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A NEW MEASURE OF INCOME FROM WEALTH

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by

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Dividends plus capital gains has become the orthodox way to measure income from wealth. The purpose of this paper is to point out some inadequacies of that concept and to suggest an alternative which, in many instances, is a better guide to consumption decisions, and which can be a more equitable measure of income for purposes of taxation as well.

Hicks says that "Income is a subjective concept, dependent on the particular expectations of the individual in question."[1] That is, one can only be sure of his present income if he can foresee the future and if he knows his future consumption plans. We will not be concerned with uncertainty here; what matters for us is the subjective nature of income--the fact that an individual's future consumption plan affects the level of his current income. Hicks summarizes the difficulties raised by this problem, saying "...income and saving...are bad tools which break in our hands."[2]

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[1] J.R. Hicks [1947] p. 177.

[2] J.R. Hicks [1947] p. 177.

In this paper we discuss ways to measure income from non-human wealth. The measures we suggest are not free of the problems described by Hicks; no measures can be. They are put forward not as theoretical ideas, but as practical improvements over the commonly used measure, dividends plus capital gains.

Part I lays out the problem and describes a few simple criteria by which we might judge alternative measures of income. In Part II, we derive a particular income measure in the context of a simple model and we point out the problems associated with the dividends plus capital gains concept. Subsequent parts report some observations suggested by the new measure of income and some qualifications to be attached to it.

I

Hicks defines today's income as the amount which can be consumed today without altering the plans for future consumption that were held yesterday. Thus today's income consists of the consumption that was planned for today plus the present value of any increases in present or future consumption that are made possible by today's events. This definition, as will be shown below, is subjective since it makes income depend on the intended future consumption stream. That is, individuals holding identical portfolios throughout a period can have different levels of income according to this definition.

It should be emphasized that this does not necessarily make the Hicksian concept of income a bad one on theoretical grounds. Hicksian income increases

when an individual is made better off, and thus it would be a useful measure for purposes of taxation if it could be observed; it preserves vertical and horizontal equity. But, unfortunately, its subjective nature makes it a non operational concept. It does, however, serve to point out how subjective and elusive a concept income really is.

Given the dependence of income on the plans for future consumption, we must begin the analysis by choosing some consumption plan. One useful assumption is that intended consumption is a perpetuity or that it is expected to grow geometrically at a constant real rate. While this assumption may be a bad one for many economic units, it is a reasonable one to make about foundations, university endowments or the very wealthy who view themselves as trustees of an estate to be passed on to their heirs. It also has the advantage of simplicity.

If we call this concept permanent consumption after Friedman,[1] then we note that permanent income--where income is measured according to Hicks --equals permanent consumption, since the remaining components of Hicksian income are unforeseen and therefore would be called transitory income by Friedman. The income concept we attempt to measure, then might best be called permanent Hicksian income. Fisher, it should be noted, argued many years ago in favor of defining income as equal to consumption for purposes of taxation.[2] Our analysis supports this view.

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[1]M. Friedman [1957].

[2]Fisher [1906] also made a distinction between actual received income and standard income--the level that could be expected forever--which anticipates the permanent transitory distinction of Friedman.

What criteria would one use to judge the quality of a particular measure of income? That depends on how the measure is to be used. We are interested in measures which might be used as guides for consumers or for the tax authorities. Thus one criterion is that the measure of income should increase when the ability to consume increases. This criterion we can discuss below. If we view this criterion as similar to the statistical concept of unbiasedness, a second criterion is immediately suggested--that of minimum variance. The smaller the random components of the income measure, the better a measure it is. Unfortunately, we cannot analyze this second criterion in the framework of the model below. To do so would require that we specify the nature and source of the random component and there does not seem to be any obvious way to choose among the many different ways of doing this. We suggest that empirical methods be used to determine which income concepts have exhibited the least variance in the past.

