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Presumptive Taxation: Revenue and Automatic Stabilizer Aspects

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Abstract

Presumptive taxation has been adopted in many countries to tax hard-to-tax activities and reduce evasion. Further, in view of the possible efficiency gains from such techniques, a case can be made for adopting presumptive taxation of global income. This paper addresses two questions. First, could revenue be increased by adopting presumptive tax methods? Second, would presumptive income taxation contribute to macroeconomic instability because it lacks the automatic stabilizer property of standard progressive income taxation? Two simple models suggest that there is scope for increasing revenue under presumptive taxation without necessarily undermining economic stability. The relevance of the first model for presumptive excise taxation in Pakistan is also examined.

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Summary

This paper examines two questions that arise when presumptive taxation is considered as an alternative to standard statutory taxation. First, could net revenue (revenue net of collection costs) be increased under presumptive taxation relative to standard taxation? This question is considered in the context of a microeconomic model of income tax evasion that examines the constraints of the bargain between the taxpayer and the tax collector. The model shows that, within certain limits, it is feasible to increase revenue with presumptive tax methods. Although not intended as a detailed case study, the model also helps explain the obstacles encountered in recent efforts to implement presumptive excise taxation in Pakistan.

Recent studies emphasize that presumptive taxation can lead to greater efficiency. In addition, it is argued that, unlike standard progressive income taxation, presumptive taxation of global income would not act as an automatic stabilizer because tax liability would be determined ex ante. This leads to the second question: Would the adoption of presumptive taxation of global income necessarily contribute to macroeconomic instability? With a rational-expectations macroeconomic model, it is shown that standard progressive income taxation acts as an automatic stabilizer only under rather restrictive assumptions. Therefore, although presumptive taxation does not have the automatic stabilizer property, in general, adopting presumptive taxation in lieu of standard taxation need not be destabilizing. The paper concludes that presumptive tax methods represent both a means to determine a minimum tax liability for hard-to-tax economic activities and an efficient form of global income taxation.

I. Introduction

Efficiency gains that result from presumptive taxation have been highlighted in some studies, most recently, by Tanzi and Casanegra de Jantscher (1987), Tanzi (1991), Sadka and Tanzi (1992). 1/ The norm for the standard (nonpresumptive) taxation of labor and capital income is to apply the legally prescribed rate structure to realized income, as defined in a statutory base. In turn, realized income is related to work effort. 2/ Under the standard methods of taxation, work effort is penalized at the margin because higher work effort results in higher income and, hence, higher tax liability. This serves as a disincentive to increasing work effort, economy-wide efficiency losses are incurred. If a tax could be designed to be levied on presumed income of the taxpayer, work effort would be increased because additional work effort resulting in additional income would not be taxed. Therefore, presumptive taxation would provide an incentive to increasing output and create economy-wide efficiency gains. The intuitive appeal of these arguments is enhanced if presumptive taxes may be levied more easily at a lower administrative cost. 3/

Two questions arise concerning the efficacy of presumptive taxation. The first relates to tax evasion. In many hard-to-tax activities, revenue losses due to tax evasion are significant as are the costs of enforcement to eliminate evasion. In such cases, the tax authority may find it advantageous to settle for a presumptive tax liability rather than having to incur the costs of assessing the statutory tax liability by conducting an expensive audit. However, the determination of the presumptive tax liability cannot be arbitrary. It must be based on accepted principles of taxation, existing set of tax laws, prevailing social norms and preferences concerning equity, ability to pay, and other factors. 4/ Equally importantly, the method of determining the presumptive tax base and liability must be acceptable to both the taxpayer and the tax authority. Adoption of presumptive taxation in lieu of standard taxation needs to be mutually and voluntarily agreeable to both parties as the result of their assessment of the benefits from presumptive taxation whereby both parties are better off than they are under the standard tax. 5/ Under standard

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1/ As Sadka and Tanzi (1992) point out, presumptive taxes were advocated earlier by Einaudi and Allais; see the references cited in that paper.

2/ The term work effort is used in reference to both individual labor effort and the individual firm's effort in utilizing its resources more efficiently.

3/ Some activities may be hard to tax due to the difficulty associated with measuring the tax base accurately or due to the difficulty of auditing; for example, the income of self-employed professionals, agricultural income.

