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A Tax on Gross Assets of Enterprises
as a Form of Presumptive Taxation

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Abstract

A tax on gross assets has been introduced in some developing countries where several factors (most notably, high inflation) enabled apparently viable enterprises to report losses for income tax purposes. The idea of a tax on the value of assets, rather than on the income that the assets generate, seems to have originated in the 17th century in Milan. It was more recently advocated by Luigi Einaudi and Maurice Allais, but their contributions have remained unknown in the Anglo-Saxon world. The economic implications of such a tax are analyzed in this paper. Special attention is devoted to efficiency and administrative aspects. Practical considerations suggest that the tax on gross assets serves as a minimum income tax rather than as a final tax.

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Summary

Taxes on enterprises cannot generally be relied upon during periods of high inflation, when otherwise viable enterprises often declare losses to the tax authorities, thereby reducing the contribution of the corporate sector to total revenue. Recently, Argentina and Mexico introduced taxes on gross assets, partly to ensure that enterprises contribute to the Treasury and partly to enhance the efficiency of these enterprises. Several other Latin American countries are considering introducing a similar tax.

This paper analyzes the tax on gross assets and relates it to more traditional forms of presumptive taxation, going back as far as the Seventeenth century, when a version of this tax, as applied to agricultural activities, was introduced in the principality of Milan. Some Italian economists credit the tax with stimulating the prosperity that followed its introduction in that region. A version of the tax on gross assets was also advocated by two important European economists, Luigi Einaudi and Maurice Allais, whose work unfortunately remains unknown in the Anglo-Saxon world.

The historical introduction is followed by an evaluation of the incentive effects of a tax on gross assets, which, it is argued would spur economic agents on to greater efforts since the implicit marginal tax rate on additional income would be zero. The paper also discusses how the taxable base and the tax rate might be determined. On administrative grounds, it is argued that the tax should focus on measurable assets and should tax gross rather than net assets. In determining the tax rate, the paper assumes that all assets are financed by debt. The proposed rate would depend on the existing statutory corporate tax rate, on the expected (average) real return on capital, and on some measure of the long-run real rate of interest. For practical reasons of international tax policy, the paper suggests that the tax base be a minimum tax against the tax on the income of enterprises, although this would reduce its efficiency.

I. Introduction

In 1988 Mexico adopted a new tax on enterprises and individuals who engage in business activities ("impuesto mínimo sobre los activos"). The base of the tax was broadly the gross assets of the taxpayer. The tax became effective in 1989 and was imposed at the rate of 2 percent. For technical reasons it was extensively amended on December 26, 1990. In 1989 Argentina introduced a similar tax, which became effective in 1990 at the rate of 1 percent. Both are annual taxes calculated on the basis of the assets declared by the enterprises or other taxpayers who own real assets. Bolivia, Costa Rica, Peru, and Uruguay have been considering the introduction of similar taxes. In Costa Rica in 1990 the government proposed such a tax to Congress but the proposal was rejected. It is likely that over the next decade the tax on gross assets will spread to other Latin American countries and perhaps to countries in other parts of the world.

There have been two basic reasons for the introduction of this tax in Latin America: first, the need for additional revenue in countries undergoing major adjustment programs; second, the realization that traditional taxes on the income of enterprises do not fare well in situations of substantial inflation. Inflation generally destroys the taxable base for the traditional taxes on business income. Furthermore, enterprises accumulate large losses that can be carried forward to future years and that guarantee that the enterprises will escape paying any taxes for several years. 1/ There has been a negative popular reaction in many countries to apparently viable enterprises that had over several years been declaring losses to the tax authorities.

The tax on the gross assets of commercial or business activities may appear as a recent technological development in the tax field and, in a way, it is. However, as with many "new" ideas in economics, it has a quite respectable background, a background that goes back to the 17th century and that, in this century, has received the attention of two prominent economists, namely Luigi Einaudi and Maurice Allais. Some version of this tax also featured in earlier years in the tax systems of the centrally planned economies.

In this paper we provide an analysis of this tax within the context of presumptive taxation in general. 2/ The next section will survey briefly the historical background. Sections III and IV will discuss some aspects of presumptive taxation of which the tax on gross assets is an example. Section V will address more directly the tax on gross assets while Section VI will draw a few conclusions.

1/ Both of these reasons were important in Argentina and Mexico.
2/ For earlier discussions of taxes on presumptive income see Tanzi (1980) and Tanzi and Casanegra de Jantscher (1989).

