❋ *Chapter 1*

# The VAT-CIT Substitution

## 1.1 ORIGINS AND OBJECTIVES

In this book an initial attempt is made to assess the possible first-round consequences of a major change in fiscal structure: partial or complete replacement of the United States corporate income tax by an indirect tax on value added. The study has two primary dimensions and is intended to fulfill two rather different functions. First, the value-added tax (VAT) has been a recurrent focus of interest among those concerned with tax policy, and discussion of the VAT has often been linked with the possibility of a reduction in the corporate income tax (CIT). Thus, the particular aspects of fiscal change we examine warrant serious analysis in their own right. However, the second and ultimately more important objective is the development and adaptation of techniques of analysis which are applicable to the evaluation of the impacts of large-scale changes in fiscal structure on specific segments of the economy. It has long been recognized that this type of analysis cannot be undertaken within the confines of the easy ceteris paribus assumptions of partial equilibrium economics. "All else" does not remain constant when major changes in tax structure are undertaken. The identification and meaningful evaluation of the full consequences of such changes would require the use of a general equilibrium analysis, one which would permit the explicit recognition of responses in various sectors of the economy to changes in fiscal variables. While the need for a general equilibrium approach to fiscal changes that are pervasive in their impacts is recognized in contemporary public finance theory, little progress has been made in applying this type of analysis to concrete policy situations. The present study is a partial step in this

direction, limited in its scope and policy implications, in that the possible macro-economic consequences flowing from the stimulus to real investment involved in the reduction of the CIT are not taken into account, the basis of comparison being in each case alternatives that involve the maintenance of a constant budgetary deficit or surplus, rather than attempting to work in terms of a constant aggregate real demand.

The development of a general equilibrium framework for the evaluation of major changes in fiscal structure was first set forth as a focus for future NBER research by John Bossons and Carl S. Shoup. In a 1969 report, they specifically proposed the VAT-CIT substitution as a subject of priority concern [Bossons and Shoup]. A number of factors contributed to the then-current interest in the value-added tax as an alternative to direct corporate taxes. This proposed change in tax structure had its origins in a general dissatisfaction with the existing system of taxation and in several specific policy concerns which came to the fore in the early 1960s. First, and probably most important, was the concern with economic growth which had emerged as a major issue in the late 1950s. One explanation offered for lagging rates of growth was the alleged depressive effect of high marginal rates of income taxation on the rate of investment. The corporate income tax became a particular target. It was thought that elimination of the CIT would stimulate investment either through increased after-tax rates of return to capital or through enhanced corporate liquidity (net-of-tax cash flow) or some combination thereof. The VAT, on the other hand, at least in its popular form as a consumption tax, would not involve any offsetting, depressive effects on growth.

A related variant of the growth argument was concerned with the adverse consequences of the corporate income tax for the composition, rather than the level, of investment. As a partial income tax, not applying to noncorporate business income, the CIT insofar as it was not allowed for in any way in the personal income tax provisions regarding dividends and capital gains, created incentives to redirect investment from the taxed corporate sector to the untaxed noncorporate sector. This allocative inefficiency was criticized by economists: an equalization of net-of-tax rates of return in the corporate and noncorporate sectors could be achieved only by higher gross returns in the corporate sector and excessive investment in the noncorporate sector. Elimination of the CIT would raise net-of-tax returns in both sectors through a flow of capital from the unincorporated to the incorporated sector. However, the possibly more serious charge was that the CIT, in discriminating against the

corporate sector, in fact discriminated against those industries which were most dynamic. If the corporate sector, for reasons of technology and organization, is the engine of productivity growth and economic progress, then the adverse consequences of discriminatory tax treatment are both static and dynamic. Within the corporate sector, moreover, the CIT discriminates also against those investments in new and specialized plant and equipment that cannot readily be made the basis for mortgage or debt finance (e.g., investment in railroad rolling stock could often be more easily financed with debt than investment in yard automation). The rate of growth, as well as the level of income and output, would be increased by a movement toward greater fiscal neutrality.

The second major impetus for advocacy of the VAT was provided by the recurrent balance-of-payments crises which have plagued the United States from the mid-1960s through the early 1970s. The deterioration in the United States trade position revived concern for the effects of tax policy on the international competitive position of the economy. In this context the apparent contrast between extensive reliance of the United States on origin-based direct taxes, which are nonrebatable under the General Agreement on Tariffs and Trade (GATT), and dominance abroad, particularly in Europe, of indirect, destination-based taxes suggested the possibility of a tax substitution, e.g., the VAT for the CIT, as an alternative to devaluation as a means of correcting trade imbalances. Somewhat more generally, the discussion of the evolving United States relationship with Western Europe embraced the VAT because of its role in the tax harmonization efforts of the European common Market.[1] The concern with international trade and economic integration leads back to the issue of growth because of the benefits to the balance of payments of sustained increases in productivity. It is primarily with reference to these issues of growth, trade, and economic integration that the Committee for Economic Development has advocated (a) an initial partial substitution of a VAT for the CIT and (b) the confinement of any future tax reductions to the remaining CIT rather than to any newly adopted VAT [Committee for Economic Development, p. 28].

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1. The role of the VAT for the Common Market countries was primarily one of tax rationalization. In general, it was introduced as a replacement for other, less desirable forms of indirect taxation, e.g., wholesale and retail sales taxes and manufacturers' and turnover taxes. As will be discussed later, these prior taxes were also generally applied on a destination basis, i.e., were rebated on exports and applied as border taxes on imports, consistent with GATT regulations. Thus, their replacement by the VAT should not have implied in itself a systematic change in the terms of trade between the European Economic Community (EEC) and other countries.

In the early 1970s, discussion of the VAT was stimulated by spec-
ulation that the Nixon administration would tie the value-added
tax to a proposal for federal assumption of major responsibility for
the financing of primary and secondary education and by the pro-
posed imposition of a United States VAT in the context of post-
August 1971 international monetary adjustments.

In addition to these topical sources of interest, the VAT has
attracted attention partially because of its seeming novelty. Only
recently enacted on a comprehensive basis by any developed, indus-
trial nations, the VAT differs sufficiently in administration from
other closely related forms of indirect taxation, e.g., the retail sales
tax, as to appear to be a new, potentially far-reaching fiscal instru-
ment.[2] Thus, government officials and legislators, particularly at
the federal level, view it as a major untapped source of stable rev-
enues.

