

NBER WORKING PAPER SERIES

HUMAN CAPITAL AND  
THE INCOME TAX

Louis Kaplow

Working Paper No. 4299

NATIONAL BUREAU OF ECONOMIC RESEARCH  
1050 Massachusetts Avenue  
Cambridge, MA 02138  
March 1993

Harvard University and the National Bureau of Economic Research. I am grateful for comments from Al Warren and for financial support from the John M. Olin Foundation. This paper is part of NBER's research program in Public Economics. Any opinions expressed are those of the author and not those of the National Bureau of Economic Research.

NBER Working Paper #4299  
March 1993

HUMAN CAPITAL AND  
THE INCOME TAX

ABSTRACT

This article examines how to treat human capital -- perhaps the vast majority of the capital stock -- under an ideal, Haig-Simons income tax. Innate ability, investments in human capital, and uncertainty in future earnings are considered. It is demonstrated that conventional income tax treatment and proposed modifications are closer to implementing a consumption tax than an income tax. Approximating ideal income tax treatment may be feasible, but assessing its desirability would require further inquiry.

Louis Kaplow  
Department of Economics  
Harvard University  
Cambridge, MA 02138  
and NBER

present value is ascertainable at birth or only becomes known gradually over time, is taxed on a deferred basis. Individuals do not sell their human capital in its entirety, so there are few realization events other than the continual experience of engaging in labor, producing current earnings.<sup>12</sup>

Thus, applying the conventional tax treatment of physical capital to human capital would not accomplish complete taxation of Haig-Simons income in most cases. It would, however, be a means of eliminating a distortion between investments of physical and human capital. The reason is that even though human capital investments typically have a positive present value, they would tend to have a zero present value at the margin.<sup>13</sup> Thus, applying the same rules would result in no marginal distortion. Accepting such a proposal on these grounds, of course, suggests that the objective is promoting efficiency rather than attempting to implement an ideal Haig-Simons tax base.<sup>14</sup>

#### 2.4. Taxation of Financial Investments Compared

It was suggested in section 1 that annual earnings and consumption were not Haig-Simons income, as they merely represented the conversion of human capital into a current flow. (That is, the consumption is precisely offset by a reduction in the value of human capital.) Rather, income arises from the fact that future flows are one period closer at the end of each period, so

---

<sup>12</sup> One could imagine making exceptions for personal services contracts -- for example, one guaranteeing an athlete a salary over five years regardless of whether he can play, or a professor's tenure contract. Also, when rights are converted -- as when one authorizes future use of one's name -- income is currently realized. (When one is injured in an accident, however, the Internal Revenue Code excludes from income compensation for lost future wages; the exclusion is permanent, rather than merely a rule designed to mimic the timing of tax liability that would have occurred but for the accident.)

<sup>13</sup> The most plausible exception would involve lumpy investment possibilities.

<sup>14</sup> As indicated in note 8, such a result would treat individuals who invest in human capital less generously than individuals who obtain the same earnings in each period as a result of innate ability. While this would be inequitable from a Haig-Simons perspective, it does not distort behavior (except to the extent that prior decisions, such as choices to have children, may be affected).

More generally, the exclusion of the value of human capital in period 0 does not distort behavior. This may seem to make the exclusion of it from the tax base less problematic, but actually it is a serious problem from an efficiency perspective as including it would essentially amount to levying a lump-sum tax on ability. See also note 24.

without engaging in valuation of individuals' future potentials at birth or at later points in time. Applying an appropriate multiplier to current wage income may serve as a proxy. Section 4 briefly comments on how arguments about the choice between an income and a consumption tax are affected by taking full account of human capital under the income tax. Section 5 concludes by addressing implications of the article's view of human capital for tax policy.

## 1. Haig-Simons Income Taxation of Human Capital

### 1.1. Definition and Illustration

The familiar Haig-Simons definition states that income is the sum of consumption and the change in net wealth during the accounting period.<sup>3</sup> To illustrate the application of the Haig-Simons definition to human capital, consider a simple example of an individual whose only wealth is human capital. The individual is born at time zero and will earn and consume 10 units per year for 20 years. The interest rate is assumed to be 10%.<sup>4</sup>

---

<sup>3</sup> See, e.g., Simons (1938).

<sup>4</sup> As will be apparent from the discussion, the analysis is more general than the examples that will be offered and could have been presented in a formal model, but that would have added little further insight. That individuals typically consume without earning when they are young is ignored. The labor-leisure choice and savings decisions are also taken as given. (To consider the former would raise questions of imputed income.) Uncertainty and investment in human capital are considered below. The example uses discrete time, with interest paid at the end of each period. Some slight inconsistencies due to rounding appear in the tables.

TABLE 1

| Period         | A<br>Earnings<br>("Income") | B<br>Change<br>in Wealth | C<br>True Haig-<br>Simons Income<br>(A + B) | D<br>End of Period<br>Wealth<br>(Previous D<br>+ Current B) |
|----------------|-----------------------------|--------------------------|---|---|
| 0              | 0                           | 85.14                    | 85.14                                       | 85.14   |
| 1              | 10                          | -1.49                    | 8.51  | 83.65   |
| 2              | 10                          | -1.64                    | 8.36  | 82.01   |
| 3              | 10                          | -1.80                    | 8.20  | 80.22   |
| 4              | 10                          | -1.98                    | 8.02  | 78.24   |
| 5              | 10                          | -2.18                    | 7.82  | 76.06   |
| 6              | 10                          | -2.39                    | 7.61  | 73.67   |
| 7              | 10                          | -2.63                    | 7.37  | 71.03   |
| 8              | 10                          | -2.90                    | 7.10  | 68.14   |
| 9              | 10                          | -3.19                    | 6.81  | 64.95   |
| 10             | 10                          | -3.50                    | 6.50  | 61.45   |
| 11             | 10                          | -3.86                    | 6.14  | 57.59   |
| 12             | 10                          | -4.24                    | 5.76  | 53.35   |
| 13             | 10                          | -4.67                    | 5.33  | 48.68   |
| 14             | 10                          | -5.13                    | 4.87  | 43.55   |
| 15             | 10                          | -5.64                    | 4.36  | 37.91   |
| 16             | 10                          | -6.21                    | 3.79  | 31.70   |
| 17             | 10                          | -6.83                    | 3.17  | 24.87   |
| 18             | 10                          | -7.51                    | 2.49  | 17.36   |
| 19             | 10                          | -8.26                    | 1.74  | 9.09  |
| 20             | 10                          | -9.09                    | .91   | 0   |
| Total          | 200                         | 0                        | 200   |   |
| PV of<br>Total | 85.14                       | 58.11                    | 143.25                                      |   |