4/ These issues are discussed in Tanzi and Casanegra de Jantscher (1987) and Tanzi (1991).

5/ If the presumptive tax is not agreeable to the tax payer, arbitrary imposition of this tax is likely to lead to extensive litigation increasing the costs of enforcement.

taxation, given the enforcement ability of the tax authority, a portion of the true tax liability can usually be evaded. 1/ Since it is not desirable to impose a presumptive tax arbitrarily, can the taxpayer be better off by voluntarily agreeing to the presumptive tax, as compared to the actual tax payment under standard taxation with evasion? Further, is it possible to design a presumptive tax also preferred by the tax authority because the revenue is greater than the level obtained under a standard tax?

The second question relates to the automatic stabilizer property of standard progressive income taxation at the macroeconomic level. Under progressive taxation, tax revenues rise when national income rises above its expected or trend level, and conversely. This serves to stabilize income around trend because, when income is realized below trend in a recession, the aggregate tax liability declines automatically with a contemporaneous expansionary impact on current income; as a result, the current income level is higher than it would be in the absence of the automatic reduction in the current tax liability. The opposite results hold if income is realized above trend. Although presumptive income taxation has been limited to selective sources of income, a compelling case can be made for its adoption as a means to tax global income also. This would involve the ex ante determination of the potential taxable income of taxpayers. 2/ As the presumptive tax liability would also be calculated ex ante on the basis of potential taxable income, tax revenue could not automatically respond to the fluctuations in the current income level. Then, the efficiency gains from presumptive taxation due to increased work effort might be negated by the efficiency losses resulting from increased instability. 3/

1/ On income tax evasion, see Allingham and Sandmo (1972). In a stylized model of tax evasion, the factors that affect the degree of tax evasion would include the probability of detection, the tax rate, and the magnitude of the fines and penalties associated with tax evasion.

2/ See Tanzi (1991). Tanzi (page 195) defines potential income of individuals as "the earnings that the individual could be expected to generate over the (taxation) period by the socially acceptable 'full' and judicious use of his total resources." The definition assumes an average work effort and does not refer to the maximum income that the individual can generate. It can readily be extended to apply to the firm's output as well.

3/ The trade-off between the distortionary effects and stabilizing impact of standard taxation is evaluated in a recent article by Greenwood and Huffman (1991). The underlying question these authors examine is, are the efficiency or welfare losses due to distortionary taxation (Harberger triangles) greater or smaller than the gains resulting from smaller cyclical deviation of income around its natural or full-employment level (Okun gaps) due to the automatic stabilizer property of distortionary taxes? The authors base their model on investment tax credits given by the government countercyclically and present simulations of the model based on parameters that conform to the U.S. data. Their simulations indicate that the welfare losses from Harberger triangles are significantly larger than the welfare losses from Okun gaps.

The present paper addresses the foregoing issues on the basis of two simple models. The first is a standard microeconomic model of income tax evasion, presented in Section II. This model indicates that, especially in view of enforcement costs, there is scope for the tax authority and the taxpayer to agree to a presumptive tax liability that yields greater net revenue (revenue net of enforcement costs) than would be collected under standard taxation. In Section III, Pakistan's recent experience with presumptive excise taxation is briefly evaluated. The second model, presented in Section IV, is a rational-expectations macroeconomic model that examines the automatic stabilizer feature of standard progressive income taxation. This model suggests that, under realistic assumptions conforming to the conditions that ordinarily prevail in many tax systems, replacing standard progressive income taxation by presumptive income taxation need not result in increased macroeconomic instability; in fact, under some conditions, it can actually enhance stability.

II. Revenue Aspects

A standard model of income tax evasion, developed along the lines of Allingham and Sandmo (1972) and Yitzhaki (1974), is used to examine the constraints of the bargain between the taxpayer and the tax collector toward adopting presumptive taxation.