Economists have been attracted to the VAT because of its allo-
cative efficiency. Unlike direct taxes, which affect incentives, e.g.,
changes in work effort, in willingness to bear risk, or in investment
and savings, and also unlike selective ad valorem taxes, which lead
to distortions in factor and commodity prices, the consumption-type
VAT can be shown to be relatively neutral in its allocative effects.
In principle, the VAT rate is the same for all activities. Therefore,
it would not create artificial incentives to use particular productive
inputs, production processes, or commodities.[3]

Finally, the concern, particularly in business circles, with the
alleged depressive effects of high, nominally progressive rates of in-
come taxation on investment, risk-taking, and growth has led to a
continuing interest in alternative revenue sources. In this regard, the
probable regressivity of the VAT, as a replacement for some part of
the personal or corporate income tax, may be viewed as a positive
attribute.

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2. The history of the VAT is relatively brief. A variant was employed by
France between 1948 and 1953. The Shoup Tax Mission to Japan proposed the
VAT as a revenue source for prefectures in 1950, but this recommendation was
never adopted. Brazil, Greece, and Turkey have, at various times, employed the
VAT as a manufacturers' sales tax. The VAT was formally adopted as a replace-
ment for other forms of indirect taxation' by the European Economic Com-
munity (Common Market) in 1963, and has recently been enacted by the final
remaining EEC members [Shoup, 1970, p. 250].

3. The only area in which the consumption-type VAT is not allocatively neu-
tral is in the allocation of time between work (and the consumption of pur-
chased, hence taxed, commodities) and leisure (an untaxed consumption com-
modity).

## 1.2 DIFFERENTIAL INCIDENCE ANALYSIS

The theoretical origins of this study are embedded in the development in public finance theory of differential incidence analysis. The most important single insight of modern incidence theory is that the effects of government policies can be assessed only with reference to some base, i.e., the configuration of the economy (e.g., price and output structure, factor and size distributions of income) under some alternative public policy. In brief, it makes no sense to talk of the "absolute" effects of any policy; it is only possible to identify the differential effects of one policy as an alternative to another. Thus, with the substitution of one tax for another, the economic configuration under the replaced tax provides a basis or benchmark for the analysis of the effects of the newly introduced tax.

Because the term "differential incidence" has become somewhat ambiguous, having been applied to almost any examination of the effects of alternative taxes, its meaning in the present context must be explored and clarified. Most succinctly, its use here is synonomous with *compensated tax* (policy) *substitution.* In effect, a reduction in the rate of one tax is compensated for by the imposition of another. Obviously, the meaning of "compensates" is not immediately clear: a wide range of useful and valid interpretations is possible, depending on the objective of the particular analysis.

In its most simple sense compensation might be interpreted to require only equal monetary (nominal revenue) yield of two alternative taxes. In its most elaborate sense compensation implies holding all relevant economic magnitudes constant except one, and measuring the effect of the tax change in the remaining dimension.

The issue of criteria for a compensating tax substitution is related, but not identical, to the issue of the range of effects of the tax substitution which are to be explicitly considered in the analysis. Again, at the most simple extreme it could be assumed that everything other than the nominal yields of the taxes being altered will remain constant, i.e., that the tax changes will have only direct effects and that the system will not further respond to the changes in tax variables. At a more complex level a comparative statics analysis of the system in equilibrium under each tax configuration provides one alternative, and a dynamic analysis of the response of the system to the tax change provides another. Thus, parallel to the definition of a compensating tax change is the identification of the effects which must be compensated. A more sophisticated definition of compensation requires a more elaborate representation of economic

processes in relation to the fiscal environment. It is in this sense that meaningful differential incidence analysis requires a general equilibrium framework.

Our study represents only a first step in the process of applying the insights of public finance theory to an analysis of concrete policy choices. Formally, the analysis is of the input-output or flow of funds variety, i.e., it does not attempt to take account of elasticities of supply, demand, or substitution through which the economy adjusts to fiscal change. Because of a number of restrictive assumptions which have been imposed by the complexity of relevant economic processes, the analysis is limited to an assessment of "first-round," or analytically short-run responses to the indicated tax change.[4] Since the range of responses analyzed is restricted, e.g., wages, production coefficients, and final demands are assumed fixed, a number of factors pertinent to a complete general equilibrium assessment of a large-scale change in fiscal structure are not examined. Nevertheless, the range of responses is broad enough to require a more complex compensation criterion than equal monetary yield.

A distinguishing feature of the analysis is its emphasis on the highly disaggregated consequences of the policy actions examined. A number of very different policies composed in part of the elements studied here may be capable of producing basically similar aggregate effects, although their consequences at more disaggregated levels may be quite diverse. The analytic richness of alternative policies resides precisely in this micro-level diversity, and differential micro-consequences ultimately must constitute the basis for policy choice.

It should be clearly understood at the outset that this study consists of an analysis of the underlying implications of this or that potential change in the tax system, and *not* of a prediction of the actual consequences were the particular policy to be enacted. This analysis-prediction dichotomy is particularly important to the comprehension and evaluation of the study. Many large-scale econometric models predict relatively accurately. However, policy changes in general operate (exert their effects) at the margin and only slowly over time. Even a highly accurate econometric model may not be able to identify the marginal effects of a specific policy change, particularly when these effects become fully apparent only

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4. By "short-run" we do not mean to imply temporally short-term responses, but rather a limitation on the extent of adaptive response by different elements of the economy to the change in tax structure which can be examined. Thus, "short-run" here is used in its analytical, microeconomic sense.

over longer periods of time. The nonpredictive, analytic purpose of a policy evaluation model, it is argued, justifies at least provisionally many of the oversimplifications incorporated in its empirical implementation. Thus, the objective of the analysis is *not* to predict quantitative shifts or precise time-profiles of response (lag structures, etc.) but to identify qualitative changes in "first-round" impacts, e.g., in income distribution, relative growth of various industries, or international trade. It should be clearly understood that these represent only intermediate-state tendencies, due to limitations on our capacity to assess empirically the full range of ultimate responses to a particular change in fiscal structure.

In the remainder of this introduction the emphasis is on the substance of the VAT-CIT substitution, while in later sections the two levels of analysis are intermingled.

