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Are Labor Supply, Savings, and Investment Price-Sensitive in Developing Countries?

A Survey of the Empirical Literature

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This chapter aims to summarize the available empirical estimates of the impact of a number of direct tax instruments on labor supply, investment, and savings in developing countries with a view to determining whether supply-side policies are relevant for such countries. Theoretical contributions are also discussed to the extent that they elucidate the empirical results.

Given that the concern is over the applicability of supply-side tax policies to developing countries, some discussion of what is meant by the concept "supply-side policy" is appropriate. As the term has come to be used in the context of developed economies and, in particular, in the context of the United States, it has, in general, referred to certain changes in tax policy—particularly those pertaining to corporate and personal income taxes—that are viewed as likely to stimulate domestic savings, investment, and labor supply. It has also come to refer more specifically to the views of those who believe that the responses of the various relevant agents to relative price changes are so elastic that tax rates can be reduced without any loss in tax revenue (see Gandhi (Chapter 1)). It should be noted, however, that the views of these elasticity optimists are not unanimously accepted (Blinder (1981), Hausman (1981)).

Supply-side policies, as they apply to developing countries, must be defined more broadly. First, the role of government as an agent for savings and capital formation is more important in developing countries. How

should the government perform this role? Second, there is some concern over the implications of changes in tax rates for tax revenue but this concern is overshadowed by the belief that the judicious use of tax policies (for example, tax incentives) will lead to an acceleration in growth rates. This emphasis on rates of economic growth immediately suggests that the applicability of supply-side concepts depends on income effects in addition to relative price effects. In particular, the availability of adequate savings in a developing country will depend not only on the interest elasticity of savings behavior but also on the marginal propensity to save.

Third, as noted above, supply-side analysis of developed countries concentrates on the role of direct taxes, both corporate and personal, on income. In developing countries, although these taxes can be of importance, it would be unwise to ignore other commonly used tax instruments. Many developing countries rely heavily on trade taxes both as a source of revenue and as an instrument of protection. Presumably, these taxes also have implications for the workings of the labor and capital markets in these countries. Further, even though the broad range of existing taxes offers considerable scope for the implementation of tax based supply-side policies, the efficacy of such policies may nonetheless be quite limited. Thus, many economists believe that developing countries suffer from structural problems that cannot be greatly alleviated by tinkering with tax rates.

This survey attempts to accommodate such a broader definition of the supply-side approach, although it cannot claim, in the space available, to provide a comprehensive evaluation of the empirical significance of supply-side effects in developing country contexts. It will conclude, however, that while reform of direct tax structures in developing countries in some cases would be useful, it may well be the case that alternative nontax reform strategies would yield greater efficiency gains.

Before considering specific contributions, a comment on the quality of much of the empirical work is appropriate. The time-series data available for developing countries is well known to be deficient. As a result, much of the empirical work uses data that typically consist of aggregate macroeconomic quantities. Such studies are of limited value, particularly for evaluating microeconomic tax reform proposals. Further, the cross-section analyses abstract from the great heterogeneity of the countries selected. It is a suspect strategy to proceed as if the data sources are observations on a typical country, ignoring the possibility of income-type effects associated with the level of development. Taking tax systems as an example, it has been shown that cross-country differences can be large and, what is more important for regression analysis, systematic (Martin and Lewis

(1956), Williamson (1961), Hinrichs (1965), Tanzi (1982, 1987), and Abizadeh and Wyckoff (1982)).¹

The implications of tax policy for labor supply, saving, and investment are discussed in Sections I, II, and III below.

I. Labor Supply

Theoretical Background

When evaluating the implications of tax policy for the labor market, the traditional approach has been to estimate the elasticity of labor supply with respect to real wage changes. The view has been that, given the assumption that factor taxes are borne where they are levied,² such an elasticity estimate will indicate labor supply responses to tax changes. The major problem, as perceived by this traditional approach, is that economic theory provides little guidance on the magnitude of the elasticity since the Slutsky equation permits an ambiguous result.³

This view, that all the implications of the taxation of labor supply can be evaluated by considering the elasticity of labor supply with respect to real wage changes, can be challenged on a number of accounts. First, and most obviously, in most frameworks the incidence of a tax on labor income and the elasticity of labor supply are directly related. The more elastic the supply of labor, the less the net wage received by labor will change and the greater will be the effect of the introduction of the tax on other factor and

¹It should be noted that, in the case of consumer analysis within a country, the discrepancies between cross-section and time-series results are frequently resolved by arguing that cross-section observations include those who are experiencing transitory income blips (Friedman (1957), Ando and Modigliani (1963)). Such a device, which permits the assumption of a typical consumer, does not carry over to countries with structural differences.

²As is traditional, unless otherwise stated, it is assumed that whatever revenue is raised is spent in a neutral fashion. There is, therefore, no need to take account of whether there are changes in net wages, and hence, labor supply effects, because of government expenditures.

³In the absence of taxation, the relevant Slutsky equation is

$$\frac{\partial L}{\partial w} = \left(\frac{\partial L}{\partial w} \right)_{\bar{u}} + L \frac{\partial L}{\partial M},$$

where L refers to labor supply, w to the wage rate, and M to income; \bar{u} refers to the fact that the first term on the right-hand side is compensated. This is the substitution effect and is known to be positive. The second term is the income effect. Given that leisure is conventionally assumed to be normal ($\partial L / \partial M < 0$), the net effect of an increase in the wage rate on a consumer's labor supply is ambiguous (cf., Atkinson and Stiglitz (1980)). Note that the compensated elasticity of labor supply is the relevant quantity to consider when evaluating efficiency losses, while the uncompensated elasticity is relevant when evaluating the revenue implication of tax changes.

goods markets. Second, as pointed out by Hausman (1983), the simple Slutsky equation may not apply because of the presence of nonlabor income and nonlinear (i.e., nonproportional) tax structures. This has a number of implications. The existence of nonlabor income makes the nature of the tax instruments important. Is it a wage tax or an income tax? Further, the nature of the income effect associated with tax changes becomes more complicated—indeed, Hausman (1983) suggests that the interaction between typical nonproportional tax systems and earnings functions produces an income effect over and above the conventional Slutsky term where this effect may well be the source of the backward-bending labor supply curve found in so many empirical studies.

The widespread use of nonproportional tax systems has a further serious implication. There is a possibility, particularly if there are positive transfer receipts at low-income levels, that the individual budget set is nonconvex, with the concomitant potential outcome of multiple equilibria. In graphical terms, this means that there is the possibility of a budget line with multiple kinks being tangent to the consumer's indifference curve at more than one point. Accordingly, in order to predict accurately the impact of taxation on labor supply in those circumstances, one would have to know the typical individual's entire preference structure (Hausman (1983)).

The above observations refer to all labor supply analyses, irrespective of whether they pertain to developed or developing countries. A third challenge to the view that tax policy analysis of the labor market can be reduced to a simple aggregate elasticity estimate of labor supply is most relevant in the case of developing countries. It is contained implicitly in the component of development literature that characterizes rural labor markets as frequently being noncompetitive. Wages are assumed to be institutionally set with the resultant outcome of persistent underemployment and unemployment of labor (e.g., Lewis (1954), Ranis and Fei (1961), Sen (1966)). If this framework is accurate, then the incidence of a general tax on labor income may be dramatically altered. Instead of facing an inelastic supply of labor in the aggregate, where this implies that labor will bear a general factor tax levied on its earnings, labor supply to the economy is now infinitely elastic. The incidence of a wage/income tax then depends on the institutional mechanisms in place and, in particular, on what happens to the net wage. More important, this nonneoclassical framework suggests that the net effect of tax policy will be determined on the demand side. If there remains an excess supply of labor after the tax has been absorbed, then any change that occurs in employment will be because of changes in demand.

Finally, it should be noted that, as far as developing countries are concerned, the focus is on the labor supply behavior of urban households, as

rural household incomes are taxed little if at all by means of direct taxes such as the income tax.

As pointed out at the beginning of this section, it is often assumed that the incidence of an income/wage tax is such that it is borne by labor. In the short run, this may well be an accurate assumption. It is worth noting, however, that, in the very long run, circumstances may be quite different. Indeed, following Feldstein (1974a, 1974b), if one uses a traditional neo-classical growth model to gauge long-run incidence effects, then the critical factor in determining the impact of a tax is whether it affects aggregate savings by changing the propensity to save. Feldstein shows that, within the context of his model for the case of wage tax, the steady-state equilibrium is completely independent of the extent to which the supply of labor responds to the net wage. The intuition is clear. In the long run in that type of model, labor affects output growth through the rate of population growth rather than through the labor participation rate. Accordingly, when assessing the impact of a wage/income tax, account must be taken of how the revenue raised is spent—in particular, is aggregate savings, and therefore the rate of capital formation, unaltered? (Note that the Feldstein approach relaxes the assumption that tax revenue is neutrally spent.) This implies that, if the full range of supply-side effects associated with wage taxes are to be appreciated, it is not enough to consider only the elasticity of labor supply. We will return to this point in Section II where the behavior of savings is examined.