II

We use a simple model to develop a measure of Hicksian permanent income. Only perpetual equity investments are considered. A particular portfolio is invested in securities that are legal claims to profits of $\pi(0)$ in the present, and if there is no reinvestment by the firms or the portfolio owner, this income stream is expected to last forever. The firms however, save s percent of these profits and invest them internally at rate r. Dividends at any point in time are therefore a constant fraction of profits and the dividends are expected to grow exponentially at rate rs, all measured in money terms.

$$(1) \qquad D(t) = (1-s)_\pi(t)$$

$$(2) \qquad D(t) = D(0)e^{rst}$$

The present market value (MV) of these securities is given by (3)
where i is the market's rate of discount of future dollars.

$$(3) \qquad MV(0) = \frac{D(0)}{i-rs} = \frac{(1-s)_\pi(0)}{i-rs}$$

We are aware of the existence of theories of competitive market equi-
librium which tell us why r and i should be equal in the long run, but
we allow them to differ for two reasons: 1) Short run stock market fluc-
tuations (changes in i) have occurred in the past with no apparent following
changes in r ; and 2) the persistent divergence of market and book values
for equities throughout modern time must be allowed for in any empirical
measure of income.

Note that capital gains (increases in MV(0)) can result from increases
in r or from decreases in i (as well as from changes in s as shown
below). But these two different forms of capital gains have very different
effects on the asset holder's well being as well as on his permanent income.
Thus capital gains of equivalent dollar value can lead to very different
levels of permanent income or of well-being and therefore to different levels
of income in the Hicksian sense. Raw capital gains, we will argue, cannot
be a component of any unbiased measure of permanent income.

To see this, we must consider the consumption plans of an individual
and see how his well-being is affected by the different kinds of capital
gains. Assume the portfolio holder wishes to consume a stream of goods

that increases in money value exponentially at rate g . The assumption

behind Friedman's permanent income is that g = 0 , of course, but we

include the possibility of g being different from zero to show the effect

of the consumption plan on the income measure.

$$(4) \qquad\qquad C(t) = C(0)e^{gt}$$

Given budget constraint (5) we can solve for present consumption

$$(5) \qquad\qquad \int_0^\infty C(t)e^{-it}dt \le \int_0^\infty D(t)e^{-it}dt$$

$$(6) \qquad\qquad C(0) = \frac{i(1-s)}{i-rs}\pi(0) - \frac{g(1-s)}{i-rs}\pi(0)$$

Note that the first term in (6) is steady-state or Friedman income

while the second term tells us how much must be saved if we are to expect

consumption to grow at rate g . Below we transform this measure of per-

manent income into easily measurable and intuitively appealing magnitudes.

But first we must show the effect of different kinds of capital gains on

steady state consumption. This can be done by differentiating (6) with

respect to the various parameters.

$$(7) \qquad\qquad \frac{dC(0)}{dr} = \frac{(i-g)s(1-s)\pi(0)}{(i-rs)^2}$$

Clearly an improvement in the prospects of the firm (an increase

in r) makes the asset holder better off and the present value of the

increases in consumption allowed by that change are equal to the value of

the capital gain, dMV(0)/dr . Thus the interest that can be earned on such

gains is a part of permanent income, and the whole gain is part of Hicksian income.

(8)
$$\frac{dMV(0)}{dr} = \frac{s(1-s)_\pi(0)}{(i-rs)^2}$$

An increase in i (a capital loss) however, makes him better off or worse off depending on whether $g \gtrless rs$.

(9)
$$\frac{dC(0)}{di} = \frac{(g-rs)s(1-s)_\pi(0)}{(i-rs)^2}$$

That is, since the change in i changes only the price at which present and future dollars trade, the asset holder is made better off or worse off depending on whether he is a buyer or seller of the future dollars whose price falls when i increases. Thus whether Hicksian income increases or decreases in this case depends on the asset holder's future consumption plans. For the case of permanent income where $g = 0$ and assets must be sold every period, he is clearly made better off (if $rs > 0$). But even in this case if we compare capital gains of equivalent present dollar magnitude, it will be true that a gain caused by an increase in r makes him better off than a gain caused by a decrease in i. In (10) we have solved for the change in i that leads to the same level of capital gains as caused by a one unit change in r.