## 1.3 CHARACTERISTICS OF THE VAT

As indicated above, it has been commonly argued that a partial or complete substitution of the VAT for the CIT would have favorable effects for the level of investment, for the interindustry and corporate-noncorporate distribution of investment, for allocative efficiency, and for the balance of payments. Nevertheless, its regressive effects on income distribution are admitted, and they provide the focus for opposition to a simple substitution of the VAT for the CIT [National Economic Development Office; Smith]. However, both the magnitude and timing of these effects will necessarily depend upon the specific nature of the legislated tax changes and upon the constellation of price changes in goods and factor markets resulting from the tax substitution. Thus, discussions of the VAT must proceed in terms of anticipated consequences on prices and factor returns of a specific VAT-CIT substitution.

The variants of the value-added tax we examine are all of the consumption type,[5] the one universally adopted by countries that have enacted a VAT. The choice is further dictated by the administrative convenience of this form, which is reflected in its adoption abroad, and by desirable economic characteristics, particularly as contrasted with the gross-product variant, which has received extensive attention elsewhere [Aaron].

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5. Ignoring governments, the tax base of a consumption-type VAT consists only of private domestic consumption expenditure, in contrast to a base of consumption plus net investment (national income or net national product) for the income type, and consumption plus gross investment (gross national product) for the gross-product type.

The obvious, although not unique, technique for administering a consumption-type VAT is the *invoice method*: each potential tax-paying entity computes a gross tax liability on all sales, as invoiced to purchasers, and then receives a credit for all VAT invoiced on its own intermediate or investment purchases. Net tax due is then the excess of the gross liability on sales over total credits for taxes paid on purchases.[6]

Since the VAT is a destination tax, it would not be invoiced on export sales, but a full credit for previously invoiced (earlier stage) VAT would be provided, resulting in a zero net rate of tax on exports. On the other hand, imports would be fully subject to VAT as a border tax. Investment purchases themselves would be wholly free of tax, since the entire VAT on investment purchases would be creditable against the gross VAT liability in computing actual tax due. A tax liability would arise only as capital services were embodied in taxable consumption output. As will be discussed later, this procedure is equivalent to *instantaneous depreciation* under an income tax.

Clearly, to exempt export or investment purchases completely, any excess of credits over liabilities must result in a rebate to the taxpayer. However, the value of the net credit would be reduced, and nominally exempted purchases would be partially taxed, if the credit were simply carried over to be applied against future VAT liabilities.[7]

The treatment of government purchases under a VAT is in the aggregate (national accounts) sense moot, since any VAT liability invoiced on government purchases is simultaneously government revenue and expenditures. However, under a multilevel govern-ment system, with the VAT imposed at the national level, the introduction of the VAT and the specific treatment of govern-ment purchases may differentially affect the fiscal status of various government units. Particularly in the context of substituting a fed-eral VAT for both federal and state CITs, achievement of inter-governmental neutrality will not be possible.

The equivalence of a value-added tax and its corresponding single-stage tax (which in the case of the consumption-type VAT would be the retail sales tax, RST), has been a subject of continuing debate

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6. For a more detailed discussion of administration, with a consideration also of VATs of the income and gross-product types, see Shoup [1970, pp. 257-261].

7. If provision were made only for a carryover to the future of net credits, the effective tax would be the difference between the nominal credit and its present value. This point is worth noting because it has commonly been ig-nored, e.g., under the French carryover treatment of net credits arising from high rates of investment undertaken by new or rapidly growing firms.

[Lindholm, 1970 and 1971; National Economic Development Office, 1971, Chapter 5, Annex 1; Shoup, 1972; Due, 1972]. Formally, the two are clearly equivalent. A consumption-type VAT and an RST in principle apply to an identical base, private domestic consumption expenditure. Under the usual competitive assumptions this would imply corresponding economic effects, i.e., the degree of tax shifting would be the same under both, with no effect on relative prices. It has been argued, however, that since the VAT is a multiple stage tax, there would be greater "slippage"[8] in forward shifting of the tax, although the logic which would lead to an expectation of systematic differences between the RST and consumption-type VAT in tax shifting does not seem particularly compelling. With a credit for earlier against later stage VAT liabilities, for example, differential shifting would imply that net-of-tax prices of *exempted* commodities (investment, export, and government purchases) would decline if a VAT replaced an equivalent RST. On the other hand it can be argued that since the VAT is in part paid considerably sooner than the RST on the final output, the added financing charge would cause forward shifting of somewhat more than the VAT, to an extent not entirely offset by the gain to the government through earlier receipts, given the higher cost of capital to private firms as compared to interest rates paid by government. This tendency would be enhanced to the extent that conventional markups might be applied to costs inclusive of VAT.

Apart from this dispute over the economic equivalence of appropriately designed value-added and retail sales taxes, the choice between them reduces to the relative ease and effectiveness of administration. For the retail sales tax it has been argued that collection is less costly since only the final-stage seller must be included in the tax administration network. Offsetting this is the greater likelihood that some taxable sales will escape tax entirely. Thus, if for administrative ease, small retail establishments are exempted from the tax, their sales entirely escape an RST, while only the markup of the retailer escapes under the VAT if the exemption takes the form of filing no tax return. Similarly, tax evasion is more difficult with a VAT. More generally, the consumption-type VAT, under the invoice method, is argued to be self-enforcing. To obtain a credit for VAT paid, a seller must report his VAT liability on sales, and the invoiced credit claimed by a purchaser can be compared with the VAT liability reported by the seller. Thus, with dual reporting a

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8. I.e., lower price increases than would be observed if the change in tax liability were fully translated into a change in price.

minimal rate of random checks would be expected to be quite effective in identifying tax evasion.

A major advantage claimed for the VAT is its ability to distinguish between business and nonbusiness purchasers. A significant complaint against the RST and related single-stage, seller-administered taxes is the difficulty of crediting purchasers. In extreme cases this even extends to exports, when, e.g., wholesaler taxes are unable to distinguish between domestic and foreign purchasers. The virtue of the VAT is that both buyer and seller are taxpaying units; thus, the tax charged at one stage can be rebated at another if a sale is nontaxable. Under any sales-type tax only one stage is directly involved in tax collection, and credits and rebates become difficult if not impossible.

A common argument for the RST relates to the ease with which "multiple rate" systems can be accommodated. Thus, the retail sales taxes of many states exempt, or tax at lower rates, purchases of such "necessities" as food, clothing, utilities, medical care and drugs, etc., and it has been alleged that such practices would be more difficult under a VAT. While it will be argued below that multiple rates are undesirable in principle and are quite ineffective in terms of their stated objectives, most commonly the mitigation of regressivity, the provision of a VAT credit to the seller of an untaxed commodity could as easily, and completely, exempt these selected transactions from taxation as would exemption under an RST.

