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TAX REFORM IN DEVELOPING COUNTRIES:
ISSUES, POLICIES AND INFORMATION CAPS

by

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June 1985

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ABSTRACT

The paper starts with an examination of a sample of tax reform packages proposed for developing countries. It extracts from these studies explicit and implicit factors motivating tax reform, and some of the views of authors of these proposals. These are then compared with reform proposals in a more limited set of developed countries. The paper then moves on to a selective review of the base of knowledge on which these reform proposals must be based. Some of the distinguishing features of developing countries, how they might modify policy conclusions, and the detailed information deficiencies which need rectification are also indicated. The concluding section takes a broader view of developing country tax reform, and presents tentative conclusions based on a stylized view of an LDC economic (tax) base.

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1. Introduction

Is tax reform in developing countries a different beast from tax reform in developed countries, or is it merely a watery reflection of the horrors lurking in the developed country tax systems? A data sparse shadow of policy conclusions emanating from American and European analysis and policy discussions. More specifically are the issues which motivate and shape tax reform in developing countries significantly different from those in developed countries? To what extent do the special economic problems of developing countries effect tax reform policies in these countries?

The present paper is a preliminary and limited attempt to answer these questions. The paper reviews a selected sample of published tax reform proposals for developing countries and the U.S., and frames the issues in the context of the existing economic literature. 1/ There is a dual objective to this exercise: To draw tentative policy conclusions for tax reform, and to outline areas which require (further) empirical research and analysis, to strengthen the foundation on which policy recommendations are based. In the next section the important issues involved in and motivating developing country tax reform are identified. Section 3 does the same for developed countries, and the two are compared in section 4. Section 5 contains a review of the empirical and economic literature, with a strong emphasis on the efficiency effects of taxes. Some of the detailed issues and information gaps arising in LDC reform are discussed in the context of the literature. Section 6 concludes the paper with a discussion of the most important issues in

1/ The paper was not designed to be a review of the literature. The strategy was to reverse the usual practice, and start from actual tax reform proposals rather than from economic theory.
developing country tax reform and possible policy choices in the context of a stylized representation of an LDC tax base. The significant information gaps in this context are also identified.

2. Issues In Developing Country Tax Reform

The expenditure policies of the government form the backdrop for all the tax reform proposals examined for this paper. The nature and usefulness of these policies is not considered except for references to the government's development objectives. Implicit in these objectives is some concept of growth with equity. In a broader perspective, expenditures could be examined along with commonly used alternatives to taxation such as government borrowing and money creation. This paper follows precedent in ignoring these issues, which in any case constitute a large and difficult area in itself. 1/

Resource Mobilization seems to have been the single most important motivating factor in LDC tax reform. There are several different contexts in which the question of mobilizing more resources arises. The most common is a growing imbalance between expenditures and revenue collections. This is commonly framed in terms of the elasticity of total tax collections with respect to national product. Another related problem is the anticipated shortfall in nontax revenues of the government such as those arising from an expected reduction in oil output or prices.

Tax Reform is placed on the national agenda as an alternative to raising existing tax rates to still higher levels. The choice is therefore

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1/ The tax reform proposals examined were by Bird, Musgrave, Musgrave and Gillis, Shoup and Shoup, Dosser, Penner and Vickery. The author also had access to some unpublished material by M. Gillis on Indonesia.
between raising rates on an existing base of direct and indirect taxes, or reforming and expanding the base. A shift in the pattern of taxes, and the feasibility of imposing new types of taxes consequently enters the agenda set by traditional resource mobilization concerns. Uncertainty in tax receipts arising from fluctuations in the base on which taxes are levied is often a contributing factor. An example is countries heavily dependent on import or export taxes which are faced with fluctuations in import or export demand.

Administrative costs, evasion and corruption are different facets of a Hydra headed monster which seems to underlie, shape and constrain developing country tax reform proposals. It is often euphemistically referred to as a problem of horizontal equity -- different individuals with similar income (or consumption) paying different taxes depending on the ease with which they can evade taxes. Evasion is much easier for the self-employed, than it is for wage and salary earners, because of the ease of withholding (lower administrative costs) for the former. Evasion appears to be much easier for the small entrepreneurs/enterprises (self-employed) than it is for the large because of lower administrative costs per unit of tax (direct and indirect) collected from the latter. This almost universally leads for both direct and internal indirect taxes, to a (arbitrarily defined) cut off size below which the tax payee is exempt from paying tax. The nature and extent of exemptions for small firms is, however, dealt with in one report, through a proposal for a structure of presumptive taxes.

Not surprisingly, these government appointed and government related reports seldom mention corruption directly. If this is factored into the equation, the last mentioned difference could be negated or reversed by the fact that large evaders may find it easier and cheaper (per unit of evasion)
to bribe different levels of officials and politicians. One interesting case mentioned is for import taxes, commonly thought to be much easier and cheaper to collect, where evasion linked corruption appeared to be undermining tax collections.

Certain types of complexity in the tax system is commonly identified as one (correctable) causative factor. Complexity is associated with tax rules which genuinely make compliance difficult, which are difficult to administer (for example requiring too much technical knowledge), or are so obscure as to give tax payers and tax collectors discretion for avoidance and harassment respectively. Simplification of the tax system is therefore proposed as a solution, and is an important factor shaping the detailed tax reform recommendations. 1/ Lowering (high) marginal rates on direct taxes, though seldom explicitly mentioned, appear as an implicit solution to the problem. This neglect is probably due to the lack of empirical data, or even an analytical framework for analyzing the problem. It is hard for the proposers to back up the underlying hypothesis that lower marginal rates would produce a more equitable outcome than the existing one.

Taxes on "luxury goods" play a central role in developing country tax reform proposals. Conventional criteria are used to define these goods; a high income elasticity of demand, and the proportion of such goods in the

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1/ Some studies simultaneously propose introduction of certain types of complexity -- summary assessment based on several indicators -- as a means of solving the evasion problem.
expenditures of the rich. The reason for the central role of luxury goods is that they are perceived as a solution for both the revenue elasticity and the equity problems. This is assumed to follow from the two definitions of luxury goods used above, though no direct evidence is adduced. Integration of the import duties on luxury goods with this system and a separate determination of the appropriate level of (additional) purely protective tariffs is also proposed. This is hypothesized to increase efficiency by reducing the discrimination between imported and domestically produced luxury goods.

The development objectives of the government with respect to savings and investment and the efficiency with which tax policies assist these objectives, shapes the detailed proposals for base broadening and reform. Some forms of savings are commonly deductible from income tax, and lifting of interest ceiling is proposed as a more efficient means of encouraging savings. High marginal rates of income tax on the highest slabs are viewed as being quite ineffective due to evasion. Implicitly they are also seen as creating inefficiency though the precise mechanism is not examined. To the extent that taxes are evaded, inefficiency cannot come from the usually hypothesized distortions in labor-leisure choice, and the double taxation of savings.

Economically efficient ways of taxing capital gains are considered and traded off with simplicity and ease of compliance and administration. For

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1/ The criterion coming from the optimal tax literature, is the consumption of the (luxury) good by the richer individuals as a proportion of total consumption of the good. See for example the textbook by Atkinson and Stiglitz.

2/ As noted in the previous footnote, this is not the criteria arising from the optimal tax theory for generating greater equity.
corporate entities and other enterprises, depreciation provisions, interest deductibility, loss carry forward provisions, investment credits, and tax holidays are considered with respect to efficiency or effectiveness per unit of tax expenditures. The last two are not however examined in an integrated way with the others. The usefulness of incentives directed at or available largely to foreign investors is questioned. Broad based domestic investment incentives are also questioned in that they are merely canceling government imposed disincentives on savers. Similarly the increase in capital intensity resulting from sectoral and regional investment incentives is seen to contradict the governments' employment generation objectives.

The efficiency of indirect taxes is viewed in the context of the deductibility of taxes paid on imported and domestically produced inputs, from taxes collected on output or sales. \(^1\) Though many of the countries considered allowed such deductibility, some disallowed it on raw materials, thus achieving only a partial gain in efficiency. The value added tax (VAT) is largely a means of achieving these efficiency gains in the indirect tax system. The deductibility provision backed by proper accounts is also viewed as facilitating the rebate of taxes paid on exports, and providing a cross check procedure for detecting evasion. The latter is seldom actually implemented, because of inadequate information processing and lack of thorough (random) audit procedures.

\(^1\) In addition to the inefficiency arising from input substitution, the cascading of taxes provides an incentive for vertical integration. Thus large integrated conglomerates are favored relative to small producers, and the development of subcontracting is hampered.
The value added tax (VAT) does add an extra feature to the tax reform debate in that it is viewed by the reformers, at least in abstract, as applicable to all value added and at a uniform rate. It therefore raises issues about the exemption or 'zero rating' of value added in certain sectors such as agriculture, and higher possibly differentiated taxes on certain goods (luxuries). As even an approximation to such a uniform VAT does not exist, the rationale for a uniform consumption tax implicit in it is not discussed. The one report which explicitly proposes a VAT, also proposes a separate structure of (final/consumed) 'luxury good' taxes, in the expectation that this will keep the VAT system simple to administer.