(10) Setting $\dfrac{dMV(0)}{di} \cdot \Delta i = \dfrac{dMV(0)}{dr} \Delta r \implies$

$$-\frac{(1-s)_\pi(0)}{(i-rs)^2}\Delta i = \frac{s(1-s)_\pi(0)}{(i-rs)^2}\Delta r$$

$$\therefore \quad \Delta i = -s\Delta r$$

We compare in (11) the effect on permanent income of capital gains of equivalent dollar value caused by changes in i and r respectively.

$$(11) \qquad -s_{\Delta}r \cdot \frac{dc(0)}{di} = \frac{srs(1-s)s_{\pi}(0)}{(1-rs)^2} < \frac{i(1-s)s_{\pi}(0)}{(1-rs)^2} = \Delta r \cdot \frac{dc(0)}{dr}$$

if $srs < i$.

Since we can only consider the case of $rs < i$ (or else the securities must be of infinite market value), we must believe that $srs < i$ and therefore that a dollar's worth of capital gains due to changes in i are worth less to the asset holder than a dollar's worth due to changes in r . In general, then, capital gains cannot be translated into a measure of permanent income until we know the source of the gain and the future consumption plan.

The two different kinds of capital gains are illustrated graphically in Figures 1 and 2 respectively for the two period case. In Figure 1, present retained earnings $(\pi(0) - D(0))$ are reinvested at rate r_1 to produce future dividend $D(1)_1$. When r increases from r_1 to r_2 , the asset holder's budget constraint shifts outward allowing him to increase his consumption. In Figure 2, the decrease in the market rate of interest from i_1 to i_2 rotates the budget constraint through the point $D(0)$, $D(1)$ and the asset holder is made better or worse off depending on whether $c(0) \gtrless D(0)$. That is, when the market rate of interest changes, an investor is obviously made better or worse off depending on whether he is a buyer or a seller of securities.