The above discussion has also implicitly assumed that the only taxes on labor income are broad-based wage or income taxes. More specific taxes such as taxes (subsidies) on the use of a factor in an industry or on the price of the given output are also possible. In a neoclassical context, these taxes have general equilibrium effects that occur as a result of differing capital labor ratios and elasticities of substitution across industries and demand effects precipitated by alterations in the distribution of income. Such effects make it difficult to analyze the incidence of these taxes, as evidenced by Harberger (1962), Mieszkowski (1969), McLure (1975), and Vandendorpe and Friedlaender (1976). In the case of developing countries, the authors typically have some modified two-sector model in the background. Notable examples of contributions in this area are afforded by Ahluwalia (1973) and Bird (1982). For example, Ahluwalia analyzes the implications of tax incentives for employment within the framework of a two-sector surplus labor economy. In this context, mention should also be made of Gandhi (1981), who discusses the efficacy of investment incentives for increasing employment. It should be noted that these papers focus on the creation of a demand for labor rather than on the definition of circumstances in which supply would be forthcoming.

Empirical Evidence: Urban Workers

Unfortunately, even for the case of the aggregate labor supply elasticity of urban workers, the available empirical literature has little to offer. What direct evidence there is suggests that, at least for Africa, the aggregate supply curve for labor for the monetized economy as a whole is positively sloped (Berg (1961)). This view is in marked contrast to the earlier presumption that African labor supply functions were backward sloping. The two views are not contradictory. To elaborate, using data drawn from the copper belt of Africa and from Kenya, respectively, Miracle and Fetter (1970) and Miracle (1976) argue that the earlier observations of backward-sloping supply curves are consistent with conventional microeconomic theory when account is taken of the costs associated with working at that time. In particular, these two papers document that, in the early part of the twentieth century, the risk of dying from a disease while at work in an urban area was considerable. It was not surprising, therefore, that the income effect associated with an increase in the wage rate tended to outweigh the substitution effect. The more recent findings of a positive labor supply response to increases in wages may then be ascribed at least in part to a reduction in the costs associated with urban employment and, in particular, to an improvement in health conditions.

Although the remainder of the empirical literature does not directly provide estimates on the labor supply behavior of urban workers, by documenting other aspects of the labor markets of developing countries, it does provide some useful indirect evidence.

One component of that literature considers the economics of urbanization. This component can be further subdivided into studies that examine the determinants of migration and studies that document the migrant experience in urban locations. Both streams are surveyed by Yap (1977). The consensus of this literature is that migration flows do respond to economic incentives in selecting employment locations. To take two recent examples, Schultz (1982), working with Venezuelan data, concluded that the elasticity of the migration rate with respect to destination wages ranges from 1.4 to 2.9. This result is analogous to that discovered by Fields (1982) for the case of Colombia.

Migrants appear not only to gain by moving to cities but to do so more rapidly than had been assumed hitherto. For example, in a paper on the experience of migrants in Brazil, Yap (1976) argues that the evidence indicates that migrants are, within a short period of time, indistinguishable from the urban born as far as income and employment patterns are concerned.

The contributions on the experiences of migrants are closely related to

studies estimating the earnings functions of urban workers in general. The picture that emerges is one of earnings being a function of objective measures such as a skill level (years of schooling) (e.g., House and Rempel (1976)). Further, turning to the earnings functions that have been estimated for urban workers in the informal sectors of developing countries' economies, there is growing evidence that these sectors also respond to market forces and that, in particular, they offer to the workers they employ a higher real income than had generally been believed to be the case (Teilhet-Waldorf and Waldorf (1983)). This observation is of interest in its own right in that proponents of the Harris-Todaro framework view this sector as affording low living standards, given its presumed role of permitting migrants to queue up for employment in the modern sector (Fields (1975)).

The literature on statutory minimum wages also provides some indirect evidence on the behavior of labor supply. Irrespective of the motivation for introducing a floor to wages (Starr (1981)), the effects of such a floor are of interest. In a study of the introduction of a minimum wage in Tanganyika in 1963, Chesworth (1967) noted that employment among the categories of workers covered by labor enumeration fell by 14.3 percent between 1962 and 1963. Unfortunately, given the potential for disequilibrium in developing country labor markets, it is impossible to discern whether this observation is recording a movement along the demand curve or the supply curve of labor. There is, however, some additional evidence. As pointed out by Watanabe (1976), minimum wage floors in developing countries are frequently set at a relatively high level, which leads to widespread cheating. This suggests that, in these countries, there are well-defined demand and supply schedules for labor.

Empirical Evidence: Rural Workers

Literature examining the behavior of rural labor markets is of interest not only because of the further insight it provides into the labor supply behavior of urban workers but also because rural labor may itself be affected by taxes such as those on international trade. The relevant literature is large and varied. For example, in a paper estimating labor supply functions in peasant agriculture on the basis of a data set collected from some 4,900 rural households, Bardhan (1979a) finds evidence against the existence of the horizontal supply curve of labor predicted by the Lewis framework. In particular, he finds, "The wage response of labor supply seems to be significantly positive for the set of agricultural laborers and small cultivators, and also for that of women in the *usual* labor force. The wage response is not significant for *total* labor supply for the set of cultivators of

all size groups taken together" (p. 81). The author concludes that labor supply decisions are determined by factors other than the wage rate, that is, the labor supply function is wage inelastic. Hansen (1969), working with data drawn from rural Egypt, concludes that the evidence is consistent with a competitive framework and that, in particular, there is a strong positive correlation between rural wages and hours worked per day during the year for males, females, and children. Rosenzweig (1980) also tested the assumption of competitive labor markets using household survey data collected in India. He concludes that, "Empirical results based on micro data from rural India stratified by sex and landholding status were generally supportive of the neoclassical framework suggesting that the annual number of [wage days] of employment observed for individuals in rural India is *mainly* supply rather than demand determined, as implied by competitive models" (p. 53). Finally, in a related demonstration of the thesis that rural wage levels in developing countries are not exogenously determined, Rosenzweig (1978) observed the existence of a negative correlation between rural wage levels and a measure of landholding inequality. His data consisted of a survey of more than 5,000 households in India.⁴

Assessment

The above contributions afford some indirect support to those who argue that supply-side considerations have a role in the determination of the equilibrium wage. However, although the empirical work supports the existence of a well-defined aggregate labor supply function, it appears not to be very elastic. Against this, the evidence does indicate that more elastic responses can be observed at the disaggregated level. Nonetheless, in view of the other reservations mentioned above, until some assumptions are made concerning the aggregate structure of all the taxes on labor income, little can be said about the supply-side implications of tax changes.

It should be further noted that this research does not demonstrate the superiority of simple tax-based policies over alternative measures. A distinguishing feature of developing countries is the degree to which their markets appear to be distorted. There is a growing body of literature that explicitly addresses these imperfections and accordingly raises alternative policy prescriptions. This literature begins with the observation that interlocking factor markets are observed in many rural communities where these may be, at least in part, an economic response to market imperfections. To be more specific, the cost of hiring and supervising labor leads

⁴Further evidence on the endogeneity of wages can be found in Bardhan (1979b) and Sumner (1981).

landowners to seek land-lease contracts. In addition, given that the intensity and quality of labor input is difficult to monitor, landowners tend to prefer sharecropping (i.e., risk-sharing) arrangements. Finally, capital markets are not complete in the sense that, because of information costs, many farmers do not have ready access to them. Landlords tend to fill this gap by providing loans, using the tenancy contract itself as collateral. This framework suggests that there are a series of nontax measures whereby the government by its intervention could induce output increases. Examples are the creation of futures markets and/or commodity price stabilization programs.⁵ This literature is extensively discussed in Bardhan (1980, 1983), Newbery and Stiglitz (1981), and Braverman and Stiglitz (1982).

Although nontax policies of this type afford some possibility for output increases, they should be viewed as being primarily one-shot efforts. That is, they ensure that the existing stock of factors is more efficiently employed but do not affect the long-run rate of growth.⁶

Even though the gains that would result from removing labor market distortions may be primarily static rather than dynamic, this is not to say that they are necessarily negligible. Some empirical work exists in which estimates of the welfare gains associated with the removal of distortions are presented. For example, Harberger (1959) concluded that, for Chile, the total cost of both product and factor market distortions was between 9 percent and 15 percent of gross national product. Not all studies, however, are as optimistic about the potential welfare gains. In a more recent study in which they examine the effect of wage differentials between different industrial sectors in Colombia, Dougherty and Selowsky (1973) conclude that the output effects associated with those differentials are relatively insignificant. The methodology of that paper was to ascribe unexplained wage variations to distortions where the latter are presumably due to many factors. However, as pointed out by de Melo (1977), their approach was a partial equilibrium one in that they held product and factor prices fixed. For his part, reconsidering the case of removing labor market distortions in Colombia in a general equilibrium context, de Melo (1977) finds the potential gains to be significant.

We turn now to consider how tax policies affect savings and investment.

⁵It should be emphasized that the value of these measures lies solely in their increasing the efficiency of the market system. No account is taken of the equity implications either of the sharecropping arrangements or of the government policy measures. As pointed out by Braverman and Stiglitz (1982), interlinking markets can, but need not, increase the utility of both landlords and tenants since such arrangements unambiguously shift the utility possibilities schedule outward.