3. Issues in Developed Country Tax Reform

Somewhat paradoxically, the most important issue in developed country tax reform is that of capital taxation and the distortion of saving and investment decisions. As the corporate sector is such an important part of these economies, the nature of this tax is a critical issue, which we will take up subsequently. The corporate tax has been conventionally seen as a tax on capital, and in this case the problem is reduced to one of appropriate capital taxation. 1/ Capital taxes are perceived (at the simplest level of analysis), as introducing a wedge between savings and investment, and distorting the savings consumption choice towards the latter. The proposed solution to this problem is the integration of the corporate tax system with

1/ See for example the papers by Harberger. The diametrically opposing view of Stiglitz that the tax is in fact a tax on pure profits, entrepreneurial wages and risk taking, is usually noted as a caveat to conclusions based on the consensus view.
personal taxation, to eliminate this source of double taxation of capital income. Basically all the different variants eliminate the corporate tax, by converting it into a withholding tax for the personal income tax system.

Reform discussion also focuses on the depreciation, interest deductibility, loss carry forward and other deduction provisions. These are shown to produce a differential effective tax on different types of investment and thus to distort the allocation of investment. These are also shown to change capriciously with changes in inflation. The important factors responsible are the differential availability of investment credits (usually only to equipment, and not to structures), and depreciation provisions not being related to true economic depreciation. In the presence of inflation, deductibility of nominal rather than inflation adjusted interest is also a complicating factor.

The saving–consumption choice will also be affected by the double taxation of savings inherent in the income tax. Wage income being taxed when it is earned followed by taxation on any part of it which is saved. 1/ The proposed solution to this efficiency problem is to shift from an income to a consumption tax. Among the ways of introducing such a tax are the "net cash flow" tax, the value added tax, and the Hall–Rabushka proposal. Implicit in these proposals is an expectation of large efficiency gains. 2/

Another important issue is the fairness of the tax system. This is not primarily a question of income distribution. There is a perception that

1/ This analysis ignores the possibility of bequests.

2/ Proponents also say that equity, based on life time discounted income/consumption will improve. Opponents assert the opposite. The critical source of difference is the issue of bequests.
the rich and powerful avoid, through manipulation of complex tax rules, paying their statutory share of the taxes. Implicit in this perception is an assumption that there are fixed costs involved in collecting information on and learning how to exploit the "tax loopholes". Consequently those with greater (lifetime) wealth find it cheaper (per unit of avoidance) to do so. Simplification of the tax system is therefore one proposed solution to this problem.

The more explicit argument is that those with higher marginal tax rates find it more profitable to engage in avoidance. A reform which broadened the base, lowered the highest marginal rates, and left actual tax payments at different income levels approximately the same, would make the system 'fairer'.

High marginal income tax rates are also seen as distorting the labor-leisure choice. The solution proposed above would therefore have a positive effect on this problem. At a little greater depth the issue really becomes one of the work incentives facing wives of prime age male workers. 1/

The generation of more revenues seems to be a relatively minor concern of developed country tax reform efforts. In Europe some countries did take advantage of the introduction of the value added tax to raise additional revenues. In the US the revenue issue has only come up because of prior tax cuts.

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1/ Though a recent paper by Hausman questions the earlier consensus, that there are low efficiency losses for US prime age males.
4. A Comparative Perspective: Issues and Economic Conditions

The most noticeable difference between the DC and LDC reform agenda is the absence of the 'luxury good' taxation issue in the former. 1/ There are two possible reasons for this: one is the much greater concern for equity/income distribution, either because of the large number of people facing absolute poverty, or because of very skewed income distributions. Another is the historically much greater reliance on indirect taxes by poorer countries. A common general conclusion is that direct taxes tend to be progressive, while (at least internal) indirect taxes tend to be regressive. If for administrative or other reasons, comprehensive income taxes were not available or greater revenues were needed, taxes on luxury goods were seen as an equitable way of raising them.

As food products are often exempt from taxes, and food constitutes a substantial proportion of the budget of the poor, the reason for regressivity is not obvious. Merit good taxes, commonly excise duties on tobacco and alcohol based products, are a major source of revenue in LDCs. This suggests that heavy merit goods taxes may play an important role in making the LDC indirect tax system regressive. 2/

The saving-investment issue is the most important common driving force in LDC and DC tax reform. The developed country discussion is motivated

1/ Most European countries which introduced the VAT did however levy a higher than 'standard' ('normal') rate on a diverse groups of commodities thought to be luxuries. See Aaron for a review of European VAT experience. Also see Ballard and Shoven.

2/ An additional reason may be that these goods are relatively price inelastic. Conventional partial equilibrium analysis (Harberger triangles) shows that this will result in low efficiency losses.
almost exclusively by the corporate income tax. Though the corporate income tax is an important source of revenues in many developing countries, the base often consists largely of foreign firms. In the latter case the question is really one of taxation of foreign investment. Some of these countries also have an enterprise tax which applies to noncorporate entities. 1/ The capital tax issue and the discussion of possible effects on the savings-consumption choice would apply to these taxes.

In developed countries the discussion is focused most heavily on the unexpected effects of the tax system on investment allocation. Developing countries play a much more active role in influencing the allocation of investment. There are a diverse lot of policies to attract foreign investment, and to effect the sectoral and regional pattern of allocation. One of the issues is whether each of these policies, viewed in isolation achieve their professed objective, and at what cost in revenue expenditures. The other is the effect of the more complex pattern of interaction of these policies. At a deeper level the combined effect of tax, and other policies related to credit markets, import protection, and price and investment controls also becomes an important problem. In other words the depth and complexity of the allocation issue is much greater in developing countries.

The more subtle issue of the double taxation of savings inherent in the income tax is not raised with equal force in developing countries. The primary reason appears to be the perception that income taxes are more progressive than consumption taxes. At the simplest level of analysis, those

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1/ The taxation of plantations and other organized agricultural enterprises can also be analyzed in this context.
with larger tangible wealth would tend to have a greater proportion of income from savings. A switch from an income to a consumption base would tend to reduce progressivity. 1/ Nevertheless some concern with this issue is reflected in the limited exemptions and deductions granted to certain savings instruments and amounts.

Another possible explanation for the lower interest, is that most developing countries are much more heavily dependent on indirect tax revenues. To the extent that this reflects taxation of consumption, these countries may already have a tax system weighted towards this side. Evasion also plays a somewhat indeterminate role in this issue. The relative ease of evasion of income and commodity taxes, and possible differences in the proportion of evaded income consumed, could effect the savings-consumption choice.

At a superficial level the fairness/avoidance issue in developed countries appears to be very similar to the evasion issue in developing countries. Both issues get related to the complexity of the tax system and the high marginal rates of taxation. Base broadening, simplification and reduction in marginal rates is part of the proposed solution in both cases. Beyond this equating the two is highly misleading. Evasion is a much deeper and more pervasive problem than avoidance, and is often associated with the problem of corruption. It can modify private and public behavior and consequently the effect of policies in fundamental ways.

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1/ Two developing countries, India and Sri Lanka, which tried to introduce an expenditure tax, apparently failed in their attempt, in that they abandoned it after a trial period.
In developing countries the solution is also much more closely linked to the question of administration costs. Exclusion of small tax payees, defined in diverse ways, by different levels and depending on the type of tax, is a reflection of this association. 1/

Raising government revenue is a much more important issue in developing countries, even though developed countries have taken advantage of tax reforms to raise revenues. 2/ One reason for this is that in developing countries the alternative is often deficit finance and money creation. The effect of this kind of implicit taxation is much more capricious and unpredictable. Inflation induced inefficiency is commonly thought to be as, if not greater than the explicitly tax related one. Another is that government expenditures are less subject to question. On the contrary many of the tax reform proposals suggest that expenditure policies are a much better means of achieving income distribution goals than tax policies.

Efficiency of the indirect tax system is a nonissue in most developed countries. 3/ This is probably because either taxes are levied at or very near the final good stage, or a VAT system is used which has the same efficiency effect. Not surprisingly it is not an important issue even in developing countries which already allow deduction of sales-excise taxes paid at intermediate stages of production. Though a number of countries not

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1/ Formally it is often justified on grounds of equity or other elements of social policy such as encouragement of labor intensive production.

2/ Many European countries set VAT tax rates which led to an increase in indirect tax revenues after the introduction of the new system.

