

## *Discussion of the Summers Paper*

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I believe that the term "supply-side economics" is a misnomer. The analytical system going under this name really consists of nothing new or fancy but merely the application of price theory to public policies concerned with major economic aggregates. This analytical approach and the public policies developed therewith do not focus particularly on supply conditions to the exclusion of effects of policy on aggregate demand. The distinguishing attribute of "supply-side" economics, and the principal issue it casts up, rather, is that it identifies the initial impact of public policies and actions in terms of alterations in (implicit or explicit) relative prices instead of changes in income.

One of the principal consequences of this distinction is that if one wants to model economic responses to public policy actions in the supply-side context, one must make very certain that the behavioral functions in one's model preclude identification of first-order income effects of government actions. The mere addition of supply equations to a standard "aggregate demand" model does not convert that model into a supply-side model.

The implications for policy of assigning first-order price effects to government actions and of rejecting the possibility of first-order income effects of such actions are enormous, but not because public policies guided by supply-side economics focus exclusively or primarily on aggregate supply conditions or because such policies primarily affect supply conditions. Rather, it is because supply-side economics dictates different policy strategies and tactics from those which have long been pursued and looks to results which differ in character and magnitude from those urged by the Keynesian aggregate demand approach.

While Summers does not provide an explicit supply-side context

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for his discussion, his paper is very much in that spirit.

Summers' provocative paper presents a wide-ranging discussion, each of the topics of which itself deserves and would make an interesting paper. I shall comment briefly on several of these, reserving more extended comments for two of his topics.

Summers first turns his attention to the postwar trends in net capital formation in the nonfinancial corporate sector. He shows that the decline during the last half of the 1970s in the rate of net investment (other than for pollution control facilities) and in such investment in relation to gross corporate product is associated with a decline in the real net rate of return. This, in turn, more reflects increases in the effective rate of tax on corporate earnings than decreases in the pre-tax rate of return. The increase in the tax rate, in turn, is attributable to inflation. Accordingly, Summers concludes that the interaction of the tax system and inflation accounts for the 1970s investment slowdown.

I take no issue with this conclusion or more generally with the proposition that tax factors materially influence the pace and volume of capital formation.

The question is why the acceleration of capital formation is important. Summers properly identifies the popular concern with the adequacy of investment in terms of effects on productivity, inflation, and unemployment. He finds, however, that changing the rate of investment is unlikely to have a significant effect on the rate of growth over the next decade, that increasing investment is likely to accentuate inflation, and that there is no reason to seek to promote investment as a means of encouraging employment. With each of these conclusions and Summers' means of arriving at them, strong issue is to be taken.

First, Summers' finding that increasing investment has an extremely limited potential for increasing growth in output is derived from a model the specification inadequacies of which include a labor supply function unrelated to anything but the passage of time and a capital supply function devoid of any behavioral arguments. Associated with this is an investment function specifying net investment as a constant function of net output. Summers' model is not useful for dealing with the question whether increasing investment implies significant gains in output and employment and decreases in the inflation rate. Nor can the model be treated as representing reality. Indeed, as specified, it serves no purpose other than to illustrate a proposition which needs no illustration, viz., if the elasticity of output with respect to a

production input is very small, large increases in the amount of that input will result in relatively small increases in output. By the way, even in this unrealistically limited context, the effect on the growth rate of increasing the share of output allocated to investment is substantially more impressive than Summers' exposition would lead one to believe. He finds, for example, that doubling the share of output allocated to investment would increase the growth rate "by only 0.3 percent per year over the next decade." But this is more correctly read "0.3 *percentage* points" and amounts to a 10 percent gain in the growth rate.

A model correctly specified to analyze the effects of a change in the rate of capital formation on growth of output will show how the initial change in the capital: labor ratio increases the marginal value productivity, i.e., real wage rate, of labor, and the consequent increase in both the demand for and supply of labor services. These increases in labor inputs, along with the initial gain in capital inputs, result in gains in output of significantly larger magnitude than Summers estimates. Moreover, the second-order income effects of the output gains also generate an increase in the optimum stock of capital, hence a further expansion of capital inputs.

Summers' line of analysis leads him to conclude that "Fears that insufficient capital accumulation must cause unemployment are as groundless as earlier concern about unemployment due to automation." This conclusion is, of course, dead wrong. It is arrived at by way of a mechanistic observation that since production inputs are substitutable it is possible to have some given amount of labor employed with virtually any given amount of capital. All this statement amounts to is that one can conceive production functions with any combination of exponent values one wishes. It is this analytically useless observation that leads to Summers' next assertion that increasing capital will decrease labor unless there is an increase in output. This is, of course, precisely the fear about the consequences of automation which Summers dismisses as groundless. Aside from being inconsistent, Summers is wrong. Other things equal (i.e., the pertinent demographics, the state of technology, the basic conditions of factor supplies, etc.), the *only* way to increase employment is by increasing labor's productivity which requires, unless the laws of production have been repealed, an increase in the capital: labor ratio. Indeed, the basic criterion for assessing the sufficiency or insufficiency of capital accumulation is whether it affords an increase in the capital:

labor ratio sufficient to maintain an acceptable rate of gain in productivity, real wage rates, and employment.