The actual income or output of the representative taxpayer is y, assumed to be constant, the income tax rate is τ, the penalty rate on tax evaded is $z > 1$, and, the probability of detection is $0 < \pi < 1/z$. The taxpayer evades some of his true tax liability, τy, by declaring only a proportion $0 < \alpha < 1$ of his true income. The taxpayer's declared income is αy on which he is assessed a tax equal to $\tau\alpha y$. With probability $(1 - \pi)$, the taxpayer is not caught evading the tax; then, his net income is

$$y - \tau\alpha y = (1 - \alpha\tau)y \tag{1}$$

The taxpayer is caught evading the tax with probability π. Then, he is made to pay a penalty which is a multiple of the tax evaded. The tax evaded being $(1-\alpha)\tau y$, the penalty is assessed as $z(1-\alpha)\tau y$. 1/ In this case, the taxpayer's net income is

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1/ This assumption conforms to the general U.S. practice. A penalty scheme that imposes a fine on the tax evaded as $z(1-\alpha)\tau y$ implies that, when the penalty rate is increased, the fine increases by the same proportion. Such a penalty eliminates the substitution effect arising due to the increase in the expected pay-off to evading the tax relative to the expected cost of getting caught; see Yitzhaki (1974).

$$y - \alpha\tau y - (1-\alpha)z\tau y = (1 - \alpha\tau - (1-\alpha)z\tau)y \tag{2}$$

The risk-averse taxpayer's utility function is

$$U(y)$$
$$U'(y) > 0 \; ; \; U''(y) < 0 \tag{3}$$

which is assumed to be strictly concave. From (1) through (3), the expected utility can be expressed as

$$EU = (1-\pi)\, U[(1 - \alpha\tau)y] + \pi\, U[(1 - \alpha\tau - (1 - \alpha)z\tau)y] \tag{4}$$

where E(.) is the expectation operator. The taxpayer's maximizes (4) with respect to α.

In this model, it can be shown that the taxpayer chooses the optimum value for α as

$$\alpha^* = \alpha(\pi;\, \tau,\, z,\, y)$$
$$0 < \alpha^* < 1 \tag{5}$$

with $\partial\alpha^*/\partial\pi > 0$, which implies that as the enforcement effort or the probability of detection is increased by the tax authority, the taxpayer declares a greater proportion of his true income, that is, he evades a smaller proportion of his statutory tax liability. 1/ Accordingly, the expected tax liability is

$$ET = (1 - \pi)\alpha^*\tau y + \pi\tau y[\alpha^* + (1 - \alpha^*)z]$$
$$= [\alpha^* + (1 - \alpha^*)\pi z]\tau y \tag{6}$$

and the taxpayer's expected income is

1/ For a proof of the foregoing arguments in this section, see Appendix.

$$Ey = (1 - \pi)(1 - \alpha^*\tau)y + \pi[(1 - \alpha^*\tau) - (1 - \alpha^*)z\tau]y$$

$$= y - [\alpha^* + (1 - \alpha^*)\pi z]\tau y \qquad (7)$$

$$= y - ET$$

There exists an income level which the risk-averse taxpayer receives with certainty, $y^c < Ey$, such that he is indifferent between y^c and Ey or $U(y^c) = EU$; that is, the taxpayer is willing to pay a premium equal to $R = (Ey - y^c)$ to avert risk. This means that it is possible for the tax authority to offer the taxpayer the alternative of paying a presumptive tax less than or equal to the expected tax liability plus the risk premium the taxpayer is willing to pay to avert risk. Let $(T^P)_{max}$ be the maximum presumptive tax liability the taxpayer is willing to pay; using (7) and R, we can see that

$$R = Ey - y^c$$

$$= (y - ET) - [y - (T^P)_{max}] \qquad (8)$$

$$= (T^P)_{max} - ET$$

hence $(T^P)_{max} = ET + R$. Therefore, the taxpayer would be at least as well-off under presumptive taxation as he would be under standard taxation if he would accept any presumptive tax liability such that

$$ET < T^P \leq (ET + R) \qquad (9)$$

The result in (9) is sufficient to conclude that revenue can be increased under presumptive taxation. However, the empirical relevance of (9) is questionable because the tax authority is not likely to have any information concerning the magnitude of R. 1/ An empirically more meaningful question is, can the authority collect a higher net revenue than what it expects to collect under standard taxation in the absence of any information on R?

1/ The tax authority would be likely to have some information on the magnitude of the tax evaded and on ET, say, from historical data or a cross-section survey of taxpayers. Therefore, even without any information on the magnitude of R, the tax authority might have some leeway to negotiate a presumptive tax liability greater than ET and increase revenues.