Observe that the present value of Haig-Simons income, about 143, is significantly greater than the present value of consumption, 85. The reason is that human capital has a present value of 58. While the individual has no physical or financial capital and has no wealth at the end of his life, his human capital is significant. In fact, at the instant of birth, the individual has wealth -- and thus Haig-Simons income -- of 85; the value of human capital at birth is simply the present value of future earnings. In each year after this, wealth declines. (The resulting pattern of changes in wealth is, as it should be, that of economic depreciation for a physical asset with this familiar cash flow pattern.) While these negative changes in wealth sum, of necessity, to 85, they are deferred to the future and thus have a lower present value. (In fact, most of the decline is toward the end of the period.) This is why the sum of the present value of the change in wealth terms is positive, and substantial.<sup>5</sup>

Consider now the value of Haig-Simons income in each period. In period 10, for example, there is consumption of 10, a change in wealth of -3.5, and Haig-Simons income of 6.5. Note, however, that the income does not arise from the earnings and consumption per se. The earnings, which is consumed, creates an increment of 10 to Haig-Simons income, but that earnings was already represented in human capital, which declines by 10 when the capital is transformed into a current flow. (The analogy is to one who withdraws 10 from a savings account to fund 10 of current consumption.) Rather, the Haig-Simons income of 6.5 represents the increase in the future value of human capital as a result of the fact that the future is one period closer. (Observe that the value of human capital rises by this 6.5 and falls by the 10 representing conversion of capital to earnings, for a net of -3.5.) Another way to see this is to note that the value of wealth at the end of the preceding period (9) was about 65. Interest at 10% on this amount for one period yields 6.5, which is the amount of Haig-Simons income in the period.<sup>5</sup>

Finally, consider how the story would differ if there were uncertainty about future earnings. Suppose, for example, that at the end of period 10 the individual would learn whether his future income flow would be 5 or 15 per period, each event having a probability of 50%. In that case, the value of Haig-Simons income until period 10 would be the same (including for period 0). At the end of period 10, when uncertainty was resolved, the individual would have a one-time increase or decrease in human capital. From that time forward, the analysis would be as before, except with periodic flows of 5 or 15 rather than 10.

Observe that this change in wealth in period 10 arises because uncertainty is resolved, not because of the change in the flow per se. To see this,

---

<sup>5</sup> If the time period were infinite, the present value of the change in wealth would simply equal period 0 wealth, so this component would be half of Haig-Simons income. (In the example, the present value of consuming 10 indefinitely would be 100, wealth in period 0 would thus be 100, and wealth would remain constant over time, so the present value of Haig-Simons income would be 200.)

<sup>6</sup> To further illustrate the point, note that Haig-Simons income in the final period is only .91 -- a year of interest on a flow of 10 (anticipated in the prior period, and thus discounted to 9.09) at 10% -- even though earnings and consumption are 10.

consider the possibility that after period 10 the flow will be 15, but that this is known (with certainty) in advance.

TABLE 2

| Period         | A<br>Earnings<br>("Income") | B<br>Change<br>in Wealth | C<br>True Haig-<br>Simons Income<br>(A + B) | D<br>End of Period<br>Wealth<br>(Previous D<br>+ Current B) |
|----------------|-----------------------------|--------------------------|---|---|
| 0              | 0                           | 96.98                    | 96.98                                       | 96.98   |
| 1              | 10                          | -0.30                    | 9.70  | 96.68   |
| 2              | 10                          | -0.33                    | 9.67  | 96.35   |
| 3              | 10                          | -0.37                    | 9.63  | 95.98   |
| 4              | 10                          | -0.40                    | 9.60  | 95.58   |
| 5              | 10                          | -0.44                    | 9.56  | 95.14   |
| 6              | 10                          | -0.49                    | 9.51  | 94.65   |
| 7              | 10                          | -0.53                    | 9.47  | 94.12   |
| 8              | 10                          | -0.59                    | 9.41  | 93.53   |
| 9              | 10                          | -0.65                    | 9.35  | 92.88   |
| 10             | 10                          | -0.71                    | 9.29  | 92.17   |
| 11             | 15                          | -5.78                    | 9.22  | 86.39   |
| 12             | 15                          | -6.36                    | 8.64  | 80.02   |
| 13             | 15                          | -7.00                    | 8.00  | 73.03   |
| 14             | 15                          | -7.70                    | 7.30  | 65.33   |
| 15             | 15                          | -8.47                    | 6.53  | 56.86   |
| 16             | 15                          | -9.31                    | 5.69  | 47.55   |
| 17             | 15                          | -10.25                   | 4.75  | 37.30   |
| 18             | 15                          | -11.27                   | 3.73  | 26.03   |
| 19             | 15                          | -12.40                   | 2.60  | 13.64   |
| 20             | 15                          | -13.64                   | 1.36  | 0   |
| Total          | 250                         | 0                        | 250   |   |
| PV of<br>Total | 96.98                       | 73.97                    | 170.95                                      |   |

As can be seen, there is no sudden change in wealth or jump in Haig-Simons income at the time the cash flow changes. Rather, wealth and Haig-Simons income are initially higher because of the future higher flow. At the end of period 10, wealth is about 92, rather than the 61 in the illustration in table 1. In the case of uncertainty, when it is learned at the end of period 10 that the future flow will be 15 for certain (rather than having a 50% probability of being 5), that difference of 31 would be Haig-Simons income in period 10. Income in the remaining periods would be as in table 2.

The preceding discussion demonstrates that Haig-Simons income due to human capital arises in three ways:

1. At birth: the expected present value of future Haig-Simons income.
2. As time passes: each period, the future is one period closer, and thus discounted less, which gives rise to a flow of Haig-Simons income in that period. (The value of this flow does not correspond to earnings or consumption, even though there is no savings.)
3. When uncertainty is resolved: at such moments, the present value of future earnings changes, which implies a one-time change in wealth, and thus positive or negative Haig-Simons income. (These changes arise due to the resolution of uncertainty, not changes in the amount of earnings over time that were anticipated.)

#### 1.2. Investment in Human Capital

Assume now that an individual may invest in human capital -- by spending time (foregoing earnings) or money in a manner that will increase future earnings. It will be easiest to see the effects of the investment and the higher return in an example in which the investment is made all in one period and the return is received all in a single, later period. Suppose, then, that the individual from our first illustration invests 5 in period 10 in order to increase earnings from 10 to 20 in period 15.