Apart from the merits of the VAT versus the RST, it can be safely suggested that at worst a VAT would be more easily administered than an equally universal profits tax, if only because it requires no inventory accounting and no estimate of depreciation.

## 1.4 CHARACTERISTICS OF THE VAT-CIT SUBSTITUTION

Our focus is on the first-round cost and price consequences of varying degrees of replacement of the CIT by a consumption-type VAT with the characteristics just described. The analysis is based upon an input-output model representing the U.S. economy in 1969.[9] It is assumed that factor incomes *other than corporate profits*, interindustry input-output coefficients, and final demands are initially unaffected by the tax substitution. It is in this sense that the analysis is restricted to "first-round" consequences of the

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9. The model is described more completely in Chapter 2.

change in tax structure. Adjustments of these variables will imply further-round consequences of the tax substitution.

The first phase of the study is concerned with the effects of the tax substitution on prices, by industry and by component of final demand. Thus, the input-output model serves the function of translating changes in tax liabilities into changes in prices. Given the restrictive assumptions imposed, first-round price effects, strictly speaking, represent "tax allocation" effects reached under common assumptions for all industries, concerning the reflection of various tax changes in pricing decisions.

It is assumed throughout that the VAT is fully shifted forward and that VAT-exclusive prices are identical for all classes of purchasers (consumption, investment, export, and government). The assumption of an appropriately flexible, monetary policy is required to support the assumed patterns of VAT shifting. More generally, under the assumption of profit-maximizing behavior on the part of producers and traders, monetary and fiscal policies are assumed to be compatible with maintaining the original (pre-VAT) level of real income along with proportionate changes in all prices and unchanged net-of-VAT demands for all commodities, with effectively complete forward shifting. This is the classical price theory argument for full shifting of a general ad valorem tax.

Correspondingly, the classical assumption regarding the CIT is that *in the short run* the returns to capital (profits, corporate income) are quasi-rents (the capital stock is fixed and the supply of capital services is inelastic with respect to the rate of return or price, as long as output price is greater than variable cost), and therefore forward shifting should not occur. That is, the elimination of the CIT should not affect output prices in the short run if the latter are determined subject to the classical condition that marginal cost equals marginal revenue.

However, in this case professional opinion is much more divided, with empirically based assertions ranging from zero shifting [Gordon] to shifting in excess of unity [Krzyzaniak and Musgrave]. In light of this dispute a range of alternative shifting assumptions is employed in the analysis, and the sensitivity of the consequences of the tax substitution to the degree of forward CIT shifting is given particular attention. For purposes of translating tax changes into price changes, CIT shifting is simply defined as the change in gross-of-tax profit relative to the change in tax liability.

To justify short-run forward shifting of the CIT it is necessary to introduce "nonclassical" theories of price determination: oligopolistic theories, in which interdependence is recognized between

producers who are subject to external constraints on collusive joint maximizing decisions or who engage in entry-restricting pricing; long-run "normal cost" and administered-pricing theories; etc. However, whatever the underlying price-formation process, forward shifting of the CIT implies that net profits, capital earnings, and rates of return enter into price determination. If market pressures on net earnings are not perfectly competitive, then CIT increases or the benefits of CIT reductions will be shifted to consumers.

This relationship of price to net capital earnings in the case of forward CIT shifting has two primary implications for the analysis of the VAT-CIT substitution. First, it determines our treatment of depreciation, which is included at replacement cost. If the returns to capital are quasi-rents, as classical price theory indicates, then changes in capital goods prices do not alter commodity prices in the short run. However, if prices are influenced by *net* profits, then changes in capital goods prices must be incorporated in commodity pricing. This is achieved by including depreciation in intermediate interindustry transactions rather than in the residual component of industry value added.

Secondly, the relationship between net capital earnings and price implied by forward CIT shifting provides a heuristic justification for the assumption of full forward shifting of the VAT, even if non-classical price formation is assumed. Thus, a failure to shift the VAT completely would reflect imperfectly competitive market pressures similar to those required for generating short-run CIT shifting. However, the "net rate of return" constraints will already have been in-corporated through CIT shifting. It therefore appears redundant to impose them a second time through an incomplete shifting of the VAT, since the tax changes are assumed to be simultaneous.

Initial presubstitution rates of CIT were determined from aggregate data by input-output sector, and are thus industry-specific. The reduction in CIT rates is assumed to be proportionate to these rates industry by industry. Because it was impossible at this level of disaggregation to distinguish among state and federal CIT liabilities, it was assumed that the proportionate reduction in effective CIT rates applies to all corporate income taxes.

The reduction or elimination of the CIT has several consequences for government. First, assuming that prices (and gross profits) are unchanged, i.e., assuming that the benefits of the CIT reduction are not shifted forward as lowered prices (exclusive of the newly imposed VAT), the government experiences only a *primary CIT revenue loss*, equal to the change in tax rates multiplied by the pre-tax-substitution levels of corporate income. But, *if* instead, the CIT

reduction is shifted forward, lowering prices, and *if* the CIT is not completely eliminated, then with gross-of-tax profits reduced, the CIT at the new, lower rates will be reduced even further than the primary loss would indicate. This *secondary revenue loss* obviously occurs only if the CIT is retained, since the maximum revenue loss, primary and secondary combined, cannot exceed the revenue yield prior to the tax substitution. Finally, the level of nominal government expenditures will be reduced if, as a result of CIT reduction and shifting, the (VAT-exclusive) *prices of government purchases decline.*

An ultimately major effect of the tax substitution is *not* taken into consideration in the present analysis: Unless the CIT is considered to be entirely shifted forward, or the effect of CIT reduction is offset by monetary stringency and increased interest rates, investment demand will increase. Thus, if real disposable income, and with it the level of consumption demand, are initially maintained at a constant level by maintaining an unchanged government budgetary deficit or surplus, an increase in aggregate demand will occur, resulting in an increase in real income or in the rate of inflation. A change in the interest rate, if used to offset the effect of the CIT reduction on the aggregate volume of investment, would in itself involve a severe redistribution of incomes and differential effects on prices. In effect, in what follows, the analysis reflects only extreme short-run impacts which occur before investment has had time to respond to the changed circumstances.