3/ In Europe, the VAT did in many cases replace a host of inefficient turnover, excise and sales taxes. See Aaron.
covered in the present review have this type of provision, there are an
equally (if not more) numerous group of developing countries which depend on
turnover taxes and excises on intermediate goods. This issue may therefore be
even more important if all developing countries are sampled. 1/

5. Empirical and Analytical Basis for Tax Reform

The economic basis for tax reform consists of the presumed or
demonstrated effect of taxes on individual behavior. The empirical,
analytical and simulation studies of individual behavior which form the
foundation are to some extent interlinked. Given the extent of controversy
surrounding each of these, however, few unambiguous answers emerge, though
useful insights can nevertheless be drawn. Though analysis and simulation
play an important role in this process, the ultimate basis has to be
empirical. 2/ Controversial specification and estimation issues which have
arisen in this context require detailed and good quality data which is
unavailable in developing countries. 3/ Therefore most of the conclusions
drawn are implicitly or explicitly based on work on developed countries.

1/ The relatively new optimal commodity tax approach is not used in the
reform proposals sampled. In this case efficiency is not merely a matter
of input distortion, and consumption distortions must be considered even
for countries which allow deductibility.

2/ If not in the technical sense, at least in terms of observation of the
empirical reality.

3/ The information system proposed in the appendix is one means of filling
the general information gap.
5.1 Labor-Leisure Choice and the Effect of Wage Taxes

Starting from the simple static textbook model of individual behavior, taxes have a potential effect on the labor leisure choice, and on the allocation of expenditures between different consumer goods and services. 1/ We take first the labor-leisure choice. The empirical problem has been to determine the effect of after tax wage rates on labor supply, and the division of this between income and substitution effects. The important factor to note in this context is that, even if the total effect is nil, this could be due to large offsetting income and substitution effects. The substitution effect can be particularly important for progressive tax structures.

On the basis of currently available studies, the evidence can be summarized as follows: for prime age males who have historically formed the bulk of the labor force, the current consensus is that the elasticity of labor supply with respect to after tax wages is close to zero. Both the income and substitution effects are small. 2/ After tax wages and consequently taxes have much stronger effects on the labor supply of females. Estimates of elasticity are as high as 1, with the substitution elasticity of 1.2, and the income elasticity ranging between -0.6 and -0.8. As married women are affected by the net income of husbands, the effect of a tax on family labor

1/ Readers interested in the basic textbook analysis of compensated and uncompensated elasticities of substitution and their relationship to efficiency (Harberger triangles) can refer to Atkinson and Stiglitz.

2/ Recent work by Hausman has however challenged this view. This work which is still controversial finds very large income and substitution effects for a segment of the group, with the net effect still being close to zero.
supply is more difficult to predict. ¹⁷ Though the tax effect on a wife's net wage and on husband's income are offsetting, the efficiency effects are cumulative. The latter puts the entire income of the former in a higher tax bracket.

Wage taxes also affect segments of the potential work force, through its influence on whether to work or not -- the entry and exit decisions. Thus unemployment insurance increases the average length of unemployment and the rate of unemployment, but also raises the participation rate. The social security benefit system speeds up the retirement, though the magnitude is relatively small.

In drawing implications of this research for developing countries, one should focus on the set of actual or potential tax payers, which is a much smaller subset of the total population. There is little reason to expect that wage elasticities for men are any greater in developing countries. On the other hand there may be much stronger cultural reasons against women's participation in the formal labor force. In many countries, however, urbanization and modernization may be bringing increasing numbers of middle class women into the labor force. The question of allowing a child care credit or a higher deduction for a working wife does therefore merit some attention. A very important issue which is entirely unaddressed is the labor income of self-employed individuals, and the difficulty of distinguishing it from income from capital.

¹⁷ The average elasticity was put at 0.15 by Fullerton (1982).
5.2 Commodity Taxation

Within the context of the same static model, the next issue that arises is the efficiency effects of commodity taxation. Whereas in the previous set of studies all commodities and services are aggregated into one consumption good, an overwhelming majority of this set of studies ignore (the consumption of) leisure altogether. Given the number of actual commodities, and the comparatively few data points available, most studies also restrict themselves to a small number of highly aggregated commodity groups (majority less than 10, many only 3 or 4). By focussing on final consumption, they also ignore the efficiency effects of taxation of inputs into production. 1/

The interaction of analytical and empirical work which was hinted at the beginning of this section can be illustrated in the present context, as it has an important bearing on measuring distortion. Analysis shows that the dropping of leisure from the estimating equations, and the choice of functional form for estimation have major consequences for measurement of income and price responses. These in turn affect the prediction of responses, and tests of the textbook theory of demand. The empirical basis for judging the efficiency and equity effects of commodity taxation is largely incidental to these studies.

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1/ I start therefore by ignoring taxation of inputs, and return to them later in this section.
The most commonly used functional form is the Stone-Geary or linear expenditure system (LES). ¹/ If only efficiency effects are considered, efficient taxation to raise specified revenues involves tax rates which are inversely proportional to own price elasticities. ²/ It can also be shown, that with the number of product groups even remotely equal to reality, the own price elasticity is proportional to the income elasticity of demand. Thus even without doing any estimation it can be determined that necessities should be more heavily taxed than luxuries. Empirical estimates of Engel curves can then be used to determine the precise tax rates given the assumed functional form.

There is probably no country in the world, and certainly no LDC, which has this pattern of taxation, despite the relatively heavy taxation of tobacco and alcohol related products. It therefore becomes inescapable, once an LES or similar function is used, to bring equity issues into the picture. As we would expect, in this case, for each taxed good the efficiency loss from taxing an elastic luxury goods must be weighed against the equity gains. The latter are larger the larger the proportion of the good consumed by the better endowed. If some additional assumptions are introduced, such as that the government can and does give an appropriate fixed (lump sum) grant to every

¹/ See Lluch, Powell and Williams for an application to LDCs. Other utility functions such as the direct adilog, 1-Branch system, constant elasticity of substitution (CES) and Cobb-Douglas have similar implications. They all belong to the class of additive utility functions. All the statements made below about the LES functions apply to all additive functions. See Barten.

²/ This is despite the fact that cross elasticities are nonzero in the LES. See Deaton.
individual, then these two opposing factors cancel each other, and uniform taxation becomes the best policy. ¹/ 

Given the orientation of empirical research, information on the elasticities of specific items such as cigarettes, alcohol, fine cloth, and a host of individual 'luxury' items which are often subjected to high tax rates is very limited or nonexistent.

If we step beyond these restrictive functional forms, the empirical results are more limited and tentative. They can be summarized as follows: the homogeneity (linear budget constraint) and symmetry (axioms of choice) properties implied by the textbook theory are consistently rejected by the data. Among the possible reasons is that aggregate demand cannot be treated as coming from a single representative rational consumer. ²/ Use of such restrictions continues, because it drastically reduces the parameters to be estimated in demand systems, thus making estimation using limited data feasible. The empirical evidence also suggests that modeling of detailed commodity demands, which it has been suggested above are necessary for detailed tax design, are best done in a single equation context.

Some general conclusions with respect to elasticities obtained at the commonly used levels of aggregation are as follows: own price elasticities

¹/ Another assumption required is that of parallel Engel curves. This of course happens when all individuals are assumed to have an LES curve with the same parameters. One way around this problem, which has been adopted by Ahmad and Stern is the use of different demand curves for different income groups.

²/ Another possibility is imperfections in the capital market which preclude borrowing against human capital. For a more detailed discussion of these and other possibilities as well as the assumptions underlying the neoclassical model, see Deaton and Muelbauer.
are (absolutely) less than unity. \(^1\) We would expect that as more detailed commodities are distinguished and the range of potential substitutes widens, price response would be larger. Stone's results suggest however that the very high elasticities which may be expected in the presence of close substitutes are still absent. There is also some evidence of a weak association between own price and expenditure elasticities. As previously noted this is automatic for the LES system. This result also appears, however for less restrictive systems. A probable reason for this is the general observation that necessities tend to have few substitutes, while luxuries have many. Finally, well determined and credible cross-price effects are rare, so that it is difficult to find a robust classification of commodity groups into substitutes and compliments.

The limited empirical results available, the pattern of commodity taxes in developing countries, and the emphasis on luxury taxes in reform proposals, suggest a pattern of commodity groupings which require investigation if a non-uniform system of taxes is to be used. The broad subdivisions of durables, nondurables and services are clearly not sufficient. Within durables, at least four groups need to be distinguished. These are housing, automobiles, personal durables \(^2\) and household durables. The last group requires at least three subgroups: furniture and other products, electrical appliances and electronic and other entertainment products. Personal durables would require at least two subgroups: relative

\(^1\) From both The Rotterdam and AIDS demand systems. See Deaton and Muelbauer.

\(^2\) Clothes, shoes, watches, jewelry, etc.
necessities and relative luxuries. **Nondurables** contain four major groups (with potential subgroups in parenthesis). Food and beverages (alcohol related, canned fruits and vegetables, processed beverages, meat & fish and basic foods), personal items (tobacco, beauty products and soaps), household operation (fuel and light, detergents, etc.), and gasoline. **Service** groups are entertainment (foreign travel, hotels, restaurants, air travel, cinemas, etc.), transportation and other services. Empirical work needs to be carried out for these commodities, keeping the efficiency, equity and tax reform aspects explicitly in sight.