II. Historical Background

The idea of a tax on the value of assets, rather than on the income that the assets generate, seems to have originated in the 17th century in the Principality of Milan when in 1760 a cadastre listing land values was enacted into law and agricultural activities were no longer taxed on some estimate of actual income generated but on the value of the land. 1/ This new tax ignored the personal conditions of the owners. Writing in 1839, Carlo Cattaneo, a prominent Italian economist of the period, wrote:

> The principal effect [of this tax] was to weigh on leisure and to stimulate enterprise and effort; since, once the tax was estimated on the base of the cadastral value, all successive improvements were exempt; the better is the land cultivated, the lower is the tax. 2/

Cattaneo added that "with a single operation one can punish leisure and stimulate effort." 3/ He attributed to this tax the economic prosperity that followed its introduction in the Principality of Milan.

The principles espoused by Cattaneo were accepted and developed by Luigi Einaudi, the distinguished Italian policy maker and economist who, after World War II, became Governor of the Central Bank of Italy and President of the Italian Republic. Einaudi was one of the most respected public finance scholars in the first half of this century and to this day remains very influential in Italy and in Latin America. Unfortunately, because his work is available only in Italian, it has not had the influence it deserves in the Anglo-Saxon world.

Almost 60 years ago Einaudi presented his ideas about what he called the optimum tax (or "imposta ottima"). 4/ He argued against a tax based on the effective income of a taxpayer, a tax that he described as "technically impossible" and "economically disastrous" because of its effects on incentives. He favored an income tax based on "average income" by which he meant the income that would be received in a given year by a taxpayer who (a) worked an average number of hours, (b) contributed an average level of effort, (c) took an average risk, and (d) used the average technology of the time. He argued that an income tax based on "average

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1/ That this was a new idea is indicated by the fact that the earliest date reported by the Oxford Universal Dictionary for the use of the word "cadastre" is 1804.

2/ Cited in Einaudi (1959) p. 213.

3/ Ibid., p. 214.

4/ Einaudi's basic ideas, together with a discussion of the experience in the Principality of Milan and of the work of Cattaneo, are outlined in Chapter 10 of Einaudi (1959). Chapter 10 is entitled, "The Italian Science and the Optimum Tax" and was first published in 1938 although the basic ideas are contained in earlier writings of 1924.

income" (or using Einaudi's preferred terminology, on "normal income") would stimulate production and contribute to growth. The concept of "normal income" is still frequently discussed in Italy where it has many supporters and has had some effect on recent Italian tax legislation. 1/ The presumptive taxes in several other countries 2/ are often an application of this concept (see Tanzi and Casanegra, 1989).

Einaudi stressed that "the fertility of the idea is not limited to land. [But it can be applied] to the taxation of commercial, industrial, and professional incomes" (Einaudi, pp. 226-27). He argued that, when taxpayers are taxed on the basis of an average income and not on their actual income, they have an incentive to produce above the average, as this excess would be taxed with a marginal rate of zero. He maintained that the determination of the "normal income" for a given category of taxpayers should be easier than trying to ascertain the effective income of each taxpayer as is done in modern income tax systems.

Another casualty of linguistic provincialism is Maurice Allais's book, L'Impôt sur le Capital et la Réforme Monétaire (Tax on Capital and Monetary Reform). This book, written by a Nobel Prize winner, is unknown to English readers. It was first published in 1977 and was reissued, also in French, in 1988. It proposes a tax system based on a general tax on physical assets, a general tax on consumption, and a few other revenue sources. For us the interesting tax is the one on physical assets.

The general tax on physical assets would be levied with a uniform rate of 2 percent (interesting enough, this is the level of the Mexican tax on gross assets) and would replace existing income taxes on individuals and enterprises. The base of the tax would be only physical assets. It would thus not include bonds, shares, money holdings, and other nonphysical assets (such as patents, copyrights, or brand names). No deductions would be allowed. Allais proposed an ingenious system for presenting the annual declaration and for determining the value of the assets. Because of space limitations only a brief description is provided here.

The taxpayer would present an annual declaration in which she would list and provide an estimated value for each and all assets located in a given municipality or district. A tax payment equal to 2 percent of the declared value of the assets would accompany the declaration. The taxpayer could choose to remain anonymous, if he wished, as long as he provided the full list of the assets he owned and sent the full payment. Thus, in a way, the tax would be ad rem rather than ad personam. The tax administration would make public the list of all assets reported and the declared values.

1/ A recent Italian book has analyzed the concept and the experiences with taxes on "normal income." See Leccisotti (1990).

2/ Until 1975, presumptive income taxes were imposed in Israel on many types of self-employed individuals. Today, these taxes apply only when the taxpayers' records are poorly maintained.