The VAT rate is determined at that level which will just compensate for the three initial governmental impacts described above: the primary CIT revenue loss, the secondary CIT revenue loss, and the reduction in the cost of government purchases. Compensation is thus defined in terms of an unchanged government surplus or deficit, rather than in terms of an unchanged level of aggregate demand. This VAT-yield criterion, which equates the net change in tax revenue to the net change in government expenditure under the assumption of a constant bill of final demand, incorporates price changes for government resulting from CIT reduction and shifting. It can be argued that this yield criterion is a politically and legislatively relevant condition, given the way such legislation is usually thought of by those responsible for its formulation. It is consistent with short-run budgetary neutrality in accordance with the restriction of the present analysis to "first round" effects. It makes no attempt, however, to avoid a net stimulative or sedative effect on the economy as a whole in the medium or longer run; indeed the levels of VAT revenue specified in this analysis as the equivalent of various levels of CIT reduction

can be expected under most circumstances to lead within a fairly short period after the change to a substantial stimulus to the economy or to increased inflationary pressure.

Just as the required VAT revenue varies with the degree of CIT reduction and shifting, so the VAT base also varies. The greater the degree of the CIT shifting, the greater will be the decline in (VAT-exclusive) prices of consumption goods, necessitating a higher VAT rate.

Thus, the relationship between the VAT rate and the degree of CIT reduction and shifting is somewhat complex. At one extreme, if the CIT is not shifted, then (a) the prices of government-purchased commodities are unchanged, (b) gross profits are not reduced and no secondary CIT revenue loss is experienced, and (c) net-of-VAT consumption expenditure is unaltered. Thus, the VAT rate is simply determined by the primary CIT revenue loss relative to the pre-substitution level of consumption expenditure. At another extreme, if the CIT is completely eliminated, then the secondary CIT revenue loss, which is due to the reduction in gross profits induced by shifting the CIT, is necessarily zero. In between these extremes, as the degree of shifting increases, required VAT revenue declines as the result of reduced government prices, while the VAT base declines as a result of reductions in VAT-exclusive consumer prices. Whether the VAT rate will rise or fall with an increase in the degree of shifting of the CIT depends on whether required revenue declines more or less rapidly than the VAT base. For intermediate degrees of CIT reduction and shifting, the required VAT rate will vary systematically with primary and secondary CIT revenue loss and with changes in government and consumer expenditures induced by CIT shifting.

Once the first-round price effects of the tax substitution have been determined, it is possible to assess the probable later round consequences for income distribution, investment, international trade and the balance of payments, etc.

## 1.5 CONSEQUENCES OF THE VAT-CIT SUBSTITUTION

This section contains a brief summary of the substantive consequences of the tax substitution for varying assumed degrees of CIT reduction and shifting. Because, as indicated above, the degree of forward CIT shifting determines the CIT revenue loss and the change in government and consumer prices resulting from CIT reduction, the CIT-compensating VAT rate depends crucially upon the assumed degree of CIT shifting. Using the model described in Chapter 2, the estimated relationship between CIT reduction and shifting, on

the one hand, and the CIT-compensating VAT rate, on the other, are outlined in Table 1-1. For relatively small reductions in CIT rates the VAT rate *rises* with increases in shifting, simply because (1) the secondary CIT revenue loss is greater than the savings in government expenditures resulting from the decline in prices, i.e., as shifting rises, the amount of VAT revenue needed to compensate also rises, while (2) the VAT base necessarily declines. Thus, on the basis of our model, if CIT rates are reduced across the board by 25 percent, the VAT rate which will just hold the government surplus (deficit) constant rises from 1.9 percent if CIT savings are not shifted to 2.9 percent if these savings are shifted forward completely in the form of lower prices. However, if the relative reduction in the CIT is large, then the secondary revenue loss due to the decline in gross profits will be small, since the remaining CIT rate, applying to the now lower pretax profits, will be relatively low, while government expenditure savings resulting from price reductions may be quite large relative to the net change in CIT revenue. If the government expenditure reduction net of the secondary CIT revenue loss, relative to the primary CIT revenue loss, is greater than the shifting-induced decline in consumer expenditures, relative to their presubstitution level, then the required VAT rate will *decline* with increased CIT shifting. In fact, in the extreme case of complete CIT removal, for which there is no secondary revenue loss (the new CIT rate is zero), government expenditure reductions result in a decline in the VAT rate from 7.7 percent in the absence of CIT shifting to 7.2 percent if the benefits of CIT removal are fully translated into lower prices.

Since an increase in CIT shifting calls for an increase in the required VAT rate when the CIT reduction is small, and a decrease when it is large, there must be, for some intermediate degree of CIT reduction, a stationary point, at which a small increase or decrease in CIT shifting calls for neither an increase or decrease in

**Table 1-1.   VAT Rate for Varying Degrees of CIT Reduction and Shifting**

| *Degree of CIT Shifting*[a] | *Degree of CIT Reduction*[b] | | |
|---|---|---|---|
| | *25%* | *75%* | *100%* |
| 0.0 | 1.92% | 5.76% | 7.68% |
| 0.4 | 2.19 | 5.91 | 7.50 |
| 1.0 | 2.91 | 6.19 | 7.22 |

Source: Table 3-1.

[a]The *proportion* of any reduction in CIT liabilities which accrues to purchasers in the form of lower prices.

[b]Percentage reduction in all corporate income tax rates.

the required VAT rate. At this level of CIT reduction, the relative change in VAT revenue required to offset the reduction must equal the relative change in the VAT base resulting from increased shifting, implying a VAT rate invariant to the degree of shifting. In our model, this equality is found at a relative CIT reduction of between 85 and 90 percent, for which the VAT rate is constant at about 6.8 percent, regardless of CIT shifting.

Invariance of the VAT rate is significant because the actual degree of CIT shifting is unknown and subject to dispute. More generally, the degree of forward shifting may not be fixed for all time, but may rather be a symptom of underlying conditions of demand, supply, and competition prevailing at the time of the tax change. In this context of uncertainty, if great weight is placed upon avoidance of unanticipated government surpluses or deficits, then on the basis of our model the risk-adverting policy would be to undertake a major reduction in the CIT, since the budgetary surplus would then be virtually unaffected by the degree of CIT shifting. Of course, the range of conceivable variability in the degree of shifting may itself be a function of the degree of CIT reduction. In that case, a VAT rate unaffected by CIT shifting may be purchased at the price of greater unpredictability concerning the degree of shifting [NEDO, pp. 43-44].