As noted earlier, the leisure-commodity choice is largely ignored in the studies reviewed earlier. Though this choice has been introduced in a few studies in the context of the linear expenditure system, this is equivalent to ignoring it, as it makes no difference to the results. For general functional forms analysis shows that to minimize efficiency losses, goods which are more complimentary to leisure should bear higher taxes. This contrasts with the previous prescription, using more restrictive analysis, to tax necessities more heavily. With no concrete evidence available, one can only speculate that 'entertainment services', 'electronic and entertainment' durables, and 'alcohol products' are the subgroups most likely to be complementary to leisure. If equity considerations are also brought into the picture, weight has also to be given to taxing more heavily those goods in whose purchase the better endowed have a greater share.

The previous analysis of consumption taxes is carried out under the following assumptions. (a) Perfect competition with either constant returns to scale or the ability to fully tax all pure profits and (b) The ability to tax all consumer goods. Under these conditions it has been shown that
production inputs should not be taxes. \textsuperscript{1/} The basic argument is that the revenue and equity goals of the government can be met in this case without taxing inputs. Input taxes on the other hand would introduce efficiency losses which move the economy inside its production possibility frontier. \textsuperscript{2/} Thus the total output available to the population is reduced without any commensurate benefits.

The empirical evidence on substitution possibilities and elasticities with respect to investment goods and intermediate good inputs is even more limited. As noted earlier, in the absence of deductibility for taxes paid on inputs, efficiency costs will arise from taxes levied on production output. Only in a few industries such as petroleum refining does evidence suggest that fixed intermediate input coefficients prevail. Most other studies have been at highly aggregated levels: distinguishing at most between two types of intermediate inputs (e.g. energy and materials), or two types of capital (equipment and structures), or two types of labor (blue and white collar), or two types of output (investment and consumption goods). \textsuperscript{3/}

At these aggregative levels a fairly high elasticity of substitution is found between equipment and structures. As many developing countries tax

\textsuperscript{1/} See Diamond and Mirrlees.

\textsuperscript{2/} This happens because of substitution of inputs in production and consequently the inefficient use of inputs in the economy as a whole.

\textsuperscript{3/} Parks' study uses three inputs: agricultural inputs, transportation services, and imported materials and commercial services. It finds strong substitutability between transport and labor and between transport and capital. Smaller elasticities of substitution are found for capital and imports and capital and labor. Capital shows complementarity with agriculture. Also see Christensen, Jorgenson and Lau, Berndt and Christensen (1973 and 1974) and Lau and Tamura.
imported capital equipment, and for some of the smaller countries this is a major source of equipment, these taxes could potentially have large efficiency costs. These taxes cannot be viewed in isolation, however, as many countries also have investment credits applicable only to equipment. A careful analysis of all such differential taxes needs to be carried out to determine the net effect. A study of total manufacturing output, with capital, labor, energy and material inputs found energy to be a complement to capital, and to be a substitute for labor and material inputs. In developing countries very high taxes (excise or output tax) are sometimes levied on the goods produced by relatively large organized enterprises (e.g. commercial alcohol, caustic soda, artificial fibers). The aggregate studies are of little use in evaluating the efficiency losses involved (in the absence of deductibility) in production, for users of these inputs. 1/ Some estimates can be made for aggregate energy and materials, but these require estimates of the relative levels of energy and materials taxes.

As noted earlier, the value added tax method of introducing deductibility has also been used in developed countries. When measured against current income, the VAT systems of France, Holland and Sweden have been found to be regressive. The British system is found to be progressive, because of more extensive zero rating (effectively no VAT is paid for value added in certain sectors). Food, heating fuel, medicines, children's clothes and books are among the zero rated items. The Dutch experience also suggests

1/ Implicit input demand functions must be estimated for this purpose. A number of studies exist, however, for agricultural inputs, usually using very restrictive functional forms. Even though these inputs are often subsidized rather than taxed, the efficiency implications are similar.
that the cross check features of VAT are far from a costless means of reducing evasion. 1/

5.3 Savings-Consumption Choice and Taxation of Capital

In moving to the effect of taxes on the savings-consumption decision, a multiperiod framework becomes inescapable. The simplest possibility, is the two period text book model. The analytical conclusion is that (for a first period individual) the net effect of interest rate changes depends on offsetting income and substitution effects. 2/ Labor supply is, however, implicitly assumed fixed in this context. Empirical estimates are based on a multiperiod generalization of this simple life cycle model.

Since Boskin's study of the effects of net of tax interest rates on consumption, several different empirical formulations have been able to find a statistically significant coefficient on the interest rate variable. These results are however very sensitive to the period of estimation. Boskin's study found an implicit interest elasticity of savings of 0.4 (assuming a real interest rate of 4-5%). Though his method of calculating after tax interest rates has not been found replicable, subsequent studies have shown how a change in the period of estimation can change the value and statistical

1/ When the conditions of the model used above are violated, inputs may need to be taxed or subsidized. This is shown from the general case by Munk. Specific studies on agriculture are by Sah and Stiglitz, and Heady and Mitra.

2/ Note that for a second period individual, all income is consumed, so that the elasticity of savings is a large negative value.
significance of this result. The evidence of a significant negative
effect of a higher interest rate is strongest for consumer durables, while the
broad category of expenditures on nondurables is most subject to the 'time
period' problem.

In drawing the implications of these results for developing
countries, it is important to note the existence of highly developed consumer
credit markets for durables, in the countries from which these results are
obtained. In many, though not all, LDCs, such markets do not exist. Even
mortgage finance for residential housing is rare. Therefore, except for
entrepreneurs who can borrow indirectly through their businesses, the effect
of after tax interest on durables purchase is likely to be less. This
reinforces the general empirical evidence of a small net effect of interest
rates on consumer spending.

This does not, however, imply that changes in tax policy cannot
affect savings decisions. In the long run, if behavior is indeed
characterized by the underlying life cycle model (with no bequests),
consumption must respond proportionally to any change in income and wealth.
This implies a unitary income elasticity in the long run. Even with a near
zero net interest rate effect on savings, a large income elasticity implies a

1/ On reviewing the evidence on the interest elasticity of consumption,
Bosworth concludes that it brings the adequacy of the life cycle model of
consumption into question.

2/ Among the many problems which plague statistical estimation, are the need
to use after tax labor income rather than the commonly used total income,
and to use the correct marginal tax rate on (the most attractive source of)
savings. Kotlikoff has also pointed out that an assumption that
government expenditures are changed to offset any changes in revenues is
implicit in these estimates.
substantial substitution effect (compensated substitution elasticity), and potentially significant efficiency gains from reform. It is possible to change the tax system so as to collect the same amount of revenue (no income effect), by replacing capital taxes by another tax. In the context of the above model this should increase savings. An evaluation of this possibility requires introduction of other issues which are ignored in the simple model.

Even in the context of the two period consumption model, labor-leisure and saving-consumption decisions are not independent. The simplest extension is to assume that all labor is supplied in the first period, but that the supply can be varied. As an illustration, consider a reduction in the tax rate on interest income accompanied by an increase in the tax rate on wage income which leaves net income unchanged. The former will increase the quantity of second period consumption demanded, but because its effective price is lower this can be achieved without an equiproportionate change in current saving. The change in the type of tax also changes the time pattern of tax payments from the second to the first period. The elimination of second period taxes permits the individual to save less in the first year, and still consume more in the second. This reduction in saving is itself used to pay the higher taxes during the first year.

Using such a model, the welfare effects of wage and interest taxes in the long run steady state can be demonstrated. In this case, both after tax wage and after tax interest affect the the labor supply and consumption decisions. In one special case in which the economy has the appropriate level of savings and capital-labor ratio, the optimal level of taxation to attain a specified revenue goal involves a positive level of interest taxes if the compensated elasticity of labor supply with respect to interest is
negative. Even if this is not true, a tax on saving is more likely to raise welfare, the larger is the compensated elasticity of labor supply (with respect to the after tax wage) relative to that of future consumption (with respect to the after tax interest rate). The reason for this result is that the interest tax acts to offset the distortions introduced by the wage tax.

In the second special case, utility is assumed to be of Cobb-Douglas form (recall that this has similar effects to that of the linear expenditure system), but the capital-labor ratio is allowed to be below the optimal level. In this case minimization of efficiency losses unambiguously requires a positive level of interest taxes. A tax on savings has the effect of raising the level of savings, thus bringing the capital-labor ratio closer to the preferred level. The explanation for this is suggested in the analysis (two paras.) above. Unlike the usual case which assumes an efficient no tax equilibrium, the absolute (uncompensated) effects on savings are important here.

Even if a positive level of interest/capital taxation is necessary for efficient taxation actual rates may be much higher than required. In switching partially from one tax to another, the long run dynamic equilibrium is not the only relevant issue. Any such change will impose different costs and benefits on different generations alive at the time the change is made. Thus a shift from capital to wage taxes will increase the burden on younger workers and reduce it on those close to retirement. One implication of the underlying life cycle model is that the marginal propensity to consume varies

1/ This case requires the assumption that government has some ability to impose lump sum taxes, so that the economy is maintained on the 'golden rule' path. The results are from Atkinson and Sandmo.
with age. To take the polar case, those close to the end of their life span will consume the entire amount of extra income. To deal with these and other complications (such as labor supply in the second period of the two period model), a simulation methodology becomes necessary.