It would not challenge the declared values but would have the power to buy any asset which it considered undervalued provided that it paid a price equivalent to 140 percent of the declared price. Any person could also propose to buy any asset on the published list at 150 percent of the declared value. Any such proposal, however, would be accompanied by a substantial deposit in order to discourage frivolous offers. The taxpayer who owned the asset under consideration would have the option to respond by paying 5 percent of the declared value if the proposal to buy was made by the tax administration, and by paying 10 percent of the value if the proposal to buy was made by someone else. In this latter case, half of the payment by the taxpayer would go to the person who offered to buy the asset at 150 percent of its price.

Allais argues that his general tax on physical assets would stimulate investment, would be equitable, and would reduce tax evasion to practically zero. In fact, if the system worked, the job of the tax administration would be reduced largely to ascertaining that all assets were reported, a function much easier than ascertaining values.

To complete this brief historical survey, a mention should be made of the taxes on the book values of the fixed assets of state enterprises introduced in the 1960s by several centrally planned economies. These taxes, levied with rates of 5-6 percent, were intended to stimulate a more efficient use of capital and to provide a sort of dividend to the state which provided the capital to the enterprises. These taxes were eventually phased out.

III. A Model of Presumptive Taxation

Suppose an individual possesses some endowment of a productive good or service. This commodity could be, for instance, land, or capital, or leisure. We assume that this endowment generates some nonmarket benefit to its individual owner. For instance, she may enjoy the self-consumed land-scape services, or recreational services, or crops of some piece of land, or the self-consumed housing services of a house. In the case of leisure, the individual may enjoy the direct consumption of it. Another possibility is to assume that for the endowment to produce a market good or service, the individual owner has to put some effort in the production process. She may have to hire workers and supervise them. She may have to search for the best or most efficient uses of her capital, etc.

In any event, we assume that for the endowment of the productive good or service to produce a market good, the individual owner must give up some nonmarket benefit which is not taxable, or invest some effort in the produc-tion process. In both cases there is a loss of utility. In order to avoid needless repetition we will simply say that the individual must make some effort in order to obtain a market, consumable, good or service from her productive endowment, and that effort is a "bad," not a "good," in that it generates disutility. We think that this is a fair description of the

productive characteristics of capital, and especially land, in many developing countries. For developed countries, this setup is more suitable for the study of the labor-leisure trade-off.

Denote the consumption of the market good by x, and effort by y. We then say that individual utility (u) is some function, $u = u(x,y)$, of x and y. Utility depends positively on x, but negatively on y. Thus, the individual faces the following choice or trade-off: in order to enjoy x, she must suffer from y.

Specifically, suppose that if the individual makes a "normal" (or "average") effort, she earns from her productive endowment an actual income of n. We refer to this level of income as normal (or average) income. Of course, she can make more or less than a normal effort, in which case her actual income will be more or less than the normal income, respectively. Let us calibrate the level of effort so that a normal effort will be designated by $y = 1$. Thus, actual income (denoted by z) is given by:

$$(1) \quad z = yn.$$

When normal (or average) effort is made (i.e., $y = 1$), actual income, according to equation (1), is indeed equal to normal income (i.e., $z = n$). When more than a normal effort is made (i.e., $y > 1$), then actual income exceeds normal income (i.e., $z > n$). Similarly, when less than a normal effort is made (i.e., $y < 1$), then actual income falls short of normal income (i.e., $z < n$).

The consumption that an individual can enjoy is equal to net, after-tax actual income, that is:

$$(2) \quad x = z-T \equiv yn-T,$$

where T is the tax payment.

Now, suppose that the Government can choose between two alternative income tax schemes. The conventional scheme is a tax on actual income, that is, a tax on z. In this case, T is some function, say T_A, of z, that is:

$$(3) \quad T = T_A(z).$$

An alternative scheme is a tax on normal (or average) income, that is, a tax on n. 1/ Such a tax on normal or average income may be termed also as a tax on _presumptive_ income; see Tanzi and Casanegra de Jantscher (1989). In this case, T is some function, say T_N, of n, that is:

$$(4) \quad T = T_N(n).$$

1/ Many aspects of such a tax, in one version or another, were discussed by Tanzi (1980) and by Tanzi and Casanegra de Jantscher (1989).

According to this tax scheme, the individual who makes more than a normal effort and earns an actual income (z) in excess of normal income (n) gets to keep all of the excess income to herself. In this way, the individual is not penalized by the state with a higher tax liability for making more effort. Making more effort produces a higher actual income without creating a higher tax liability, unlike the case when the tax is levied on actual income. In the latter case, more effort, which means more actual income, generates also a higher tax liability. Put it differently, with a tax on normal income, the marginal tax rate on actual income is zero.

