

THE IRRELEVANCE OF THE DOUBLE DIVIDEND

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CONSIDERABLE CONTROVERSY SURROUNDS THE double-dividend hypothesis that a pollution tax can improve both the environment and the tax system (e.g., Oates, 1995; and Goulder, 1995a). A carbon tax could help reduce greenhouse gas emissions, for example, and the revenues could be "recycled" by reducing other distorting taxes on labor or capital income.

In this paper, we argue that much of the debate is misplaced. We describe problems with both analytical models and computational models that have been used to substantiate or refute the hypothesis. These fundamental problems essentially make the current debate irrelevant.

ANALYTICAL PROBLEMS WITH THE DOUBLE-DIVIDEND HYPOTHESIS

Among academic economists, the debate about the double-dividend hypothesis (DDH) began with models that were primarily static analytical general equilibrium models of a single period with a limited number of commodities, such as a clean good, a dirty good, and labor supply. In this section, we discuss several problems with this literature. First, the double-dividend hypothesis is not well defined, or at least not commonly stated. Second, the hypothesis is debated as a theoretical proposition, when its very nature is empirical. Under any consensus definition, the hypothesis *must* be valid for certain circumstances, that is, for certain starting points and certain parameter values. It is an empirical issue when and where those circumstances pertain. Third, the hypothesis is debated as a probabilistic statement, when the models are deterministic. Each side says the DDH is "likely" or "unlikely," when these models have no random variables, no variance, and no concept of probability. Fourth, some of this debate focuses on the number of dividends instead of the net social gain. Analysts can count three or four dividends from a particular reform, but that information is

useless if some other reform with one dividend provides a larger net gain to society. Fifth, these simple analytical models cannot address the complexity of actual environmental tax policies in the United States. For current policy, it is irrelevant whether two dividends arise in a two-good static model. For these reasons, we later discuss larger dynamic computational models.

The Double-Dividend Hypothesis Is Not Well Defined

To clarify, perhaps we should say that the double-dividend hypothesis is too well defined, since each author seems to use a different definition. The concept first appeared in Pearce (1991):

Governments may then adopt a fiscally neutral stance on the carbon tax, using revenues to finance reductions in incentive-distorting taxes such as income tax, or corporation tax. This "double-dividend" feature of a pollution tax is of critical importance in the political debate about the means of securing a "carbon convention." (p. 940)

More specifically, the usual definition follows Bovenberg and de Mooij (1994), who state the hypothesis by saying:

In particular, governments can use the revenues from pollution taxes to decrease other, distortionary taxes. In this way, environmental taxes may yield a "double dividend"—not only a cleaner environment but also a less distortionary tax system. This argument suggests that one may wish to push the role of environmental taxes beyond that of solely an instrument for environmental protection and employ these instruments also as a revenue-raising device. (p. 1085).

The way they analyze this hypothesis is by comparing the second-best environmental tax rate (in the presence of preexisting distortionary taxes) to the first-best Pigovian rate (the marginal social damage from pollution) in a static model with a clean good, a dirty good, and labor supply. The tax on the dirty good can improve the environment,

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