One of Summer's most startling conclusions is that if the rate of growth of the money stock is held constant, investment-oriented tax changes which increase investment, hence, one must presume, increase total output above levels otherwise attained, will result in an increase in the inflation rate. This conclusion derives from misspecification of the direct effects of the tax change and of the responses thereto. The correct specification is that the tax change reduces the real supply price for any given amount of capital, the response to which is a shift in the use of current income from consumption toward saving. Insofar as the reduction in real capital supply price is reflected instantaneously in an increase in the returns on stocks and bonds, this entails no shift from money to securities, as Summers claims, but from purchase of consumption goods and services to purchases of claims on capital assets. Nothing in this response mechanism necessarily pertains to any change in velocity. All that is left as a source of effect on the price level, therefore, is the effect of larger stocks of capital and the consequent increases in labor inputs on total output. As Summers correctly notes—but denies—"... the effect of increased investment on the rate of inflation is just the negative of its impact on the growth rate of real output."

To summarize to this point, on the score of the effects of increasing the stock of capital on output, employment, and the price level, Summers negative conclusions are derived from misspecification. While certainly not dismissing the welfare gains which Summers believes are the real payoff from increased investment, I think he grossly underestimates the gains in output, hence employment, which would result from increased investment in response to reducing the existing tax bias against saving and capital formation.

Summers' discussion of how tax "incentives" affect investment behavior—the last three sections of his paper—are more useful. He is quite right in criticizing the treatment embodied in the standard large-scale econometric models. For the most part, these models depend on a capital stock adjustment formulation but take a no-think approach to the adjustment process. Yet as Summers himself points out, the lack of theory to explain the pace of adjustment from one optimum stock of capital to another is not, itself, a fatal flaw in analyzing the effects of tax changes on the economic

aggregates. To be sure, it impairs the usefulness of these models for forecasting purposes but the social welfare is little diminished by any such model imperfections. More to the point is whether these or any other models are so specified as to capture correctly the effects of tax "incentives" on the desired stock of capital.

The relevant formulation for this purpose proceeds, as Summers notes, from the specification of the production function, from which the schedule of the marginal product of capital is derived. *This* is the capital "demand" function, obviously unaffected *initially* by any tax change, since it is not a behavioral function. The capital supply function is the schedule showing the amounts of capital individuals wish to hold at varying net, real rates of return, given the level of total income. With taxes of the character the U. S. relies upon, market or pre-tax rates of return required for each quantity of capital must, obviously, exceed the net or after-tax rates. It is the intersection of the downward sloping marginal product and upward sloping supply schedules which determine the optimum stock of capital. Clearly, changes in tax provisions affect this optimum by altering the capital supply schedule *in pre-tax terms*. A tax change per se can have no initial effect on the marginal product of capital. Nor has it any initial first-order income effect to alter the supply of capital. It affects only the pre-tax returns required to obtain the after-tax return at which a given amount of capital will be held.

I belabor you with this simple exposition only to emphasize that the effect of a tax change on investment derives solely from the way in which taxes affect the supply of capital, hence saving behavior. With no change in the tax regime and other things given (i.e., the rate of technical progress, the condition of labor supply, etc.), saving = investment will increase with the increase in total income, hence the increase in the desired stock of capital, through time. Given the level of income, however, a change in taxes affecting the rental cost of capital generates a new optimum stock of capital *at that total income level*. It consequently impels a change in the amount of saving out of that total income, hence a change in consumption, as people seek to shift to the new desired stock of capital. It is, therefore, *only* through its effects on saving that tax changes can alter the stock of capital.

For purpose of analyzing the ultimate effect of tax changes on the stock of capital, nothing more is needed. For purposes of estimating the effects of tax changes on saving = investing, i.e., the

adjustment from one optimum stock to another, far more is needed, specifically theory and data to explain the pace of the adjustment.

The search for this explanation is complicated by virtue of the fact that few, if any, feasible tax changes will affect the desired stock of *each component of the total stock* of capital in the same proportion. Virtually all such tax changes will result in some change in the composition of the capital stock. The time required to effectuate that change will differ from one type of capital to another; it takes a good deal longer, ordinarily, to build a petroleum refinery than to manufacture a new machine tool. Searching the data for stable saving functions, therefore, is chasing a will o' the wisp.

But instability in the saving function does not imply instability or shifting parametric values in the desired stock of a capital function. Accordingly, there is no real problem rising from changes in policy rules, of the sort Summers suggests, in the use of a properly specified cost of capital formulation. Set in the correct model context, this specification entails no difficulty whatever in differentiating the effects of temporary or permanent investment tax credit changes. Moreover, it generates the carefully differentiated, with respect to both magnitude and timing, estimates of the effects of different types of tax changes of the sort Summers illustrates without resort to the exotic sort of explanation Summers offers.

I find myself mostly in agreement with Summers' conclusions about the relative magnitude of the effects of capital-favoring tax changes, despite the fact that I largely disagree with the way he arrives thereat. What this proves is that even when marching to different drummers, people can arrive at the same destination. It is heartening to discover that despite quite different perceptions of what supply-side economics is about, it is possible to come quite close together on tax policy prescriptions aimed at regeneration of economic progress.