5.4 Comparison of Different Types of Taxes

Such a model has been used to compare the efficiency effects of income, consumption, and wage taxes. 1/ The base case for comparison is a uniform income tax of 30%. This is compared with equal discounted revenue yielding uniform wage and consumption taxes. They show the following results to hold under a variety of parameter values. The wage tax is less efficient than the income tax. The reason is that the income tax spreads the distortion over both the labor-leisure and consumption saving choices, and the larger tax base permits lower rates. The capital tax element of the income tax also involves an element of nondistorting lump sum taxation of existing capital/wealth. 2/ The consumption tax is shown to be superior to the income tax. One reason for this is that the tax involves a substantial indirect capital levy on existing household wealth, when it is surrendered for consumption goods. The second reason is a shift in tax burden from younger to older generations with less elastic responses. Separate simulations on the

1/ See Auerbach, Kotlikoff and Skinner. They are forced however to make some restrictive assumptions. One of these is the use of a CES function with intertemporal additivity, which means that some of the cross effects considered by Atkinson and Sandmo are zero by assumption.

2/ Any such lump sum tax can only be obtained once.
same model also show a uniform capital tax to be even worse than the wage tax, because of very high tax rates on a smaller base. 1/

Introduction of a small degree of progression in each of these taxes results in substantial efficiency losses. In addition the gap between the progressive versions of the consumption, income and wage taxes widens, with the ranking unchanged. These results are consistent with earlier partial equilibrium studies suggesting that the efficiency losses are proportional to the square of the tax rates. Other studies also support this conclusion. 2/

The analysis so far has been based on the pure life cycle model. Empirical investigation suggests that life cycle savings cannot explain more than a small proportion of US savings. 3/ A polar model is that of Barro in which the utility function of the next generation enters that of its parent. It has been shown that this is equivalent to the current generation having the consumption and leisure of all future generations in its own utility function. That is we can think of individuals as having infinite lives. 4/ Given some restrictions on this function (homotheticity) which are milder than ones used in the previous simulation model, the long run capital-labor ratio

1/ There are cross cohort income effects, and substitution effects arising from differences in marginal responses. Different revaluations of full time earnings, depending on when they arrive (more in the future than in present), that is Summers' (1981) 'human wealth effect' plays a role in determining both income and substitution effects. The results relating to consumption taxes are relatively insensitive to parameter changes, while those relating to wage and capital taxes do show some sensitivity. The efficiency ordering is not changed however.

2/ See Ballard, Shoven and Whalley and the references given there.

3/ Kotlikoff and Summers.

is independent of wage or consumption taxes. It depends only on the capital income tax. Therefore in comparing proportional taxes, capital taxation is still the worst tax, but the income tax is now inferior to the wage tax. The consumption tax remains the least inefficient tax.

A possible solution of the problem of whether the "life-cycle" or "infinite life" view is more appropriate is that the US may well consist of a minority of wealthy 'Barro type' households, and a majority of relatively poor, life cycle households. This is consistent with recent findings that one of the important implications of the Barro model, that consumption is independent of age, is contradicted by the evidence. \(^1\) If we evaluate the analysis in this environment, some form of a consumption tax or an income tax with deductions for interest earnings appears to be the most efficient form of taxation.

For developing countries, an alternative approach is also consistent with the empirical evidence mentioned above, needs to be considered. \(^2\) This is a life cycle model expanded to include bequests (inheritance) as a luxury good. The family culture in many developing countries suggests that households strive to maintain and enhance the family position (wealth) if they can, or draw down on the family inheritance when conditions become unfavorable. Taxation of bequests or the returns to holding wealth might then be treated in the context of luxury good taxation. Because of the direct link

\(^1\) Presented in a mimeographed paper by Kotlikoff. This may, however, be due to the fact that expected life time earnings are related to age.

\(^2\) Blinder. This model is consistent with the cross-section evidence, but not the time service evidence from developed countries. Increasing per capita income should result in higher bequest savings and rising savings rates if bequests remain a luxury good.
to savings, however, this simple analogy may not be completely adequate, and more careful work needs to be done.

In drawing implications for developing countries, there are important differences to note. The developed country analysis assumes that the tax alternatives considered apply to a representative individual, i.e., a representative of the entire population. In developing countries the population base for different taxes can be significantly different, though these may overlap in varying degrees. This is partly a result of the administration problem, which along with tax evasion is another important difference. This leads into the third difference that of a large proportion of self-employed persons in the potential tax base, and the difficulty of separating their labor income from returns to capital investment. Though much more work needs to be done to draw firm conclusions, given the present state of knowledge, I would draw the following tentative conclusions: that tax evasion considerations argue for maintaining multiple points of taxation, and therefore point to a mix of income and consumption taxes. That the capital tax element of the income tax (and wealth tax) should not be higher than the wage tax, and this should bear some relation to the tax rates on luxury goods, because of the possibility of substitution between them. 1/ High marginal rates of tax on any set of households are likely to increase evasion and the resource costs involved in it, and to distort decisions towards areas in which evasion is easier and administrative costs of ensuring compliance is greater. Thus even though the mechanism for efficiency losses is different,

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1/ Note that this conclusion is based purely on efficiency grounds, and distributional issues are ignored in this entire section.
the total welfare losses may not be significantly different from that in developed countries. As cautioned earlier, more research is needed to support these hypothesis.

5.5 Corporate Taxes: Subsidy or Pure Profits Tax

Traditional neoclassical analysis of corporate taxation treats it as if it is a tax on capital (additional to any tax on savings implicit in the personal income tax). 1/ This contrasts with the Marshallian view that the tax is a tax on pure profits. The former view is partly based on the assumption that all investment is financed by new issues, and all returns are distributed as dividends when they accrue. The empirical evidence shows that new issues are a small fraction of total investment. For established companies, the proportion is even smaller. Various provisions of the income tax code such as depreciation, interest deductibility, capital gains tax on a realization basis, and the personal income tax interact to affect both the financial and investment decisions of the corporation. Though the precise effects of any particular system require detailed empirical work, analysis yields some interesting conclusions.

Given perfect capital markets and absence of uncertainty, which are implicit in all the analysis considered so far, corporations will never finance investments by new share issue, when interest payments are

1/ See e.g. Harberger (1969).
deductible.\textsuperscript{1} Even if interest deductibility is removed, this result continues to hold in the absence of tax imputation, as long as dividends are not taxed (within the corporation) at a higher rate than retained earnings. \textsuperscript{2} Another important feature of the tax system, which among other things, influences the choice between using credit (borrowing) or retained earnings to finance investment is the treatment of capital gains. Because capital gains are taxed when they are realized, not at the time of accrual, owners of assets can choose the time of realization to minimize their tax liability. Effective tax rates on capital gains (at least in developed countries) are a fraction of the normal personal income tax rate. This factor tilts the incentive towards use of retained earnings, thus countering the effect of interest deductibility. \textsuperscript{3} It can be shown that a classical corporate tax system (single rate, no imputation), is nondistorting with respect to the borrowing-retained earning decision if accruing capital gains are taxed at the same rate as income, and there is no interest

\textsuperscript{1} The formal analysis is based on the assumption that all individuals have the same personal tax rate. In developing countries, an identifiable family often has controlling shares and management control of many public companies. Its marginal tax rate would be the relevant one. See King, Stiglitz (1973, 1976).

\textsuperscript{2} When dividends are distributed to individuals they would be liable to the personal income tax in addition to the implicit taxation of dividends through the corporate income tax.

\textsuperscript{3} In closely held or private limited companies, this provides an incentive to controlling shareholders with high marginal tax rates to accumulate financial assets. Controlling shareholders in public companies in developing countries are more likely to do the same thing. Auerbach and Bradford have also shown that the effective capital gains tax is the only one relevant for marginal decisions (in this context). The tax on dividends merely affects the value of the firm, and a one time charge on it will therefore merely act as a tax or subsidy on existing wealth.
deductibility. This result is not affected by inflation, as long as the entire tax system is either unindexed or fully indexed.

For each method of financing it is possible to determine whether a given corporate tax structure imposes a tax on capital (additional to the personal income tax), or a subsidy. The case in which depreciation allowances are equal to true economic depreciation, illustrates the basis for the simplistic conclusion that the corporate tax is a tax on capital. If all investment is financed by new issues, the classical system of corporate tax does act as a tax on capital. The popular prescription to introduce a system of imputing to the shareholder the tax paid by the corporation ('pierce the corporate veil'), does work to eliminate the tax on capital in this case.