The detailed derivation of our analytical model is relegated to the Appendix. In the next section, we will only state and explain heuristically the results.

IV.   Properties of Presumptive Taxation

Several useful and interesting comparisons can be made between the tax on normal or presumptive income and the tax on actual income. Since normal income is exogenously given (at least in the short run), it follows that the base for the normal income tax is fixed and thus does not depend on individual behavior. In this way the normal income tax works like a lump-sum tax: it imposes no marginal tax burden on actual income. Thus, it maintains Pareto efficiency. This is not to say that the tax does not change individual behavior. To the contrary, when effort is a normal "bad" (that is, the individual will make less effort to increase actual income, if she is given a lump sum transfer--a commonly accepted assumption in the labor supply literature), then a tax on normal income increases effort and, consequently, actual income. What is implied by the efficiency of the normal income tax is that no wedge is created by the tax between the individual marginal rate of substitution between consumption (x) and effort (y), on the one hand, and the marginal productivity of her effort (n), on the other hand. 1/ This is unconditionally true in the short run, since normal income is fixed in the short run.

In the longer run, individuals can invest in their human capital and increase their productive capacity. That is, they can increase normal income (n), which is the income that can be obtained by a normal level of effort (namely, y = 1). Hence, a tax on normal income tends to discourage investment in human capital in the long run. But so does the tax on actual income. This is because an increase in normal income means an increase in actual income as well. This disincentive effect of both forms of taxation on investment in human capital may be alleviated, in principle, and even totally eliminated, by allowing appropriate tax deductions for investment in human capital.

1/ Notice that the marginal productivity of effort is equal to normal income (n). This is because, by (1), increasing effort (y) by one unit increases actual income (z) by n.

In contrast, the tax on actual income has the familiar disincentive effects on effort. Therefore, its redistributive capacity is severely restricted. One always has to consider the trade-off between the size of the national pie and its distribution when employing a tax on actual income in order to reduce income inequalities.

Furthermore, actual income (or consumption) is not a good measure of utility or well-being. Utility depends not only on actual income but rather also (negatively) on work effort. Therefore, when individual A has a higher actual income than individual B, it does not necessarily mean that individual A is better off than individual B, if individual A had to make a much greater effort than individual B in order to obtain a higher actual income. Thus, to tax more heavily people with higher actual income is not necessarily equitable. For instance, John Stuart Mill (1923, p. 808) wrote: "I am as desirous as anyone that means should be taken to diminish... inequalities, but not so as to relieve the prodigal at the expense of the prudent. To tax the larger incomes at a higher percentage than the smaller is...to impose a penalty on people for having worked harder...." 1/

Therefore, because of the disincentive effects on effort and because actual income is not necessarily a good indicator of well-being, it follows that an optimal tax on actual income is not necessarily progressive, that is, the average tax rate on actual income (namely, $T_A(z)/z$) need not increase in line with actual income (namely, z). In his pioneering work, Mirrless (1971) concluded that the tax is almost linear for the bulk of the income range, that is, the marginal tax rate is almost constant (a flat rate income tax). Sadka (1976) showed that the marginal tax rate on actual income should gradually decline to zero at the top end of the income distribution.

In contrast, the optimal tax on normal income should always be progressive. That is, the average tax rate on normal income (namely, $T_N(n)/n$) increases in normal income (namely, n). Apparently, this result obtains because the normal income tax creates no disincentive effects on effort.

Another result which is most important for our purposes is that it is often the case that when actual income serves as the tax base, people with low actual incomes will not be taxed at all and may even be offered some kind or another of income supplements (a negative income tax). This creates a strong incentive not to make any effort at all to produce actual income.

1/ A similar argument may apply to risk-taking when losses cannot be fully offset for tax purposes. In this case, one can argue that "to tax the larger incomes at a higher percentage than the smaller is...to impose a penalty on people for having taken a greater risk." This argument is nullified when losses are fully offset. In the latter case, the tax refund in the event of a loss compensates for the higher tax in the event of a big gain.