Generally, the net revenue collection would be less than the expected tax liability of the taxpayer, ET, because of the collection costs associated with enforcement. Let $C(\pi)$ be the direct and indirect cost of enforcement; arguably, $C'(\pi) > 0$ indicating that the cost of enforcement rises with the degree of enforcement reflected in π. Also, letting ET^n be the net expected tax revenue,

$$ET^n = ET - EC(\pi) \tag{10}$$

Presumably, the tax authority maximizes (10) with respect to π to attain the optimum level of enforcement. 1/ Given π, (10) implies that the minimum presumptive tax revenue that the tax authority would accept is ET^n. Under these circumstances, ignoring R, it is possible to assess a presumptive tax liability such that

$$ET^n \leq T^P < ET \tag{11}$$

which means that both the taxpayer and the tax authority can be at least as well-off under presumptive taxation as under standard taxation. But when the agreement on some magnitude of T^P satisfying the equilibrium condition in (11) is reached, the net tax revenue may be increased. 2/ The above analysis indicates that presumptive taxation may be adopted and the associated efficiency gains may be reaped at least without a net revenue loss to the government ($ET^n = T^P$). 3/ Further, once the two parties agree on the magnitude of T^P the tax authority may lower the enforcement effort to

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1/ This maximization is consistent because $\partial ET/\partial \pi$ is positive under the assumptions of the model. Revenue maximization would also imply that the remaining policy parameters, τ and z, might also be adjusted along with π; here, the focus is on π.

2/ The exact magnitude of T^P would depend on the nature of the bargain between the tax payer and the tax authority; a Nash (cooperative) equilibrium solution would be feasible. Under this solution, the tax authority would share the benefit from lowered enforcement costs with the tax payer and induce him to agree to T^P satisfying (11). Similarly, in a more general setting, the risk-averse taxpayer would also be willing to reveal and pay a part of the risk premium to the tax authority. The arguments involved in (8) through (11) would imply that an equilibrium solution for T^P would fall within the limits $ET^n < T^P < (ET + R)$.

3/ Recall from (6) that ET corresponds to the income level, y, resulting from a given level of work effort under standard taxation. Fixing T^P serves as an incentive for increasing work effort because increased work effort, resulting in efficiency gains in the form of a higher income level, $y^P > y$, goes untaxed.

a minimum and reduce the collection costs, therefore, it is entirely feasible that net revenue is actually increased ($T^p > ET^n$). 1/

An empirical problem in achieving the equilibrium in (11) is that the tax authority's estimate of ET need not necessarily correspond to the taxpayer's estimate and $EC(\pi)$ does not realistically reflect the actual collection costs. Indeed, by construction, the tax authority does not have information on the values of α^* and y, therefore, it is possible for the tax authority to underestimate or overestimate ET. Similarly, $EC(\pi)$ may be subject to estimation errors as a result of ignoring indirect costs associated with enforcement, for example, costs of lengthy litigation. Consequently, if the net expected tax revenue, ET^n, is underestimated then (11) will hold but possibly at a revenue cost to the tax collector because the lower the level ET^n the lower the level of T^p the tax collector is likely to accept. On the other hand, if ET^n is overestimated then (11) is not likely to be achieved.

III. Capacity-Based Excise Taxation in Pakistan

Pakistan adopted a capacity-based excise scheme for selected major commodities in 1991. 2/ The main justification for adopting this scheme was to eliminate evasive collusion between the firms and tax collectors and increase revenues. Following the adoption of the presumptive scheme, the tax inspectors posted at major factories were withdrawn and this was expected to lower collection costs. The presumptive excise scheme envisaged determination of a fixed tax liability for the fiscal year after ascertaining, in consultation with the firms, the firms' capacity output levels under normal circumstances. Allowances were made for production stoppages resulting from extraordinary events such as natural calamities, strikes, etc. In the cases where an objective assessment of capacity was not feasible, a "consultative" tax scheme was proposed to determine the tax liability by direct negotiation with the firms. 3/ In implementation, the

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1/ Presumptive taxation is likely to have also some implementation costs, for example, the costs associated with determining the presumptive tax base. However, especially for hard-to-tax areas of economic activity, the cost of determining the presumptive tax base is likely to be lower than the cost of enforcing a standard tax.