The sensitivity of the tax-substitution-induced price changes to the assumed degree of CIT shifting determines the relationship between the degree of CIT shifting and the compensatory VAT rate. Again, zero shifting of the CIT provides an extreme; in this case, prices exclusive of VAT are unaltered by the tax substitution, while VAT-inclusive prices rise by the VAT rate. With any degree of positive forward shifting of the CIT, however, VAT-exclusive prices (investment, exports, and government) decline, and the net rate of increase in VAT-inclusive consumption prices is less than the VAT rate. Thus, in our model, if the CIT is not shifted, repeal of the CIT requires a compensatory VAT rate of 7.68 percent, and consumption prices rise just by this percentage. But with full forward CIT shifting, the required VAT rate is 7.22 percent, while consumption prices increase by only 1.68 percent. In the first case (no shifting), VAT-exempt prices are unaffected. In the second case (full shifting), these prices decline, in the extreme by 5.45 percent (private fixed investment). The size of consumption price increases and VAT-exempt price decreases are of course smaller if the CIT is only partially removed, but increases in the degree of shifting invariably increase the magnitude of VAT-exclusive price declines and reduce

the magnitude of VAT-inclusive price increases, as indicated in Table 1-2.

At the first-round stage all of the consequences of the VAT-CIT substitution flow from alterations in tax liabilities and, corrspondingly, in prices. The most important dimensions in which these consequences are explored are income distribution, investment, and international trade.

### 1.5.1 Consequences for Income Distribution

In unrelieved form the change from the CIT to the VAT is invariably regressive. Consider specifically the case of complete repeal of the CIT. With zero CIT shifting consumption prices rise by the VAT rate while after-tax corporate profits increase by the full amount of the former CIT revenue (equal to the revenue yield of the newly imposed VAT). If the increases in consumption expenditures are allocated to households on the basis of the level and composition of these expenditures and the increases in profits are allocated on the basis of wealth, then changes in *tax liability relative to income* decline with income class: from a net increase in liability of 6 percent at incomes between $5,000 and $7,500 to a net decrease of 7 percent at incomes above $15,000.

**Table 1-2. Price Indices for Consumption and Nonresidential Fixed Investment for Varying Degrees of CIT Reduction and Shifting**

| *Degree of CIT Shifting* | *Price Indices* | |
|---|---|---|
| | *Consumption*[a] | *Investment*[b] |
| | *CIT Reduction of 25 Percent* | |
| 0.0 | 101.92 | 100.00 |
| 0.4 | 101.57 | 99.36 |
| 1.0 | 100.69 | 97.76 |
| | *CIT Reduction of 75 Percent* | |
| 0.0 | 105.76 | 100.00 |
| 0.4 | 104.18 | 98.28 |
| 1.0 | 101.45 | 95.31 |
| | *CIT Reduction of 100 Percent* | |
| 0.0 | 107.68 | 100.00 |
| 0.4 | 105.28 | 97.82 |
| 1.0 | 101.68 | 94.55 |

Source:  Table 3-5.

[a]VAT-inclusive prices.

[b]VAT-exclusive (exempt) prices.

If the CIT reduction is fully shifted forward in the form of lower prices, the rest of the world reaps a net benefit of $2.5 billion as a result of export price reductions. Similarly, the prices of capital goods decline, due to the shifted reduction in the CIT. Only VAT-inclusive consumption prices rise, although to a lower degree than in the case of zero CIT shifting. After-tax profits under the full-shifting assumption are unaffected by the tax substitution. If the reduction in prices of investment goods is distributed to households on the basis of wealth holdings, and if consumption price increases are distributed as indicated in the preceding paragraph, it is again possible using our model to estimate the impact of the change in tax structure on the distribution of income. The domestic burden of the price increases, although positive in the aggregate, declines by income class from about 2 percent at incomes between $5000 and $7500 to minus 0.2 percent at incomes above $15,000.

Perhaps the most interesting finding concerning income distribution is that multiple-rate and VAT-exemption schemes do not mitigate the underlying regressivity of the VAT. To maximize the progressivity of a multiple-rate VAT in our model, all consumption commodities exhibiting income elasticities less than unity were assumed to be completely exempt from the VAT.[10] We thus carried to an extreme the common practice of exempting "necessities" from state retail sales taxes, in order to reduce the regressivity of that particular ad valorem levy.

This exemption scheme failed in significantly reducing the regressivity of the VAT-CIT substitution. For example, if the CIT is eliminated, the exemption of commodities in inelastic demand in our model reduces the Gini coefficient (*index of inequality*) only from 0.397 to 0.394 if the CIT is not shifted, and from 0.380 to 0.377 if the CIT reduction is fully shifted, the initial figure in each of these comparisons being to the postsubstitution value of the Gini coefficient in the absence of an exemption. These increases in equality compare to a pre-tax-substitution Gini coefficient of 0.374, indicating that the exemption partially reduces the regressive effect of the VAT-CIT substitution, especially if the CIT is fully shifted.

Moreover, this marginal mitigation of regressivity is purchased at the price of a significant increase in the basic VAT rate, from about 7 percent to over 15 percent for those commodities still subject to VAT. This extreme rate differential, zero for some classes of

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10. Administratively, sellers would *not* invoice VAT on final sales of these commodities, but would receive full credit for VAT on intermediate purchases, even if this resulted in a net credit.

commodities versus 15 percent for others, could be expected to produce significant allocative distortions as households change their consumption patterns, by substituting exempt for taxable commodities, in an attempt to minimize tax liabilities.

In a more realistic context, in which fewer commodities were subject to exemption, this rate differential could be significantly reduced but only at the price of an even less effective amelioration of regressivity. In addition, the allocative distortions that occur in response to differential rates of taxation would remain; thus, the allocative neutrality of the VAT, its most significant positive attribute, would be lost. Finally, the European experience indicates quite clearly that the private and governmental costs of tax administration are greatly increased by the incorporation of dual and multiple VAT rates [NEDO, p. 5].

