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A Comprehensive Attack on Tax Deferral

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A COMPREHENSIVE ATTACK ON TAX DEFERRAL†

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The definition of a tax base developed by Haig and refined by Simons has become the normative standard for evaluating income tax rules.[1] Haig-Simons income is defined as the sum of "(1) the market value of rights exercised in consumption and (2) the change in the value of the store of property rights between the beginning and end of the period in question."[2] Although the accretion tax model Haig-

1. H. SIMONS, PERSONAL INCOME TAXATION (1938). Simons had a limited, but important, purpose in setting out a definition of "ideal income":

> Since the devices of accounting and tax legislation contemplate only very rough approximation to income, it is decisively important to see behind these methods of calculation an "ideal income," calculable by different and less practicable methods. Only on the basis of some broader conception is it possible to criticize and evaluate merely practicable procedures and to consider fruitfully the problem of bettering the system of presumptions. Indeed, if there be any excuse for a treatise like this, it must lie in the importance of maintaining some broad — and perhaps quite "impractical" — conception in terms of which existing and proposed practices in income taxation may be examined, tested, and criticized.

Id. at 105-06 (footnote omitted). It served this function well, as demonstrated by even a brief review of recent legal literature. *See, e.g.*, Andrews, *A Consumption-Type or Cash Flow Personal Income Tax*, 87 HARV. L. REV. 1113, 1113-19 (1974); Epstein, *The Consumption and Loss of Personal Property Under the Internal Revenue Code*, 23 STAN. L. REV. 454, 455 (1971); Halperin, *Interest in Disguise: Taxing the "Time Value of Money,"* 95 YALE L.J. 506, 508-09 (1986); Kelman, *Personal Deductions Revisited: Why They Fit Poorly in an "Ideal" Income Tax and Why They Fit Worse in a Far from Ideal World*, 31 STAN. L. REV. 831, 833 (1979); Klein, *Timing in Personal Taxation*, 6 J. LEGAL STUD. 461, 463, 464 n.17 (1977); Stephan, *Federal Income Taxation and Human Capital*, 70 VA. L. REV. 1357, 1359 n.2 (1984); Strnad, *Taxation of Income from Capital: A Theoretical Reappraisal*, 37 STAN. L. REV. 1023, 1024-25 (1985).

2. H. SIMONS, *supra* note 1, at 50. Simons discussed Professor Haig's earlier accretion concept. *Id.* at 61-62. That concept was introduced in Haig, *The Concept of Income — Economic and Legal Aspects*, in THE FEDERAL INCOME TAX 1, 7 (R. Haig ed. 1921). Simons also gave credit for this definition of "income ideal" to Georg Schanz. *Id.*; *see* Schanz, *Der Einkommensbegriff und die Einkommensteurgesetze*, 13 FINANZ ARCHIV 1 (1896); *see also* Musgrave, *In Defense of an Income Concept*, 81 HARV. L. REV. 44, 47 n.7 (1967) (observing that Schanz was the first to propose the accretion concept).

This definition includes (although not explicitly) the income tax itself in the tax base. *See*

Simons describes is the keystone of many tax policy arguments, tax commentators readily admit that administrative constraints turn the definition into an unachievable ideal.[3]

One significant departure from the ideal is the Internal Revenue Code's failure to tax unrealized gains.[4] The Code's treatment of unrealized gains has nothing to do with its definition of income, and everything to do with the timing of the tax assessment. Requiring a realization event before assessing a tax, as the Code does, avoids the difficult administrative problems of determining the value of property by hypothesizing a market event.[5] Additionally, such a requirement prevents the possibility that the taxpayer will be forced to liquidate an investment or borrow to pay any tax due.[6]

Ironically, Simons was generally indifferent to the timing implications of his definition,[7] and instead concentrated his critique of the

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Andrews, *supra* note 1, at 1114 n.2 (demonstrating that including the income tax in the tax base is really only an issue of tax rates).

3. *See, e.g.*, Andrews, *supra* note 1, at 1142-43, 1148; Epstein, *supra* note 1, at 457; Klein, *supra* note 1, at 465.

4. An unrealized gain occurs when a taxpayer retains property that has appreciated in value. The Code taxes this appreciation only when the taxpayer enters into a realization event by disposing of the property. *See* Eisner v. Macomber, 252 U.S. 189 (1920); Andrews, *supra* note 1, at 1115-16, 1123-48. The Code's failure to tax imputed income is the other reason it falls short of the Haig-Simons ideal. *See id.* at 1115, 1122; Klein, *supra* note 1, at 463-67, 475; Stephan, *supra* note 1, at 1363. Although the exclusion of imputed income from the Code's tax base is largely attributable to the definition of income, tax timing also plays a significant role. *See infra* notes 127-33 and accompanying text.

5. *See* H. SIMONS, *supra* note 1, at 56, 100, 103-04, 153; Andrews, *supra* note 1, at 1141-42; *see also* H. SIMONS, *supra* note 1, at 82-89 (critiquing attempts to define income in terms of transaction profit, instead of acknowledging that this approach provided merely an administratively workable solution for identifying income).

6. *See* Andrews, *supra* note 1, at 1143. *But see* Shakow, *Taxation Without Realization: A Proposal for Accrual Taxation*, 134 U. PA. L. REV. 1111, 1167-76 (1986) (providing data showing that liquidity is not as serious a problem as it seems). If liquidity is not significant, then failure to tax periodic increases in the cash surrender value of life insurance policies or deferred annuity contracts is indefensible. Valuation is easy, and to delay tax payment, even a time-value-adjusted tax payment, is unwarranted. *See id.* at 1137-38. The same argument applies to installment sales. *See generally* Note, *Fairness and Tax Avoidance in the Taxation of Installment Sales*, 100 HARV. L. REV. 403 (1986) (discussing tax deferral and tax avoidance opportunities of installment sales).

