

**Exchange and production equations.  
Understanding a debate between Sraffa and Harrod**

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Among the many reviews of Piero Sraffa's *Production of Commodities by Means of Commodities*, only Harrod's prompted a public comment by the author. A substantial part of this comment is devoted to challenging Harrod's claim that the "rates of exchange" in a self-replacing economy are simple (inverted) ratios of the amounts exchanged by the industries. Sraffa recognised, of course, that this *is* the case with two industries, but he drastically contested the possibility of extending this property to more than two. The aim of this paper is to show that Harrod's claim was, on the contrary, analytically correct, if stated in terms of amounts directly *and indirectly* exchanged. Our argument will be based on the formal identity, which has been noted by some early commentators (and in particular by Peter Newman), between Sraffa's "no-surplus" equations and a linear model of exchange.

Showing Harrod's claim to be correct leads us, somewhat surprisingly, to formalise the idea that prices are also determined by "physical real costs", that is by the amounts of the commodities "destroyed" in the course of production. As Kurz (1998 and 2002) argued on the basis of Sraffa's unpublished manuscripts, Sraffa was pursuing precisely this idea in the late 20s of last century, when he first conceived his "no-surplus equations". As we shall see, the "double" equality of relative prices in a self-replacing economy with the ratios of amounts exchanged between pairs of industries, on one hand, and with the physical real cost of a commodity in terms of another, on the other hand, far from being contradictory, represents but different ways of looking at the same object.