Thus, dual rates can be objected to on a number of counts, and use of such schemes has little mitigating effect on the basis regressivity of the tax substitution. However, this finding does not provide a substantial argument against the VAT-CIT substitution on distributional grounds. First, the position could be taken that the U.S. tax structure would be improved by the regressivity implied by a VAT-CIT substitution. The overall progressivity-regressivity of the tax system as a whole would be only marginally influenced in any event. Secondly, other means could be found to compensate for the regressivity of the VAT-CIT substitution while retaining the basic allocative neutrality of the VAT. For example, systems of rebatable credits against personal income tax liabilities have often been proposed in the context of otherwise regressive ad valorem taxes. Thus, the VAT could be levied at a higher rate than estimated to be required here to compensate for the CIT, with a credit against the income tax permitted for VAT imputed on a basic level of per capita consumption. The additional revenue requirements resulting from income tax losses could be reduced if the credit were of the "vanishing" variety, i.e., were itself included as a component of taxable income and subjected to tax. Alternatively, but somewhat more radically, the VAT itself could be replaced by a direct *progressive expenditures tax* of the type proposed by Kaldor. This tax would preserve the allocative neutrality and many of the other desirable characteristics of the VAT that relate to investment and trade. In a system already employing an income tax, administration of a progressive expenditures tax would only require in addition that taxpayers consistently adjust the realized income as now reported by the flows into and out of investment, and by gifts and bequests made or received.

### 1.5.2 Investment Consequences

We assessed the investment effects of the VAT-CIT substitution on the basis of the liquidity theory of investment elaborated by Kuh, Meyer, and Glauber. Following Brittain, Lintner, and Dobrovolsky, we assumed that dividends are determined by nominal profits. Investment is then a function of *real* cash flow net of dividends and corporate profits taxes. If it is assumed that the CIT is not shifted, its repeal will not alter the prices of capital goods. Profits (net of tax) would then increase in our model by $42.68 billion, equal to total CIT liabilities, which would imply an increase of $18.43 billion in dividends. The remainder, a $24.25 billion increase in real net cash flow, would result in a *cumulative* increase in gross investment of $32.05 billion.[11] In the short run the Meyer-Glauber elasticities indicate that gross investment in plant and equipment would increase by 5.3 percent, or $5.3 billion. In this case, since capital goods prices are unaffected by the tax change the investment stimulus operates only in the incorporated sector.

With elimination and full forward shifting of the CIT, nominal net cash flows are unaffected by the tax substitution. However, the shifted CIT reduction has the effect of reducing capital goods prices by more than 5 percent. Thus, *real* net cash flows are necessarily increased, by $4.24 billion. The cumulative increase in gross investment stimulated by this price reduction is projected to be $8.98 billion, with a short-run increase of 1.5 percent or $1.5 billion. In this case the stimulus operates on the investment activity of both the incorporated and the unincorporated sectors since the price reductions benefit all investment activity. Of the $8.98 billion increase in cumulative gross investment, the unincorporated sector would account for $3.37 billion and the incorporated sector for $5.61 billion.

Thus, under either CIT shifting assumption the replacement of the CIT by the VAT might significantly stimulate aggregate investment demand. In addition, the composition of investment demand would be significantly altered in favor of the corporate sector if the CIT were not shifted. It must be pointed out, however, that in the input-output model itself, the assumption has been adhered to that no change occurs in the level or composition of real final demand. The above estimates of increases in investment resulting from the substitution are "second round" effects not included in the model. Since increases in effective (VAT-inclusive) consumption prices might

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11. This amount represents the undiscounted sum of all future increases in investment resulting from an increased real cash flow in the current period.

reduce real consumer demand, it could be expected that the investment stimulus would operate in more than one way. Investment could be shifted toward sectors supplying disproportionately large components of final demand that are exempt from the VAT and for which prices may have declined. Alternatively, the process of "capital deepening" (greater capital intensity of production), rather than "capital widening" (growth in productive capacity) could accelerate in response to a reduction in the cost of capital relative to wages.

### 1.5.3 International Trade Effects

Our contention is that the international trade consequences of the VAT-CIT substitution have often been misunderstood and confused. On the realistic assumption that the VAT is fully shifted forward, any balance-of-trade effects of the change in tax structure must result from the reduction or elimination of the CIT, not from the imposition of the VAT itself. In general, the VAT has no effect on the terms of trade. As a destination-based tax the VAT will have trade effects only if it is substituted for an origin-based tax, the reduction of which is shifted forward in lower prices of exports and of import-competing goods. Thus, if the CIT is *not* shifted the terms of trade are unaltered. Prices of imports and of import-competing commodities (if subject to the VAT) rise by equivalent proportions (the VAT rate), while VAT-exclusive export prices are unaltered. Thus, zero shifting of the CIT would imply an unchanged balance of trade.

If the CIT reduction is shifted in the form of lower VAT-exclusive prices, then its replacement by a VAT will serve (at least in the short run) to stimulate exports and reduce imports. If the CIT is completely eliminated, the improvement in the balance of trade is estimated in our model to be between $2.7 billion and $4.7 billion, depending on the export and import elasticities employed. To place these estimates in perspective, the complete removal of a forward-shifted CIT is demonstrated to be equivalent to an effective devaluation of about 5 percent. Since such a devaluation is a perfectly conceivable alternative to the VAT-CIT substitution, and has in fact been effected between 1971 and 1973, balance-of-trade consequences provide no substantial argument in favor of the tax substitution. This is particularly true since one quite conceivable outcome of the tax substitution is an unchanged balance of trade (if the CIT is not shifted).

However, while the effect of VAT-CIT substitution on the balance of trade under the most favorable assumptions would be equivalent to a 5 percent devaluation, the effect on international capital flows

might be quite different. Depending on the degree to which elimination of an unshifted CIT increased after-tax corporate profits and rates of return, significant capital inflows might be predicted, which might well reduce the deficit in the balance of payments. In brief, a devaluation would operate primarily on the trade account, while the tax substitution might operate either on the trade account (if the CIT is shifted), on the capital account (if the CIT is not shifted), or on both trade and capital accounts (intermediate degrees of CIT shifting). Unfortunately, it has not been possible within the confines of this study to assess quantitatively the potential implications of the tax substitution for international capital flows.

As a final note on trade consequences, it should be pointed out that the elimination of a shifted CIT and a 5 percent devaluation are equivalent only in terms of the *net* change in the balance of trade. In general, the devaluation apparently operates more strongly through increases in exports than through the substitution of import-competing goods for imports, while the reverse would be true under the tax substitution with CIT shifting.[12] However, changes in *real* export and import flows would be quite similar under either of these policies.