TABLE 3

| Period         | A<br>Earnings<br>("Income") | B<br>Change<br>in Wealth | C<br>True Haig-<br>Simons Income<br>(A + B) | D<br>End of Period<br>Wealth<br>(Previous D<br>+ Current B) |
|----------------|-----------------------------|--------------------------|---|---|
| 0              | 0                           | 85.60                    | 85.60                                       | 85.60   |
| 1              | 10                          | -1.44                    | 8.56  | 84.16   |
| 2              | 10                          | -1.58                    | 8.42  | 82.58   |
| 3              | 10                          | -1.74                    | 8.26  | 80.84   |
| 4              | 10                          | -1.92                    | 8.08  | 78.92   |
| 5              | 10                          | -2.11                    | 7.89  | 76.81   |
| 6              | 10                          | -2.32                    | 7.68  | 74.49   |
| 7              | 10                          | -2.55                    | 7.45  | 71.94   |
| 8              | 10                          | -2.81                    | 7.19  | 69.14   |
| 9              | 10                          | -3.09                    | 6.91  | 66.05   |
| 10             | 5                           | 1.60                     | 6.60  | 67.65   |
| 11             | 10                          | -3.23                    | 6.77  | 64.42   |
| 12             | 10                          | -3.56                    | 6.44  | 60.86   |
| 13             | 10                          | -3.91                    | 6.09  | 56.95   |
| 14             | 10                          | -4.30                    | 5.69  | 52.64   |
| 15             | 20                          | -14.74                   | 5.26  | 37.91   |
| 16             | 10                          | -6.21                    | 3.79  | 31.70   |
| 17             | 10                          | -6.83                    | 3.17  | 24.87   |
| 18             | 10                          | -7.51                    | 2.49  | 17.36   |
| 19             | 10                          | -8.26                    | 1.74  | 9.09  |
| 20             | 10                          | -9.09                    | .91   | 0   |
| Total          | 205                         | 0                        | 205   |   |
| PV of<br>Total | 85.60                       | 59.62                    | 145.22                                      |   |

First, examine period 10. Observe that Haig-Simons income does not fall particularly in that year. Wealth rises, but not because the lower flow in period 10 constitutes an investment. Rather, the rise from 66.05 to 67.65 reflects two components: a rise of 6.6 representing interest on 66.05 at 10% and a fall of 5 because wealth is converted to earnings in that amount. This net increase in wealth of 1.6 would have occurred even if there were no "investment" -- that is, if it simply was the case that year 10 was going to be a low earnings year.

Second, consider period 15. Even though earnings is twice as high, Haig-Simons income is slightly lower than in period 14. The reason, again, is that Haig-Simons income is simply the interest on the prior period's human capital. In period 16, Haig-Simons income falls additionally because there is a drop in

wealth in period 15: wealth rises by 5 representing interest and falls by 20 because that much wealth is converted to earnings, for a net fall of about 15.

Viewing the investment as a whole, the main point is that its effects are reflected in wealth at period 0. The lower annual earnings and consumption in the investment year and the higher flow in the recovery year are anticipated, so they are reflected in initial wealth and in each year's change in wealth (meaning that they affect Haig-Simons income in each year before the investment takes place). The "investment" character is not particularly relevant. If it were anticipated that some years would involve lower earnings and others higher, whether because of planned investment, natural changes in capacity, or exogenous economic factors, the analysis would be the same.

The only way investments and returns can cause notable changes in annual Haig-Simons income is if they are unanticipated. Thus, if a new educational opportunity is presented or an expected one becomes unavailable (or not worthwhile in light of unexpected changes in the economy), Haig-Simons income would change on that account. Or, if the value of one's education were uncertain ex ante, and perhaps only revealed upon completing education or taking a first new job (or slowly over time, as one switched jobs or was promoted), the resolution of uncertainty would give rise to Haig-Simons income, as noted previously. Observe, however, that such income is just as likely to be negative as positive. For example, a graduate who gets a job that pays more than the job held previously, but not as higher paying as anticipated, experiences a decline in wealth (because initial wealth consisted of the expected present value of future earnings). An increase in wealth arises only if the higher paying job offers a wage greater than the anticipated increase.

## 2. Actual and Alternative Income Taxation of Human Capital

### 2.1. Wages

The standard, uncontroversial income tax treatment of wages is that they are income when earned. Thus, in the preceding illustrations, income in each period would simply be the earnings flow in column A. True Haig-Simons income

is thus understated by the change in wealth in each period (which is positive for period 0 and negative in most instances thereafter). Thus, conventional "income tax" treatment is precisely that of a wage or consumption tax. It is familiar that a consumption tax ignores unrealized appreciation, and that a conventional income tax is much like a consumption tax with respect to unrealized capital gains and pension savings. The analysis in section 1 establishes that a conventional "income" tax offers consumption tax treatment for the largest component of wealth, human capital.

## 2.2. Investment in Human Capital

Previous analyses have argued that the current U.S. income tax mistreats investments in human capital (education, on-the-job training) in two respects: (1) foregone earnings are effectively expensed rather than capitalized (because the foregone earnings are simply not taxed), and (2) direct outlays (e.g., tuition) are often not deductible when they should be capitalized.<sup>7</sup> While it is clear that current rules are not correct (and obviously discriminate in favor of investing time rather than making expenditures), the treatment proposed by others does not correspond to measuring Haig-Simons income. As noted in subsection 1.2, Haig-Simons income would include the discounted present value of an educational investment in period 0 wealth, which also implies that income in each period before the time of the investment itself also reflects Haig-Simons income for that project.<sup>8</sup>

---

<sup>7</sup> See, e.g., Boskin (1977), Goode (1976); Stephan (1984), Vickrey (1947); also Beer (1993) (suggesting that investments in human capital be treated as purchases of options). The second discriminates against investments in human capital relative to those in physical capital. The first is ambiguous: expensing is more generous than capitalization when tax rates are constant, but, with progressive rates, expensing may be less generous because all the implicit deduction may come in low-earning years when the actual decline in the value of human capital may be in high-earning years. (The tax system affects investments in human capital in other respects: for example, free or below-cost public education is tax-free and contributions to educational institutions are deductible.)

<sup>8</sup> Related, as discussed previously, Haig-Simons income is not affected by the fact that lower new receipts in a period arise due to an investment in education or simply the inability to earn more; nor is it affected by whether higher future earnings reflect investment or innate ability. Proposed "correct" treatments of investments in human capital, however, treat these quite differently. (When innate ability is responsible for low earnings in early years and higher earnings later, the treatment is more favorable -- assuming identical tax rates in each period -- than when the same earnings patterns reflects investments in human capital.)