⁶This assertion has to be modified to the extent that devices such as price stabilization systems alter savings behavior. For a discussion of these possibilities, see Newbery and Stiglitz (1981).

II. Savings Behavior

Theoretical Background

The theoretical microeconomic literature on how savings behavior is affected by tax policy has tended to concentrate on the issue of how various tax instruments affect the net rate of interest. The presumption of much of that literature is that, once the incidence of a tax has been determined, all that remains is to calculate the interest elasticity of savings. In this, the relevant literature parallels that in which the effects of taxes on labor supply are discussed. It is easy to show, within the context of a two-period life-cycle framework, that the impact of a change in interest rates is ambiguous, since it depends on a balancing of substitution and wealth effects (Atkinson and Stiglitz (1980)). Some of the ambiguity is removed when it is recognized that the balanced-budget incidence analysis used in the optimal tax framework allows one to concentrate on the compensated rather than on the total price elasticity. Ambiguity remains, however, in that, within the two-period life-cycle framework, the elasticities are defined in terms of consumption, whereas the compensated elasticity of savings to interest rate changes is of greater concern to the analysis here. The conclusion is that that interest elasticity can take on any sign.⁷

Some writers question the relevance of the life-cycle framework, either because it is too limited, or because it represents an inappropriate specification of consumer preferences. Under the former critique is the work of Kotlikoff and Summers (1981), who argue for the inclusion of a bequest motive, while, under the latter critique, should be included the work of those who favor a myopic consumption function (e.g., Ball and Drake (1964), Clower and Johnson (1968)). Indeed, in the Clower and Johnson formulation of the myopic consumption function, interest rates do not even play a direct role in the savings process.

The results of the literature on the myopic consumption function may be particularly relevant for developing countries. Thus, it is quite possible that, in these countries, the precautionary motive for savings is more im-

⁷Following Feldstein (1978), savings are defined as $S = PC$, where S designates savings, C retirement consumption, and $P = 1/(1 + r)$ the "price" of consumption in retirement (r is the interest rate). In compensated terms this yields

$$\left(\frac{\partial S}{\partial P} \right)_a = C + P \left(\frac{\partial C}{\partial P} \right)_a,$$

where $\partial C / \partial P < 0$ by assumption. The compensated effect of a change in the rate of interest is, therefore, ambiguous. A compensated increase in r (a decrease in the "price" of future consumption) is guaranteed to result in an increase in the demand for retirement consumption (C). However, savings might not increase since one does not have to save as much as before to ensure a given consumption level.

portant than the life-cycle motive. For example, account must be taken of the role of children in providing for the retirement of their parents.⁸

As pointed out in the introduction, the supply-side perspective as it applies to developing countries should also be concerned with the question of savings behavior in countries experiencing growth, that is, how does aggregate savings respond to increases in income? A substantial theoretical literature exists on this subject. This literature was the outcome of an attempt to reconcile early empirical work undertaken in developed countries in which it emerged that cross-section data indicated the existence of a nonproportional relationship between consumption and income, while time-series data suggested that the relationship is proportional. The best known reconciliation (the permanent-income hypothesis) of these two observations can be reduced to the argument that the cross-section regressions tend to estimate short-run consumption functions, while the time-series regressions estimate the analogous long-run function (Modigliani and Brumberg (1954), Friedman (1957), and Ando and Modigliani (1963)). From a development perspective, the long-run function is most relevant. Should the proportional relation hold for developing countries, it implies that the income elasticity of savings would be unity—with economic growth, the share of output devoted to savings would remain constant, everything else being held equal.

The above macroeconomic debate took place in the absence of tax considerations. When taxes are accommodated in this framework, as they are, for example, in Feldstein (1974a, 1974b), the crucial link is viewed as being how the redistribution of income from the private sector to the government affects aggregate savings. If the government's marginal propensity to save exceeds that of the private sector, the net effect of an increase in taxation with a concomitant increase in government expenditures is an increase in capital formation.

Just as in the case of labor-market behavior, there are difficulties in uncritically applying the results of the above literature to developing countries. Indeed, the situation in many developing countries is such that the efficacy of tax-based savings incentives programs may be questioned. Issues associated with the mobilization and deployment of domestic savings are often viewed as being central. Financial institutions may not be well developed (e.g., Miracle, Miracle, and Cohen (1980)). Further, the ex-

⁸Indeed, Kotlikoff and Spivak (1981) suggest that the current instability of family arrangements in the United States may in part be due to the improvement in the completeness of U.S. capital markets where this reduces the need for risk-sharing behavior on the part of the family!

change rate and domestic climate may be such as to encourage capital flight.

Finally, it has often been pointed out (e.g., Galbis (1979b)) that, in many developing countries, interest rates are often set at artificially low rates. This has resulted in a large literature in which it is argued that such an institutional constraint will result in financial repression. Thus, with the incentive for financial savings being greatly weakened (Galbis (1979a), World Bank (1983)), it is argued that the reduced supply of such savings requires the introduction of rationing mechanisms as far as investment is concerned. The work of Shaw (1973) and McKinnon (1973) is perhaps the best known. More recent contributions have refined their original work. Spellman (1976) attempts to introduce the role of financial intermediation into a one-sector growth model; Vogel and Buser (1976) argue that the degree of financial repression is sensitive to changes in risk as well as to changes in the mean return to financial investments; van Wijnbergen (1983) examines the implications of relaxing McKinnon's assumption that the alternative investment opportunity to financial assets consists of "unproductive assets" by allowing for curb market funds, where these have been documented to be of considerable empirical importance (e.g., Tun Wai (1977)). Finally, Galbis (1981) raises the question that, in a second-best world, it may not be optimal for interest rates to be market determined.⁹

Empirical Evidence

Much of the empirical development economics literature on savings behavior has not addressed the issue of the interest elasticity of savings. Data availability is a major reason for this. As Mikesell and Zinser (1973) point out in their survey, data on savings are inaccurate by the very nature of their method of calculation, that is, savings figures are frequently obtained residually. As a result, it is quite conceivable, for example, that the result obtained by Krishna and Raychaudhuri (1982) for India of a marginal propensity to save out of permanent income exceeding that out of transitory income—an unexpected outcome—is the product of inaccurate data. Further, given the widespread use of interest rate ceilings, it is not clear what should be the appropriate choice of a rate of return variable. As a result of all of these difficulties, many of the empirical results should be approached with great caution. So as to emphasize that the difficulties are genuine, it should be noted that Williamson (1968) found interest rates to have an

⁹Special conditions of financial markets in developing countries and their impact on optimal taxation of financial savings are highlighted in Ebrill (Chapter 4).

insignificant impact on savings in India, while Gupta (1970), using a different data set, found that, for some specifications, they had a significant positive effect. (Some of the statistical and conceptual difficulties associated with measuring saving (and investment) in India are discussed in Gothoskar and Venkatachalam (1979).)

Instead, a large proportion of the available empirical research has been concerned more with the macroeconomic issues raised above. Thus, a major effort has been made to estimate consumption functions for developing countries. Various hypotheses are tested. In particular, the life-cycle model is frequently tested, as is the hypothesis that savings rates increase with income levels. Many of the early contributions have been exhaustively surveyed elsewhere (Mikesell and Zinser (1973), Snyder (1974)). A good example of this literature is Landau (1971). Also notable is Leff and Sato (1975), in which a simultaneous equations model of aggregate savings is developed. Other examples of recent additions to this literature are Song (1981) and McDonald (1983). The consensus of this literature is that some relationship between savings and income does exist and, further, that some versions of the life cycle/permanent income hypotheses are appropriate. More specifically, McDonald (1983), in his study of savings behavior in Latin America, found that the income elasticities of consumption were, with a few exceptions, in the range of 0.7 to 1.1. This lends some support to the hypothesis that the proportionality result of the permanent-income framework applies to developing countries. Of course, it also implies that, as countries develop, there is no particular tendency for the savings rate to increase.

The empirical work also shows that there are other important determinants of savings, where these include demographic factors (e.g., dependency rates and age distribution (Bilsborrow (1979)), occupation, income distribution, life span (Ram and Schultz (1979)), and the urban-rural distinction). Note that to the extent that growth affects these variables, savings rates will change. Further, insofar as income distributions can be altered by tax policy (Goode (1961)), that provides a potential lever for government intervention. The policy might prove to be unpalatable, however, to the extent that the government tries to increase aggregate savings by distributing income from the poor (low propensity to save) to the rich (high propensity to save).

A large number of papers examine the impact of the growth in the government sector on aggregate savings. These papers constitute the empirical analogue of Feldstein's (1974a, 1974b) theoretical contributions, although it must be emphasized that the concept of government savings is particularly difficult to pin down. The relevant papers have concentrated on evaluating the "Please effect," where this can take either a strong or a

weak form (Please (1967, 1970)). The strong form maintains that aggregate savings will decline with the growth of the share of tax revenues in gross domestic product (GDP), whereas the weak form contends that under such circumstances aggregate savings may increase but not by much. Papers in which this and related hypotheses are tested include those by Bhatia (1967), Morss (1968), Thimmaiah (1977), and Tahari (1979). The consensus of this literature seems to be that the Please effect is not valid. Bhatia concludes that aggregate savings increase quite sharply on the basis of a cross-sectional study of 20 African countries—for every 1 percent increase in the tax-GDP ratio, private consumption declined by 0.21 percent of GDP, while public consumption increased by 0.05 percent of GDP. Morss, using data drawn from a cross-section of 46 developing countries, felt confident in rejecting the Please effect. Tahari reached a similar conclusion. Thimmaiah, using time-series data from India, could not reject the weak form of the Please effect. On the other hand, Landau (1971) did find evidence to support the Please effect in the case of Latin American countries.