A third kind of capital gain results from a change in the firm's payout ratio. This affects the asset holder in a way that depends on the
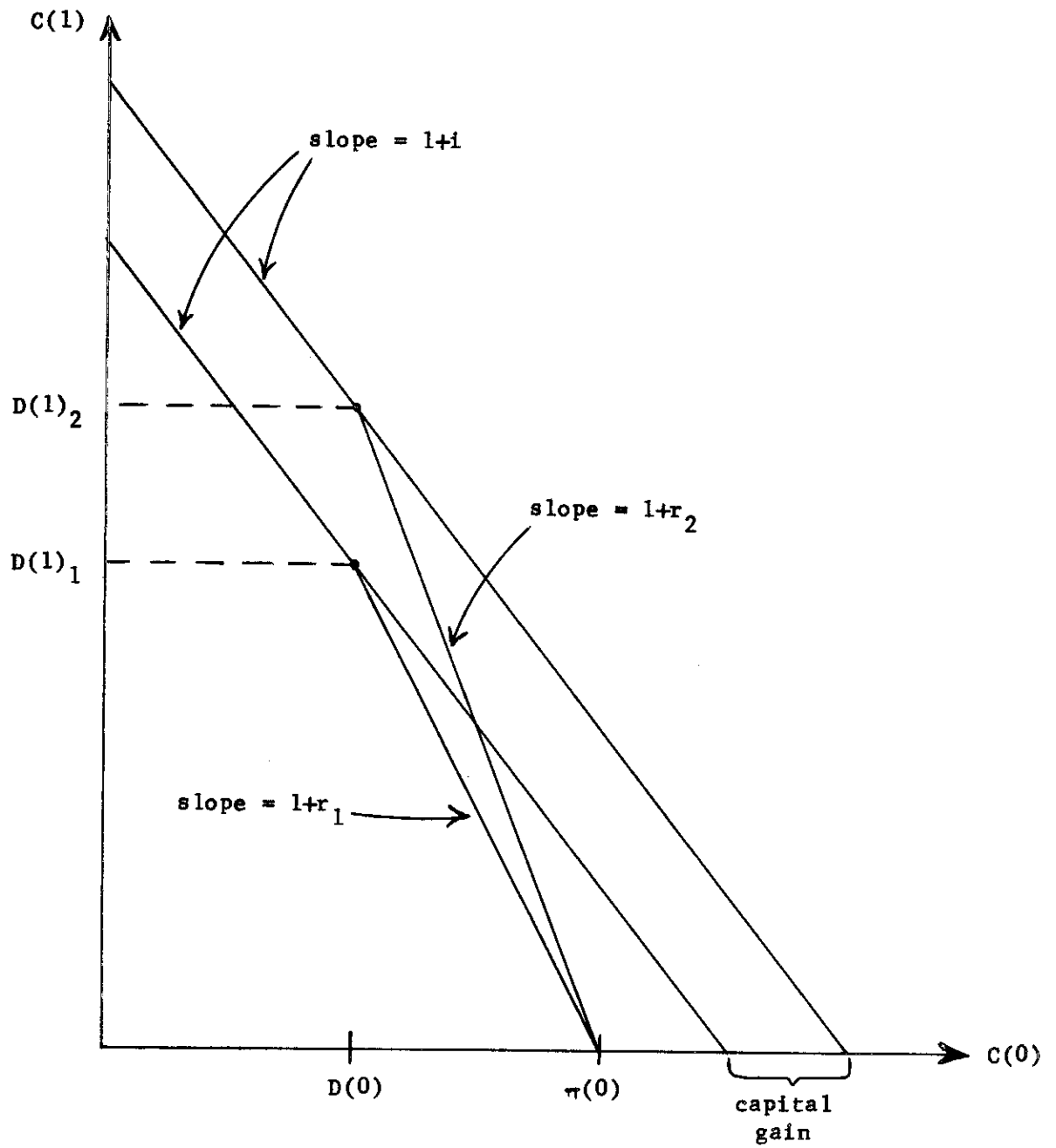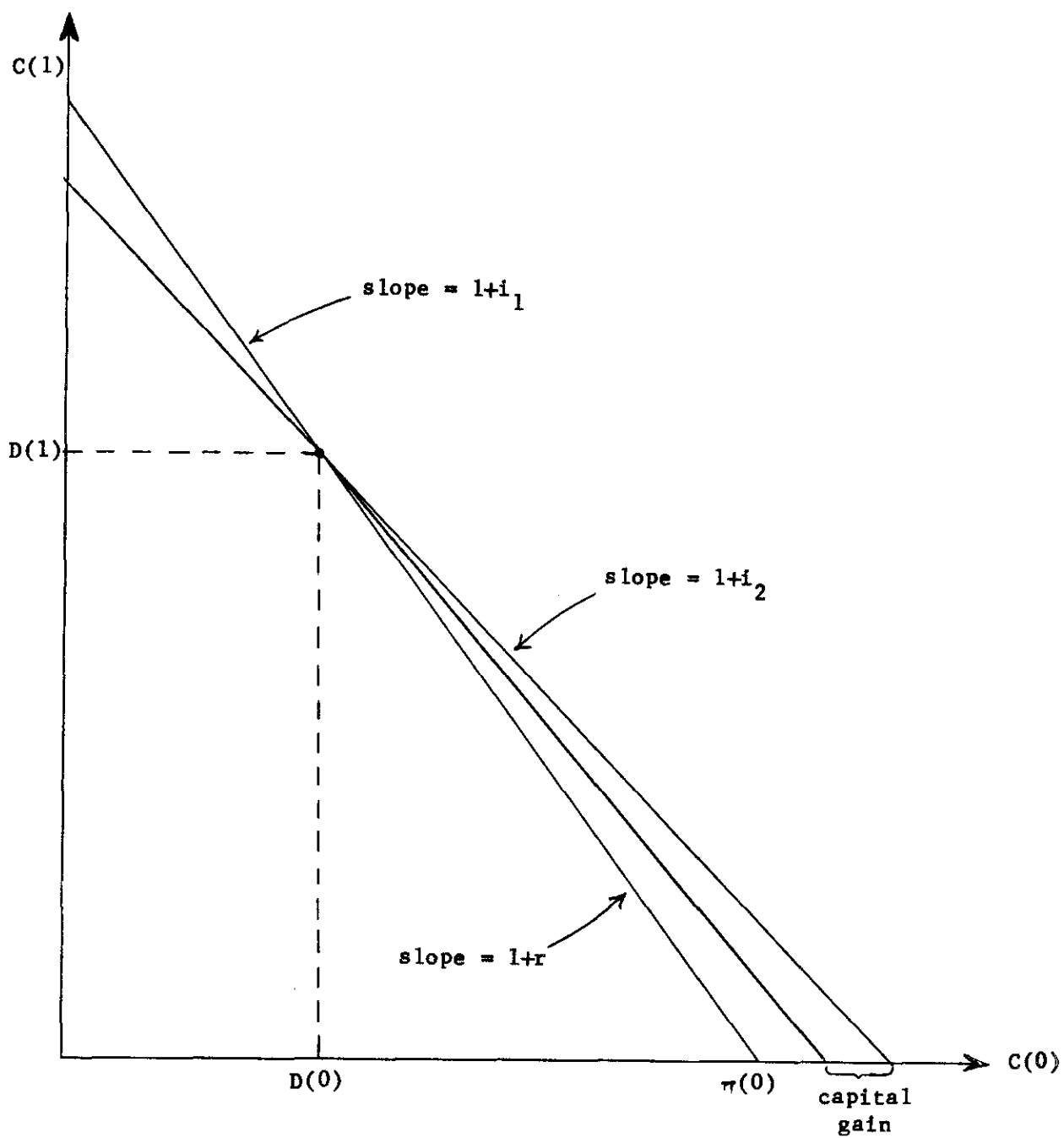
FIGURE 1