The difference between Haig-Simons income and various alternative treatments can be understood better in a modified example. The example in table 3 -- an investment of 5 in period 10 for a return of 10 in period 15 -- had a positive present value at the time it was made. Consider instead an investment of 5 with a return of 8.05, which has a present value of zero. (Table 4 presents only the investment itself to clarify the discussion.)

TABLE 4

| Period         | A<br>Earnings<br>("Income") | B<br>Change<br>in Wealth | C<br>True Haig-<br>Simons Income<br>(A + B) | D<br>End of Period<br>Wealth<br>(Previous D<br>+ Current B) |
|----------------|-----------------------------|--------------------------|---|---|
| 0              | 0                           | 0                        | 0   | 0   |
| 1              | 0                           | 0                        | 0   | 0   |
| 2              | 0                           | 0                        | 0   | 0   |
| 3              | 0                           | 0                        | 0   | 0   |
| 4              | 0                           | 0                        | 0   | 0   |
| 5              | 0                           | 0                        | 0   | 0   |
| 6              | 0                           | 0                        | 0   | 0   |
| 7              | 0                           | 0                        | 0   | 0   |
| 8              | 0                           | 0                        | 0   | 0   |
| 9              | 0                           | 0                        | 0   | 0   |
| 10             | -5                          | 5                        | 0   | 5   |
| 11             | 0                           | 0.50                     | 0.50  | 5.50  |
| 12             | 0                           | 0.55                     | 0.55  | 6.05  |
| 13             | 0                           | 0.61                     | 0.61  | 6.66  |
| 14             | 0                           | 0.67                     | 0.67  | 7.32  |
| 15             | 8.05                        | -7.32                    | 0.73  | 0   |
| 16             | 0                           | 0                        | 0   | 0   |
| 17             | 0                           | 0                        | 0   | 0   |
| 18             | 0                           | 0                        | 0   | 0   |
| 19             | 0                           | 0                        | 0   | 0   |
| 20             | 0                           | 0                        | 0   | 0   |
| Total          | 3.05                        | 0                        | 3.05  |   |
| PV of<br>Total | 0                           | 0.88                     | 0.88  |   |

In this case, there is no effect on Haig-Simons income before period 11. (The present value of zero in period 10 obviously has a present value of zero in all prior periods). In period 10, the investment of 5 is sunk, so wealth at the end of the period is 5. This produces Haig-Simons income in periods 11 through 15, corresponding to the interest on the wealth. In period 15, aside from the interest, there is no Haig-Simons income from this investment (because wealth falls by the amount earned).<sup>9</sup> This result corresponds to

capitalizing the initial investment of 5 and applying economic depreciation, which by definition reflects the change in value of the investment over time. When the asset produces only a single flow at the end of its useful life, there is economic appreciation until that time, and a single decline (to zero) at the end. This, combined with including the period 15 flow in income, gives the Haig-Simons result.

Thus, the alternative capitalization approach for investments in human capital would correspond to Haig-Simons income if investments in human capital had a present value of zero. While this may be true at the margin, it will not be true as a whole. The capitalization treatment ignores the positive present value, taxing only the higher cash flow, when earned. This constitutes a realization (consumption tax) approach to the extent of the positive present value. Haig-Simons income includes the positive present value in wealth beginning in period zero. (And, as noted in subsection 1.3, there are substantial changes in the valuation of wealth only when uncertainty is resolved -- for example, if an investment turns out to be more or less valuable than was anticipated.)

### 2.3. Taxation of Physical Capital Compared

It has been suggested that capitalization of investments in human capital would eliminate discrimination between them and investments in physical capital. One might ask how this can be true if capitalization systematically undertaxes (relative to Haig-Simons income) investments in human capital. The answer lies in the distinction between positive and zero present value projects. With a machine, it is generally assumed that the purchase is made at a competitive price and that the use will be in producing a product sold in a competitive market. In such instances, the present value of the investment is zero. In such cases, capitalization (with economic depreciation) measures Haig-Simons income accurately.

---

<sup>9</sup> The table shows a decrease in wealth of 7.32, which is the wealth at the beginning of the period; if one adds the interest of .73 during the period to that amount, the total is 8.05, the amount of earnings in the period.

Consider an investment in a machine with a positive present value. In this case, the basis for depreciation in a conventional income tax will be cost, so that even if an economic depreciation rate is employed, income will be mismeasured. The positive present value, as in the example in table 3 involving the human capital investment, is taxed on a deferred basis, when earnings are received. Thus, capitalization does treat human and physical capital similarly, but this treatment correctly measures Haig-Simons income only when the present value of an investment is zero.<sup>10</sup>

Physical capital, at the time it is purchased or constructed, does not generally have a nonzero present value. To the extent there is positive present value, it is the opportunity to make the investment rather than the machine itself that has the positive value. (The machine is fungible; the opportunity by assumption is not, for if it were the excess profits would be competed away.) Such positive values may arise due to a monopoly position (whether secured by a patent or otherwise), scarcity of resources one already owns, or entrepreneurial ability possessed by the purchaser (i.e., human capital). Most returns properly attributed to physical capital, in contrast, simply involve recoveries of cost.

With human capital, however, positive present value investments are the rule.<sup>11</sup> But such investments have positive value only when viewed narrowly, as in table 3 where an individual invests 5 in period 10 for a return of 10 in period 15. The value lies in the opportunity to make this investment, which, in the example, existed at birth. (In other instances, the opportunity may not be apparent until later, but it remains true that the availability of the opportunity rather than the investment itself that produces the change in wealth.) Each individual's human capital is an asset -- often the only significant asset -- they own. The returns on this asset, whether their

---

<sup>10</sup> Related, just as the value of an investment in human capital may change due to the resolution of uncertainty, so may the value of physical capital. And, with physical capital, such changes in value are not generally recognized. (Of course, when physical capital declines in value, there is an incentive to sell it to realize the loss currently.) Rules for valuing inventory are an exception, in that they sometimes allow valuation at market rather than at cost.