There is also an important body of literature that attempts to evaluate the empirical significance of the financial repression which is presumed to be an inevitable outcome of institutionally setting interest rates at artificially low rates. The consensus is that financial repression does exist and can be a severe drag on economic development. For example, in a paper by the Research Department of the Fund (International Monetary Fund (1983)), the authors concluded that there is good *prima facie* evidence to support the assertion that countries with positive real rates of interest experience a higher rate of growth than that enjoyed by countries in which the real rate of interest is negative. Fry (1980a) finds that savings are affected positively by the real deposit rate of interest. He argues that his estimates of savings and growth functions are such as to allow him to conclude that the cost of financial repression is around one half of a percentage point in growth forgone for every percentage point by which the real rate falls below the equilibrium rate. In another paper, Fry (1978) finds further evidence of the importance of financial repression. He concludes that the specific transmission mechanism proposed by Shaw (1973) appears to fit the facts better than that proposed by McKinnon (1973). In particular, McKinnon's twin assumptions to the effect that investments are lumpy and entirely self-financed which, taken together, imply that potential investors must accumulate money balances prior to investing, leads to the testable hypothesis that money and physical capital are complements. This hypothesis is not sustained by the data. Shaw's alternative approach, which assumes that investors are not constrained to self-finance because of the emergence of noninstitutional markets in response to financial repression,

does receive support. Other papers, in which it is argued that financial repression can be important, are Chandavarkar (1971) and Vogel and Buser (1976). Also noteworthy are two papers by Fry (1980b) and Leff and Sato (1980), in which it is pointed out that artificially low interest rates affect not only long-term growth rates but also short-term macroeconomic adjustment processes.

All of the above suggests that, even though aggregate savings may not be very interest-sensitive, the allocation of that aggregate between conventional financial assets and alternatives such as curb market funds and works of art is indeed responsive to economic incentives.¹⁰ Presumably, this responsiveness extends to the behavior of asset holders as they determine their portfolio allocations within the category of conventional financial assets. There is, unfortunately, little empirical work addressing this issue. An exception is a paper by Bürkner (1982), in which he concludes on the basis of financial data collected for the Philippines, that investors in the Philippines react to relative changes in rates of return just as their counterparts do in developed countries.

Assessment

To the extent that the empirical literature on savings behavior addresses the concerns of supply-side economists, it does it best in its evaluation of the financial repression hypotheses of Shaw and McKinnon. While the empirical work in this area demonstrates that savings may be sensitive to changes in interest rates and, therefore, are also sensitive to changes in tax policy, it also raises the issue of whether savings-based tax incentives represent the most effective reform route for countries to pursue. Specifically, the distortion to savings decisions implied by the existence of financial repression may be far larger than that associated with the fact that interest income is subject to income tax.¹¹ To place the relative magnitudes of these distortions in some context, consider that, for Ghana during the late 1970s, official market interest rates on savings deposits rarely exceeded 10 percent, while the rate of inflation was frequently in the neighborhood of 100 percent.

As for the remainder of the empirical literature, most of it is concerned with macroeconomic aggregates rather than supply-side issues. In particu-

¹⁰In this context, note that the alternatives include placing savings overseas. This alternative emphasizes the important role of confidence in the determination of savings allocation decisions.

¹¹This issue is treated in greater depth in the next chapter. That chapter also discusses some of the factors that should be taken into account when trying to determine how to use taxes so as to enhance the return to financial savings.

lar, inadequate attention has been devoted to the question of whether aggregate savings, as opposed to its components, is affected by the type of tax structure. Is a consumption-based tax preferable to an income-based tax, for example, as argued by Due (1976)? This is an important issue since it raises the possibility that the substantial reliance of developing countries on broad-based consumption taxes may have been conducive to savings. As an aside on this, it is interesting to note that Tahari (1979) has found on the basis of his cross-section work that (private) savings behavior appears to be stimulated more by direct than indirect taxation! While theoretically possible, too much store should not be placed on this somewhat surprising conclusion given the heterogeneous nature of the countries in his sample and the aggregative nature of his regression results. Besides, the net effect of government's actions on aggregate savings depends on the manner of disposition of the tax revenues.

As is well known, aggregate savings do not necessarily equal gross investment for any single country. Thus, for a given country, investments can be made by domestic or foreign investors. Further, since this survey is concerned with results that have implications for supply-side policies, the term "investment" is interpreted here in a restricted sense as referring to those increments in the stock of a nation's capital which result in increases in market output. Investment in works of art and so on are accordingly excluded. Given this potential difference between savings and investment and given that there exists a wide range of specifically targeted tax instruments, for example, those aimed at manufacturing and tourism investment, we turn now to consider investment behavior as a separate topic.

III. Investment Behavior

Theoretical Background

The theory of how investment behavior responds to changes in tax policy has been heavily influenced by the neoclassical framework established by Jorgenson (1963). The most important conclusions of the literature can be found in Hall and Jorgenson (1971), Stiglitz (1973), King (1975), Fleming (1976), Atkinson and Stiglitz (1980), and King and Fullerton (1984). For our purposes, it is important to note the observation that attempting to gauge the impact of tax policy on the cost of capital (and, therefore, on the rate of investment) by concentrating on the corporate tax rate is misleading. In many countries, the corporate tax structure interacts with the personal tax system (for example, through the tax treatment of dividends and capital gains) and, further, the specific provisions of the corporate tax are

of critical importance.¹² On the latter point, the corporate tax will not affect the cost of capital if companies are allowed to make deductions against their tax liabilities that accurately reflect the contribution of capital to the production process. For example, in the context of the U.S. tax system, there are two approaches to ensuring that the tax system would be neutral with respect to the cost of capital. First, if the corporation uses debt finance on the margin and if debt interest is deductible and depreciation allowances accurately measure the value of the capital used up (a difficult quantity to measure in an inflationary environment), then increases in the corporate tax rate will leave the cost of capital unaffected. The alternative approach, easier to implement administratively, would disallow interest deductions and replace depreciation allowances with expensing.¹³ The two approaches are equivalent in present value terms.¹⁴

The above literature refers to the effects of taxes in a world without risk. There is, however, an additional body of work that relaxes this constraint and allows for the existence of risk. The emphasis has been on the role of the government as a risk-sharer through its tax instruments. The question of interest has been whether taxation encourages more or less risk taking. The answer depends on factors such as the degree of investor risk aversion and the extent of loss-offset provisions (cf., Atkinson and Stiglitz (1980)). It should be noted, with respect to the latter, that the present value of loss-offset provisions are of greatest relevance—the fact that many countries permit full loss-offset for an indefinite period in nominal terms does not take account of the cost associated with the postponement of the tax benefits.

When one turns to consider that part of the theoretical literature concerned with developing country issues, one finds that it differs from the papers cited above in a number of important respects. First, given the variety of developing country experiences, it is more concerned with the multitude of direct tax structures in existence (cf., Lent (1967), Usher (1977)). Many of these tax structures employ devices not commonly used in devel-

¹²Moreover, as emphasized by King and Fullerton (1984), within a country, capital income taxes can be quite variable in their treatment of different transactions.

¹³It might be worth noting that this alternative approach is also automatically inflation-proof.

¹⁴It must be recognized that, in practice, the two systems may not be equivalent. Thus, for example, start-up companies will not in general have the profits against which they can deduct their investment expenditures. While it is true that these companies can be compensated by allowing them to carry their expensing allowances forward, for equivalence to be maintained, these carry-forward provisions would have to be indexed for inflation and the real rate of return.

oped countries. For example, Agell (1983) shows how tax holidays can be accommodated with the neoclassical cost of capital model.

Second, there is a belief that the neoclassical model may not apply readily to developing countries. Capital markets are imperfect. Therefore, financial policy and, in particular, policies concerning dividend/retained earnings behavior, are no longer irrelevant to aggregate investment behavior. More important, the structure of a country's system of financial intermediation can be significant. Thus, as pointed out in the previous section, the fact that interest rates are maintained at an artificially low level in some countries could well lead to financial disintermediation with the result that the demand for investment funds must be met by rationing. This manifestation of financial repression raises the possibility that investment may increase with interest rates as a result of an increase in available savings.

Third, and related to the possibility that financial repression may imply that investment behavior is quantity-constrained rather than price-constrained, is the argument that the growth performance of some countries (where this is influenced by their investment efforts) may be limited by the availability of foreign exchange. This possibility, commonly referred to as the two-gap hypothesis, is discussed by McKinnon (1964) among others.