2/ Capacity-based excise taxation was not new in Pakistan. It was introduced in the 1960s, to be abandoned later; for details, see Cnossen (1977).

3/ For example, in the case of cigarettes, an objective assessment of capacity proved too cumbersome. The same number of machines in different firms could produce different qualities of cigarettes and this would result in a different value of output for each firm with the same capacity. The value of output being the objective base for the excise tax, determination of tax liability on the basis of capacity alone would have resulted in inequities.

presumptive scheme met with very limited success. 1/ In most cases, it was not implemented because no agreement could be reached between the taxpayers and the authorities on the magnitude of the capacity output levels and the corresponding tax liabilities. In some cases, implementation was delayed by litigation when some taxpayers contested their tax assessment in the courts. As a result, most of the commodities designated for taxation under the capacity scheme remained subject to the existing standard excises. In other words, most taxpayers, by default, opted for the standard form of taxation instead of presumptive taxation.

The analysis in the previous section can shed some light on this outcome in the case of Pakistan. In view of the solution in (11), a possible explanation could be that the tax authority might have over-assessed the presumptive tax liability (T^p) by overestimating the net expected revenue (ET^n), perhaps as a result of underestimating enforcement costs. Indeed, if enforcement costs had not been fully taken into consideration, then it would have been impossible to reach a voluntary agreement between the taxpayers and the authorities. 2/ Because, in this event, the tax authority would have insisted on a presumptive tax revenue larger than the expected tax liability of taxpayers under standard taxation ($T^p > ET$) and a solution as in (11) would not have been reached. As a result, taxpayers would not have agreed to the level of presumptive tax proposed by the tax authority and would have preferred the existing standard form of taxation.

IV. Automatic Stabilizer Aspects

The validity of the argument that a standard progressive income tax has the automatic stabilizer property depends closely on model specification. In principle, it is possible to design a progressive income tax scheme that serves to reduce the variance of realized income around its expected level and thereby the welfare losses associated with cyclical fluctuations. 3/ Such a tax would also be distortionary and result in welfare losses. A

1/ The only major comprehensive tax agreement that was successfully completed was with the cement manufacturers. In this case, the tax authority was able to fix the tax liability of each firm for the fiscal year in advance, with the tax scheduled to be paid in monthly installments. No delays in payment were encountered and the auditing of these firms for excise tax purposes was not necessary during the fiscal year 1991/92.

2/ It was also possible that political support for the adoption of the capacity excise scheme could have been garnered only if the presumptive tax revenue had been greater than the expected tax revenue under standard taxation. Additionally, the tax authority may have attempted to extract a part of the firms' risk premium, as implied by the general solution for the presumptive tax revenue (T^p); see Footnote 2, page 9.

3/ For example, see McCallum and Whitaker (1979). Such fiscal and monetary policy rules were advocated as early as 1948 by Friedman.

trade-off would exist between the welfare losses and the possible welfare gains from the automatic stabilizing effects of distortionary taxation. 1/ However, in many plausible models, a standard distortionary tax need not exhibit the automatic stabilizer property; in fact, it may actually be destabilizing. 2/ If this is the case, adopting a different tax with smaller distortionary effects is preferable. It was noted earlier that, under a presumptive income tax, some efficiency gains might be incurred due to increased work effort but such a tax would not have the automatic stabilizer property because the tax liability would be determined ex ante. In this respect, the following considerations are relevant in adopting presumptive income taxation in lieu of standard progressive income taxation. On the one hand, if standard taxation has the automatic stabilizing property, its distortionary effect may be reduced and the efficiency gains from presumptive taxation may be incurred at the cost of increased instability; the decision to adopt a presumptive tax depends on this trade-off. On the other hand, if standard taxation does not have the automatic stabilizer property or has destabilizing effects, then presumptive taxation should be preferred because the efficiency gains from presumptive taxation either come at no cost of increased instability or are compounded due to decreased instability. In this section, the implications of adopting a presumptive tax on global income for macroeconomic stability are examined in the context of a rational expectations model. The conditions under which a standard progressive income tax possesses the automatic stabilizer property are derived. If these conditions do not hold, the standard tax may be destabilizing and adopting a presumptive income tax can actually improve macroeconomic stability.