Most studies of optimal taxation on actual income suggest that people at the bottom end of the distribution of normal income find it in their interest to have no actual income and they in fact choose to have no income. This is socially inefficient. With a tax on normal income, this is never the case. Everyone will produce an efficient amount of actual income, given his or her normal or presumptive income. 1/

V. A Tax on Gross Assets of Enterprises

In many countries, mostly developing ones, the tax on the actual income of enterprises had led to many problems. A major problem is the inflationary environment of these countries which allowed companies to change true sizable profits, via nominal interest deductions, into reported losses for tax purposes (see Sadka, 1991). The enterprises simply stopped contributing to tax revenues and the withholding tax on wage earners became the major source of direct tax revenues. For instance, during the high inflation periods in the early 1980s in Israel, and before a comprehensive tax indexation scheme could exert its influence on tax revenues, wage earners accounted for roughly two thirds of all income tax revenues, compared with about 40 percent at present. Furthermore, since accumulated losses are in many cases carried forward with indexation for inflation, enterprises could go on without any contribution to tax revenues for many years.

Second, in some developing countries capital is not always allocated to its most efficient uses. The reason might be that there are alternative, socially inefficient uses by the owners of capital, which are intangible and thus untaxable; consequently, such uses become attractive to the individual, private owner, even though they are socially inefficient.

In such cases, a tax on gross assets of individuals and enterprises may serve as a tax on normal or presumptive income, as compared with a tax on actual income. This is because gross assets may be a good indicator of normal or average income. Thus, a tax on gross assets has in the long run similar effects on employment and capital accumulation as a tax on actual

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1/ Finally, one can equivalently replace the notion of normal (or average) income by the notion of potential income, where the latter is defined as the income the individual can achieve when she makes the maximum level of effort. Whether the tax is levied on normal or potential income-- in both cases the tax base does not depend on individual behavior. Normal income as well as potential income are both exogenously given, at least in the short run. Hence, a tax on normal income can be equivalently replaced by a tax on potential income (with a lower rate) and vice versa (see the Appendix for a formal proof). Thus, all the advantages of the normal income tax pertains to the potential income tax as well. However, normal income being an average for many taxpayers is easier to measure.

income, but it enhances more efficient uses of capital 1/ and is easier to administer in developing countries, especially in inflationary environments.

Indeed, economic theory suggests that the market value of the firm's assets is equal to the net present value of the future (after tax) cash flows generated by these assets. That is, the market value of the assets reflects more the high true profits to be generated by them, rather than the low profits or even losses reported for tax purposes.

As mentioned earlier, a tax on gross assets of enterprises has been introduced in Mexico and Argentina, and has been under consideration in Costa Rica, Peru, and Uruguay. So it is very likely that this tax will spread to other developing countries. (One may view the property tax in developed countries as a kind of tax on gross assets, though it does not serve in lieu of a tax on the income generated by the property.) It will be therefore useful to study the main practical issue associated with a tax on gross assets. As with the implementation of any tax, key elements are the definition of the tax base and the determination of the tax rate.

1. Tax base

In determining the tax base, one has to pay attention to two issues: which assets to include in the base and how to evaluate them. The two issues are not totally independent of each other. For instance, one may wish to exclude a certain asset from the tax base not on theoretical ground, but rather simply because there is no practical, meaningful way to evaluate it.

When dealing with the issue of evaluating assets, the first aspect that comes to mind is inflation. However, in order not to be overwhelmed with the effect of inflation and distract attention from other, perhaps even more complicated issues, we shall leave aside discussion of the effect of inflation for later on, and assume for the moment that the rate of inflation is negligible.

In principle, we think that the tax base should include all fixed assets, such as land, structures, machinery, and equipment. These assets are essential to the production process of the firm. Coupled with labor, raw materials, energy, and other variable inputs, these fixed capital assets generate a stream of incomes to the firm. The idea is then to calculate and

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1/ A tax on gross assets is neutral with respect to risk-bearing because the tax liability is then a priori given, independently of whether a high return or a low return is actually experienced. In contrast, a tax on actual income, without a loss offset, discourages risk- bearing since it cuts into the owner's high return in case of "success" without offering a tax refund in case of "failure" (loss). With full loss offset, a tax on actual income encourages risk-bearing, since it reduces the risk to the owner, by taking an equal share in profits and losses.

tax the <u>normal, additional</u> (marginal) contribution of these assets to the firm's stream of incomes.

In order to avoid double taxation, the firm's holdings in fully or partially owned subsidiaries or any other companies should not be included in the firm's tax base because the subsidiary itself is liable to pay the tax on its gross assets. An exception to this rule is the firm's holdings in foreign entities. These holdings should be taxed with proper credit afforded against foreign-paid taxes. A difficulty may arise regarding enterprises that are owned by foreign firms. In this case, it is essential to work out a tax treaty with the foreign countries that will accept the tax on gross assets as an income tax, which qualifies for a foreign tax credit in the foreign countries. For otherwise, enterprises owned by foreign firms will be taxed twice: by the home country (through the tax on gross assets) and by the foreign country (via the income tax). So far, the U.S. Internal Revenue Service has refused to grant credits against foreign taxes on gross assets, claiming that such taxes cannot be viewed as income taxes. For this reason, Mexico, for instance, made the tax on gross assets a minimum <u>income</u> tax, so that U.S. firms will qualify for credits against taxes on gross assets paid by their subsidiaries in Mexico. We shall discuss this issue further in the concluding section.