<sup>11</sup> See, e.g., Davies and Whalley (1991, appendix).

present value is ascertainable at birth or only becomes known gradually over time, is taxed on a deferred basis. Individuals do not sell their human capital in its entirety, so there are few realization events other than the continual experience of engaging in labor, producing current earnings.<sup>12</sup>

Thus, applying the conventional tax treatment of physical capital to human capital would not accomplish complete taxation of Haig-Simons income in most cases. It would, however, be a means of eliminating a distortion between investments of physical and human capital. The reason is that even though human capital investments typically have a positive present value, they would tend to have a zero present value at the margin.<sup>13</sup> Thus, applying the same rules would result in no marginal distortion. Accepting such a proposal on these grounds, of course, suggests that the objective is promoting efficiency rather than attempting to implement an ideal Haig-Simons tax base.<sup>14</sup>

#### 2.4. Taxation of Financial Investments Compared

It was suggested in section 1 that annual earnings and consumption were not Haig-Simons income, as they merely represented the conversion of human capital into a current flow. (That is, the consumption is precisely offset by a reduction in the value of human capital.) Rather, income arises from the fact that future flows are one period closer at the end of each period, so

---

<sup>12</sup> One could imagine making exceptions for personal services contracts -- for example, one guaranteeing an athlete a salary over five years regardless of whether he can play, or a professor's tenure contract. Also, when rights are converted -- as when one authorizes future use of one's name -- income is currently realized. (When one is injured in an accident, however, the Internal Revenue Code excludes from income compensation for lost future wages; the exclusion is permanent, rather than merely a rule designed to mimic the timing of tax liability that would have occurred but for the accident.)

<sup>13</sup> The most plausible exception would involve lumpy investment possibilities.

<sup>14</sup> As indicated in note 8, such a result would treat individuals who invest in human capital less generously than individuals who obtain the same earnings in each period as a result of innate ability. While this would be inequitable from a Haig-Simons perspective, it does not distort behavior (except to the extent that prior decisions, such as choices to have children, may be affected).

More generally, the exclusion of the value of human capital in period 0 does not distort behavior. This may seem to make the exclusion of it from the tax base less problematic, but actually it is a serious problem from an efficiency perspective as including it would essentially amount to levying a lump-sum tax on ability. See also note 24.

Haig-Simons income simply equals the value of wealth at the end of the prior period times the interest rate. This characterization has analogs for common financial investments.

Consider first a dividend-paying stock. While dividends are generally viewed as one of the most obvious components of income (after wages), it should be apparent that dividends are not Haig-Simons income. If one owns a share of stock worth 50 immediately before a dividend and a share worth 49 immediately after a dividend of 1, there is no change in wealth. Any change in wealth represented by the dividend occurred previously and would be reflected by a prior rise in the value of the shares. But investments in stock are usually taxed on a realization basis, so unrealized gain (or loss) is ignored. Dividends are taken to be realization events to the extent of the dividend (and without regard to basis). If a stock paid dividends equal to the corporation's earnings at all times, the tax treatment would correspond to that in the above examples involving human capital: the flow would be taxed, but not changes in wealth. If, however, the flow is expected to be constant indefinitely and the investment had zero present value (i.e., the price of the stock equaled the present value of the future flows), this measure of income would be accurate. Human capital differs because of the positive present value at the outset (and because it inevitably has a finite life).

Second, consider interest on a bond. While interest is also classically viewed as income, this characterization is potentially misleading as in the case of dividends. Even if no interest is currently paid (as with an original issue discount obligation), there is still income. The income consists of the increase in present value arising because each period the final payment moves one period closer. That some cash may be transferred periodically from the borrower to the lender affects the amount of principal outstanding, but not whether income arises.<sup>15</sup>

---

<sup>15</sup> Limiting taxation to interest actually paid is imposing a type of realization requirement. As is familiar, awaiting realization is tantamount to consumption tax treatment to the extent of the deferral involved.



## 2.5. Human Capital as a Gift

One might rationalize the conventional treatment of human capital, which ignores period zero wealth and the changes in wealth thereafter, by calling one's endowment of human capital a "gift," which would not be taxed under a conventional income tax. Related, human capital would be deemed to have a carry-over basis of zero, which would explain why no amortization is allowed.<sup>16</sup> Finally, changes in the value of human capital due to the resolution of uncertainty might be ignored under the guise of the realization requirement, as is done for physical assets and investments.

While all this could be said, it still does not explain why this wealth is not "wealth." The exclusion of gifts from recipients' income, carry-over basis, and ignoring unrealized gains and losses are all contrary to the Haig-Simons income concept.<sup>17</sup> To be sure, some have objected to taxing gifts both to the donor and donee, although such arguments are not usually grounded in the concept of income, certainly as an economist would view it.<sup>18</sup> Even granting that gifts should be included only once, it is more commonly argued that gifts are income to donees (the income being no longer available to donors), while taxing donors instead is administratively more feasible.<sup>19</sup> But the value of one's genetic endowment has not been taxed to the donor, unlike the value of cash.<sup>20</sup> So, by this logic, perhaps human capital should be included in the tax base in any event.<sup>21</sup>

---

<sup>16</sup> The gift of human capital is commonly called an "inheritance," even though the donor is still alive. The tax treatment would then involve the step-up of basis to current market value, which is not provided for human capital and is by consensus viewed as contrary to a pure tax on income.

<sup>17</sup> Simons (1938) in particular emphasized how conventional gift treatment was improper.

<sup>18</sup> For an exception, see Brennan (1978).

<sup>19</sup> This argument implicitly assumes that gifts involve no implicit quid pro quo; if they did, they would be little different from purchases of personal services, and thus the recipient should be taxed with no offsetting deduction to the donor.

<sup>20</sup> The value of human capital is also excluded from the base of gift and estate taxes.

<sup>21</sup> One might counter that when gifts of appreciated assets are made, the appreciation is not taxed to the donor; nor is it taxed to the donee until there is a realization event. This does correspond to the present treatment

Whatever categories are invoked and analogies made, it seems apparent that the conventional income tax treatment of human capital is inconsistent with a unified concept of income that considers economic values.<sup>22</sup> Unavoidable difficulties in coming to agreement on stipulated definitions reflect on the desirability of designing a tax base in reliance upon definitions of abstract concepts rather than appeals to underlying objectives, as is discussed in the conclusion.

### 3. May One Tax Human Capital?

Two common objections to applying the Haig-Simons concept to human capital are that it would be infeasible and in violation of individual liberty. It is thought to be infeasible because of valuation problems.<sup>23</sup> How would one determine the value of an individual's human capital at birth? Or even at graduation from college? Just as we do not tax changes in the value of physical capital or investments until realization (with cash flows produced often counting as partial realization events), we arguably cannot tax human capital until realization through earnings. In fact, individual idiosyncrasy and the lack of a market may be a much larger obstacle to accurate valuation than for financial investments (many of which are actively traded) or physical investments (where there may be some trading). A related problem concerns liquidity: In the first example, how would one in period zero pay a tax on Haig-Simons income of 85 (which was over half the present value of the individual's Haig-Simons income)?