Two major exceptions to the Code's realization principle are its provision for amortization deductions for wasting assets and other property subject to wear and tear or obsolescence, *see* I.R.C. §§ 167-69, 179, 184, 188, 280F, 611 (1982 & Supp. IV 1986), and its inventory rule of lower than cost or market, *see* Treas. Reg. § 1.471-2(c) (1958); 4 B. BITTKER, FEDERAL TAXATION OF INCOME, ESTATES AND GIFTS ¶ 105.4.4 (1981 & Supp. 3 1989). *See generally* H. SIMONS, *supra* note 1, at 88 (criticizing asymmetric treatment of value changes).

7. There remains the possibility, under the arrangements here proposed, of postponing tax payments and thus of retaining the use of funds which, under an income-tax procedure involving annual reappraisal of investment assets, would be payable to the government at earlier dates. Enjoying large gains, realizable but unrealized, one could in effect borrow from the treasury without interest, sometimes for many years. While this possibility indicates a significant difference between the "ideal" methods of calculating taxable income and the modified realization procedure, there would seem to be no serious inequities involved in adherence to the methods which practical considerations so strongly dictate. . . . Moreover,

federal tax system on its exclusion of certain income items.[8] However, those criticisms pale in comparison to the Code's failure to adhere to what the Haig-Simons ideal establishes as the proper time for tax assessment.[9] That ideal implies that any consumption or changes in the market price of asset holdings that occur during the designated taxing period should be assessed and taxed at that time.[10]

Although the timing differences between Haig-Simons and the Code might appear largely inconsequential because both models use equivalent income measures, time-value-of-money analysis demonstrates that timing differences seriously affect the fairness and allocative efficiency of the taxing system.[11] "Time value of money" is a

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the treasury is protected in most cases against abuse of the postponement opportunities, for wholesale postponement would ordinarily subject the income, when realized, to much higher surtax rates.

H. SIMONS, *supra* note 1, at 168-69; *see also id.* at 208; *id.* at 44 (acknowledging that the term "income" is frequently used to mean gain from transactions and noting that the "distinguishing feature of this conception is that it presupposes no allocation of income to assigned periods of time — that it does not raise the often crucial question as to when 'income' accrues"); *id.* at 50 ("The relation of the income concept to the specified time interval is fundamental — and neglect of this crucial relation has been responsible for much confusion in the relevant literature."); *id.* at 89-100 (critiquing Irving Fisher's work on capital, interest, and consumption).

8. Simons argued that gifts, inheritances, and bequests should be included in the tax base, *see id.* at 56-58, 125-47, as well as interest from state and local securities, *id.* at 170-84, and imputed income from property, *see id.* at 112-19.

9. Professor Warren might criticize the text's claim that the Haig-Simons definition tells us something about timing:

> Simons's idea . . . is strictly personal in its application. As Simons himself put it, the concept is simply an arithmetical operation, designed to identify the change in a person's position over the course of an accounting period. It does not provide a standard for deciding whether a given receipt, transaction, event, or whatever is income in some abstract sense. Nor does the idea usefully illuminate the nature of the aggregate tax base, let alone the appropriate taxable unit or period, a limitation not always appreciated by either Simons's disciples or the denigrators of his formulation.

Warren, *Would a Consumption Tax Be Fairer Than an Income Tax?*, 89 YALE L.J. 1081, 1084-85 (1980) (footnotes omitted). However, although Simons tells us nothing about the appropriate length of a taxing period, his interest in formulating a definition that properly identifies income with persons "for comparative purposes (for measurement of relative incomes)," H. SIMONS, *supra* note 1, at 52, suggests that, whatever taxing period the government adopts, a person's tax base must include consumption and changes in asset values that occurred during that taxing period. *See also supra* note 7 (identifying Simons' acknowledgment of timing issues).

10. The verb *occur* is hopelessly imprecise and ambiguous in a discussion focused on the proper timing of a tax assessment. Nevertheless, I use it instead of the more traditional term *accrue* to avoid confusion with the tax accounting method that presupposes the realization-event model. Moreover, *occur* seems to capture more accurately the central notion of *value* in the Haig-Simons definition of income. *See* H. SIMONS, *supra* note 1, at 99-100 (resisting the term *accrual* because it inadequately describes the notion of periodic reevaluation of the taxpayer's assets and obligations).

11. Time-value-of-money analysis has become conventional fare in the tax legal literature during the past 15 years. *See, e.g.*, M. GRAETZ, FEDERAL INCOME TAXATION 384-90 (2d ed. 1988); S. SURREY, PATHWAYS TO TAX REFORM 108-11, 117-25, 317-19 nn. 29-31, 323-24 nn. 1-3 & 6-7 (1973); Andrews, *supra* note 1, at 1123-28; Blum, *New Role for the Treasury: Charging Interest on Tax Deferral Loans*, 25 HARV. J. ON LEGIS. 1 (1988); Canellos & Kleinbard, *The Miracle of Compound Interest: Interest Deferral and Discount After 1982*, 38 TAX L. REV. 565 (1983); Halperin, *The Time Value of Money — 1984*, 23 TAX NOTES 751 (1984); Halperin, *supra*

shorthand reference to the simple principle that a person prefers a dollar today over one tomorrow, because, by investing today's dollar, that person tomorrow will have not only the dollar but also an investment return on it. This simple principle was frequently forgotten or underestimated in the income tax arena, because policymakers saw that a failure to tax in one period led to an increased tax base in a later period, and they believed that the progressive tax rates would eliminate any advantage to the taxpayer.[12] This thinking was misguided for two reasons. It failed to appreciate, first, that the amount of untaxed income did not increase, but the nonassessment of tax allowed the taxpayer a larger amount to invest in the later period, and, second, that the taxpayers who benefitted most from the delay were those otherwise already subject to the highest progressive tax rates.