Cash balances, accounts receivable, inventories, and other current assets should not be included in the tax base. The rationale for this is that these assets are not inherent in the production process, nor do they constitute an integral part of the real economic nature of the firm's activity. They are there because production and transactions are not timeless and because of the institutional framework in which the firm operates. If the firm were always to sell its products and to pay for its labor, raw materials, etc., at exactly the same point in time, then it would hold no cash and there would be no accounts receivable (nor accounts payable on the liability side). Similarly, if production were timeless, the firm would hold no inventories. Current assets tend, by their very nature, to fluctuate considerably during the year in response to various transitory phenomena and they could not serve as a measure of the firm's "ability to pay," when the latter concept is understood to be tantamount to the firm's potential income.

In principle, the tax base should include not only tangible assets but intangible assets as well. For instance, intangible assets, such as goodwill, brand name, and market power, certainly have their own contribution to the firm's ability to pay or potential income. Thus, they should, in principle, be taxed. However, there does not seem to be a practically meaningful way to establish arm's length prices for these intangibles 1/ and hence they should be excluded from the tax base for

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1/ In fact, in many countries a firm would not officially admit it possesses any kind of market power, since it may invite in such a case one sort or another of government intervention to nullify such a market power.

practical reasons. An exception to this rule arises when the firm is sold to an arm's length party. In the latter case, it is very likely that the price paid for the firm will reflect, in addition to the production costs of the firm's <u>net</u> tangible assets plus some adjustment costs and the like (Tobin's q), also the value of the firm's intangibles. It is interesting to note in this case that the buying firm (the parent company) will include the value of the intangibles of the purchased firm (the daughter company) in its consolidated balance sheet, either as a separate item or as an imputation to the other tangible assets of the daughter firm. But the daughter company will still have no mention of the value of the intangibles in its balance sheet. Thus, when computing the value of the gross assets of the daughter firm, one has to resort to the parent company's financial statements in order to compute the value of the intangibles. Notice that our recommended treatment of intangibles creates some inequity: in one case (when they are realized), they are subject to tax; in another case, they are not. In this respect, our treatment of intangibles is no different than the conventional treatment of capital gains: when they are realized, they are taxed; when they only accrue, but are not realized, they escape the tax.

Having established what assets to include in the tax base, one has to determine what value to assign to them. Now we drop our assumption that the rate of inflation is negligible. One cannot simply rely on the (historic) book value (i.e., purchase price or production cost) of the assets. A minimal requirement will be to adjust the (depreciated) value of the assets by the rate of inflation. The latter is most commonly measured by the Consumer Price Index (CPI). The market value or replacement cost of many fixed assets, such as machinery, equipment, or structures, which are relatively elastically supplied, is closely related to their production costs. In many high inflation, developing countries, wages and other input costs are indexed to the CPI. These other costs may include the cost of energy whose price is set by the government and indexed to the CPI, loans provided either directly or indirectly by the government and indexed (principal and interest) to the CPI, imported raw materials with the rate of foreign exchange closely following the CPI, and other items.

In this case, the depreciated book value of the asset, adjusted by the CPI, may be indeed a good estimate of the market value of the asset. However, for a relatively inelastically supplied factor of production, such as land, the CPI-inflated book value may deviate considerably and consistently from the market value. For such assets, one may consider adjusting the book value by a <u>regional</u> index of real estate prices or by asset-specific indexes (see Tanzi, 1981).

Lastly, since some fixed assets may be purchased and some sold during the tax year, the tax base should be a <u>weighted average</u> of the stock of gross assets that existed during the tax year. The weight assigned to each asset would be the proportion of the year the asset was owned by the firm.

An alternative would be to tax the assets owned by the firm on a specific day of the year (say, the last day of the fiscal year).

2. Tax rate

The first issue that we encounter when discussing the tax rate is somewhat related to the issue of the tax base: whether gross assets or net assets (that is, gross assets less debt) should be taxed. We advocate gross assets as the tax base. We prefer to impose a relatively low tax rate on gross assets than a relatively high tax rate on net assets. Suppose, for instance, that all assets (of firms and individuals) are financed 50 percent by debt (a debt-to-equity ratio of one). In this case a tax on gross assets at the rate of t is equivalent to a tax on net assets at the rate of 2t. Thus, if all firms and individuals use the same rate of debt-financing, it would make no economic difference whether gross assets or net assets are taxed (since the tax rate can be adjusted accordingly). Now, firms may employ different debt-financing ratios. We nevertheless still recommend that the tax be imposed on gross assets. In this way, we eliminate any tax advantage to debt over equity financing. All gross assets, no matter how financed, are equally taxed.