Fourth, recognition of the fact that aggregate investment consists of a number of components in addition to private domestic investment has stimulated research. Attention has been devoted to the determinants of foreign direct investment and foreign aid. To what do these capital flows respond? It is clear, for example, that if a complete explanation of how taxes affect private foreign investment flows is to be determined, the interactions of differing national tax systems must be taken into account. For example, Hartman (1981a) considers how U.S. foreign direct investment might be influenced by U.S. tax policies. An important element of the current U.S. tax structure is that income from foreign sources is liable to taxation only on repatriation, which implies that firms should finance foreign investment out of foreign earnings to the greatest extent possible. Work in this area is still at an early stage.¹⁵

Fifth, at this macroeconomic level, there has been concern over the degree of complementarity or substitutability between the components of aggregate investment. In particular, are capital inflows a substitute for domestic saving and investment? Thus, Chenery and Strout (1966) viewed all capital inflows as net addition to a developing country's capital stock,

¹⁵In particular, the interaction between national tax systems can be expected to have interesting side effects. For example, foreign capital may not be attracted by reductions in a developing country's marginal tax rates due to tax treaties, tax sparing, etc.

whereas Weisskopf (1972b) viewed such inflows as being a substitute for domestic savings. Papanek (1972) argued for an intermediate position. There has also been concern over the impact of public investment on private investment.

Finally, as mentioned in the introduction, investment behavior can be influenced by taxes and distortions other than direct income-based taxes. Notable among these other instruments are trade taxes or marketing boards and agricultural price support systems. While these devices may be introduced for a number of reasons (e.g., with a view to levying an optimum export tax whereby a country exploits its market power in world markets (Corden (1974), Sanchez-Ugarte and Modi (Chapter 11)), they can frequently have unintended effects, particularly at the level of individual industries.

Empirical Evidence

The available empirical work reflects the bias mentioned above against the neoclassical framework. For example, Bilsborrow (1977) tests an eclectic theory of investment behavior that allows for variables representing the internal financial structure of the firm. He finds, using data drawn from Colombia, that accelerator effects, cash flow effects, balance sheet risk variables, and, most notably, the availability of foreign exchange were important determinants of investment flows. However, the rate of return to investors can still be an important determinant of investment behavior. In her study of the inflationary process in India, Ahluwalia (1979) found that the interest elasticity of private investment exceeded 2, which would suggest that a tax policy aimed at altering the rate of return could be stimulative. In contrast to this result, the papers cited earlier, in which the financial repression hypotheses are evaluated, find—almost as a corollary to the existence of artificially low interest rates—that investment is quantity-constrained by rationing. For example, Fry (1978) finds for his sample of countries that an increase in the real rate of interest has a positive effect on growth. Related to this is the work of Thirlwall (1974), who discovered, for his global sample of countries, that inflation exercises a positive influence on investment, but on further examination found that, if the sample is limited to developing countries, this influence is negative. If the role of the inflation variable for the case of developing countries is interpreted as its being a proxy for the degree of financial repression, then the sign of the effect is understandable. (This result is similar to one reported in Ebrill (Chapter 5).) It should be noted that, to the extent that these effects are important, they reduce the effectiveness of tax incentive programs for investment.

More neoclassical in nature is the example of Lim (1983). He concentrates on the specifics of the investment incentive programs in peninsula Malaysia, calling attention, in particular, to the role of generous tax holidays that tend to be awarded on an indiscriminate basis. He finds that there is some evidence of investor reactions to these incentives—there is some tendency for both capital intensity and utilization rates to increase.

The empirical literature evaluating the two-gap hypothesis, that is, the argument that growth prospects are often constrained by the availability of foreign exchange, is inconclusive. Weisskopf (1972a) and Blomqvist (1976) cast some doubt on this argument. On the other hand, for the case of Sudan, Wynn (1980) finds some evidence to support it. All authors agree, however, that testing the hypothesis is particularly difficult since, given the accounting identity between the excess of imports over exports and the corresponding excess of savings over investment, it is not easy to identify *ex post* the true constraint on a country's development.

There is little empirical work on the determinants of foreign investment flows. Hartman (1981b) finds that U.S. aggregate foreign direct investment does, in fact, respond to changes in tax policy. In particular, it is influenced negatively and quite strongly by the after-tax rate of return to domestic investment. As further evidence of the sensitivity of foreign investment flows to economic variables, Hartman (1982) shows that foreign investment flows into the United States respond to changes in U.S. tax policy. However, when one considers the experience of developing countries, there are fewer grounds for optimism over the ability of tax policies to attract investment flows. Lim (1983) finds in his work on a cross-section of 27 developing countries that the presence of natural resources and a proven record of economic performance were far more important than fiscal incentives in attracting such flows. Although they do not consider the impact of tax incentives *per se*, Root and Ahmed (1979) corroborate Lim's results for nonextractive industries in that they find that those countries that have attracted the most foreign investment have substantial urbanization, relatively advanced infrastructures, and so on.¹⁶

The issue of whether capital inflows are a substitute for domestic savings and investment has been examined empirically by Papanek (1973), Stoneman (1975), and Gupta and Islam (1983), among others. Given their careful empirical methodology, Gupta and Islam's (1983) work would appear to be the most interesting. They find, after decomposing aggregate capital inflows, that foreign aid had a more negative impact on savings than for-

¹⁶As an aside, it is worth noting that the other component of foreign capital flows, mentioned above, namely, foreign aid, to the extent that it is increasingly being associated with structural adjustment, is responsive to changes in tax policy.

eign investment, although these effects never appeared to be very large. In a related paper looking at the other side of this issue, Feldstein and Horioka (1980) show that, for the developed countries, international differences in savings rates correspond to almost equal differences in domestic investment rates, again suggesting, as do Gupta and Islam (1983) in the context of developing countries, that domestic savings are the most important determinant of domestic investment.

Sundararajan and Thakur (1980), using data collected on India and Korea, test a modified neoclassical framework to see the impact of public investment on private investment. Simulations show that, in India, increases in public investment initially lead to substantial crowding out of private investment with a weak reversal of this tendency occurring in subsequent periods. In Korea, in marked contrast, there is evidence of a strong complementarity between public and private investment. Tun Wai and Wong (1982), using data drawn from a number of countries, found evidence of financial crowding out in some countries (Malaysia and Mexico). Further, on the subject of financial structure, they find that, in the case of Korea, retained earnings play a less important role than credit availability in determining investment flows, that is, again the financial structure is important.

The allocation effects of various trade taxes, notably export taxes, and price support systems have been extensively evaluated in the literature. The thrust of the work has been to estimate the relevant supply elasticities for the commodities whose prices are affected, thereby providing additional insight into the degree to which investment changes in response to changes in incentives.

Most of the papers are concerned with agricultural commodities. Booth (1980), in her consideration of the role of export taxes in member countries of the Association of South East Asian Nations, points out that Thailand's export tax on rice, levied at a fairly high rate in the 1970s, has led many producers to shift out of rice production. While the resultant production distortion is a cost to the economy, it does indicate that Thai farmers respond to economic circumstances.¹⁷ Further evidence of the sensitivity of agricultural interests to government intervention can be found in Tolley, Thomas, and Wong (1982). They cite, for example, the fact that Korea

¹⁷As an aside, it should be noted that, even though the export tax distorts Thailand's production, there could be a net benefit to the economy. Thailand has market power in the world rice market and the net effect of the export tax with its concomitant reduction in the supply of rice is for Thailand to get a higher price for its rice exports than previously (cf., Tolley, Thomas, and Wong (1982)).

attained self-sufficiency in rice production during the 1970s, a period in which the Government's farm purchase price increased by more than 70 percent in real terms. (They argue that a supply elasticity of 0.3 is appropriate for this case.) Finally, mention should be made of Tanzi (1976), who shows that the export tax levied by Haiti on its coffee exports has had a major negative impact on production.

Intervention in agricultural markets need not take as explicit a form as a price support. Marketing boards, which sell a country's product at a different (usually higher) price than that which it pays to domestic suppliers, are indirectly performing the role of an export tax. In his discussion of the case of the Cocoa Marketing Board in Ghana, Leith (1974) cites evidence which suggests that the short-run supply elasticities for cocoa are of the order of 0.15 to 0.20, while the corresponding long-run elasticities range from 0.71 to 1.0.

The above results draw on a large body of research in which agricultural supply response to price changes in general is evaluated. Much of this literature, a good example of which is Dowling and Jessadachatr (1979), is surveyed in Askari and Cummings (1977). The short-run and long-run supply elasticities (the latter are particularly important for perennials) of previous researchers are tabulated. The authors comment that there is an enormous range of elasticity estimates where, disturbingly, this range occurs not only across commodities but also within commodities. It is also notable that the majority of the long-run elasticity estimates cited are less than unity. This implies that substantial price incentives are needed to stimulate increases in output.

Assessment

All of the above implies that investors do react to economic incentives and that, therefore, a tax-based policy of incentives could have some role to play. However, the empirical results above also suggest that investment is influenced by a number of factors. These run the range from the existence of capital market imperfections due to financial repression as evidenced by the role of liquidity effects to the existence of other distortions such as those associated with price support systems and marketing boards. The fact that Askari and Cummings (1977) reported such a broad range of supply elasticities may be due not to the vagaries of the econometric techniques employed but rather to the differing circumstances that farmers in different countries experience. For example, is the market for inputs free or regulated? If regulated, the observed supply elasticity might be lower.