The importance of the time-value-of-money principle is demonstrated easily by the following two-period example. Assume a 30% tax rate, a 20% pretax rate of return, and an investment at Time 0 of $10,000. At Time 1, the taxpayer's investment has grown to $12,000 ($10,000 \times (1 + .2)$). If the government taxes the $2000 gain at that time, the taxpayer then has only $11,400 ($12,000 - ($2000 \times .3)$) to reinvest during the next period.[13] At Time 2, that $11,400 has grown to $13,680 ($11,400 \times (1 + .2)$), and the tax on the $2280 gain leaves an after-tax return of $12,996 ($13,680 - ($2,280 \times .3)$). On the other hand, if the government assesses no tax at Time 1 (when the taxpayer's investment has grown to $12,000), the taxpayer can reinvest $12,000 and by Time 2 the pretax return will have grown to

note 1; Johnson, *Silk Purses from a Sow's Ear: Cost Free Liabilities Under the Income Tax*, 3 AM. J. TAX POLY. 231 (1984); Kelman, *Time Preference and Tax Equity*, 35 STAN. L. REV. 649 (1983); Kiefer, *The Tax Treatment of "Reverse Investment": An Analysis of the Time Value of Money and the Appropriate Tax Treatment of Future Costs*, 26 TAX NOTES 925 (1985); Association of the Bar of the City of New York, Committee on Taxation, *Transactions Involving Deferred Payment of Accrued Liabilities: Federal Income Tax and the Time Value of Money*, 20 TAX NOTES 699 (1983); Sunley, *Observations on the Appropriate Tax Treatment of Future Costs*, 22 TAX NOTES 719 (1984).

12. *See supra* note 7.

13. This article adopts a comparison analysis that assumes that the taxpayer's investments will change in response to different tax rules. Some might refer to this approach as a partial-equilibrium analysis. *See* Kaplow & Warren, *An Income Tax by Any Other Name — A Reply to Professor Strnad*, 38 STAN. L. REV. 399, 414-15 (1986). In an effort to isolate and explain differences among tax rules, this approach fails to account for market changes that may result from those different rules. The analysis should not be misconstrued as reflecting real-world market effects, but instead should be seen as a methodological tool for understanding the different tax models.

The example in the text and others that follow treat accretions and decretions as occurring at a particular point in time to avoid an analysis that depends on calculus. Although most marketplace changes in value occur gradually over time, the basic methodology and conclusions of this article would not change if that complexity were taken into account.

$14,400 ($12,000 × (1 + .2)). A 30% tax on the resulting $4400 gain would yield an after-tax return of $13,080 ($14,400 − ($4400 × .3)).

The higher tax base, in absolute dollar terms, resulting from the tax delay is attributable to the taxpayer's investment of the $600 of unpaid taxes at a 20% pretax rate; the $120 return on that investment ($600 × .2) accounts for the $84 difference in after-tax wealth ($13,080 − $12,996). The $2000 gain at Time 1, which the government fails to tax until Time 2, still results in only a $600 tax at Time 2. This observation is the key to understanding the operation of the time-value-of-money principle in the tax context: Not having to pay the $600 tax liability until later allows the taxpayer to invest it and retain the after-tax return on the unpaid tax liability, or $84 ($600 × .2 × (1 − .3)), even after the $600 is ultimately paid at Time 2.

The tax deferral advantage has both economic and social implications. Economic resources potentially are misallocated as investors search for investments that will produce unrealized gains and retain those investments to avoid taxation. Further, wealth redistribution efforts are undermined because the opportunities for tax deferral are greater for persons with capital wealth.[14]

The time-value-of-money principle, while exposing the serious problems created by the Code's realization-event rule, provides the analytical tool for designing a tax system that solves them. This article presents a proposal which demonstrates that, with a few assumptions, time-value adjustments virtually convert the Code's realization-event taxing model into the Haig-Simons ideal.[15] To avoid liquidity and most valuation problems, the proposal operates in the Code's familiar fashion of assessing a tax only when a market transaction occurs. However, the difference between the proposed taxing model and the Code is in the manner of computing the tax liability. The method proposed here uses the initial investment and selling price to estimate

14. "Economic resources" refers to goods and services that are exchanged in the marketplace. *See* Warren, *supra* note 9, at 1084.

15. The proposed conversion to the Haig-Simons ideal is incomplete in two respects. One variance from the ideal concerns the timing of the tax on the accretion of human capital. For a further discussion of the concept of human capital, see Klein, *supra* note 1, at 465-69; Stephan, *supra* note 1; Warren, *supra* note 9, at 1113-17; and *infra* notes 120-26 and accompanying text. Difficulties of measurement, and of accurately allocating human capital accretion to particular periods in the taxpayer's life, place it beyond the proposal's taxing technique. The second variance from the ideal involves imputed income from services and property produced and consumed outside the marketplace. For a further discussion of the concept of imputed income, see 1 B. BITTKER, *supra* note 6, at ¶ 5.3; H. SIMONS, *supra* note 1, at 51-52, 112-22; and *infra* notes 127-33 and accompanying text. Policy and practical considerations allow for only partial taxation of the value of imputed income under present law and under the proposal advanced here. This article argues that these two exceptions are insufficient reasons for rejecting further consideration of the proposal.

the gains and losses for each period the taxpayer holds or produces an asset, computes a tax for each period based on the estimated market price changes, and adjusts the period's tax for any payment delay. The tax assessed at the time of the realization event is the sum of the time-adjusted tax for each period that the taxpayer holds or produces the asset.