This is not to say that we ignore the fact that the firm must pay interest on its debt, which reduces the amount of funds available to pay the tax. To the contrary, the rate of tax will be designed as if the assets were fully financed by debt. This amounts to exempting, at the corporate level, equity holders from tax on a return on their equity, which is equal to the interest on debt. To put it differently, dividends (up to a rate which equals the interest rate) and interest are treated equally, both being tax deductible. Of course, they should both be taxed at the individual level (through interest, dividend, and capital gains taxes). In this way, one can achieve an integration of the corporate tax with the individual income tax.

Suppose that the expected real return on capital is estimated to be p. Assume further that the real rate of interest is r. Under these circumstances, the presumptive "profit" of the firm is taken to be p-r per one unit of value of gross assets (after allowing for an imputed interest on equity). If the existing statutory corporate tax rate is r, then our recommended rate of tax (t) on the gross assets is given by t = r (p-r).

When resources are (economy-wide) efficiently allocated, p and r are uniform across all firms. And to maintain interfirm and interindustry efficiency, the tax rate on gross assets must be uniform too. However, at present it is likely that capital is not efficiently allocated (and one of the aims of the tax on gross assets is to improve efficiency). Therefore, in order to allow a more gradual, smoother transition toward a more efficient resource allocation, interindustry variation in the tax rate on gross assets might be justified. This variation, if introduced, should be gradually eliminated in the longer run.

Lastly, in many countries, with a corporate income tax in place, accelerated depreciation allowances, investment tax credits, and the like are often used as counter-cyclical macroeconomic policy tools intended to stimulate a sluggish economy. These tools may be preserved in our case of a tax on gross assets too, in the form of a lower tax rate for new capital assets.

VI. Conclusion

We outlined two purposes for a tax on presumptive income. One purpose is to extract some taxes from firms or individuals who managed to take advantage of certain economic conditions (e.g., high inflation) in order to report losses and escape the traditional income tax. Another purpose is to enhance economic efficiency in the spirit of the writings of Einaudi and Allais.

In view of the first purpose, a tax on gross assets can merely serve as a minimum income tax. Thus, the tax on gross assets does not come in lieu of the tax on actual income. However, the second purpose dictates that a tax on normal income should not serve as a minimum tax on income. The efficiency advantage of the tax on normal income is that it gives an incentive to the economic agents to produce above the average, as this excess would not be taxed at all (i.e., zero marginal tax rate). Hence, if the presumptive tax only serves as a minimum tax, it loses a great deal of its efficiency advantage, since all income in excess of the income level which generates the minimum tax is then subject to an ordinary tax on actual income.

Nevertheless, practical considerations tilt the balance in favor of the tax on gross assets as a minimum tax and not as a final tax in lieu of the ordinary tax on actual income. Developing countries can vastly benefit from direct foreign investments and are eager to attract such investments. The U.S. Internal Revenue Service is unlikely to accept a tax on gross assets, when it is a final tax, as an income tax. This may be the case in other economic powers. As a result, firms located in the United States, Europe, and Japan, may not be entitled to tax credits against foreign taxes on gross assets paid by their subsidiaries in foreign countries. Such firms will be doubly taxed on their investments in countries with gross asset taxes. This could be detrimental for direct foreign investment. Therefore, the tax on gross assets should serve only as a minimum tax and not as a final tax.

1.   A basic income tax model

Following the same notation employed in the text, we note that the individual faces a standard consumer's utility maximization problem, subject to a budget constraint, that is:

$$(A1) \qquad \max_{(x,y)} u(x,y)$$

$$\text{subject to: } x = z - T \equiv ny - T.$$

It is assumed that u is strictly increasing in x, strictly decreasing in y, and strictly concave in (x,y). It is further assumed that consumption (x) is a normal good, while effort (y) is a normal "bad," that is: a lump sum transfer made to the individual lowers her effort.