IV. Conclusions

Although the empirical literature examining the impact of tax policy on labor supply, savings, and investment leaves much to be desired, it nonetheless appears that changes in tax policies will have some effects. The behavior of these aggregates appears, however, to be determined as much by other elements such as the sophistication of financial intermediaries and the completeness of capital markets as by these tax policies. Given the existence of widespread market failure in many developing countries, the impact of changes in tax policies may be quite difficult to predict as the costs associated with such changes are potentially large. This is not to deny that there may be circumstances in which most would agree on what would constitute useful tax reforms. The reduction of large export taxes comes to mind in this respect (see Sanchez-Ugarte and Modi (Chapter 11)). However, it may be the case that a more promising supply-side approach might be one that also aims at alleviating the most obvious sources of market failure. This fact seems to have been appreciated by researchers who examine the economics of sharecropping structures and interlinked factor markets.

REFERENCES

- Abizadeh, Sohrab, and J.P. Wyckoff, "Tax System Components and Economic Development: An International Perspective," *Bulletin, International Bureau of Fiscal Documentation* (Amsterdam), Vol. 36 (November 1982), pp. 483-91.
- Agell, Jonas, "Subsidy to Capital Through Tax Incentives in the ASEAN Countries: An Application of the Cost of Capital Approach Under Inflationary Situations," *Singapore Economic Review* (Singapore), Vol. 28 (October 1983), pp. 98-128.
- Ahluwalia, I.J., *Behaviour of Prices and Outputs in India: A Macro-Econometric Approach* (New Delhi: Macmillan, 1979).
- Ahluwalia, Montek S., "Taxes, Subsidies, and Employment," *Quarterly Journal of Economics* (Cambridge, Massachusetts), Vol. 87 (August 1973), pp. 393-409.
- Ando, Albert, and Franco Modigliani, "The 'Life-Cycle' Hypothesis of Saving: Aggregate Implications and Tests," *American Economic Review* (Nashville, Tennessee), Vol. 53 (March 1963), pp. 55-84.
- Askari, Hossein, and John Thomas Cummings, "Estimating Agricultural Supply Response with the Nerlove Model: A Survey," *International Economic Review* (Osaka, Japan), Vol. 18 (June 1977), pp. 257-92.
- Atkinson, Anthony B., and Joseph E. Stiglitz, *Lectures on Public Economics* (New York: McGraw-Hill, 1980).

- Ball, R.J., and Pamela S. Drake, "The Relationship Between Aggregate Consumption and Wealth," *International Economic Review* (Osaka, Japan), Vol. 5 (January 1964), pp. 63-81.
- Bardhan, Pranab K. (1979a), "Labor Supply Functions in a Poor Agrarian Economy," *American Economic Review* (Nashville, Tennessee), Vol. 69 (March 1979), pp. 73-83.
- (1979b), "Wages and Unemployment in a Poor Agrarian Economy: A Theoretical and Empirical Analysis," *Journal of Political Economy* (Chicago), Vol. 87 (June 1979), pp. 479-500.
- , "Interlocking Factor Markets and Agrarian Development: A Review of Issues," *Oxford Economic Papers* (New Series), Vol. 32 (March 1980), pp. 82-98.
- , "Labor-Tying in a Poor Agrarian Economy: A Theoretical and Empirical Analysis," *Quarterly Journal of Economics* (Cambridge, Massachusetts), Vol. 98 (August 1983), pp. 501-14.
- Berg, Elliot J., "Backward-Sloping Labor Supply Functions in Dual Economies—The Africa Case," *Quarterly Journal of Economics* (Cambridge, Massachusetts), Vol. 75 (August 1961), pp. 468-92.
- Bhatia, Rattan J., "A Note on Consumption, Income, and Taxes" (unpublished, International Monetary Fund, November 2, 1967).
- Bilsborrow, Richard E., "The Determinants of Fixed Investment by Manufacturing Firms in a Developing Country," *International Economic Review* (Osaka, Japan), Vol. 18 (October 1977), pp. 697-717.
- , "Age Distribution and Savings Rates in Less Developed Countries," *Economic Development and Cultural Change* (Chicago), Vol. 28 (October 1979), pp. 23-45.
- Bird, Richard M., "Taxation and Employment in Developing Countries," *Finanzarchiv* (Tübingen), Vol. 40, No. 2 (1982), pp. 211-39.
- Blinder, Alan S., "Thoughts on the Laffer Curve," in *The Supply-Side Effects of Economic Policy*, ed. by Laurence H. Meyer (Boston, Massachusetts: Kluwer-Nijhoff, 1981).
- Blomqvist, Å. G., "Empirical Evidence on the Two-Gap Hypothesis: A Revised Analysis," *Journal of Development Economics* (Amsterdam), Vol. 3 (July 1976), pp. 181-93.
- Booth, Anne, "The Economic Impact of Export Taxes in ASEAN," *Malayan Economic Review* (Singapore), Vol. 25 (April 1980), pp. 36-61.
- Braverman, Avishay, and Joseph E. Stiglitz, "Sharecropping and the Interlinking of Agrarian Markets," *American Economic Review* (Nashville, Tennessee), Vol. 72 (September 1982), pp. 695-715.
- Bürkner, Hans-Paul, "The Portfolio Behaviour of Individual Investors in Developing Countries: An Analysis of the Philippine Case," *Oxford Bulletin of Economics and Statistics*, Vol. 44 (February 1982), pp. 127-44.
- Chandavarkar, Anand G., "Some Aspects of Interest Rate Policies in Less Developed Economies: The Experience of Selected Asian Countries," *Staff Papers*, International Monetary Fund (Washington), Vol. 18 (March 1971), pp. 48-112.

- Chenery, Hollis B., and Alan M. Strout, "Foreign Assistance and Economic Development," *American Economic Review* (Nashville, Tennessee), Vol. 56 (September 1966), pp. 679-733.
- Chesworth, D., "Statutory Minimum Wage Fixing in Tanganyika," *International Labor Review* (Geneva), Vol. 96 (July 1967), pp. 43-66.
- Clower, Robert W., and M. Bruce Johnson, "Income, Wealth, and the Theory of Consumption," in *Value, Capital, and Growth: Papers in Honour of Sir John Hicks*, ed. by J.N. Wolfe (Edinburgh: Edinburgh University Press; Chicago: Aldine Publishing Co., 1968).
- Corden, W.M., *Trade Policy and Economic Welfare* (Oxford: Clarendon Press, 1974).
- de Melo, Jaime A.P., "Distortions in the Factor Market: Some General Equilibrium Estimates," *Review of Economics and Statistics* (Cambridge, Massachusetts), Vol. 59 (November 1977), pp. 398-405.
- Dougherty, Christopher, and Marcelo Selowsky, "Measuring the Effects of the Misallocation of Labour," *Review of Economics and Statistics* (Cambridge, Massachusetts), Vol. 55 (August 1973), pp. 386-90.
- Dowling, J.M., and Phitsanes Jessadachatr, "The Supply Response of Sugar Cane in Thailand," *Malayan Economic Review* (Singapore), Vol. 24 (October 1979), pp. 74-88.
- Due, John F., "Value-Added Taxation in Developing Economies," in *Taxation and Development*, ed. by Nian-Tzu Wang (New York: Praeger, 1976).
- Feldstein, Martin S. (1974a), "Incidence of a Capital Income Tax in a Growing Economy with Variable Savings Rates," *Review of Economic Studies* (Edinburgh), Vol. 41 (October 1974), pp. 505-13.
- (1974b), "Tax Incidence in a Growing Economy with Variable Factor Supply," *Quarterly Journal of Economics* (Cambridge, Massachusetts), Vol. 88 (November 1974), pp. 551-73.
- , "The Welfare Cost of Capital Income Taxation," *Journal of Political Economy* (Chicago), Vol. 86, No. 2, Part 2 (April 1978), pp. S29-S51.
- , and C. Horioka, "Domestic Saving and International Capital Flows," *Economic Journal* (London), Vol. 90 (June 1980), pp. 314-29.
- Fields, Gary S., "Rural-Urban Migration, Urban Unemployment and Underemployment, and Job-Search Activity in LDCs," *Journal of Development Economics* (Amsterdam), Vol. 2 (June 1975), pp. 165-87.
- , "Place-to-Place Migration in Colombia," *Economic Development and Cultural Change* (Chicago), Vol. 30 (April 1982), pp. 539-58.
- Flemming, J.S., "A Reappraisal of the Corporation Income Tax," *Journal of Public Economics* (Amsterdam), Vol. 6 (July-August 1976), pp. 163-69.
- Friedman, M., *A Theory of the Consumption Function* (Princeton: Princeton University Press, 1957).
- Fry, Maxwell J., "Money and Capital or Financial Deepening in Economic Development?" *Journal of Money, Credit and Banking* (Columbus, Ohio), Vol. 10 (November 1978), pp. 464-75.

