The Gains from Taxing Land

Nicolaus Tideman and Florenz Plassmann

Professors Nicolaus Tideman and Florenz Plassmann are leading academic investigators into the challenge of how to raise the productivity ceiling that overlays the capitalist economy.

They demonstrate that maximum gains are achieved when governments collect as much revenue as possible from land. Improvements in productivity come from three sources. Two fiscal reforms are generally recognized by economists: removing taxes from working induces people to make more efficient decisions about the allocation of their time between work and leisure, and removing taxes from saving induces people to make more efficient decisions about the allocation of their income between consumption and saving.

The third source of efficiency gains tends to be ignored by economists. Public charges on the rent of land reduces the potential profit from land speculation and brings more land into production.

The authors' first published effort on the subject was the chapter "Taxed out of Work and Wealth", published in *The Losses of Nations* (Othila Press, 1998). More recently, Tideman collaborated with three graduate students to publish "The Avoidable Excess Burden of Broad-Based U.S. Taxes" in *Public Finance Review* (September 2002). Their computer model was a greatly refined direct descendant of the model used for "Taxed out of Work and Wealth". In academic life there is always a possibility of refinement, and here the authors report results from further work on their continually evolving model of the U.S. economy.

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MODELS always simplify the subject being studied. Modelers must make judgments as to what level of complexity is worthwhile, considering the cost of complexity and the possibility that a model that is too simple will lead to misinterpretation. Our model incorporates some simplifying assumptions that are commonly used by economists.

We assume that the economy is composed of a large number of consumers who are identical to one another and live forever. We assume that the economy is perfectly competitive and always maintains full employment. Unemployment represents a choice not to work. In our simplified economy, there are only three things that consumers care about: the quantity of private goods that they consume, the quantity of public goods that are provided for them, and the number of hours per week that they must work. They find it worthwhile to save some of their income because saving yields returns that can be used to increase future consumption. An "intertemporal utility function" describes how the benefits of goods and leisure, now and later, vary with the quantities of each.

The amount of private goods produced depends on the amount of work that people choose to do, the amount of capital that people have accumulated, and the amount of land that is employed in the production process. The level of services provided by government depends on government revenue, which depends on tax rates. The government allocates fixed shares of its revenue to investment, public services, and transfer payments that are distributed equally to the identical workers.

Most economists who construct models of this general sort assume that there are only two factors of production, labour and capital. We distinguish land as a separate factor of production. We also incorporate into our model the idea that taxing land removes the profit from land speculation, leading to an increase in the quantity of land that enters into the production process.

Models of the sort we use generally incorporate an assumption that the cost of producing another unit of capital goods, in terms of foregone consumption goods, does not depend on how much capital is produced. We saw this assumption as potentially misleading when considering tax changes that might greatly increase the level of saving. For the model used to develop the figures shown below, we found a way to avoid this assumption and have the cost of capital rise as the level of investment rises. This is the most important advance over the model presented in *Public Finance Review*.

THE BASE MODEL starts with data for the year 2000, using it to determine the observable preferences of consumers for goods and leisure.
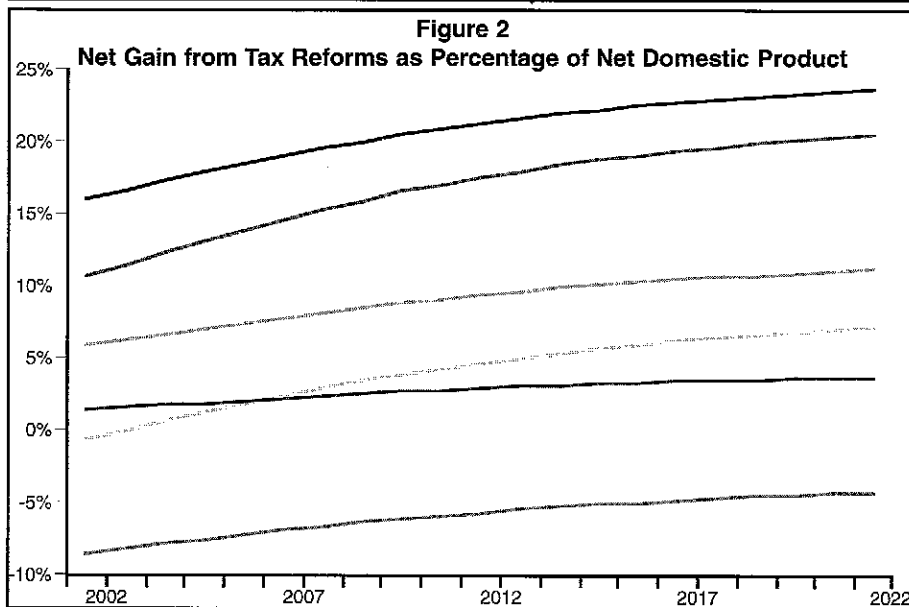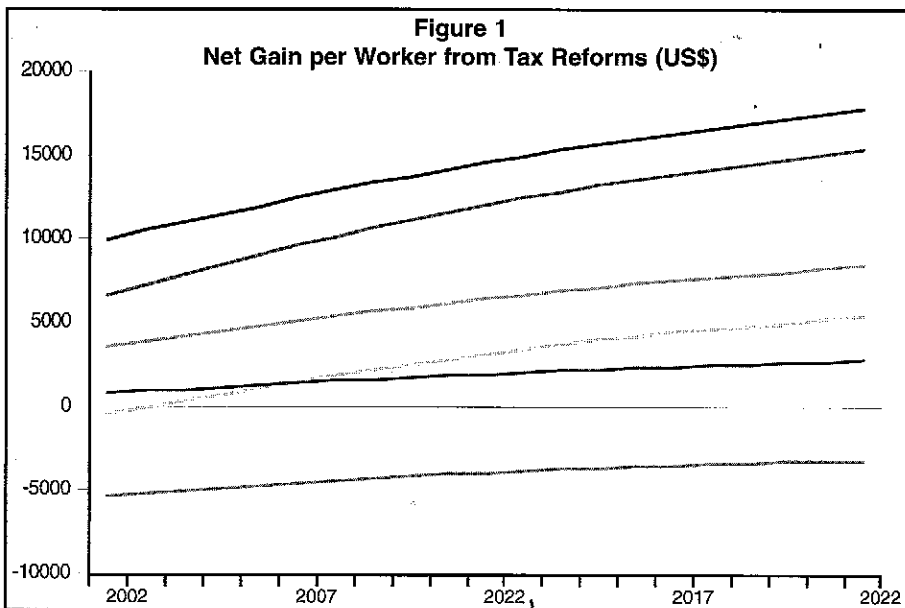
The amount that people save in response to the available returns reveals their relative preferences for consuming goods now and in the future. We project the taxes of 2000 into the future and trace the plans that people will make for work and leisure, consumption and saving, to provide themselves with the greatest possible satisfaction. The level of revenue that is generated in each future year, taking account of predicted future behaviour, provides a standard for raising revenue that any modelled tax reform is expected to meet.