Our analysis compares two different income tax schemes. The conventional scheme is a tax on actual income, that is, a tax on z. In this case, T is some function, say $T_A(\cdot)$ of z, that is:

$$(A2) \qquad T = T_A(z).$$

An alternative scheme is a tax on normal or average income, that is, a tax on n. In this case, T is some function, say $T_N(\cdot)$ of n, that is:

$$(A3) \qquad T = T_N(n).$$

In order to compare these two tax schemes, one has to specify the objective of the government, the government's revenue needs, and the productive capacity of the economy. Suppose that the range of normal incomes in this economy is between $N_1 > 0$ and $N_2 < \infty$, and let F(n) describe the cumulative distribution function of normal incomes, that is: F(n) is the number of individuals with a normal income below n, or equal to n. Denote the level of effort that an individual with a normal income of n (henceforth, an n-individual) makes by y(n), so that her actual income is then $z(n) \equiv ny(n)$.

Suppose also that the government has to finance an amount G of public expenditures by income tax revenues. Let T(n) be the tax payment made by an n-individual, whether through a tax on actual income or on normal income.

The government then faces a budget constraint

$$(A4) \qquad \int_{N_1}^{N_2} T(n)dF(n) = G.$$

which states that tax revenues (the left-hand side of (A4)) must equal public expenditures.

In designing the tax scheme, the government attempts to maximize some social welfare function which we assume to be of the commonly employed form

$$(A5) \qquad \int_{N_1}^{N_2} \frac{1}{1-\sigma} [u(n)]^{1-\sigma} \, dF(n),$$

where $0 = \leq \sigma \neq 1$, and $u(n)$ is the utility level enjoyed by an n-individual. The above social welfare function is very general. Two extreme, special cases are worth mentioning. When $\sigma = 0$, we have the classical Benthamite, utilitarian sum-of-utilities social welfare function. When σ approaches infinity we have the Rawlsian max-min social welfare function, which exhibits the highest degree of egalitarianism. Thus, depending on the specific value of σ, the social welfare function (A5) can exhibit any degree of egalitarianism, from the lowest level to the highest level. In what follows, we do not assume any specific value of σ, so that our results hold in general for any degree of egalitarianism.

Our aim is to compare a tax on actual income, in which case

$$(A2') \qquad T(n) = T_A(z(n)),$$

and a tax on a potential income, in which case

$$(A3') \qquad T(n) = T_N(n).$$

The optimization problem faced by the government when designing an optimal tax scheme on actual income is to choose such a tax scheme which maximizes the social welfare function (A5), subject to the budget constraint (A4). In doing so the government faces also a _market_ economy implementability constraint which states that the government can dictate neither the level of effort (i.e., $y(n)$), nor the actual income (i.e., $z(n) \equiv ny(n)$), nor the consumption (i.e., $x(n)$) of an n-individual. Rather, once the government chooses a tax scheme on actual income (i.e., T_A), it is left up to an n-individual to choose her level of effort, actual income, and consumption so as to maximize her utility subject to her budget constraint (see A(1)). A similar optimization problem is faced by the government in designing an optimal tax on normal income.

Fortunately, it turns out that our basic model is isomorphic to the optimal tax model developed by Mirrlees (1971), and then further analyzed for our purposes by Sadka (1976a and 1976b), and by Helpman and Sadka (1978). The results reported in the text draw on these studies.

2.   _An extension: A diversity of distastes for effort_

A useful extension of the model employed so far is to let variations of actual incomes for any given level of normal income. Specifically, let us assume that for each level of normal income there are many people with

different tastes for consumption and distastes for effort. That is, utility (u) becomes a function not only of consumption (x) and effort (y), but rather also of some taste parameter (α), that is $u=u(x,y,\alpha)$. For each level of normal income (n), denote the cumulative distribution function of the taste parameter by $H_n(\cdot)$.

Here again we may consider a tax on actual income and a tax on potential income. Under the latter tax, people with the same normal income (n) may generally have different actual incomes, depending on their taste parameter (α), but they are all liable for the same amount of tax.

This extended model is also isomorphic to a model of income taxation studied by Helpman and Sadka (1978). It turns out that the results presented in the text (for the original model) are valid in our extended model as well. 1/

3.   <u>An extension: a tax on potential income</u>

We have so far calibrated the level of effort so that y = 1 was designated as a "normal" level of effort. Hence, an income level of n which equals ny when normal effort (i.e., y = 1) is made, was designated as normal income. Thus, a tax on n was a tax on normal income.

One may alternatively calibrate effort so that y = 1 is the maximum level of effort or potential effort. In this case, an income level of n which equals ny when the maximum effort (i.e., y = 1) is made may be interpreted as potential income. With this interpretation in mind, a tax on n is a tax on potential income (see Tanzi, 1980).

1/ Strictly speaking, we have to assume that the distributions of normal incomes and of tastes are statistically independent (that is: H_n is independent of n).

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