- (1980a), "Saving, Investment, Growth and the Cost of Financial Repression," *World Development* (Oxford), Vol. 8 (April 1980), pp. 317-27.
- (1980b), "Money, Interest, Inflation and Growth," *Journal of Monetary Economics* (Amsterdam), Vol. 6 (October 1980), pp. 535-45.
- Galbis, Vicente (1979a), "Money, Investment, and Growth in Latin America, 1961-1973," *Economic Development and Cultural Change* (Chicago), Vol. 27 (April 1979), pp. 423-43.
- (1979b), "Inflation and Interest Rate Policies in Latin America, 1967-76," *Staff Papers*, International Monetary Fund (Washington), Vol. 26 (June 1979), pp. 334-66.
- , "Interest Rate Management: The Latin America Experience," *Savings and Development* (Milan), Vol. 5, No. 1 (1981), pp. 5-44.
- Gandhi, Ved P., "Unemployment in Developing Countries: Can Tax Incentives Help?" (unpublished, International Monetary Fund, February 3, 1981).
- Goode, Richard, "Taxation of Saving and Consumption in Underdeveloped Countries," *National Tax Journal* (Columbus, Ohio), Vol. 14 (December 1961), pp. 305-22.
- Gothoskar, S.P., and T.R. Venkatachalam, "Household Saving and Investment in India," *Margin* (New Delhi), Vol. 12, No. 1 (October 1979), pp. 28-40.
- Gupta, K.L., "Personal Saving in Developing Nations: Further Evidence," *Economic Record* (Melbourne), Vol. 46 (June 1970), pp. 243-49.
- , and M. Anisul Islam, *Foreign Capital, Savings, and Growth: An International Cross-Section Study* (Dordrecht, Netherlands; Boston, Massachusetts: Reidel Publishing Company, 1983).
- Hall, R.E., and D.W. Jorgenson, "Application of the Theory of Optimum Capital Accumulation," in *Tax Incentives and Capital Spending*, ed. by Gary Fromm (Washington: Brookings Institution, 1971).
- Hansen, Bent, "Employment and Wages in Rural Egypt," *American Economic Review* (Nashville, Tennessee), Vol. 59 (June 1969), pp. 298-313.
- Harberger, Arnold C., "Using the Resources at Hand More Effectively," *American Economic Review, Papers and Proceedings of the Seventy-First Annual Meeting of the American Economic Association* (Nashville, Tennessee), Vol. 49 (May 1959), pp. 134-46.
- , "The Incidence of the Corporation Income Tax," *Journal of Political Economy* (Chicago), Vol. 70 (June 1962), pp. 215-40.
- Hartman, David G. (1981a), "Tax Policy and Foreign Direct Investment," NBER Working Paper No. 689 (Cambridge, Massachusetts: National Bureau of Economic Research, 1981).
- (1981b), "Domestic Tax Policy and Foreign Investment: Some Evidence," NBER Working Paper No. 784 (Cambridge, Massachusetts: National Bureau of Economic Research, 1981).
- , "Tax Policy and Foreign Direct Investment in the United States," NBER Working Paper No. 967 (Cambridge, Massachusetts: National Bureau of Economic Research, 1982).

- Hausman, Jerry A., "Income and Payroll Tax Policy and Labor Supply," in *The Supply-Side Effects of Economic Policy*, ed. by Laurence H. Meyer (Boston, Massachusetts: Kluwer-Nijhoff, 1981).
- , "Taxes and Labor Supply," NBER Working Paper No. 1102 (Cambridge, Massachusetts: National Bureau of Economic Research, 1983).
- Hinrichs, H.H., "Determinants of Government Revenue Shares Among Less-Developed Countries," *Economic Journal* (London), Vol. 75 (September 1965), pp. 546-56.
- House, William J., and Henry Rempel, "The Determinants of and Changes in the Structure of Wages and Employment in the Manufacturing Sector of the Kenyan Economy, 1967-1972," *Journal of Development Economics* (Amsterdam), Vol. 3 (March 1976), pp. 83-98.
- International Monetary Fund, *Interest Rate Policies in Developing Countries: A Study by the Research Department of the International Monetary Fund*, Occasional Paper No. 22 (Washington, October 1983).
- Jorgenson, Dale W., "Capital Theory and Investment Behavior," *American Economic Review, Papers and Proceedings of the Seventy-Fifth Annual Meeting of the American Economic Association* (Nashville, Tennessee), Vol. 53 (May 1963), pp. 247-59.
- King, Mervyn A., "Taxation, Corporate Financial Policy, and the Cost of Capital: A Comment," *Journal of Public Economics* (Amsterdam), Vol. 4 (August 1975), pp. 271-79.
- , and Don Fullerton, eds., *The Taxation of Income from Capital: A Comparative Study in the United States, the United Kingdom, Sweden, and West Germany* (Chicago: University of Chicago Press, 1984).
- Kotlikoff, Laurence J., and Avia Spivak, "The Family as an Incomplete Annuities Market," *Journal of Political Economy* (Chicago), Vol. 89 (April 1981), pp. 372-91.
- Kotlikoff, Laurence J., and Lawrence H. Summers, "The Role of Intergenerational Transfers in Aggregate Capital Accumulation," *Journal of Political Economy* (Chicago), Vol. 89 (August 1981), pp. 706-32.
- Krishna, Raj, and G.S. Raychaudhuri, "Trends in Rural Savings and Capital Formation in India, 1950-1951 to 1973-1974," *Economic Development and Cultural Change* (Chicago), Vol. 30 (January 1982), pp. 271-98.
- Landau, Luis, "Saving Functions for Latin America," in *Studies in Development Planning*, ed. by Hollis B. Chenery (Cambridge, Massachusetts: Harvard University Press, 1971).
- Leff, Nathaniel, "Macroeconomic Adjustment in Developing Countries: Instability, Short-Run Growth, and External Dependency," *Review of Economics and Statistics* (Cambridge, Massachusetts), Vol. 62 (May 1980), pp. 170-79.
- , and Kazuo Sato, "A Simultaneous-Equations Model of Savings in Developing Countries," *Journal of Political Economy* (Chicago), Vol. 83 (December 1975), pp. 1217-28.
- Leith, J. Clark, *Foreign Trade Regimes and Economic Development: Ghana* (New York: National Bureau of Economic Research, 1974).

- Lent, George E., "Tax Incentives for Investment in Developing Countries," *Staff Papers*, International Monetary Fund (Washington), Vol. 14 (July 1967), pp. 249-323.
- Lewis, W. Arthur, "Economic Development with Unlimited Supplies of Labour," *Manchester School of Economic and Social Studies*, Vol. 22 (May 1954), pp. 139-91.
- Lim, David, "Fiscal Incentives and Direct Foreign Investment in Less Developed Countries," *Journal of Development Studies* (London), Vol. 19 (January 1983), pp. 207-12.
- , "Tax Incentives and Resource Utilization in Peninsular Malaysian Manufacturing," in *Further Readings on Malaysian Economic Development*, ed. by David Lim (Kuala Lumpur: Oxford University Press, 1983).
- Martin, Alison M., and W.A. Lewis, "Patterns of Public Revenue and Expenditure," *Manchester School of Economic and Social Studies*, Vol. 24 (September 1956), pp. 203-44.
- McDonald, D., "The Determinants of Saving Behavior in Latin America" (unpublished, International Monetary Fund, April 13, 1983).
- McKinnon, Ronald I., "Foreign Exchange Constraints in Economic Development and Efficient Aid Allocation," *Economic Journal* (London), Vol. 74 (June 1964), pp. 388-409.
- , *Money and Capital in Economic Development* (Washington: Brookings Institution, 1973).
- McLure, C.E., Jr., "General Equilibrium Incidence Analysis: The Harberger Model After Ten Years," *Journal of Public Economics* (Amsterdam), Vol. 4 (February 1975), pp. 125-61.
- Mieszkowski, Peter, "Tax Incidence Theory: The Effects of Taxes on the Distribution of Income," *Journal of Economic Literature* (Nashville, Tennessee), Vol. 7 (December 1969), pp. 1103-24.
- Mikesell, Raymond F., and James E. Zinser, "The Nature of the Savings Function in Developing Countries: A Survey of the Theoretical and Empirical Literature," *Journal of Economic Literature* (Nashville, Tennessee), Vol. 11 (March 1973), pp. 1-26.
- Miracle, Marvin P., "Interpretation of Backward-sloping Labor Supply Curves in Africa," *Economic Development and Cultural Change* (Chicago), Vol. 24 (January 1976), pp. 399-406.
- , and Bruce Fetter, "Backward-sloping Labor-Supply Functions and African Economic Behavior," *Economic Development and Cultural Change* (Chicago), Vol. 18 (January 1970), pp. 240-51.
- Miracle, Marvin P., Diane S. Miracle, and Laurie Cohen, "Informal Savings Mobilization in Africa," *Economic Development and Cultural Change* (Chicago), Vol. 28 (July 1980), pp. 701-24.
- Modigliani, Franco, and Richard Brumberg, "Utility Analysis and the Consumption Function: An Interpretation of Cross-Section Data," in *Post Keynesian Economics*, ed. by Kenneth K. Kurihara (New Brunswick, New Jersey: Rutgers University Press, 1954).