As noted earlier this method of financing is not relevant in the presence of interest deductibility. In this case if investment is financed on the margin by borrowing, there is absolutely no distortion of the investment decision. It has been shown the corporate tax is, in this case, a tax on pure profits (or rents). Removal of interest deductibility results in converting it into a tax on interest income (as for new issue finance) as well. For a closely held company the owner manager with personal tax rate higher than the corporate tax rate may have an incentive to declare, that part of wage earning that he wishes to save, as income from capital. In this case the effect of the corporate tax is to reduce the tax rate on entrepreneurship below what it would otherwise have been.

In the case in which retained earnings are used to finance investment, it has been shown that the corporate tax provides a subsidy to the use of capital. This is because retained earnings are only used as a source of finance in preference to borrowing if they reduce the personal tax
liability. This of course depends on the method of capital gains taxation. These results apply even in the presence of inflation.

From this analysis we can derive a corporate tax system which is neutral to the decisions made by the corporate firm. It should have the following provisions: (a) immediate/free expensing of investment, (b) no deductibility of interest, (c) no tax discrimination between retained earnings and dividend pay outs, (d) full-loss offset, (e) no inflation indexing if the personal income tax is not indexed (alternatively, both should be fully indexed). This has to be coupled with a personal income tax in which accruing capital gains are taxed at the same rate as other income. Though this system also tends to reduce the complexity of the corporate tax system, practical problems are not eliminated. Thus unlimited carry forward of losses is not sufficient to produce a full loss offset system. It also requires that the firm be allowed to cumulate these at the riskless interest rate. Another difficulty is the practical one of taxing capital gains on an accrual basis. As these are usually done on a realization basis, they are subject to two opposing factors: one is the postponement of tax liability to a future time at which they are finally sold. The other is that their accumulation over time results in a tax rate which is higher than normal, in the presence of a progressive rate structure. Some form of interest compounding coupled with averaging of these gains is therefore necessary. ¹/ One way to eliminate these two problems is to replace them by a cash grant equal to the corporate

¹/ An alternative is to have no tax on capital gains to corporate shares, and subject firm profits after payment of the appropriate corporate tax to a withholding tax. This tax has to be fully creditable against individual income tax liability including that on the individuals share of net corporate profits.
tax payable on all losses. After which all current profits are taxed at the corporate tax rate and then subjected to a withholding tax which can be offset against personal income tax liability (including share of net corporate profits). Such a method may be preferred for new firms, particularly in sectors where the government is trying to encourage investment. 1/

In the presence of uncertainty (assumed absent in the above analysis) such a system has an additional attraction. The government effectively becomes a silent partner in the enterprise, and shares the risk. This leads unabiguously to an increase in private investment, which yields positive net revenues to the government in a competitive economy. The revenues would tend to be even greater if firms make oligopolistic profits or rents. 2/

Some qualifications must be made to the analysis of corporate taxation. Formal derivation of many of the results given above was based on the assumption that all shareholders have the same personal tax rates. With different tax rates there would be a conflict between shareholders on how to

1/ In this system there is no incentive for shareholder managers to misclassify labor income as capital income or vice versa. The system is also neutral with respect to the decision to incorporate, as the present value of the corporate firm is unchanged by the tax. Still another way of accomplishing the same results would be to replace the personal income tax by a "cash flow" tax.

2/ See Stiglitz (1976) and Gordon.
run the firm, and this issue has not been resolved in the literature.\footnote{1}{Another unresolved problem is why firms pay dividends, when individuals could reduce tax liabilities by taking the return in the form of capital gains. Auerbach (1979) and Bradford (1981) have shown that equilibrium will be established such that the higher tax rate on dividends will be exactly offset by less than dollar-for-dollar increase in equity value with retained earnings. In this situation the effective tax rate is merely the rate on capital gains. An increase in dividend taxes merely lowers equity values (reducing old people's wealth and stimulating savings).}

One of the implications of different tax rates is that corporate shares will be preferred by high tax individuals. Empirical work has shown that the proportion of shares in investors' portfolio rises with income. Another implication, the 'clientele effect' has also received some support from empirical work. Firms with low pay out ratios (i.e. more of the returns in the form of capital gains) appear to attract shareholders with significantly higher tax rates. In most developing countries many supposedly public companies are controlled and directly managed by specific family groups. These family groups can in principle take decisions based on their own marginal tax rates. If this happens, the single tax rate assumption would be fairly close to the reality in developing countries.

It is useful at this point to step back and examine the empirical evidence on the actual effect of the corporate tax. What is important for this purpose is the marginal effective tax rate. The average rate reflects cash flows and tax burdens, but the marginal rate is more appropriate for examining the incentives to save and invest. A recent study of four DCs calculated effective marginal rates on capital income.\footnote{2}{King and Fullerton.} It is possible to separate out the effect of corporate taxes for only two countries. Their
results show that for both Sweden and the USA, the effect of an abolition of
the corporate tax system (prevalent in 1980) would be to increase the tax rate
on capital. That is, these corporate tax systems provided an implicit subsidy
to the corporate sector, contrary to popular perception. Also note that in
these cases, a reduction in the tax rate to zero, results in a rise in the
total tax on capital. Even if we exercise caution in not accepting these
results too literally, the basic point is that the nominal corporate tax rate
may bear little relation to the marginal effective rate on new capital.

This study also contains estimates for the effective tax rates on
three types of assets (machinery, buildings and inventories) and three types
of industry (manufacturing, other industry and commerce). A wide dispersion
in rates of capital taxation over these assets and industries was found. As
inflation affects effective rates, both average effective rates and their
dispersion was sensitive to inflation. For actual rates of inflation the
rates ranged from -37% on machinery in the UK to 69% on inventories in
Sweden. On comparing the average annual growth of GNP in each country with
its average effective rate and the dispersion of the effective rate, the
former was positively, and the latter negatively related to GNP. The first
result is basically consistent with the view of corporate taxation as a
mixture of taxes on pure profits, and risk taking (and entrepreneurship for
closely held companies). The latter result appears to be consistent with
earlier analysis showing that the efficiency effects of differential taxation
of different types of capital may be much greater than those arising from
intertemporal distortion (taxation of savings/capital). A simulation analysis
of UK capital taxation also shows high efficiency losses from differential
taxation of different capital assets.
In reforming or changing the corporate tax system the transitional effects may be as, if not more, important than the long term effects considered above. Changes in the corporate tax rate, and changes in investment incentives (accelerated depreciation or investment credit) will have different short term effects even when they are designed to have the same long term effect. A decrease in the tax rate will confer a windfall gain on owners of capital at the time of the reform, while an increase in incentives may actually confer a windfall loss on existing holders. In the first case, stock market prices will rise instantaneously, as investors capitalize tax savings. The resulting increase in wealth will increase consumption, tending to increase required rates of return. A simulation exercise used to evaluate reform of the US tax system showed that this results in a decrease in savings. \(^1\) It was also demonstrated that an increase in investment incentives leads to an increase in savings because of the implicit one time taxation of pre-existing wealth.

One implication of this result is that a move towards immediate expensing, as suggested in the ideal corporate tax system above, with a revenue offsetting rise in the corporate tax rate, will still increase savings. In applying these results to developing countries a few caveats must be kept in mind. Even a tax on pure profits can provide incentives for tax evasion if it becomes too high. Another is that the full employment assumption may be much less tenable. The effects on the capital intensity of

\(^1\) Auerbach and Kotlikoff (1983a) actually report the opposite simulation (effect of rise in the tax rate).
production in the corporate sector, and other issues this gives rise to need to be investigated further.

5.6 Capital Mobility and Tax Reform

In an open economy, savings need not equal investment, so that tax policy can have different effects on the two. The polar perfect capital mobility case assumes a small open economy in a world with perfect international capital markets. Assume either that there is no foreign fiscal policy, or that the foreign pretax rate of return remains fixed. If the country under consideration taxes the capital income of residents independent of source, the effects of tax reform will be essentially similar to those presented earlier. The general equilibrium effects on before tax factor prices will however be minimal.

In the presence of the type of tax evasion common in developing countries, there will be additional effects. As no formal analysis exists, I can only provide an illustration. Assume for the moment that the marginal cost of evasion is constant and higher on domestic source income of residents than on foreign source income. Then residents would transfer savings abroad. If foreigners do not evade taxes, the entire domestic capital stock would be foreign owned, while internal savings would be invested abroad. Clearly this situation is untenable, and the marginal costs of evasion must move in such a way as to be equal in equilibrium. A rise (fall) in the tax rates on capital will in this case have the additional effect of substituting

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1/ Total investment is financed by national savings plus inflow of aid and private foreign capital (savings).
foreign for domestic (domestic for foreign) savings in domestic investment, and in an increase (fall) in the resource cost of evasion. For similar reasons, part of the gains from opening of the capital account of the economy will be offset by the higher taxes required to offset revenue losses from capital taxation.