An income tax system designed around this approach would look very different from the Code. Provisions for capital gains and losses, depreciation and amortization, capitalization of incurred expenses, nonrecognition of gains and losses on property, net operating losses, and passive activities would no longer be necessary. Moreover, the system proposed here would permit serious consideration of the repeal of the federal corporate and wealth transfer taxes, because those taxes serve primarily to reach some of the income that escapes taxation when individual taxpayers exploit the existing realization-event principle. Without the incursions on the tax base resulting from tax deferral, administration of either a corporate or wealth transfer tax may prove unnecessary.

Others have previously proposed a time-adjusted-realization-event tax ("TARET") or a variation of it.[16] The main objections to these

16. *See, e.g.*, CONGRESSIONAL BUDGET OFFICE, REVISING THE INDIVIDUAL INCOME TAX 70-81 (1983); INSTITUTE FOR FISCAL STUDIES, THE STRUCTURE AND REFORM OF DIRECT TAXATION 127-49 (1978) (Report of Committee chaired by J.E. Meade) [hereinafter MEADE REPORT]; Auerbach, Retrospective Capital Gains Taxation (Draft Nov. 1988); Blum, *supra* note 11, at 27-93; Brinner, *Inflation, Deferral, and the Neutral Taxation of Capital Gains*, 26 NATL. TAX J. 565, 570-71 (1973); Diamond, *Inflation and the Comprehensive Tax Base*, 4 J. PUB. ECON. 227 (1975); Gann, *Neutral Taxation of Capital Income: An Achievable Goal?*, LAW & CONTEMP. PROBS., Autumn 1985, at 77, 145-47; Helliwell, *The Taxation of Capital Gains*, 2 CAN. J. ECON. 314 (1969); Vickrey, *Averaging of Income for Income Tax Purposes*, 47 J. POL. ECON. 379 (1939); *see also* Galvin, *Tax Legislation in the Reagan Era — Movement to or from a Consumption Base?*, 48 LAW & CONTEMP. PROBS. 31, 35-39 (1985) (proposing annual valuations and taxation for taxpayers owning assets exceeding a certain value); Shakow, *supra* note 6 (proposing annual taxation on market value changes of some assets and time-value-of-money adjustments of the tax upon the sale of others).

Congress already has introduced taxpayers, in a limited way, to time-adjusted tax computations. *See* I.R.C. § 453(l)(3) (1982) (The installment method is available for a dealer's disposition of residential lots or time-shares if the dealer elects to pay interest on the amount of deferred tax attributable to the use of the installment method.); I.R.C. § 453A (1982 & Supp. IV 1986) (This provision charges interest, with some exceptions, on the tax deferred by the use of the installment method for nondealer dispositions for more than $150,000 of business or rental property. The interest is charged only to the extent that the deferred payments for these types of dispositions for the tax year exceed $5 million.); I.R.C. §§ 460(a)(2), (b)(2)-(3) (Supp. IV 1986) (For some long-term contracts, the taxpayer must use the percentage-of-completion method for calculating taxes owed on a portion of the contract during the contract's duration. When the taxpayer completes the contract, however, the taxpayer must "look back" and calculate the taxes that would have been payable each year if actual total costs had been known. If the taxpayer underpaid taxes in any period under the percentage-of-completion method, interest will be assessed for the payment delay; conversely, if the taxpayer overpaid in any period, the government must pay interest on the prepayment.); I.R.C. § 995(f) (Supp. IV 1986) (This provision imposes an interest charge on shareholders of a Domestic International Sales Corporation, or "DISC," to compensate for tax deferral enjoyed with regard to accumulated DISC income.); I.R.C. §§ 1291-97 (Supp. IV 1986)

proposals have been that the system for allocating gains and losses to prior periods is inaccurate and that the time-value adjustments are complicated and administratively burdensome.[17] This article explores the operation of TARET and demonstrates that it produces economic neutrality and fairness among taxpayers, while simplifying the tax system by eliminating the need for provisions designed to reduce deferral advantages or ameliorate the inequities created by the realization-event rule. Finally, even if one decides that TARET should not be implemented, considering its operation provides a useful and quite different perspective on tax policy and taxing issues. In Simons' words, exploring the TARET model allows us "to consider fruitfully the problem of bettering the system of presumptions."[18]

Part I establishes the foundation for the time-adjustment component in TARET by explaining tax deferral through examples and analogies. Part II sets forth TARET and shows how it achieves the goals of economic neutrality, fairness, and administrability. Section II.A.1.a, dealing with nonexhaustible assets used in business or investment ventures, presents the core concepts of the model; further refinements are provided in discussions of assets that the taxpayer exhausts, produces, or devotes to consumption. Section II.D extends the TARET approach to debt, and includes an extended discussion of the controversy concerning the proper treatment of future costs. The final section of Part II summarizes the model and its operational implications. Part III continues the evaluation of the TARET model by comparing it to the "consumption tax" approach,[19] which has gained political attention in recent years as a viable and desirable alternative to the present unwieldy tax regime.[20] The purpose of this Part is to

(These provisions apply to shareholders who are United States persons investing in a foreign corporation that earns a substantial amount of passive income, or a "PFIC." If U.S. shareholders realize a gain from the disposition of PFIC stock or receive corporate distributions in excess of 125% of the average amount of distributions received during the three preceding taxable years, they must compute their tax in a manner similar to the time-adjusted approach described in the text.).