Suppose the fiscal deficit is financed only by money creation, 3/

$$M_t - M_{t-1} = P_t D_t \tag{12}$$

where M_t is the money stock, P_t is the price level and D_t is the real deficit, and t refers to the current time period. Money creation process is described by

$$M_t = M_{t-1}(1 + \mu_t) \tag{13}$$

1/ For a recent discussion of this trade-off see Greenwood and Huffman (1991). For a discussion of this trade-off in the context of monetary policy (inflation tax), see Erbas (1986).

2/ This possibility was discussed by McCallum and Whitaker (1979); for more extensive discussions, see the articles by Miller and Christiano in Meltzer and Brunner (1984).

3/ Presence of bond finance would not affect the general results.

where μ_t is the rate of money creation. Using (12) and (13) and rearranging terms, it can be shown that the rate of money creation is determined as

$$\mu_t - E\mu_t = \theta\left(\frac{P_t D_t}{EP_t D_t} - 1\right) ; \qquad \theta = \frac{EP_t D_t}{M_{t-1}} > 0 \tag{14}$$

where E(.) stands for expectations rationally formed at the end of (t-1) and θ is a constant parameter whose value is known at the end of (t-1). The following identities are valid by approximation

$$\mu_t = m_t - m_{t-1} ;$$

$$\left(\frac{P_t D_t}{EP_t D_t} - 1\right) = [(d_t + p_t) - E(d_t + p_t)] \tag{15}$$

where

$$m_t = \log(M_t) \; ; \; m_{t-1} = \log(M_{t-1}) \; ; \; d_t = \log(D_t) \; ; \; p_t = \log(P_t)$$

Therefore, letting $E\mu_t = \mu$ in (14) and using (15), the money creation process can be expressed in logarithms as

$$m_t - m_{t-1} = \mu + \theta[(d_t + p_t) - E(d_t + p_t)] \tag{16}$$

In most countries, income taxes are not indexed with respect to changes in the price level. Therefore, it is realistic to assume that, under a standard progressive income tax, the current <u>nominal</u> tax liability is determined by the current <u>nominal</u> income level. Such a tax in logarithms can be expressed as

$$z_t + p_t = z_0 + \epsilon(y_t + p_t) \tag{17}$$

where z_0 is a constant, y_t is the real income level, and $\epsilon > 0$ is a policy parameter that measures the degree of progressivity of the tax. 1/ The deficit in the current period is assumed to be inversely related to tax revenue,

$$d_t + p_t = d_0 - \delta(z_t + p_t) + \eta_t \tag{18}$$

where $\delta > 0$, d_0 is a constant, and η_t is a white-noise random error term indicating random policy shocks on the level of the deficit from the revenue and expenditure side. 2/ Using equations (16) through (18), the money supply process can now be expressed as

$$m_t = m_{t-1} + \mu - \gamma\epsilon[(y_t + p_t) - E(y_t + p_t)] - \theta\eta_t \tag{19}$$

where $\gamma = \theta\delta$.

Aggregate supply, aggregate demand, and money demand functions (all in logarithms), respectively, can be specified in a highly simplified manner as

$$y_t = a_0 + a_1(p_t - Ep_t) + u_{1t} \tag{20}$$

$$y_t = b_0 - b_1[r_t - E(p_{t+1} - p_t)] + u_{2t} \tag{21}$$

$$m_t - p_t = c_0 + c_1 y_t - c_2 r_t + u_{3t} \tag{22}$$

All the parameter values in (20) through (22) are positive, r_t is the anti-logarithm of the nominal interest rate, and u_{1t}, u_{2t}, u_{3t} are white noise random error terms; equations (19) through (22) describe the complete model.

1/ The parameter ϵ is the elasticity of the nominal income tax liability with respect to nominal income level; the higher the degree of progressivity chosen by the tax authority, the greater the value of ϵ.

2/ The budget deficit may also be contemporaneously correlated with the expenditure level due to the automatic stabilizer property of expenditures; here the focus is on tax revenue and (18) appears to be a plausible expression of the behavior of deficit: deficit rises when tax revenue falls, and conversely.

