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GDP is a Measure of Output, not Welfare. Or, HOS Meets the SNA

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What effect, if any, do changes in the terms of trade have on the level of output (GDP) or welfare? I examine this issue through two versions of a textbook, Hecksher-Ohlin-Samuelson (HOS), two-good model of a small, open economy. In the first version both goods are for final consumption. In the second, one good is an imported intermediate input into the other. In both versions, economic theory suggests that an improvement in the terms of trade raises welfare (consumption) but leaves aggregate output (GDP) unchanged. This follows from a continuous-time analysis using Divisia index numbers. I then show that a national income accountant applying the principles of the 2008 System of National Accounts (SNA) would reach the same conclusions.

An important qualification in the case where imports are intermediate inputs is when competition is imperfect. Now an improvement in the terms of trade does raise GDP: the size of the effect depends on the size of the markup of price over marginal cost. The national income statistician will still get the right answer here but the theorist assuming perfect competition will get it wrong. Macroeconomists typically assume imperfect competition and there is currently a lively debate about the size of markups. But the standard methodology for productivity measurement and growth accounting assumes perfect competition. So there is a significant inconsistency here between two branches of economics studying the same topics which needs to be resolved.