The term "TARET" will be used throughout the article to refer to the particular time-adjusted model that I am putting forth. Although some aspects of TARET have been suggested by others, its particular solutions to the variety of tax-deferral opportunities produced by the realization-event principle are unique to TARET.

17. Andrews, *supra* note 1, at 1148; Vickrey, *Tax Simplification Through Cumulative Averaging,* 34 LAW & CONTEMP. PROBS. 736, 740 (1969).

18. H. SIMONS, *supra* note 1, at 106; *see supra* note 1 (quoting the complete passage).

19. The consumption tax refers to a tax "in which accumulation is comprehensively excluded." Andrews, *supra* note 1, at 1120; *see also id.* at 1117 n.7 (providing an historical sketch of the development of the consumption tax idea); *id.* at 1120 n.11 (discussing the relationship of value-added taxes to the consumption and accretion models).

20. *See, e.g.,* Babbit, Letter to the Editor, Wash. Post, Jan. 31, 1988, at D6, col. 4; Kilborn, *Tax System: Efficiency vs. Fairness,* N.Y. Times, Dec. 10, 1988, at 35, col. 3 (national ed.); Price, *Time is Right for the Right Type of Tax,* L.A. Times, Oct. 31, 1987, § 2, at 8, col. 4.

begin the debate about whether TARET or the consumption tax best achieves the tax goals of economic neutrality, fairness, and administrability. The conclusion emphasizes certain issues, regarding adjustments to exclude general price-level changes from the tax base and the transition rules necessary to move from the realization-event model to TARET, that must still be explored before TARET can become a serious alternative to the present tax structure.

I. UNDERSTANDING TAX DEFERRAL

Consider again the simple example of the taxpayer who acquires an asset for $10,000, enjoys a 20% pretax rate of market price increase for each period, sells the asset at the end of the second period, and is taxed at a 30% rate for gains earned in each period. A comparison of Table I, illustrating the tax consequences under the Haig-Simons ideal, with Table II, illustrating the tax consequences under the Code's realization-event model, shows the significance of taxing an accretion when it occurs, rather than when it is realized.

TABLE I: HAIG-SIMONS MODEL

	Time 0	Time 1	Time 2
Investment	$10,000	$10,000	$11,400[3]
Profit	0	$ 2,000[1]	$ 2,280[4]
Tax	0	$ 600[2]	$ 684[5]
After-tax return	$10,000	$11,400	$12,996

1. $10,000 investment multiplied by 20% rate of market price change.
2. $2000 profit for period multiplied by 30% tax rate.
3. $10,000 base investment plus $1400 after-tax profit from Time 1.
4. $11,400 investment multiplied by 20% rate of market price change.
5. $2280 profit for period multiplied by 30% tax rate.

TABLE II: REALIZATION-EVENT MODEL

	Time 0	Time 1	Time 2
Investment	$10,000	$10,000	$12,000[3]
Profit	0	$ 2,000[1]	$ 2,400[4]
Tax	0	0[2]	$ 1,320[5]
After-tax return	$10,000	$12,000	$13,080

1. $10,000 investment multiplied by 20% rate of market price change.
2. No tax is assessed because no realization event has occurred at Time 1.
3. $10,000 base investment plus $2000 untaxed profit from Time 1.
4. $12,000 investment multiplied by 20% rate of market price change.
5. Sum of $2000 profit at Time 1 and $2400 profit at Time 2, or $4400, multiplied by 30% tax rate.

The $84 difference ($13,080 — $12,996) in the after-tax returns

reflected in Tables I and II is attributable to the realization-event model's deferral of tax on the $2000 appreciation occurring at Time 1.[21] By being able to delay paying $600 in tax, the taxpayer, under the realization-event regime, could invest that money and obtain $120 of additional appreciation between Time 1 and Time 2 ($600 × .2). That $120 was, of course, itself subject to the 30% tax at Time 2, but the taxpayer was still left $84 better off.[22] The tax base is preserved to the extent that the tax base at Time 2 includes the $2000 increase at Time 1, but the comparison with the Haig-Simons ideal demonstrates that more is needed to equate these two models.

Analogies to interest-free loans, tax forgiveness, and a tax-free return on investment income further demonstrate the value of tax postponement and are useful in understanding TARET's solutions to tax deferral.[23] Table I shows that the $2000 accretion occurring at Time 1 leads to a $600 tax liability at Time 1, and Table II shows that the realization-event model allows the taxpayer to postpone payment of that $600 tax liability until Time 2. Comparing the two models suggests that one way to describe the value of tax deferral is as the equivalent of an interest-free loan from the government. Had the government charged the taxpayer the same rate of interest that the investment earned, the Table II taxpayer would have owed $720 (the $600 of tax plus $120 of interest), rather than $600, at Time 2. The cost of borrowing, or the $120, however, would have led to a deduction and a lower tax base at Time 2 under the realization-event model. This lower tax base in turn would have reduced the tax liability by $36 ($120 × .3), leaving the taxpayer with an after-tax savings from the government's interest-free loan of $84 ($120 − $36). The interest-free loan analogy is the mirror image of the earlier explanation for the difference between the after-tax returns under Tables I and II. This article relies heavily on this analogy to explain the Code's failings and TARET's approach, because TARET's response to tax deferral problems is simply to impose interest on unpaid tax liabilities.

A second way to describe the benefit that tax deferral confers on the taxpayer is to consider how much the taxpayer would have to set

21. The amount of the tax on the increase in the asset's value at Time 1 might be greater at Time 2 if the progressive rate schedule operated to place the taxpayer at a higher marginal rate at that time. It might also change if Congress imposed different tax rates for the different tax periods. The discussion in the text isolates the time-value-of-money issue by assuming that the same tax rate applies in both time periods.

