EFFECTIVE CAPITAL GAINS TAX RATES: A REPLY

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WE thank Donald Kiefer for studying the technical details of our paper (*NTJ*, 1989), although we disagree with most of his criticism. Here is our point-by-point response.

a) *Capital gains in lump sum or as a series of payments.* Kiefer is correct in pointing out that our scenario of capital gains generated in a series of increments at a constant rate over a multi-year period is no different from that underlying the BAP method attributed to Bailey (1969), Auerbach (1983), and Protopapadakis (1983). This commonality only strengthens our criticism of the BAP method by allowing a direct comparison between that method and our own valuation-based (VB) method.

b) *Definition of the effective rate of capital gains tax (CGT).* Contrary to Kiefer's claim, all of the methods compared in our paper use the same definition of the effective CGT rate, t_e. It is defined as the accrual-equivalent tax rate consistent with the equation of $g^* = g(1 - t_e)$, where g is the per-share pre-CGT growth rate and rate of return from capital gains, and g^* the post-CGT growth rate and rate of return from that source.

c) *IRR vs. NPV.* Kiefer fails to see that the difference between the BAP and VB methods in calculating the effective CGT rate arises *only* where there is tax deferral. Given the same general definition of that rate, the two methods must arrive at the same calculated rate in the absence of deferral under a one-year holding period. In contrast, as reported in our Figure 1, the two methods arrive at a different effective tax rate in the presence of tax deferral, under the multi-year scenario. That difference is attributed *solely* to the use of a different time-value of money. The BAP method is incorrect in compounding CGT payments using the IRR endogenous to each investment. In contrast, the VB method uses an exogenous discount rate commensurate with market conditions and the relevant risk of each investment. To prove that this is the only source of difference between the two methods, we show below that when properly modified, the BAP method generates the same result we derive by the VB method.

Under a regime of CGT applied at the statutory rate t to gains *realized* at the end of year j, we calculate the post-tax accumulation of a dollar investment as under the BAP method:

$$V_1 = (1 + g)^j - t\,[(1 + g)^j - 1].$$

Under the alternative regime of CGT applied annually to *accrued* gains at the effective rate t_e, we modify the BAP method by compounding tax payments at the post-tax opportunity interest rate, r, instead of the growth rate, g. This produces the post-tax accumulation

$$\begin{aligned} V_2 &= (1 + g)^j - t_e g[(1 + g)^0(1 + r)^{j-1} \\ &\quad + (1 + g)^1(1 + r)^{j-2} \\ &\quad + \ldots + (1 + g)^{j-1}(1 + r)^0] \\ &= (1 + g)^j - t_e g\left[\frac{(1 + r)^j - (1 + g)^j}{r - g}\right]. \end{aligned}$$

The accrual-equivalent CGT rate is calculated by setting $V_1 = V_2$ and solving for t_e:

$$t_e = t\left[\frac{r}{g} - 1\right]\left[\frac{(1 + r)^j - 1}{(1 + g)^j - 1} - 1\right]^{-1}.$$

This is the result reported in our equation (7) (the power -1 is missing there due to a typographical error) based on the VB method.

d) *Dividends and the effective CGT rate.* Kiefer's claim that methods preceding ours of calculating the effective CGT rate ignore all sources of income but capital gains

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is factually incorrect, illogical, and irrelevant. Factually, all of the authors cited focus on the effect of CGT in common stocks in the U.S., for which cash dividends is the predominant source of value. Kiefer's disregard for the main source of net cash flows from the producing to the consuming sector is illogical. It contradicts the essence of valuation in an economy where CGT is imposed precisely on those assets which cannot be directly consumed. Finally, Kiefer's insistence on the absence of other sources of income in previous methods is irrelevant; his dividend-free formulation can be shown to accommodate dividends as a source of value and the basis of capital appreciation. His equation (7), which does not specify the source of value P, is

$$P = \frac{P[(1 + g)^j - [(1 + g)^j - 1]t]}{(1 + r)^j}.$$

This price expression can be further specified by substituting for P any value, including our own dividend valuation expression (equation (4) in our paper).

Consistent with our argument that the presence of dividends as a source of value does not affect the calculation of the effective CGT rate, we proved above that our result can be obtained by modifying the BAP method without specifying the source of value.

e) *Dividend tax and the effective CGT rate.* Based on his equation (6), Kiefer claims that the effective CGT rate is a function of the firm's dividend tax rate, which renders our results incomparable with those of BAP, where no dividends are specified. To disprove this claim, we cite the above conclusion that the specific identity of the source of value has no bearing upon the effective CGT rate. Since the discounted value of dividends is homogeneous in the flat-rate dividend tax, the per-share constant growth rate, $(P_j - P_{j-1})/P_{j-1}$, which is the base for the CGT, is not affected by the dividend tax. This is based on the further assumption that in partial equilibrium dividend tax does not affect the firm's investment and financial decisions, and therefore its per-share growth rate. With exogenous growth rate and post-tax shareholders' opportunity rate of return, our equation (7) shows an effective CGT rate that is not a function of the dividend tax.

In a related criticism, Kiefer claims that our method is unique and peculiar in defining a stacking order of the taxes on dividends and capital gains, making the latter dependent upon the former, but not the other way around. As stated, this claim is incorrect. As shown above, under all the methods compared in our paper, including our own, the effective CGT *rate* is independent of the dividend tax. On the other hand, under all those methods the CGT *revenue* partially decreases with any increase in the dividend tax that causes a decrease in the asset's value and—given the growth rate—the *dollar value* of the capital appreciation.

f) *What determines r and g?* Based in the partial equilibrium surrounding the single firm, our method of deriving the effective CGT rate treats as parameters shareholders' opportunity rate of return, r, and the firm's per-share growth rate, g. Kiefer claims that such a treatment is possible only because our method is unique (his view!) in specifying dividends as the source of value. He cites his equation (8) as "proof" that in all the methods but ours, r or g must be endogenous. He goes on claiming that in the absence of dividends, g is determined by r, as well as by the statutory CGT rate, t, and the holding period, j.

This claim is incorrect. Kiefer's equation (8) is obtained by rearranging his valuation equation (7) cited above, stating g instead of P as a dependent variable. In our partial equilibrium analysis, causality goes in the following direction:

$$(r, g, t, j) \rightarrow t_e \rightarrow g^*$$

where $g^* = g(1 - t_e)$. Here r, g, t, and j are exogenous parameters that jointly determine t_e, while t_e and g jointly determine the post-tax growth rate, g^*. His equation (8), showing g as a dependent variable, merely restates equilibrium relationships, not causality.

g) *Partial vs. general equilibrium.* Kie-

fer's final claim is that the use of IRR as an opportunity rate of return for tax payments under the BAP method is correct in general equilibrium, even if our use of the cost of capital, r, is valid in partial equilibrium. This claim does not and cannot have a basis in theory, since it implies the inconsistent assumption that, in equilibrium, the CGT payments on assets of the same risk class should be discounted at interest rates which vary according to the growth rate of each asset.

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