Using the undetermined coefficients technique, the solution for y_t can be obtained as 1/

$$y_t = a_0 + \frac{b_1(1 + \gamma\epsilon)}{\Phi} u_{1t} + \frac{a_1 c_2}{\Phi} u_{2t} - \frac{a_1 b_1}{\Phi} u_{3t} - \frac{\theta a_1 b_1}{\Phi} \eta_t \; ; \tag{23}$$

$$\Phi = (a_1 b_1 c_1 + a_1 c_2 + b_1) + b_1(1 + a_1)\gamma\epsilon$$

The smaller the values of the coefficients of the random terms in (23), the smaller is the variance of income. Inspection of (23) shows that, as ϵ rises, then Φ rises and the values of the coefficients of the error terms except the coefficient of u_{1t} (the supply shock) decline. However, the coefficient of u_{1t} declines as ϵ rises if

$$b_1(c_1 - 1) + c_2 < 0 \tag{24}$$

This is to say that the standard income tax specified in (17) is unambiguously stabilizing (or its impact is to reduce the variance of y_t) if and only if (24) holds. Since (24) includes no policy parameters, there is no compelling reason for it to hold in general, therefore, the tax in (17) may well have a destabilizing effect. Recall that ϵ is the policy parameter which reflects the aggregate degree of the progressivity of the distortionary tax on income. We may argue that the higher the value chosen for ϵ the higher are the welfare losses due to distortionary taxation. Therefore, if (24) holds, increasing ϵ lowers the variance of income and creates welfare gains at the cost of increasing welfare losses from increased distortions.

If (24) does not obtain, then the tax in (17) has a destabilizing effect with respect to the supply shocks and switch to a presumptive tax can actually improve the stability of the income level by dampening the impact of such shocks. This fact can be seen by postulating that, under presumptive taxation, (17) becomes

$$z_t + p_t = z_0 + \epsilon E(y_t + p_t) \tag{17'}$$

which implies that the nominal tax liability is determined ex ante according to the expected or trend nominal income level and does not respond to the

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1/ The details of the solution are available from the author.

fluctuations in the current nominal income level. 1/ By substituting (17') into (18) and using (19), money supply under presumptive taxation becomes

$$m_t = m_{t-1} + \mu + \eta_t \tag{19'}$$

Now, with (19') and (20) through (22) describing the complete model, the solution for y_t obtains as

$$y_t = a_0 + \frac{b_1}{\Phi'} u_{1t} + \frac{a_1 c_2}{\Phi'} u_{2t} - \frac{a_1 b_1}{\Phi'} u_{3t} - \frac{a_1 b_1}{\Phi'} \eta_t \; ; \tag{23'}$$

$$\Phi' = a_1 b_1 c_1 + a_1 c_2 + b_1$$

Therefore, given that (24) does <u>not</u> hold, the coefficient of u_{1t} in (23') is smaller than the coefficient of the same error term in (23). Of course, whether the variance of y_t is actually reduced as the result of presumptive taxation will depend on the relative magnitudes of the remaining random shocks on income (u_{2t}, u_{3t}, and η_t). However, the above arguments make it clear that, under a plausible specification, the automatic stabilizer property of standard progressive income taxation is moot. Therefore, switch to a presumptive income tax is not necessarily destabilizing.

V. Conclusions

This paper addressed two questions that arise when presumptive taxation is considered as an alternative to standard taxation. First, could revenues be increased under presumptive taxation? Second, would presumptive taxation of global income contribute to macroeconomic instability? The answers to both questions suggested by the simple models above favor presumptive taxation.

1/ We may interpret the expected income level, $E(y_t + p_t)$, as the potential income level, as estimated by the tax authority at the beginning of period t. In reality, the presumptive taxes would be subject to random shocks as well (say, a tax relief granted as the result of a harvest failure, a surtax imposed as an emergency revenue measure). Presumably, this kind of randomality in the tax rule is captured by η_t, the random shock attributed to deficit in (18). The important point to note is that, in contrast to (17), in (17'), the systematic correlation between the nominal tax level and nominal income level is severed.