22. That figure is derived as follows: $120 multiplied by the 30% tax rate equals $36, and $120 minus $36 equals $84. These computations can be more simply described as $120 × (1 − .3) = $84.

23. For a similar analysis of tax deferral, see M. GRAETZ, *supra* note 11, at 385-90; Andrews, *supra* note 1, at 1124-28.

aside at Time 1 in order to have $600 available at Time 2 to pay the tax. If the taxpayer's rate of return remains 20% and she pays a tax on that return at Time 2, she would have to set aside only $526.32 at Time 1.[24] That is the same as saying that $73.68 of tax ($600 − $526.32) is forgiven at Time 1, which is the equivalent of $84 ($73.68 × [1 + .2(1 − .3)]) at Time 2.[25] This tax-forgiveness analogy, as is true for all discussions of tax deferral, relies on determining the amount of taxes not paid at Time 1 ($600), when the increase in the market value of the taxpayer's asset ($2000) occurred. It is especially useful because it highlights the fact that, in the realization-event model, the amount of the tax calculated on the income that occurred at Time 1 remains unchanged at Time 2, *i.e.*, that time-value-of-money is ignored.

A third way to describe the advantage of tax deferral is to observe that the after-tax return of $13,080 achieved under the realization-event model is equivalent to the after-tax return if the taxpayer were taxed on the $2000 of income at Time 1 and then not taxed on any further income yielded from the after-tax investment of $1400 ($2000 × (1 − .3)). Under this yield-exemption analogy, the only tax owed at Time 2 would be $600, which is the tax on the profit earned on the original $10,000 investment between Time 1 and Time 2, leaving a $13,080 after-tax return. Table III illustrates this analogy.

TABLE III: YIELD-EXEMPTION MODEL

	Time 0	Time 1	Time 2
Investment	$10,000	$10,000	$11,400
Profit	0	$ 2,000[1]	$ 2,280[3]
Tax	0	$ 600[2]	$ 600[4]
After-tax return	$10,000	$11,400	$13,080

1. $10,000 investment multiplied by 20% rate of market price change.
2. $2000 profit for period multiplied by 30% tax rate.
3. $11,400 investment ($10,000 base investment plus $1400 after-tax profit from Time 1) multiplied by 20% rate of market price change.
4. $2000 of the $2280 profit multiplied by the 30% tax rate. The remaining $280 ($1400 × .2) profit represents the profit on the after-tax profit from Time 1 of $1400 ($2000 (1 − .3)) and, according to this model, is excluded from taxation.

24. This amount is derived by solving for X in the following formula: [1 + .2(1 − .3)]X = $600.

25. Equivalence in this context means that the taxpayer is indifferent about receiving a certain amount of money at Time 1 or a larger amount at a later time. The amount received at the later time is equivalent only if it is equal to the after-tax return that the taxpayer would have if she had received the money earlier and invested it herself. Two important aspects of the equivalence computation are compound interest and that each period's profit is taxed at each period in accordance with the Haig-Simons ideal.

The equivalence of the yield-exemption analogy to the realization-event model is easily identified if the computation of the after-tax return for the Time 1 profit under the realization-event model is stated in its simplest arithmetic form:[26]

$(I)(R)(1 + R)^{n-1}(1 - T)$

I = market value of asset at time of acquisition
R = rate of market price change
n = the number of periods since asset was acquired
T = rate of tax

This depiction of the realization-event model's treatment of the Time 1 profit demonstrates that the yield-exemption analogy merely describes this formula's components in a different order. It focuses first on the after-tax function $(1 - T)$ and then the reinvestment function $(1 + R)^{n-1}$, reminding us that the transitivity property of arithmetic makes this difference irrelevant. The yield-exemption analogy, as is true for all discussions of tax deferral, depends on determining the amount of taxes not paid at Time 1 ($600) when the increase in the value of the taxpayer's asset ($2000) occurred. This analysis is particularly useful because it illustrates dramatically that timing differences carry implications for the tax base, and that any effort to make the accretion tax base comprehensive requires consideration of when the government intends to assess the tax on accretions and decretions.[27]

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26. The formula does not show the total tax liability owed under the realization-event model, because it does not take into account the profit earned on the original investment during each period. The explanation in the text isolates the question of taxation of the profit in the first period and its treatment under the realization-event model.

27. One danger of considering the yield-exemption analogy is that it is easy to overlook the conditions necessary for the equivalence to hold. Professor Graetz identifies some of those conditions in the following manner:

> (i) The applicable tax rates must remain constant — rates can neither be progressive nor change over time.
>
> (ii) Interest rates must be constant. The yield from the investment must be the same without regard to when the investment is made.
>
> (iii) The deduction must produce an immediate tax savings equal to the taxpayer's marginal rate multiplied by the deduction. This means that the deduction must offset income from other sources and cannot be either lost or delayed by carryover requirements.
>
> (iv) Taxpayers are assumed to be concerned only with their after-tax position. Typically, the tax savings is assumed to be invested so as to yield a return identical to that of the original investment. It is assumed that the opportunities for investment at the assumed rate of return are unlimited.
>
> . . . .
>
> (v) Where borrowing is involved (again with constant tax and interest rates), the equivalence would hold only if the ratio of borrowing to after-tax investment were the same under a yield exemption and an immediate deduction. If speculative investment opportunities (or borrowing opportunities) were limited, after-tax differences between winning and losing taxpayers would be lessened under the immediate deduction method [referring to nontaxation of Time 1 profit under the realization-event method].
>
> (vi) The system must be closed. Tax is collected at an identical rate on the earnings from an asset immediately deducted and on amounts received at the close of the transaction