In most developing countries foreign investment is in the corporate sector, and is subject to the host country corporate income tax. The existing analysis makes the conventional assumption that the corporate tax is an effective tax on capital. In this case, the effect of taxes depends on how the investor's home country treats the income received in the host country. If the foreign investor is subject to a credit system of taxation as is true for many US corporations, the host country can tax at the effective rate applicable in the home country, without affecting foreign investment. This is because there is a corresponding reduction in the liability for home country taxes. Therefore any gains from replacing capital/corporate taxation will be at least partially offset by the revenue losses from foreign companies. This would require higher offsetting changes in other taxes in the context of tax reform, and reduce the gap in efficiency costs between the two sets of taxes.

If the foreign company is subject to a deduction system of home country taxation as most European companies are, foreign investment would be less under any positive tax on such capital. The pretax rate of return would rise till the after tax rate of return to the foreign country is the same as in the home country. Wages will fall to an extent depending on how inelastic the supply of labor is. The tax is therefore borne entirely by the host, so that the effect of offsetting tax changes on savings is again similar to
earlier tax reform analysis, but the effect on total investment would tend to be compounded.

Feldstein and Horoika found a high and significant correlation between domestic savings and investment and concluded that capital is relatively immobile across countries. In developing countries this would be compounded by sovereign risk and information problems. Harberger's earlier paper, on the other hand, found rates of return in different countries uncorrelated with capital-labor ratios, and concluded that capital was relatively mobile. But rates of return in different countries would be highly correlated with capital-labor ratios only if aggregate production functions were identical. In a subsequent paper Harberger has suggested that the correct answer lies in between. 1/ Unfortunately little analytical work has been done on tax policy in the presence of partial mobility of capital.

Public sector pricing policies, price and interest controls, import, investment and other types of quantity controls, also involve implicit tax subsidy policies. These however lie outside the scope of the current review. In any case these problems appear much less significant in developed countries, and have received relatively less attention in the empirical and theoretical literature on tax reform. More work does appear needed on issues such as shifting from quantity controls to tax subsidy policies.

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1/ In the last study Harberger focused on gross capital flows into and out of countries. This would presumably include official development aid, and be higher for poorer countries.
6. **Issues, Tentative Policy Conclusions, and Research Agenda**

As indicated in section 2, revenue concerns expressed in different ways such as a current or anticipated gap between expenditures and revenues, or an increasing gap, were a central motivating factor in tax reform. The World Bank has also historically been concerned with the issue of resource mobilization. Two standard methods for increasing revenues, point the way to the real underlying issues. One is to raise the tax rates on an existing subset of incomes or goods. An important issue underlying this was raised by Brennan and Bachanan's (1977) description of the government as a monopolist revenue raiser. As in conventional monopoly theory government may have reached the inelastic point (elasticity ≤ 1) on the revenues from the specified sub-base. In contrast to the infamous Laffer curve, evasion makes this a realistic possibility. The other method is to put a tax on a new set of tax bases (income, goods, or economic units). This is an issue of efficient tax design. The fact that evasion was an underlying factor in LDC tax reform discussion was also noted in section 2. The distorting effects of taxes, and the efficiency gains from tax reform is an equally fundamental underlying reform issue.

A recent review of tax reform lessons derived from disaggregated simulation studies concluded that both the efficiency costs and the distributional consequences of fiscal policies were much larger than had been thought previously. ¹/ In many countries, powerful groups appear to obtain special dispensation and privileges in the name of equity, creating distortions and efficiency losses to the economy. In others, an excessive

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¹/ Shoven and Whalley.
fixation on the use of tax policy for attaining equity goals places demands on the tax administration, which it is unable to meet. For example creation of progressivity within a commodity group such as cloth, by taxing different types of fibers and different qualities of material, creates complexity which can be exploited by evaders and corrupt enforcers. The result is that revenue generation can suffer without significant gains in equity. In both types of country situations, there is little appreciation of the efficiency losses created by the tax system. Though distributional issues cannot be ignored as a constraint on democratic or semidemocratic LDC governments' tax policy, the efficiency of the tax system appears to be (in my judgment) the most important factor at this time. 1/

There are three issues central to the question of the economic efficiency of the developing country tax system. The relative emphasis to be placed on consumption versus income taxes, relates to the important issues of the incentives and disincentives for savings and investment. A subsidiary issue is the degree of progressivity to have in each case. Luxury taxes and nontaxation or subsidization of basic items such as food determine the progressivity of consumption taxes. Exemptions and deductions, and marginal tax rates on income influence the progressivity of the personal income tax system. The second issue of efficient taxation is the actual effect of the corporate tax system as it interacts with the personal tax system. The possibility of converting corporate taxes into a tax on rents and risk

1/ This is one reason why the survey in the previous section is weighted more heavily towards efficiency concerns. In countries where distributional considerations have historically been ignored, they must clearly be given an equal weight.
sharing, offers enormous possibilities in countries generally acknowledged not to have complete equity and insurance markets. Lastly the haphazard system of indirect taxes, in many developing countries suggests considerable possibilities for reform. The conventional analysis of tariff policy treats it merely as a distortion of the foreign trade structure. The goods (and services) tax elements of the tariff structure (i.e. excluding protective elements which are a separate issue), is really a problem of designing an efficient indirect tax system.

The previous discussions of consumption, income, wage and other taxes, have by and large assumed that they mean the same thing in developed and developing countries. In discussing the issues further, a clear appreciation of the meaning of these terms in LDCs is useful. For this it is helpful to have a stylized picture of the tax base, in a "typical" developing country in mind. 1/ To any one who has worked on developing countries, it is the familiar picture of an economy consisting of a organized sector and of household producers, transacting with each other and the rest of the world. The former of course consists of the corporate sector (private and public), plantations and large commercial farms, and other large enterprises (industrial, mining, banking, finance, etc.). Any direct or indirect (income tax) wage tax is essentially a tax on the wage and salaried employees of this sector, and sometimes even more restricted to the corporate sector (and of course the government).

1/ Obviously countries will differ in the extent to which the stylized pattern applies. Thus we expect the most highly developed LDCs to fit the developed country pattern better, while the least developed LDC will have virtually no organized sector.
For a discussion of taxes in most countries the relevant part of the household sector is that containing the urban entrepreneurs and professionals. The labor employed by them and the mass of small farmers is a separate component lying largely in the background and forming part of the equity constraint. 1/ The importance of this classification arises from the administration-evasion problem which was seen to underlie virtually all aspects of practical tax reform proposals (section 2). Any income and commodity taxes imposed on this sector fall haphazardly on it, depending on evasion skills and costs, and administrative attention. These conclusions are based on a critical assumption. That other things being equal, evasion costs rise and/or administration costs fall with the scale of the unit from which taxes are to be collected. This would be true for example if there are fixed costs per unit, as appears plausible. Research is, however, needed to test this hypothesis.

The income tax on this sector is primarily a tax on entrepreneurial income. The issue of capital and wage taxes is largely irrelevant in this context, given the difficulty of separating out the wage and capital components of this income. 2/ For commodity taxes there is an important exception to the uncertain application of taxes on this sector. Purchases from and sales to, the organized sector and the rest of the world form much more definite and accessible control/collection points which can and have been

1/ An exception to this is the issue of taxation of land rents, a highly political issue in many countries, which is not considered in this paper. See however Feldstein (1977).

2/ Entrepreneurial income in the organized sector, including that of controlling shareholder-managers in the corporate sector, is almost as difficult to separate into wage and capital components.
used widely in developing countries. 1/ One implication of this framework is that, in practice, export taxes are more likely to be observed on the goods produced by the household sector. 2/

The most important distortions in the commodity tax structure arise, because of taxes on imports and the output of the organized sector, which are used as inputs in production. In addition to the usual losses from input substitution, this has two other implications (testable hypothesis) for the organized sector. Firstly there is an incentive to fragment into smaller units, thus effectively shifting production into the household sector, even where this is an inefficient means of production. The second is an incentive for vertical integration in cases in which it is possible to reduce the payment of input taxes. Reform of the system therefore requires, that the organized sector be permitted to deduct from taxes paid on sales, any taxes paid on purchases (including the nonprotective element of import taxes). This may require in addition a rise in commodity taxes on subsectors in which net tax collections are significantly reduced. A complete determination, must however be done in the context of consumption/final goods taxes.

Allowing deductibility for the household sector involves more difficult issues. Effective removal of distortions in the organized sector requires that firms with negative tax liability (i.e. less taxes are due from it than it has paid), be given a credit. Such a system would accentuate the

1/ Somewhat surprisingly sales to the organized sector seem to have been much less used as a tax point.

2/ These taxes may not, however, be optimal in the overall perspective.
evasion-administration problem in the household sector. Analysis suggests, however, that it is not even necessary, as the final sales of the household sector are not effectively taxable. Though precise determination of tax rates on inputs used by the household sector requires much more information, two simple principles of input taxation are well known. Firstly, inputs (including imported ones) into this sector which are more substitutable in production, should be taxed less heavily than those used in relatively fixed proportions. Secondly, if a greater proportion of the input is used in producing a final good which needs to be taxed more heavily, it should have relatively higher taxes. This area of input substitutability and usage, is one in which much more empirical research needs to be done. To minimize discrimination against honest firms in the unorganized sector, limited deductibility would still need to be allowed to this sector. Those firms with proper records would be allowed to deduct input taxes from their output tax liability but would not get any credit for excess taxes paid (with the exception of exporters). This effectively reduces the marginal distortion introduced by input taxes, but does not eliminate it for those who should have received a credit. Dishonest firms evading output taxes are subject to the full input distortion.