FIGURE 2

difference between the market interest rate and the firm's internal rate
of return.

$$(12) \qquad \frac{dC(0)}{ds} = \frac{(r-i)(i-g)}{(1-rs)^2} \pi(0)$$

Clearly, if the firm's rate of return exceeds the rate of interest, every
extra dollar the firm invests makes the asset holder better off and there
will be capital gains to reflect this.

It should be clear from the above that a change in the market value
of one's portfolio does not automatically represent an improvement in well
being. Capital gains, therefore, should not be a component of Hicksian
income or of any measure of permanent income. Instead we have constructed
a measure of permanent income that increases only as the ability to consume
forever increases. This measure is, by derivation unbiased in the sense
we described above, and therefore a more useful measure of income if in-
come is to be used to guide consumption decisions.

To be of practical use, however, our measure of permanent income
must be expressed as a function of observable quantities. This is done
in (13) which tells us that Friedman permanent income (Y) equals dividends
plus that part of the growth in the market value of securities that is due
to retained earnings.

$$(13) \qquad Y = \frac{i(1-s)}{1-rs} \pi(0) = D(0) + rsMV(0)$$

Note that if $r = i$, $rsMV(0)$ will be equal to retained earnings. If mar-
kets are imperfect or slow to adjust, r can differ from i, and in this

case it is the rate of growth of profits (rs) that is used to tell us
how much of the increase in the market value of securities can safely be
called permanent income. Note also that if r = i and if all parameter
values remain constant over a time period, rsMV(0) will equal retained
earnings and capital gains as well. In this case, all the income concepts
will be the same.