For simplicity, the discussion of tax-deferral opportunities has focused exclusively on the postponement of tax on increases in the market price of the taxpayer's asset holdings. However, tax-deferral opportunities also arise under the realization-event model when taxpayers are permitted to take premature deductions by anticipating decretions before they have occurred.[28] For example, the Code's generous amortization rules overestimate decretions during the early years of a taxpayer's ownership of what I will refer to as "exhaustible assets," or assets that depreciate in value from wear and tear or obsolescence, producing the same tax-deferral advantages as postponing taxation of market price increases.[29] The Code refuses to follow the realization-event principle for market price decreases and to allow a deduction only on disposition of an exhaustible asset because taxpayers typically realize profits (in the form of rents or otherwise) before they realize those decreases.[30] Fairness requires that a taxpayer who invests in an asset that does not produce unrealized gains should be allowed to deduct the costs that produce the realized profits. Otherwise that taxpayer will suffer tax acceleration, which translates into analogies that are the mirror images of those used to explain tax deferral — an interest-free borrowing by the government, a tax surcharge, or a tax on a phantom yield.[31]

The appropriateness of allowing some fair estimate of decretions, however, does not explain the Code's historically generous allowances. The usual explanation is Congress' interest in encouraging capital

(whether by the disposition of the asset or by some other event, such as the taxpayer's death).

M. GRAETZ, *supra* note 11, at 388-89; *see also* Graetz, *Implementing A Progressive Consumption Tax*, 92 HARV. L. REV. 1575, 1602 (1979).

28. *See* Andrews, *supra* note 1, at 1126-28.

29. *See, e.g.*, I.R.C. §§ 167-69, 179, 184, 188, 280F, 611-14, 616-17 (1982 & Supp. IV 1986).

30. For discussion of TARET treatment of exhaustible assets, see *infra* notes 72-79 and accompanying text.

31. To demonstrate the impact of postponing a deduction for an incurred loss, consider the following example: a taxpayer, taxed at a 30% rate, acquires an asset for $10,000, enjoys rents for each of two periods equal to 20% of the asset's market price, suffers a decrease in the asset's market price for each of the two periods of 10%, and sells the asset at Time 2 for $8100. Assume that all net profits can be reinvested at a pretax rate of return of 10%. Table A shows the tax consequences of these transactions under the Haig-Simons ideal.

investment through tax subsidies.[32] A related, but less traditional,

TABLE A: HAIG-SIMONS IDEAL

	Time 0	Time 1	Time 2
Investment	$10,000	$10,000	$10,700[4]
Rents	0	$ 2,000[1]	$ 1,800[5]
Interest	0	0	$ 170[6]
Loss	0	$ 1,000[2]	$ 900[7]
Tax	0	$ 300[3]	$ 321[8]
After-tax return	$10,000	$10,700	$11,449

1. $10,000 investment multiplied by 20% rental rate.
2. $10,000 investment multiplied by 10% depreciation rate.
3. $1000 net profit ($2000 − $1000) for period multiplied by 30% tax rate.
4. $10,000 base investment reduced by $1000 of depreciation between Time 0 and Time 1 ($9,000), increased by $2000 cash rent received, and reduced by $300 of taxes paid.
5. $9000 investment in asset at Time 1 multiplied by 20% rental rate.
6. $1700 of cash ($10,700 after-tax return − $9000 investment in asset) multiplied by 10% rate of return.
7. $9000 investment in asset at Time 1 multiplied by 10% depreciation rate.
8. $1070 net profit ($1800 + $170 − $900) multiplied by 30% tax rate.

Table B shows the tax consequences of these transactions if a strict realization-event rule were applied, denying the taxpayer any deduction for the loss in the value of the asset until it is sold.

TABLE B: REALIZATION-EVENT MODEL

	Time 0	Time 1	Time 2
Investment	$10,000	$10,000	$10,400[4]
Rents	0	$ 2,000[1]	$ 1,800[5]
Interest	0	0	$ 140[6]
Loss	0	$ 1,000[2]	$ 900[7]
Tax	0	$ 600[3]	$ 12[8]
After-tax return	$10,000	$10,400	$11,428

1. $10,000 investment multiplied by 20% rental rate.
2. $10,000 investment multiplied by 10% depreciation rate.
3. $2000 taxable income for period multiplied by 30% tax rate. (The $1000 depreciation in asset value is ignored in the absence of a realization event.)
4. $10,000 base investment reduced by $1000 of depreciation between Time 0 and Time 1 ($9000), increased by $2000 cash rent received, and reduced by $600 of taxes paid.
5. $9000 investment in asset at Time 1 multiplied by 20% rental rate.
6. $1400 of cash ($10,400 after-tax return − $9000 investment in asset) multiplied by 10% rate of return.
7. $9000 investment in asset at Time 1 multiplied by 10% depreciation rate.
8. $40 taxable income—consisting of $1800 of rent, $140 of interest, and a $1900 realized loss upon the sale of the rental property ($10,000 − $8,100) — multiplied by 30% tax rate.