Taxing human capital also is thought to violate liberty, as it might force individuals to work in order to realize the value of their human capital so that they could pay their taxes. It is suggested that this objection is not

---

of human capital. But it is well recognized that allowing deferral of tax on unrealized appreciation is contrary to the Haig-Simons concept. Moreover, one suspects that for most families (all but the very wealthy), the bulk of gifts to younger generations other than of human capital do not have a significant component of unrealized appreciation that is deferred for substantial periods of time.

<sup>22</sup> The discussion of the comparison of an income and consumption tax in section 4 reinforces this argument.

<sup>23</sup> See, e.g., Stephan (1984).

inconsistent with taxing wages actually earned, because then the individual has already chosen to enter the market.<sup>24</sup>

While both lines of argument have frequently been stated, they have received little development (in sharp contrast to whether physical and financial investments should be taxed purely on a realization basis). For present purposes, two thoughts are in order. First, it is always useful to consider theoretical ideals and to follow arguments (here, from the Haig-Simons definition) to their logical conclusions even if the result may not be implemented. Perhaps defects in applying the Haig-Simons approach to human capital reflect on the underlying value of that approach. (On this, more below.) Also, in fashioning second-best proposals, it is useful to know the starting point from which one may be distorting incentives or altering the distribution of wealth.

Second, both objections derive most of their force from the assumption that taxing human capital would involve performing early valuations and requiring that tax be paid regardless of whether individuals actually work. Consider a more modest approach: tax wages when earned, but gross them up by a factor designed to reflect the extent to which Haig-Simons income is understated.<sup>25</sup> In the examples presented above, a multiplier of  $1 + rt/(1+r)$ ,

---

<sup>24</sup> See, e.g., Warren (1980). This argument is related to the objection against taxing the value of leisure, or, more generally, employing an ability tax. I find such general objections much less plausible than do many commentators. First, I find it persuasive that an ability tax, if feasible, follows from utilitarian, Rawlsian, or other starting points that are concerned substantially with individual welfare. A contrary, libertarian perspective suggests that a distributive (as opposed to benefits-funding) role for taxes is essentially unjust; if this principle were accepted, an income or consumption tax of the sort normally discussed would be unlikely to pass muster. Second, the forced wages argument is rather strained. Income, sales, property, and other taxes may force the poor to work more than otherwise, and they surely induce others to adjust their behavior. Also, consider that an ability tax with an upper limit of 90% of wages or income would probably achieve 99% of the ability tax result without literally violating the forced-labor constraint. Finally, the justification for the view that individuals have an entitlement to 100% of the fruits of their time when they use it outside the marketplace but not when, because they are not multi-talented, they must trade on the market (to the benefit of others, to the extent of consumers' surplus) is obscure. See Stephan (1984).

<sup>25</sup> Vickery and others have long proposed that a similar approach be applied when taxing capital gains. Auerbach (1991) has offered a scheme of retrospective capital gains taxation that is holding-period neutral (i.e., one that does not distort realization decisions), but that does not require information on values over the holding period. It also avoids liquidity

where  $r$  is the interest rate and  $t$  is the time period of the flow, will result in a present value of the income tax base precisely equal to the present value of true Haig-Simons income.<sup>26</sup>

Note how this approach avoids the familiar objections. No valuation or liquidity problems arise (aside from ones ordinarily involved in taxing wages). Nor is there any forced labor: as with a conventional tax on wages, the tax base is only the wages actually earned.<sup>27</sup>

---

problems, by allowing the tax to be paid only upon a sale (or other selected recognition events).

<sup>26</sup> To demonstrate this, let  $e$  be the amount of earnings in period  $t$ . Initial (period 0) wealth due to these earnings is  $e/(1+r)^t$ . In period  $i$  (for  $i \leq t$ ), there will be an increase in wealth of  $er/(1+r)^{t-i+1}$ , reflecting that the future flow is getting closer in time to the present. Finally, in period  $t$ , there is also a decline in wealth of  $e$ . Taking the present value of all these components yields an increment to the present value of Haig-Simons income of  $e[1+rt/(1+r)]$ . (In a model with continuous time, the multiplier would be  $1 + rt$ .) The text does not address uncertainty, but it should be clear that the results would be the same. That is, applying the multiplier to each possible future wage flow and weighting by probabilities will give a present value of Haig-Simons income at any point in time equal to what one would have applying the definition directly, as was done in the examples in section 1. (This statement is correct on average -- *ex ante* -- but not *ex post*. For example, individuals experiencing more favorable than average resolutions will be overtaxed, in that the multiplier is based on the assumption that the higher wages were anticipated beginning in period 0. Individuals experiencing unfavorable resolutions are undertaxed.)

This approach does not simulate implementation of a Haig-Simons tax base in all respects. First, it omits imputed income. Second, while it provides the same results in terms of present values, it need does not measure utility, which differs when individuals are risk-averse (assuming, as seems plausible, that some of the risk in future income from one's human capital cannot be diversified). Whether this difference makes the surrogate approach more or less desirable than pure Haig-Simons treatment depends upon the objectives one chooses to pursue, as emphasized in the concluding remarks. Third, the approach insures only that the present value of the tax base is correct, which is sufficient with proportional rates but not with progressive rates. (The problem of an optimal progressive rate structure if human capital were treated in accordance with the Haig-Simons concept is obviously complicated, as much of one's lifetime income is in period 0. One could apply some sort of averaging.) Fourth, as discussed in note 29, its effect on the incentive to work are rather different from a tax that made most of its levy on the period 0 present value of future labor income. See also note 14.

<sup>27</sup> If the time period is long enough and the interest rate high enough, one would have to worry about taxes exceeding 100%. Of course, with multipliers applied to all wage income, tax rates raising the same revenue would be lower. The problem of taxes owed exceeding wages can, however, still arise. (The reason is that, as is familiar, an income tax can make an asset having positive present value have negative present value after payment of taxes. The asset consisting of the right to a future year's earnings could be subject to this effect.) As a practical matter, one could modify the approach in various ways (withholding in early years, capping the maximum rate, or applying a constant multiplier as discussed below).