Of course, if consumption is expected to grow at rate g, (6) tells
us that an amount equal to g per cent of the market value of the portfolio
must be saved each time period. Thus, rewriting, we find out how much of
the portfolio must be sold to finance current consumption.

$$(14) \qquad\qquad C(0) = D(0) + (rs-g)MV(0)$$

Clearly, sales (purchases) depend on the difference between the growth rates
of dividends and desired consumption. It is (14) which we suggest should
be used used as a measure of income for foundations, universities, professional
societies or any asset holder who wishes his income to grow at some constant
rate g .[1] Empirical methods should be used to determine the best way to
measure rs , the growth rate of profits.[2]

We have shown the shortcomings of the dividends plus capital gains
measure of income as a guide to consumption decisions and we suggest that

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[1]The American Economic Association's practice is to count only dividends
as income. A report by a committee headed by Milton Friedman (Friedman
[1967]) suggested an alternative to this practice but the analysis above
suggests that neither the current method nor Friedman's alternative are ap-
propriate for a perpetual institution.

[2]The author is currently experimenting with different measures of income to
find one with a low historical variance. The results will be presented in
a separate paper.

these same shortcomings make it a bad measure for purposes of taxation as
well, since it is the ability to consume that corresponds to economic well-
being, and therefore to ability to pay. While the analysis has been written
down in terms of monetary variables, nothing changes when it is adjusted
properly to account for inflation. In this case the rate of inflation plus
the desired real rate of growth of consumption are written separately to
replace g wherever it appears.[1]

III

The income measure we propose, of course, is good only if one wishes
his future consumption to grow exponentially at any rate g . It should
be noted that if one wishes to consume all his wealth in the present
(g = -100%) , then capital gains are a part of income by our definition.
This is how it should be since capital gains measure the change in present
value of all future income claims. Present value is the correct concept
for the measurement of income when present consumption alone is desired.
When future consumption is desired, however, present value is not a good
index to use to measure income.

Many economic units, of course, do not plan for consumption to grow
exponentially, and these units need a different measure of income. I will
not analyze here any of the many possible alternative consumption plans,

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[1]It is also possible to write i or r as the sum of a real rate of return
and the rate of inflation, but nothing useful is gained by this since it is
the monetary concept which we observe in the market. The separation makes
more sense for g which is provided independently of any market variables.

each with a separate income definition, but I will point out the obvious qualitative implications of the analysis above for the life-cycle saving model. According to the life-cycle model at its simplest, individuals wish to save when young and working, and to dissave when old and retired. Thus they wish to purchase assets when young and in this case will be made better off by low security prices. Indeed, a market crash that is not associated with any real economic phenomonon is a boon to young savers since it lets them buy in on the ground floor. Increases in securities prices make them worse off.[1] The reverse is true for the old and retired who are selling securities. Again we see the importance of the consumption plan for the mea-sure of income, and again we see how the arbitrary taxation of capital gains can be inequitable.

The income measure I propose is, therefore, not suitable for life-cycle savers, and therefore should not be used for purposes of taxation. While perhaps more equitable in its tax burden than dividends plus capital gains, it is obviously inferior to the ideal measure of income which has been suggested by Fisher, namely consumption. From this vantage, the con-sumption tax is seen not as an alternative to an income tax, but as an income tax itself when income is measured properly. Only a consumption tax can measure equitably changes in the ability to consume.

I do not wish to defend the present tax treatment of capital gains in the United States; they are more a result of political compromise on the question of vertical equity than they are an attempt to guarantee hori-zontal equity. It is interesting, however, to see that there is some rationale

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[1]An interesting simulation that shows the response of life-cycle savers to different kinds of capital gains is reported in J. Tobin and W. Dolde [1971].

for them in the analysis above. First, taxes on capital gains are levied when they are realized, not when they accrue. Thus the tax is a consumption tax with the exception of portfolio switches. The young, for example, need not pay taxes on their unrealized capital gains, which, if accompanied by a general rise in asset prices, have made them worse off. The old, who have been made better off, must pay the tax if they wish to benefit from the gains.

