willing to assume that net trade accurately represents the concept of comparative advantage, it is best to consider my indices as theoretically consistent, internationally comparable, measures of trade structure. But whatever variable is chosen to represent comparative advantage (or more generally trade structure) the desire to make international comparisons means that one must confront the issue of scaling. And in this regard, my analysis has sought to emphasize that the chosen scale variable should have a firm theoretical foundation.

References

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