Thus, a simulated tax on human capital that follows the dictates of the Haig-Simons approach seems feasible and not obviously offensive to liberty. This still leaves the question of whether it is desirable.<sup>28</sup> The posited multiplier has what may appear to be peculiar properties for defining a tax base designed to measure ability to pay. In particular, the multiplier increases with time. In the preceding example with an interest rate of .1, the multiplier rises from 1 in period 0 to nearly 2 in period 10 and almost 3 by the last period. Why should wages of one near retirement be taxed at nearly three times the level of one early in a career? The answer, simply, is that the Haig-Simons concept of income includes interest in the tax base. Thus, the later flows add to wealth initially, and are earning interest as well throughout. The component in the multiplier,  $tr$ , represents the periods over which interest is earned. Thus, wages earned late in life must be grossed up to reflect this. (A Haig-Simons income tax would treat a machine producing this earnings pattern the same way: if one purchased it for zero in period zero, immediately had the value included in the tax base, and then paid tax on its earnings net of any depreciation or appreciation thereafter, the result would be identical to excluding the value of the machine at time zero, ignoring changes in wealth throughout, and grossing up earnings in each period by this multiplier, implying a higher tax as time passes.) Regardless of what one thinks of the equity implications, it is clear that such a tax on labor income would be problematic with regard to its distortion of the labor-leisure choice.<sup>29</sup>

An alternative approach to taxing wages as earned in an attempt to implement the Haig-Simons concept would be to compute a single multiplier to be applied to wages in every period that would produce a tax base having a

---

<sup>28</sup> One objection would be that taxing human capital on an effective accrual basis while taxing capital income on a realization basis would distort investment. Thus, if one favored taxation of true Haig-Simons income, a movement toward an accrual system for human capital might best be accompanied by such an approach with physical and financial assets -- whether using market-to-market or Auerbach's (1991) retrospective approach.

<sup>29</sup> It is familiar that a constant tax rate is usually less distorting than a rate that varies over time while raising the same amount of revenue, because distortion in each period rises disproportionately with the tax rate. See also note 14.

present value equal to the present value of Haig-Simons income. In table 1's illustration, the multiplier would be approximately 1.68.<sup>30</sup> The magnitude of this multiplier indicates the extent to which the Haig-Simons tax base is understated on account of taxing only wage flows. More generally, the appropriate multiplier for a given individual would depend on the actual earnings over his lifetime, and thus could not be computed with certainty in early years. One could make approximations based on life expectancy and other information, perhaps with corrections in later years, but then the system might be both more complicated and less precise than using annually increasing multipliers. Moreover, if one truly believed in taxing Haig-Simons income properly, it is not clear why the use of increasing multipliers would be objectionable.<sup>31</sup> Rather, applying a constant multiplier to differing individuals would overtax those with more earnings in early years and undertax those with earnings concentrated in later years, relative to true Haig-Simons income.

#### 4. The Choice Between an Income Tax and a Consumption Tax

It has been demonstrated that, under a conventional income tax, wages receive consumption tax treatment. This is true to the extent inheritance, broadly construed,<sup>32</sup> determines future wages. If expenses of education -- direct outlays and foregone income -- were capitalized, as has sometimes been suggested, then future wages, to the extent their discounted value does not exceed educational costs, would receive income tax treatment. But to the extent education has a positive present value, consumption tax treatment is provided. Because human capital is such a substantial component of wealth, these aspects of a conventional income tax represent a substantial departure from pure Haig-Simons income tax treatment, possibly greater than the failure

---

<sup>30</sup> This is derived simply by dividing the present value of true Haig-Simons income, 143, by the present value of the wage flow, 85.

<sup>31</sup> One might amend the income concept to include some sort of averaging of effective tax burdens over time. Presumably the desirability and appropriate form of such averaging would have to be derived from a principle other than that of taxing Haig-Simons income. (See the discussion in the concluding remarks concerning arguments from stipulated definitions versus derivations from underlying objectives.)

<sup>32</sup> That is, it includes genetic endowment as well as learning in the home.

to tax unrealized appreciation of physical and financial assets and the consumption tax treatment available for much of retirement savings.

As a result, most discussions that compare an income tax and a consumption tax are not really engaging in such a comparison (to the extent wage income is involved). In order to make the comparison involve a pure income tax, one would have to change the treatment of wages. This may affect the analysis and one's view of the results. For example, section 3 indicates that a true Haig-Simons income tax produces a higher effective burden on wages earned in later years, which affects both the equity and efficiency of the tax. If, for example, one objected to such treatment of human capital, then one should consider whether such reasoning also called for rejecting what is really analogous treatment of physical and financial capital under an accrual income tax.

Related, the present analysis of human capital casts light on a familiar argument concerning the fairness of an income tax versus a consumption tax. A consumption tax often is said to be fairer than an income tax because the latter discriminates among individuals depending on when they earn income. The argument can be seen in the following illustration (which assumes an interest rate of .1):

TABLE 5

|   |          | Year 1 | Year 2 | PV    |
|---|----------|--------|--------|-------|
| A | Earns    | 10     | 0      | 10    |
|   | Consumes | 0      | 11     | 10    |
|   | "Income" | 10     | 1      | 10.91 |
| B | Earns    | 0      | 11     | 10    |
|   | Consumes | 0      | 11     | 10    |
|   | "Income" | 0      | 11     | 10    |

Individual A earns 10 in year 1 and consumes 11 in year two, which is possible because of interest income of 1 in year 2. B also consumes 11 in year 2, but finances this out of year 2 earnings. Consumption taxation would produce the same outcome for both these individuals. An income tax, it is suggested, discriminates against A, who has the misfortune to earn his income earlier.<sup>33</sup>

<sup>33</sup> See, e.g., Andrews (1975) (indicating that this argument is more important than the one that an income tax discriminates according to time of

He has the same present value of earnings as B, and the same pattern of consumption, yet has more taxable income.

This argument would no longer be valid if instead of a conventional "income" tax, one considered a tax on Haig-Simons income, including human capital. In that case, B would have year 1 income of 10 (the present value of earning 11 in year 2) and year 2 income of 1 (the interest on year 1 wealth, as the 11 moves from the future to the present). Thus, both individuals have identical Haig-Simons income, so there is no discrimination.<sup>34</sup> The discrimination in the conventional income tax arises because earnings are given consumption tax treatment, while savings are not. It is this departure that discriminates in favor of those who earn later, rather than anything inherent in the Haig-Simons income concept.

It remains the case that the income tax does not treat equally (in present value terms) individuals who *consume* their wealth in different periods. This difference, which does not depend on when or how income is earned, is unaffected by the analysis of human capital.