Second, capital gains are taxed at half the rate of other income. Above, we showed how capital gains are a part of income if they are to be consumed in the present, but not if perpetual consumption is desired. Assuming the normal horizon to be between one period and infinity gives a weak justification for the taxation of capital gains at the mean rate suggested by these extremes assuming, of course, that they are to be taxed prior to their use for consumption purposes. The ideal consumption tax would tax gains fully when and if they are ever consumed, of course, so the present half-rate compromise for capital gains is too low for gains that are eaten, too high for gains that are saved forever.

Third, no capital gains tax must be paid on assets transferred at death. Since these assets are not traditionally cashed in for consumption goods, this is an appropriate tax treatment. However, there is no reason why the taxation of these gains should be forgiven altogether. Rather, the tax should be collected whenever the assets are cashed for consumption purposes. The consumption tax, of course, would handle this problem correctly. Thus the present treatment of capital gains, while not ideal, can be partially justified, and might well be better than one which taxes gains at a full rate as they accrue.[1]

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[1]See M. David [1968] for a discussion of capital gains taxation.

IV

    While our analysis has been free from considerations of uncertainty, it is interesting to note a portfolio strategy suggested by equation (14) in the case where there are unpredictable fluctuations in i that are not associated with changes in the other variables. The asset holder can insure himself from these random revaluations of future earnings by choosing assets according to their saving rates in such a way that rs = g . That is, he could choose stocks with a large s (growth stocks) if his own g is large, and vice versa. This sets his consumption equal to his dividends and insures him from market fluctuations caused by changes in i , the discount rate, since changes in i do not affect consumption in this case. Thus uncertainty over i may be the reason why investment counselors often determine whether a client wishes current income or growth before giving portfolio advice. By setting rs = g , capital gains and losses that are caused by changes in the market's evaluation of future income need not have an effect on the proposed consumption plan. Such a portfolio holder could ignore the state of the market and worry only about the fundamentals that determine the pro= fitability of the firms whose equity he owns. This strategy would have to be rethought, of course, if it were shown that some other characteristic of the securities was not distributed independently of s , in which case the selection of securities according to s might affect in some other way the income stream yielded by the portfolio.

    Nonetheless, we can see that if this portfolio strategy is widely followed, there could grow up an aversion to consumption from capital gains.

This may explain why the dividends plus gains concept is not more widely used as a measure of income by trust officers and others who manage perpetual funds. Rather than encounter the knotty problems of how to measure and smooth capital gains for consumption purposes, one need only buy assets whose dividends cover present consumption needs and then ignore market fluctuations. In financial circles, a man is considered a fool if he splurges just because his stocks go up, and the reason for this is obvious from the above despite the economists' present orthodox definition of capital gains as income.

V

We have derived an income concept in this paper which can be used as an appropriate guide for perpetual institutions in their consumption decisions. We have shown why it is superior for these purposes to the commonly used alternative, dividends plus capital gains. We have also shown that the dividends plus gains concept is useful only in cases where an asset holder intends to consume his entire wealth in the current period. For other situations, other income measures are needed.

We suggest that the taxation of capital gains is inequitable and that only a consumption tax can properly handle questions of equity when income can be transferred from one period to another for purposes of con-sumption.

Finally, we note the significance of the work above for the large and growing empirical literature on portfolio management. Essential

ingredients of such research are data on the income yielded by the various

assets in question. We have shown why it might be profitable to use more

than one definition of income for such research, and we have suggested an

empirical concept which should be considered as one of those definitions

along with the more questionable concept of dividends plus capital gains.

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