First, there is room to increase revenue by adopting presumptive tax methods, in particular, when the tax collector takes into account realistically the implicit and explicit costs associated with determining the correct statutory tax liability of the taxpayer. This appears to be an empirically feasible exercise to the extent the tax authority can estimate the cost of enforcement of a given tax (for example, the number of cases audited in a given year and the man-hours devoted to this task) and the expected tax yield under standard taxation (given the present level of enforcement) from historical data. Nevertheless, as noted by Tanzi (1991), there are difficulties associated with the determination of the presumptive or potential tax base. However, it may be argued that the main objective of adopting presumptive taxation is not so much the accurate determination of the tax base but it is the determination of a presumptive tax level which is acceptable to both the taxpayer and the tax collector such that the net tax revenue is increased. To some extent, this argument relieves the burden on the tax authority of determining the presumptive tax base and focuses implementation of such a tax on the more tenable task of determining collection costs. 1/ Even in the absence of a reliable estimate of the presumptive tax base which is agreeable to both parties, as long as expected revenue and enforcement costs under standard taxation can be realistically estimated, it is feasible to negotiate a presumptive tax resulting in an increase in net revenue. However, with an overly ambitious revenue target from presumptive taxation relative to standard taxation, the tax authority is likely to fail to reach an agreement with taxpayers, as has been the case in Pakistan since 1991.

Second, even though presumptive income taxation does not have the automatic stabilizer property, along with the argument that this property of an empirically relevant standard income tax may be moot, adoption of presumptive tax techniques with respect to global income need not contribute to macroeconomic instability. It appears that, in practice, the stability considerations under presumptive taxation are of second-order importance. Particularly when the efficiency gains from presumptive taxation are considered along with the possible net revenue gains, there are grounds to endorse presumptive taxation. Indeed, to the extent the possible revenue gains reduce the budget deficit, presumptive taxation can be viewed as contributing to macroeconomic stability.

1/ This not to say that the tax authority should not attempt to estimate the presumptive tax base as accurately as possible. However, this may not be immediately feasible while pressing revenue needs are imminent.

APPENDIX

For the risk-averse taxpayer, it is true that $EU < U(Ey)$ by definition. Notice from (7) that $Ey = (1-\tau)y$ when $\pi = 1/z$; hence by (4)

$$(1-\frac{1}{z})U(\ (1-\alpha\tau)y\ ) + (\frac{1}{z})U(\ (1-\alpha\tau-(1-\alpha)z\tau)y\ ) < U(\ (1-\tau)y\ ) \qquad (A1)$$

and $dEU/d\pi < 0$. Therefore, $0 \leq \pi < 1/z$ is required for $0 \leq \alpha < 1$, that is, there exists a value of π, π^*, $\pi^* < 1/z$, such that $EU|_{\pi=\pi^*} = U((1-\tau)y)$ or $\alpha = 1$. The first and second order conditions for a maximum that obtain from the maximization of (4) with respect to α are

$$\frac{\partial(EU)}{\partial\alpha} = [\ -(1-\pi)\ \frac{\partial U(\ (1-\alpha\tau)y\ )}{\partial\alpha} + \pi(z-1)\frac{\partial U(\ (1-\alpha\tau-(1-\alpha)z\tau)y\ )}{\partial\alpha}\ ]\tau y = 0 \qquad (A2)$$

$$\frac{\partial^2(EU)}{\partial\alpha^2} = [(1-\pi)\frac{\partial^2 U(\ (1-\alpha\tau)y\ )}{\partial\alpha^2} + \pi(z-1)^2\frac{\partial^2 U(\ (1-\alpha\tau-(1-\alpha)z\tau)y\ )}{\partial\alpha^2}\ ]\ (\tau y)^2 < 0 \qquad (A3)$$

With $0 < \pi < \pi^*$, the optimal value of α, α^*, obtains from (A2) such that $0 < \alpha^* < 1$ due to the strict concavity of the utility function. Differentiating (A2) with respect to π and rearranging terms, we can show that, with $z > 1$,

$$\frac{d\alpha^*}{d\pi} = -(\tau y)\ [\ \frac{\frac{\partial U(\ (1-\alpha\tau)y\ )}{\partial\alpha^*} + (z-1)\frac{\partial U(\ (1-\alpha\tau-(1-\alpha)z\tau)y\ )}{\partial\alpha^*}}{\frac{\partial^2(EU)}{\partial(\alpha^*)^2}}\ ] > 0 \qquad (A4)$$

where the sign follows from $U'(.) > 0$ and (A3).

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