## 5. Concluding Remarks

This article has demonstrated that a Haig-Simons income tax on human capital departs substantially from conventional and proposed income tax treatments of wages and education. Despite previous objections to including human capital more directly in the tax base, it appears that one could move substantially toward a more complete Haig-Simons tax base without great administrative difficulty and without raising serious objections concerning violations of individual liberty. Finally, it is suggested that the

---

consumption), Blueprints for Basic Tax Reform (1984). The analysis assumes that the earlier earnings have the same present value as the later earnings. If they had the same nominal value, the one with earlier earnings would be better off in a no-tax world as well as with an income tax.

<sup>34</sup> It is straightforward to demonstrate that this argument holds with any number of periods and any pattern of earnings, as long as the present value of earnings and consumption patterns are the same. If B earns less than A in period  $t$  and more in period  $t'$  (with the present value being equal), B can borrow from the  $t'$  earnings to provide equal available funds for period  $t$ . The income tax treatment of the interest precisely offsets the income tax treatment of the differences in the earnings stream for each time period. Thus, Haig-Simons income in each period is the same for both individuals.



conventional income tax is closer to a consumption tax than is generally realized, because human capital -- the most important asset of most individuals -- receives treatment that is close to that dictated by a consumption tax.

The question remains of what implications follow from this analysis. First, it should be observed that neither the Haig-Simons definition of income nor the base of a consumption tax follow directly from basic moral principles or a particular view of distributive justice.<sup>35</sup> Thus, it might be more useful to ask what treatment of human, physical, and investment capital is best from some such ethical perspective. Most fairness arguments tend to appeal to instincts rather than first principles. Moreover, since taxation is a complex second-best problem, in which considerations of a just distribution, incentives, and administrative costs must be traded off, it is important to identify precisely one's underlying objectives and how they are to be weighted, for otherwise there is no way to determine which imperfect system is preferable.

Nonetheless, stipulated definitions, such as the Haig-Simons definition of income, and conventional fairness arguments often prove helpful. For example, if investments in human and physical capital are treated differently (and in a manner that results in a different net burden), investment decisions surely will be distorted. Thus, one might argue that capitalizing foregone earnings and direct outlays for human capital investments is desirable because it is closest to how we treat investments in physical capital.<sup>36</sup>

Perhaps the most provocative issue raised by considering the application of the Haig-Simons definition to human capital is the propriety of taxing individuals on their period 0 wealth -- that is, their expected future income

---

<sup>35</sup> For the consumption tax, it can be said that in some simple models it is consistent with maximizing welfare from a utilitarian perspective. See, e.g., Atkinson and Stiglitz (1980). Most arguments about the fairness of the tax are not generally so grounded.

<sup>36</sup> This argument does not clearly follow from a definition of income, however. Rather, it begins with the existing treatment of physical capital, which sometimes involves a departure from Haig-Simons treatment, and applies the approach to human capital, where substantial departure is the rule rather than the exception.

at birth. Setting aside problems of feasibility and liberty, because they may be alleviated by taxing later wages inflated by an appropriate multiplier, the question arises whether such treatment is desirable in principle.

Arguably, less turns on this question than first appears. Since all individuals' tax bases would be increased similarly over their lifetimes (allowing correspondingly lower rates), the effect may largely be a wash. Differences would arise among individuals with different life expectancies and earnings profiles, but these usually would be modest in comparison to the magnitude of initial wealth of such individuals. With regard to different earnings profiles, the Haig-Simons approach, it was noted, taxes earnings later in life at a much higher rate than earnings earlier. Such uneven tax rates over time may result in a greater distortion of the labor-leisure choice than arises under conventional treatment (equivalent to consumption tax treatment).

Another effect of taxing full Haig-Simons income with respect to human capital would be to increase labor's share of the tax base. (In the illustration in table 1, the excluded portion, in present value terms, is over 40% of the Haig-Simons tax base.) If one simultaneously moved more closely to accrual taxation of capital income, there would be an opposing effect. Whatever the magnitude of the net effect, however, it seems arbitrary for the shares of revenue to be raised by taxing labor and capital to be determined by deduction from a stipulated definition, rather than with regard to considerations of efficiency and the resulting distribution of wealth.

## References

- Andrews, William D., 1974. "A Consumption-Type or Cash Flow Personal Income Tax." *Harvard Law Review* 87, 1113-1188.
- Andrews, William D., 1975. "Fairness and the Personal Income Tax: A Reply to Professor Warren." *Harvard Law Review* 88, 947-958.
- Atkinson, Anthony B. and Joseph E. Stiglitz, 1980. *Lectures on Public Economics* (New York: McGraw-Hill).
- Auerbach, Alan J., 1991. "Retrospective Capital Gains Taxation." *American Economic Review* 81, 167-178.
- Beer, Yishai, 1993. "Toward Extension of the Option Tax Legislation." *Tax Notes*, February 22, 1097-1107.
- Blueprints for Basic Tax Reform, 1984 (Bradford, David F. and the U.S. Treasury Tax Policy Staff).
- Boskin, Michael J., 1977. "Notes on the Tax Treatment of Human Capital," in *Conference on Tax Research 1975* (Washington: U.S. Government), 185-195.
- Bradford, David A., 1986. *Untangling the Income Tax* (Cambridge: Harvard University Press).
- Brennan, Geoffrey, 1978. "Death and Taxes: An Attack on the Orthodoxy." *Public Finance/Finances Publiques* 33, 201-224.
- Davies, James and John Whalley, 1991. "Taxes and Capital Formation: How Important Is Human Capital?," in *National Saving and Economic Performance* (Bernheim, B. Douglas and John B. Shoven, eds.) (Chicago: University of Chicago Press) 163-197.
- Goode, Richard, 1976. *The Individual Income Tax* (Washington: Brookings Institution).
- Goode, Richard, 1977. "The Economic Definition of Income," in *Comprehensive Income Taxation* (Pechman, Joseph A., ed.) (Washington: Brookings Institution) 1-30.
- Klein, William A., 1977. "Timing in Personal Taxation." *Journal of Legal Studies* 6, 461-481.
- Simons, Henry C., 1938. *Personal Income Taxation* (Chicago: University of Chicago Press).
- Stephan, Paul B., 1984. "Federal Income Taxation and Human Capital." *Virginia Law Review* 70, 1357-1427.
- Vickrey, William, 1947. *Agenda for Progressive Taxation* (New York: Ronald Press Co.).
- Warren, Alvin, 1980. "Would a Consumption Tax Be Fairer Than an Income Tax?" *Yale Law Journal* 89, 1081-1124.