TAX POLICY AND STOCK PRICES

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This is the text of an address delivered by Tom Downs at The National Bureau of Economic Research Summer Institute, Cambridge, on July 31, 1986. Among the dozen people in attendance were: A. Auerbach (Wharton), D. Bradford (session moderator, Princeton), T. Downs (Boston College), M. Feldstein (Harvard), P. Hendershott (Ohio State), and Mervyn King and Jonathan Leape (London School of Economics).

My objective is to describe our model for measuring fundamental value. We define fundamental value as the present value of the residual cashflow stream that an asset stock is expected to provide for shareholders. Our intent is to link fundamental value to policy and structural parameters, and then to see how changes in those parameters impact the fundamental value measurement. Of course, this approach yields insights about shareholder wealth only to the extent that stock prices are unbiased reflections of fundamental values, and to the extent that a one dollar change in fundamental value leads to a one dollar change in stock prices. It is important to keep in mind, as Lawrence Summers has recently reminded us, that stock prices are influenced by "animal spirits", and that animal spirits seldom abide by our presumed ceteris paribus conditions.

Measuring fundamental value requires the determination of the source of residual cashflows. Almost by definition, only capital is a store of value and so only capital generates residual cashflows. Suppliers of variable factor inputs such as labor, raw materials, and energy, are reimbursed an amount just equal to the value of their productive services and therefore these factors do not pass through to shareholders any cashflows. The efficiency of labor markets, too, is assurance that the value of human capital is not reflected in stock prices. The source of residual cashflows is therefore the capital upon which the firm has proprietary rights. We maintain that future investments promise incremental cashflows with a present value just equal to the cost of the investment so that, simply stated, stock prices reflect only the returns stemming from the existing asset base.

Measuring the firm's total fundamental value then, requires the specification of the residual cashflows expected from all existing capital: plant, equipment, inventories, land, and intangibles. Yet we are ultimately interested in how fundamental value is impacted by parameter changes, so here we empirically concentrate on plant and equipment and ignore the other capital types because their fundamental values are likely insensitive to parameter changes.

As shown in equation 3 on page 5, the residual cashflow that the asset stock in place at time s is expected to provide shareholders at time s+t equals the after-tax rent, $(1-\tau)$NOI, plus the tax saving from non-cash tax deductions, τTAXD, less the after-tax cost of debt financing. Notice that the dividend payout ratio does not enter this equation because a one dollar residual, that is, one dollar "available for common", has the same present value regardless of payout policy. I turn now to a description of the expected cashflow streams that seem to be implied by the information set and asset base existing at year-end 1984.

The rent, or NOI, provided per unit of real capital equals that capital's rental price. We compute the real stock existing at year-end 1984 and then project the survival path of the stock over its remaining productive life. Our service lives and depreciation patterns are consistent with BEA and National Income Product Accounts information. Column 1 of table 1 on page 34 shows the mortality distribution of the vintage capital stock. For example, roughly half the real stock will have expired by the end of the sixth year of service and roughly 95% of all discounted residual cashflows will be received within ten years.

The tax depreciation deductions promised by the existing stock can be inferred by depreciating historic investment flows by the practices then in use. Column 4 of this table shows that promised deductions sum to $1243 billion, or $717 billion on a discounted basis. It is mildly interesting to note that the present value of deductions per dollar of the vintage capital stock is 33 cents, whereas per dollar of new capital it is about seventy cents.

With the NOI and TAXD streams specified we can go ahead and compute the total market value of debt and equity by discounting with the weighted average after-tax cost of funds. This relationship is expressed in equation 9 on page 10. Discounting the after-tax NOIs and depreciation tax shield with the 12.4% average cost of funds yields a total financial market value estimate of $1352 billion dollars. Given the assumed debt ratios of one-third, the market value of equity, or rather our fundamental value estimate of nonfinancial corporate plant and equipment, is $906 billion dollars.

What is interesting is that not only do these cashflow streams provide enough information to compute fundamental value at year-end 1984, but also they allow us to compute the fundamental value expected at any time during the asset's life. For example, at year-end 1985 the $406 billion pre-tax NOI and $251 billion depreciation deduction will have fallen off the expected return stream and all remaining returns will be discounted one period less. Comparing the motion in the fundamental value of the assets with their replacement cost highlights the independence of these two value constructs and provides additional insights on why the ratio of market value to replacement cost should not really converge to unity, even under steady state conditions. Column 1 of table 2 on page 40 lists this Q ratio.

Consider the difference between replacement cost and fundamental value. The replacement cost of a capital stock is the amount it would cost to replace all vintage capital with new capital while leaving productive capacity unchanged. For example, suppose two alternative capital stocks are comprised of one unit of real capital; i.e., from the perspective of a production function the stocks are identical. Because each stock contains one unit of real K they have identical replacement costs.

But suppose one of those stocks is comprised of a new unit of capital whereas the other is comprised of vintage assets, say a 4 unit real investment made 3 years ago where all capital productively depreciates by straight line over a four year life. The four units will, over the past three years, have lost three-quarters of their productive capacity and will have depreciated to one unit of K. But this unit has only got one year left before it expires. The present value of this one year cashflow stream is assuredly different than the present vlue of the four year cashflow stream offered by the capital stock comprised of one unit of new capital. From the Q ratios listed in column 1 we notice two things. One is that Q falls as the stock ages. Two, is that even though our model assumes marginal Q is unity, i.e., every dollar of investment raises fundamental value by a dollar, even though marginal Q is unity, average Q is only 0.62.

Fundamental value is sensitive to differences in the intertemporal distribution of expected returns. Replacement cost is not. We have introduced a model for computing fundamental value.