### 1.5.4 Regional Effects

In Chapter 7, particular attention is devoted to the *differential regional consequences* of the tax substitution, especially its implications for the relatively low-income South. It is shown that, depending on the degree of CIT shifting (complete versus zero), repeal of the CIT would increase net southern tax liabilities by between 0.7 and 2.1 percent of disposable personal income in that region. In contrast, the rest of the country, with per capita incomes one-third greater than in the South, would experience a 0.7 percent reduction in tax liabilities relative to income if the CIT were not shifted, and only a 0.3 percent increase if the CIT were fully shifted.

On a regional basis, the tax-substitution-induced investment expansion is found to be significantly nonneutral. To project the probable regional investment increases the ad hoc assumption was employed that a region's share of any industry's investment expansion would be equal to its share of base (actual 1969) investment in that industry. Applying the model to a selected group of manufacturing industries for which regional investment statistics were

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12. This statement will be true if the relative price elasticity of exports (U.S. export prices to world prices) is greater than the relative price elasticity of imports (domestic prices of import-competing goods to world prices).

available and assuming complete CIT repeal, it was found that zero CIT shifting would generate a 10 percent increase in investment nationally; by region, the investment expansion would range between 7.5 percent in the West South Central to 12.5 percent in New England. The South as a whole would experience an increase of 9.3 percent, versus 10.3 percent for the rest of the nation. In the case of full CIT shifting the national expansion of 1.9 percent would decompose into a regional range of from 1.5 percent (West South Central) to 2.2 percent (New England), with an aggregate Southern expansion of 1.7 percent in contrast to an expansion of 2.0 for the rest of the nation. Thus, the South would experience a marginally lower investment stimulus than the rest of the United States, primarily because of differences in the South's industrial composition.

In terms of changes in international trade flows, the South would benefit most from the potential stimulus to import-competing industries of a shifted CIT reduction, but would be only marginally affected by any export expansion. Thus, if the CIT is shifted, the stimulus to income and output in the South flowing from the VAT-CIT substitution might be quite great.

### 1.5.5 Other Substitution Effects

Virtually no attention has been given to *intergovernmental fiscal effects* of a VAT-CIT substitution. In the discussion of these effects it is usually pointed out that, notwithstanding the large direct labor component in expenditures by state and local governments, these jurisdictions would benefit significantly from complete elimination of the federal CIT, if this were shifted forward in the form of lower prices of government-purchased goods and services. However, if federal repeal caused states simultaneously to repeal their own corporate income taxes, as might be expected, then state-local governments, as a group, would suffer a significant net decline in budget surpluses regardless of the degree of CIT shifting.[13] This adverse change in budgetary status would be aggravated if these governments were not effectively exempted from the VAT (via either a

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13. In section 1.4, we pointed out that since we could not separate federal and state CIT liabilities at the individual industry level, we were forced to assume that all CITs would be proportionately reduced. However, as discussed later, the net burden of a state CIT is significantly reduced by the existence of a federal CIT, since state CIT liabilities can be deducted in computing the base for the federal CIT. This advantage would be lost if the federal CIT were greatly reduced or repealed. Thus, it is not unlikely that states would in fact follow the federal suit in CIT reduction. Also, elimination of the federal CIT could significantly increase the administrative costs of the state CIT.

credit or exemption from invoicing). Thus, if a federal VAT were substituted for the state-federal CIT, explicit provision for sharing of federal revenues with affected state-local governments would be necessary if the tax substitution were not adversely to affect the fiscal condition of individual jurisdictions. Whether such compensatory federal action would in fact be desirable and, if so, how such a distribution of federal revenues should be designed remain open questions.

An assumption of the analysis is that nominal factor incomes other than corporate profits are unaffected by the tax substitution. However, consumer prices (inclusive of VAT) are found to increase under all CIT shifting and reduction assumptions, implying declines in real wages. To assess the differential short-run pressures for further-round price and output adjustments in different industries, *wage adjustments* required to restore pre-tax-substitution levels of real wages are compared by industry with the decline in CIT liabilities, under the assumption of repeal and zero shifting of the CIT. Not surprisingly, it is found that the CIT savings greatly exceed potential short-run labor cost increases in relatively capital-intensive, highly incorporated industries. Conversely, labor-intensive, unincorporated industries could experience aggregate increases in wage bills greatly in excess of CIT savings.

Much popular concern has focused on the potential *interindustry redistribution of tax burdens* implicit in a VAT-CIT substitution. To provide some evidence on this score the principal assumption of the study, that the VAT is fully shifted forward in higher prices, is dropped. It is demonstrated that, in the short run, if neither the CIT nor the VAT were shifted, and if VAT-exclusive prices to all purchasers were equalized,[14] then highly incorporated and rapid growth (high-investment) industries would experience significant increases in net profits, while after-tax profits would decline for relatively unincorporated, low-growth industries.[15]

The strongest argument for the VAT-CIT substitution is the positive effect it would have on the overall allocative efficiency of the United States economy. This increase in efficiency would follow from improvements in production (in particular from a reallocation

14. Retaining the assumption of equal VAT-exclusive prices for all purchasers implies that introduction of an unshifted VAT will reduce effective prices on investment, export, and government sales. Thus, the change in after-tax profits need not equal the net change in government tax receipts.

15. By "highly incorporated industries," we mean those industries in which a large share of value added is accounted for by incorporated enterprises, and conversely for "relatively unincorporated industries."

of capital from the noncorporate to the corporate sector), from reallocation of consumption, and from probable increases in the rate of capital accumulation.

As has been indicated throughout, the consequences of the VAT-CIT substitution discussed here represent estimates only of the results of first-round, short-run responses to this change in tax structure, projected under a highly restrictive and confining set of assumptions. However, ultimate consequences of the substitution will only flow from the more pervasive responses of households and producers, not to mention fiscal and monetary authorities, to these initial effects. This in itself is sufficient justification for the analysis; it at least provides a basis for qualitative estimates of the probable ultimate effects on important economic magnitudes and of further policy adjustments which would be necessary or desirable.

In conclusion, it would appear that the only unique argument in favor of the VAT-CIT substitution is the probable improvement in allocative efficiency which such a movement toward a more neutral system of taxation would induce. Redistributive effects certainly do not provide a basis for advocating this substitution, and putative investment and international trade effects could be more confidently achieved by other means.