- Morss, Elliott R., "Fiscal Policy, Savings, and Economic Growth in Developing Countries: An Empirical Study" (unpublished, International Monetary Fund, July 17, 1968).
- Newbery, David M.G. and Joseph E. Stiglitz, *The Theory of Commodity Price Stabilization: A Study in the Economics of Risk* (Oxford: Clarendon Press; New York: Oxford University Press, 1981).
- Papanek, Gustav F., "The Effects of Aid and Other Resource Transfers on Savings and Growth in Less Developed Countries," *Economic Journal* (London), Vol. 82 (September 1972), pp. 934-50.
- , "Aid, Foreign Private Investment, Savings, and Growth in Less Developed Countries," *Journal of Political Economy* (Chicago), Vol. 81 (January/February 1973), pp. 120-30.
- Please, S., "Saving Through Taxation—Reality or Mirage?" *Finance & Development* (Washington), Vol. 4 (March 1967), pp. 24-32.
- , "The 'Please Effect' Revisited," International Bank for Reconstruction and Development (World Bank), Working Paper No. 82 (July 1970).
- Ram, Rati, and Theodore W. Schultz, "Life Span, Health, Savings, and Productivity," *Economic Development and Cultural Change* (Chicago), Vol. 27 (April 1979), pp. 399-421.
- Ranis, Gustav, and John C.H. Fei, "A Theory of Economic Development," *American Economic Review* (Nashville, Tennessee), Vol. 51 (September 1961), pp. 533-65.
- Root, Franklin R., and Ahmed A. Ahmed, "Empirical Determinants of Manufacturing Direct Foreign Investment in Developing Countries," *Economic Development and Cultural Change* (Chicago), Vol. 27 (July 1979), pp. 751-67.
- Rosenzweig, Mark R., "Rural Wages, Labor Supply, and Land Reform: A Theoretical and Empirical Analysis," *American Economic Review* (Nashville, Tennessee), Vol. 68 (December 1978), pp. 847-61.
- , "Neoclassical Theory and the Optimizing Peasant—An Econometric Analysis of Market Family Labor Supply in a Developing Country," *Quarterly Journal of Economics* (Cambridge, Massachusetts), Vol. 94 (February 1980), pp. 31-56.
- Schultz, T. Paul, "Lifetime Migration Within Educational Strata in Venezuela: Estimates of a Logistic Model," *Economic Development and Cultural Change* (Chicago), Vol. 30 (April 1982), pp. 559-93.
- Sen, Amartya K., "Peasants and Dualism with or without Surplus Labor," *Journal of Political Economy* (Chicago), Vol. 74 (October 1966), pp. 425-50.
- Shaw, Edward S., *Financial Deepening in Economic Development* (New York: Oxford University Press, 1973).
- Snyder, Donald W., "Econometric Studies of Household Saving Behaviour in Developing Countries: A Survey," *Journal of Development Studies* (London), Vol. 10 (January 1974), pp. 139-53.
- Song, Byung-Nak, "Empirical Research on Consumption Behavior: Evidence from Rich and Poor LDCs," *Economic Development and Cultural Change* (Chicago), Vol. 29 (April 1981), pp. 597-611.

- Spellman, Lewis J., "Economic Growth and Financial Intermediation," in *Money and Finance in Economic Growth and Development: Essays in Honor of Edward S. Shaw: Proceedings of the Conference Held at Stanford University*, ed. by Ronald I. McKinnon (New York: Dekker, 1976).
- Starr, Gerald, "Minimum Wage Fixing: International Experience with Alternative Roles," *International Labor Review* (Geneva), Vol. 120 (September-October 1981), pp. 545-62.
- Stiglitz, Joseph E., "Taxation, Corporate Financial Policy, and the Cost of Capital," *Journal of Public Economics* (Amsterdam), Vol. 2 (February 1973), pp. 1-34.
- , "The Corporation Tax," *Journal of Public Economics* (Amsterdam), Vol. 5 (April-May 1976), pp. 303-11.
- Stoneman, Colin, "Foreign Capital and Economic Growth," *World Development* (Oxford), Vol. 3 (January 1975), pp. 11-26.
- Sumner, Daniel, A., "Wage Functions and Occupational Selection in a Rural Less Developed Country Setting," *Review of Economics and Statistics* (Cambridge, Massachusetts), Vol. 63 (November 1981), pp. 513-19.
- Sundararajan, V., and Subhash Thakur, "Public Investment, Crowding Out, and Growth: A Dynamic Model Applied to India and Korea," *Staff Papers*, International Monetary Fund (Washington), Vol. 27 (December 1980), pp. 814-55.
- Tahari, Amor, "The Impact of Taxation on Saving and Consumption in Developing Countries: A Paradox?" (unpublished, International Monetary Fund, March 29, 1979).
- Tanzi, Vito, "Export Taxation in Developing Countries: Taxation of Coffee in Haiti," *Social and Economic Studies* (Kingston, Jamaica), Vol. 25 (March 1976), pp. 66-76.
- , "Tax Policy in Middle-Income Countries: Some Lessons of Experience," *Bulletin*, International Bureau of Fiscal Documentation (Amsterdam), Vol. 36 (August/September 1982), pp. 411-20.
- , "Quantitative Characteristics of the Tax Systems of Developing Countries," in *The Theory of Taxation for Developing Countries*, ed. by David Newbery and Nicholas Stern (New York: Oxford University Press, 1987).
- Teilhet-Waldorf, Saral, and William H. Waldorf, "Earnings of Self-Employed in an Informal Sector: A Case Study of Bangkok," *Economic Development and Cultural Change* (Chicago), Vol. 31 (April 1983), pp. 587-607.
- Thimmaiah, G., "Taxation and Government Consumption," International Bureau of Fiscal Documentation, *Bulletin* (Amsterdam), Vol. 31 (December 1977), pp. 551-57.
- Thirlwall, A.P., *Inflation, Saving and Growth in Developing Economies* (London: Macmillan; New York: St. Martin's, 1974).
- Tolley, George S., Vinod Thomas, and Chung Ming Wong, *Agricultural Price Policies and the Developing Countries* (Baltimore: Johns Hopkins University Press, 1982).
- Tun Wai, U, "A Revisit to Interest Rates Outside the Organized Money Markets

- of Underdeveloped Countries," *Quarterly Review*, Banca Nazionale del Lavoro (Rome), Vol. 30 (September 1977), pp. 291-312.
- , and Chorng-huey Wong, "Determinants of Private Investment in Developing Countries," *Journal of Development Studies* (London), Vol. 19 (October 1982), pp. 19-36.
- Usher, Dan, "The Economics of Tax Incentives to Encourage Investment in Less Developed Countries," *Journal of Development Economics* (Amsterdam), Vol. 4 (June 1977), pp. 119-48.
- Vandendorpe, A.L., and A.F. Friedlaender, "Differential Incidence in the Presence of Initial Distorting Taxes," *Journal of Public Economics* (Amsterdam), Vol. 6 (October 1976), pp. 205-29.
- van Wijnbergen, S., "Interest Rate Management in LDC's," *Journal of Monetary Economics* (Amsterdam), Vol. 12 (September 1983), pp. 433-52.
- Vogel, Robert C., and Stephen A. Buser, "Inflation, Financial Repression, and Capital Formation in Latin America," in *Money and Finance in Economic Growth and Development: Essays in Honor of Edward S. Shaw: Proceedings of the Conference Held at Stanford University*, ed., by Ronald I. McKinnon (New York: Dekker, 1976).
- Watanabe, Susumu, "Minimum Wages in Developing Countries: Myth and Reality," *International Labor Review* (Geneva), Vol. 113 (May-June 1976), pp. 345-58.
- Weisskopf, Thomas E. (1972a), "An Econometric Test of Alternative Constraints on the Growth of Underdeveloped Countries," *Review of Economics and Statistics* (Cambridge, Massachusetts), Vol. 54 (February 1972), pp. 67-78.
- (1972b), "The Impact of Foreign Capital Inflow on Domestic Savings in Underdeveloped Countries," *Journal of International Economics* (Amsterdam), Vol. 2 (February 1972), pp. 25-38.
- Williamson, Jeffrey G., "Public Expenditure and Revenue: An International Comparison," *Manchester School of Economic and Social Studies*, Vol. 29 (January 1961), pp. 34-56.
- , "Personal Saving in Developing Nations: An Intertemporal Cross-Section from Asia," *Economic Record* (Melbourne), Vol. 44 (March 1968), pp. 194-210.
- World Bank, *World Development Report, 1983* (New York: Oxford University Press, 1983).
- Wynn, R.F., "Foreign Capital, Trade and Savings: The Sudan 1955-71," *The Malayan Economic Review* (Singapore), Vol. 25 (October 1980), pp. 14-29.
- Yap, Lorene Y.L., "Rural-Urban Migration and Urban Underemployment in Brazil," *Journal of Development Economics* (Amsterdam), Vol. 3 (September 1976), pp. 227-43.
- , "The Attraction of Cities: A Review of the Migration Literature," *Journal of Development Economics* (Amsterdam), Vol. 4 (September 1977), pp. 239-64.