Taking Account...

A New Look at the Impact of the Terms of Trade

In a recent working paper, Marshall Reinsdorf, economist at the Bureau of Economic Analysis (BEA), takes a new look at the impact of changes in export and import prices on the U.S. economy as measured by their effects on real gross domestic income (GDI), calculated by deflating gross domestic product (GDP) by the gross domestic purchases price index. Even though trade is less important for the economy in the United States than is the case in many countries, changes in the terms of trade can have a significant impact on real GDI. In the first half of 2008, for example, a terms-of-trade shock made the growth rate of real GDI negative even though real GDP rose at a rate of 1.8 percent per year. From 1973 through 2007, the median absolute effect on annual real GDI growth was 0.2 percentage point.

Export and import prices have an increased importance in determining the real income of many nations as a result of the vast expansion of global trade over the past half century. Rising export prices or falling import prices increase the gains from trade, while falling export prices or rising import prices reduce the gains from trade. Consequently, the change in the terms of trade—defined as an exports price index divided by an imports price index—indicates the direction of the influence of trade prices on GDI. Nations that export or import large amounts of volatile commodities, such as crude oil, regularly experience terms-of-trade shocks large enough to cause significant, short-term swings in real GDI.

According to Reinsdorf's paper, the petroleum price shocks that occurred in late 1973 and in 1980 subtracted more than a full percentage point from annual growth of real GDI, and in the first half of 2008, price increases in petroleum and other imported commodities subtracted 2 percentage points from the annualized growth of real GDI, making it negative despite the steady growth of real GDP.

When petroleum prices are excluded, the author finds, however, that the U.S. terms of trade have improved steadily since 1996. Combined with the effects of declining prices of tradable goods excluding petroleum, these terms-of-trade improvements contributed an average of 0.15 percentage point to real GDI growth in the years from 1996 to 2007. On a cumulative basis, the gains over this period boosted real GDI by 1.8 percent.

The paper uses an economic approach to index numbers to develop theoretical measures of the terms of trade, trading gains, and real GDI. Laspeyres and Paasche indexes are shown to provide upper or lower bounds for these concepts, and the averages of these bounds, as provided by Fisher ideal indexes, provide point estimates that account for substitution effects. To analyze the sources of change in real GDI, the paper develops formulas for the contributions to change in real GDI of changes in the terms of trade and in the relative price of tradable goods and services.

Reinsdorf's paper, "Terms of Trade Effects: Theory and Methods of Measurement," is available at www.bea.gov/papers/working_papers.htm.

BEA Economists Present at AEA/ASSA Meetings

Several BEA economists participated in the American Economic Association/Allied Social Sciences Associations meetings held in San Francisco in January.

Papers presented as part of the conference session "Implementation of a New Architecture for the U.S. National Accounts" included a general overview by BEA Director Steve Landefeld and Dale Jorgenson of Harvard University and chair of the BEA Advisory Committee.

In addition, Brent R. Moulton and David B. Wasshausen of BEA and Michael J. Harper and Steven Rosenthal of the Bureau of Labor Statistics presented their paper on integrating the GDP accounts with the productivity account.

Dennis Fixler of BEA presented his paper "Accounting for R&D: An Overview."

For more about papers presented at the meetings, please visit www.bea.gov/about/director.htm.