The corporate tax is one tax which is most similar in outline, and the basic analysis presented in the last section can be assumed to apply. As

1/ Negative-evasion or attempts to collect subsidies which are not legally due.

2/ Cross elasticities have to be taken account of, and some inputs may have to be subsidized.

3/ The second point relates to the efficiency of final goods taxes.
indicated there the effect of the system depends on the precise provisions, such as interest deductibility and depreciation allowances, and its interaction with capital gains and income tax provisions of the personal tax system. Empirical analysis of the system is needed to determine whether it constitutes a tax or subsidy (as in two of the developed countries studied), and to separate out the marginal (from average) rates relevant for determining efficiency effects. Such a study would also determine the differential incentives it provides to acquisition of different types of assets and to different economic sectors. The high variances in incentives found in developed countries, suggest the possibility of considerable efficiency losses. Equally important is the possibility, suggested by analysis, that it can be reformed in a such a way as to convert it into a tax on pure profits and on risk sharing. The latter can have strong additional benefits in countries with undeveloped equity and insurance markets.

Before analyzing the consumption tax versus income tax issue in the context of the stylized model, it is useful to recapitulate the existing analysis. This shows that a uniform consumption tax is more efficient than an equal yield uniform income tax. A progressive consumption tax also appears to maintain its lead over a progressive income tax. Progression in either case involves considerable additional efficiency losses. This does not rule out the possibility that a flat consumption tax with zero rates on certain commodity groups, combined with a flat income tax with a standard deduction is more efficient than either type of progressive tax.

In the context of our stylized representation, the choices are more limited. The consumption tax is essentially a tax on organized sector output
coupled with an indirect tax (through inputs) on the household sector. \(^1\) The latter entails additional efficiency costs which are not considered in previous analysis. The income tax has three main components. A wage tax on salaried employees in the organized sector, a tax on entrepreneurs income (all sectors), and a tax on interest income of bank depositors and bond holders. To the extent that interest income goes to the taxed wage earners, developed country analysis suggests that complete elimination of interest taxation to convert it into a wage tax would be inefficient. As these two sources are hypothesized to be relatively cheaper ways of withholding tax, complete elimination would also raise administration costs. To the extent that interest income goes to individuals who are formally (or informally) outside the income tax net, the primary distorting effect is to shift savings towards investment in the household sector (self-employed capital), where evasion costs are hypothesized to be lower.

The most important element in the comparison of the income tax with the consumption tax is therefore the comparison of the entrepreneurial income tax with the imperfect consumption tax on goods produced by the household sector. If a uniform tax is used, the base of the former is likely to be much smaller than the latter, requiring higher tax rates. It is therefore hard to make a decision purely on abstract efficiency grounds, and more work (and information gathering) on the effect of the tax system on savings and investment seems to be urgently needed.

Because the base of the two taxes is different, distributional constraints also enter the picture. These are commonly met in practice by

\(^1\) One possibility of expanding the scope of the tax is considered below.
fairly progressive rates of income tax and fairly high rates of taxation on certain subsets of luxury goods. Both of these will nominally fall on entrepreneurs (in addition to others). The more important practical issue is therefore the appropriate mix of income and consumption taxes, and the marginal rates in each case. High marginal rates of income tax in addition to the conventional effects, provide increased incentives for evasion. On the revenue side, this could reduce elasticity of revenue from entrepreneurial income taxes to one or lower. The resource costs of evasion also rise. I would hypothesize that the most significant distortions occur in the pattern of investment, towards subsectors in which evasion is easier. For example, popular opinion holds that real estate is one such subsector. Similarly in the case of high luxury goods taxes, production of these goods would tend to shift towards the household sector. This is particularly true of consumer durables, whose services cannot be taxed once they have been purchased, and must face a one time tax. This stylized model therefore suggests multiple base taxation which is able to limit the applicable marginal rates.

One innovative way of lowering the higher rates, and overcoming the constraints imposed by the evasion-administration problem is as follows: a uniform value added tax, with zero tax on basic foods (and possibly a few more, easily defined and identified, items consumed by the poor). It has to be introduced at a fairly low rate, and administered by a separate administration. By starting from manufacturing, and gradually extending it to the wholesale and other sectors, it could progressively approximate the
Theoretical consumption tax. ¹/ The experience, particularly of developing countries, with this type of tax needs to be studied further.

¹/ Korea has had a similar tax for some time. Indonesia is also attempting something like this, and the initial results seem to be promising. The vital importance of a computerized information system is highlighted in this context.
APPENDIX

Tax Payer Information Systems,
Evasion and Sample Auditing

Except perhaps for the smallest developing countries, a taxpayer information system for dealing with the evasion administration problem should be considered. For the medium-large LDCs with significant evasion problems, a simple but reasonably comprehensive computerized information system is an important element of the tax system. This has to be used in combination with well defined procedures for detailed auditing of a statistically selected sample of actual and potential tax payers. Such a system can also provide extremely useful information for policy analysis and advice.

A computerized information system has to have the following elements:

(1) Every individual who is an actual or potential tax payer for any type of tax would be required (by law) to obtain a personal identification number (PIN). This number would be required to be used on all transactions with the government (e.g. passport, drivers license applications, registrations, and different types of tax declarations). It would also be required on all business transactions (i.e. excluding purchases of goods and services for personal consumption). ¹/ Note the the PIN, for all individuals working in the tax bureaucracy plays an important role. The PIN of the

¹/ This means that every transaction between individuals would normally have two PINS entered on it.
inspector who audits or approves a tax payer's return would also be entered on that return.

(2) All associations of individuals, such as partnerships and corporations would have an economic identification number (EIN). The central information unit would have a record of the PINs of all individuals constituting such an association (and thus associated with each EIN). As in (1), these EINs would have to be noted on all transactions. Public sector units, agencies and departments of the government which engage in commercial transactions would also have an EIN which must be noted on each transaction.

(3) An integrated computerized data bank which pools a limited set of important facts from separate tax declarations made for Income, Wealth, Tariff, Sales, Excise, Land and other taxes. An enormous amount of information is currently submitted by tax paying units when they file for different types of taxes. A carefully selected set of information which is not too large to become unmanageable, but can be useful for statistical analysis and cross-checks would be entered into the data bank. Thus, for example, it would be useful to take different sources of personal income (wages and salary, self-employment income, dividend and capital gains on corporate shares, interest on bonds and loans, etc.) and match these with wealth held in different types of assets (business assets, corporate shares, bonds, loans and deposits, residential housing, etc.). Similarly, both corporate and business declarations may yield information on
total sales, types of goods or services produced or sold, current non-labor expenses, capital expenditures, wage bill, number of employees, electricity used and area occupied. This may be matched with similar information on a VAT declaration or some of the information on a sales/excise tax declaration.

(4) Information from local and municipal authorities and public utility companies could also be subsequently integrated into the system if thought desirable and useful. One word of caution is necessary. Only information which it can be determined will be of specific use should be collected and saved. Otherwise, there is a danger of being swamped by excessive information, and the collection and saving of information becoming a substitute for actual collection of taxes at minimum cost.

(5) Some of this basic, essential information, say, all that can be entered on a single page, may also be required from an individual or economic entity which claims not to have any tax liability. The experience of Korea suggests that the efforts to collect and process large amounts of information may not yield commensurate benefits in terms of reduced evasion. 1/

(6) The information processing staff must be completely separate from and isolated from the tax inspectors and auditors and the public. A

1/ See Choi.
great deal of care is, therefore, needed when introducing the system. One way is to start it initially as a purely statistical agency which is handed over the data by the tax authorities.

Detailed Audit

One important use of this information would be in designing a stratified sampling system for random auditing. The information system should help in identifying different categories of current or potential tax payers according to their potential tax evasion. A randomly selected set of such entities would then be subject to intense investigation and detailed cross-check of transactions. Though for very large economic entities this may involves a check almost every year the mass of potential tax payers would be subject to self assessment plus random checks of this form.

To a smaller extent the data bank may also provide information on individual transgressions. Thus by comparing simple norms for a given category of borrowers and an individual's return across time, evasion may be identified in some cases. Similarly, an information record of all tax inspectors who had investigated such individuals may give an indication of which of them are more likely to be corrupt.

A reasonably sure, relatively swift and severe penalty for evasion and corruption, coupled with strong safeguards against harrassment are an essential element of good tax administration. As hypothesized in the main paper, a simple tax system with little potential for ambiguity may be the cheapest way of minimizing harrassment and ensuring swifter punishment.
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