Here we report the consequences of four possible tax reforms. Two of these involve collecting 90% of the rent of land. The first uses an income tax to collect enough revenue to match current tax collections; the second uses a sales tax for that purpose. (The required income tax starts at 8.05% and falls to 5.99% after 20 years; the required sales tax starts at 8.34% and falls to 5.81% after 20 years.) Both reforms involve abolishing the corporate income tax and the part of the property tax that falls on land. We compare these two tax reforms with two others that have received recent consideration in the press: replacing the progressive income tax with a flat (proportional) income tax, and replacing the progressive income tax with a sales tax.

We measure the gains (or losses) that people receive from these tax reforms by three ways in which the economy changes. People change the amount that they work, the amount that they consume, and the amount that they save. We combine these three changes into two overall measures of the value of these tax reforms: a measure of net benefits in dollars and a measure of net benefits as a percentage of what the economy produces (Net Domestic Product, or NDP).

When taxes are removed from labour and capital and placed on land, people work more and save more. Such a shift in the structure of public finance also reduces the extent to which people speculate in land, which brings more land into production. To see how much of the net benefit is attributed to reduced land speculation, we redo the calculations under the assumption that there is no land speculation in the economy at present, so that there is no increase in land use as a result of increasing taxes on land. The resulting net gains are shown in Figures 1 and 2.

The figures show a net gain of about $10,000 per worker (16% of NDP) in the first year, rising to $17,800 (23.7% of NDP) after 20 years for the most productive tax reform, which involves collecting 90% of the rent of land and using the income tax as a residual tax. When the sales tax is used as the residual tax, the gain per worker is about $3,300 less. The reason for this is that a sales tax concentrates all of the distorting effect of taxation on the decision about how much to save, inducing people to save more than is really efficient, while an income tax spreads the distorting effect of taxes between the decision about how much to save and the decision about

Figure 1
Net Gain per Worker from Tax Reforms (US$)

Figure 2
Net Gain from Tax Reforms as Percentage of Net Domestic Product

Key
Maximum Land Tax; Residual Income Tax
Maximum Land Tax; Residual Sales Tax
Maximum Land Tax; Residual Income Tax (no boost)
Maximum Land Tax; Residual Sales Tax (no boost)
Replace Progressive Income Tax with Flat Income Tax
Replace Income Tax with Sales Tax

how hard to work. This illustrates the general economic principle that spreading the distorting effects of taxes over several decisions generally produces a smaller loss than when the distortion is concentrated on a single decision.

When we assume that it is not possible to increase the efficiency with which land is used, the net gain per worker is $3,650 per worker, or 5.85% of NDP in the first year, rising to $8,400 per worker per year, or 11.2% of NDP after 20 years. When a sales tax is used as the residual tax, there is a slight loss in the first year and a greatly diminished gain in later years.

Our analysis of a flat income tax indicates that such a tax would produce a gain of $880 per worker (1.4% of NDP) in the first year, rising to $2,800 (3.8%) after 20 years. Replacing the income tax with a sales tax produces a loss of $5,300 per worker (8.5% of NDP) in the first year, falling to a loss of $3,200 (4.2% of NDP) after 20 years. People produce more with a sales tax, but they work harder to do it, and when the cost of the extra work is properly counted, people wind up worse off.

THE ESSENCE of our analysis is that there are considerable gains to be achieved from taxing land more and labour and capital less. These gains come from increasing the intensity with which land is used, and inducing people to work more and save more. The additional saving produces more capital, which leads to higher wages in future years. If a nation needs to tax income or sales, then income taxes are less harmful than sales taxes.