The $21 smaller after-tax return as of Time 2 under the strict realization-event model is attributable to the one-period postponement of the $1000 deduction for the decretion of the asset's market price. That postponement led to a Time 1 tax liability that was $300 greater than it should have been, which meant that the taxpayer lost $30 pretax profit by not having that $300 to invest at 10%, or $21 of after-tax profit ($300 × .1(1 − .3)). The $21 loss of after-tax profit can be analogized to the taxpayer making an interest-free loan to the government of $300 that could have earned a 7% return after taxes (.1(1 − .3)). It can also be analogized to a tax surcharge because the taxpayer overpays $300 at Time 1 and receives only a $300 tax reduction at Time 2, rather than its time-value equivalent of $321 ($300 × [1 + .1(1 − .3)]). Finally, it can also be analogized to a tax on a phantom yield on the amount of after-tax loss. Had the after-tax loss at Time 1 of $700 ($1000 depreciation less the $300 tax savings) not occurred, $70 of investment return would have been earned at Time 2 ($700 × .1), and that $70 would have resulted in $21 of tax.

32. *See* M. CHIRELSTEIN, FEDERAL INCOME TAXATION 135-45 (5th ed. 1988). *But see* Durst, *Inflation and the Tax Code: Guidelines for Policymaking*, 73 MINN. L. REV. 1217, 1239-42, 1246-51 (1989) (explaining how recently enacted depreciation schedules reflect economic

justification is that premature deductions for exhaustible assets are an antidote to the tax advantages enjoyed by taxpayers who invest in property that predictably will produce deferrable gains. Premature deductions thus equate the tax treatment of exhaustible assets that produce accretions that are taxed when they occur, and other investments that produce accretions that are taxed after they occur. The generous amortization allowances also reduce the disadvantages of realizing gains, by offering taxpayers the opportunity for tax relief if they reinvest. By lessening the differences between taxpayers who retain investments that produce unrealized gains and those who change their investments, the Code lessens the realization-event model's detrimental effects on resource allocations.[33]

Concern for economic distortions produced by a tax system that encourages investment in assets that produce deferrable income and discourages disinvestment also explains other tax relief provisions such as the repealed, but not forgotten, capital gains deduction[34] or the numerous nonrecognition provisions.[35] The practical barriers to taxing unrealized gains leave Congress, if it wants to further its goals of economic neutrality and tax equity, with only the alternative of providing tax deferral for various types of investments and investment transactions. The consumption tax responds to the problem of tax deferral similarly, but more comprehensively and simply, by deferring taxation of all income until the taxpayer spends it for consumption purposes. However, this article demonstrates that an alternative solution is possible. Part II challenges the practical-barriers

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depreciation which takes inflation into account); Gann, *supra* note 16, at 138-40 (offering a similar analysis).

33. This explanation of accelerated depreciation deductions is an extension of Professor Andrews' explanation of special rates for realized capital gains. *See* Andrews, *supra* note 1, at 1133-35.

34. *See id.* The 1986 Tax Reform Act eliminated the capital gain preferential tax rate by amending I.R.C. § 1201 (1982 & Supp. IV 1986) and repealing I.R.C. § 1202. *See* Tax Reform Act of 1986, 100 Stat. 2085, Pub. L. No. 99-514, § 301, 99th Cong., 2d Sess. (1986). The capital gain preferential tax is gone, but capital gains remain favored sources of income because they allow the deduction of capital losses. *See* I.R.C. § 1211 (1982 & Supp. IV 1986). Further, the Code continues to distinguish capital gains and losses from ordinary income and losses, *see* I.R.C. §§ 1(j), 1201, 1211 (1982 & Supp. IV 1986), and policymakers favor restoration of the preference. *See, e.g.*, Uchitelle, *Bush, Like Reagan in 1980, Seeks Tax Cuts to Stimulate the Economy*, N.Y. Times, Sept. 22, 1988, at A1, col. 1 (national ed.); *see also* Dept. of Treasury, The Direct Revenue Effects of Capital Gains Taxation: A Reconsideration of the Time-Series Evidence, Research Paper No. 8801, *reprinted in* 134 CONG. REC. S7208-11 (daily ed. June 6, 1988) (demonstrating revenue-raising potential of lower capital gains tax); Jones, *The Capital Gains Debate: Partisan Politics or Economic Discourse?*, 41 TAX NOTES 1373 (1988) (describing the shortcomings of economic methods of predicting the revenue impact of lower capital gains rates).

35. *See, e.g.*, I.R.C. §§ 1031, 1033, 1034, 1039, 1041 (1982 & Supp. IV 1986).

assumption by using time-value-of-money analysis to provide a solution to the problem it uncovers.

II. THE TARET MODEL

The differences in a taxpayer's after-tax returns under the Haig-Simons and realization-event models stem from differences in the timing of the tax assessment. This suggests that the Haig-Simons ideal can be achieved by assessing a tax at the time of a realization event that takes into account any delay in taxing market price changes occurring in earlier periods. Although TARET departs from Haig-Simons by merely estimating the amount of market price changes in a period, it relies on the ideal to establish when those changes occur.[36] The following four steps describe how TARET is computed: (1) Estimate the accretion or decretion in an asset's market price for each period the taxpayer held (or produced) the asset, based on its value at the time of the realization event; (2) Compute a tax liability (or refund)[37] for each period based on the amount of accretion or decretion allocated to that period; (3) Adjust the tax liability (or refund) computed for each period for the time delay in making the payment; and (4) Sum each period's time-adjusted tax to determine the total tax owed to or by the government at the time of the realization event.[38]

The following discussion describes TARET's operation by looking

36. An important assumption in the description of the Haig-Simons and TARET models is that the term "assets" encompasses a broad range of types of wealth. It includes, of course, cash, land, buildings, machines, goodwill, inventory, stocks, bonds, jewelry, paintings, and homes. As used in this article, however, it also includes items that are typically excluded as too undifferentiated from other previously acquired assets or too remote from realization because they are nontransferable, such as know-how, organization of a skilled labor force, legal advice, an unfinished manuscript by an unpublished author, or an artist's idea for a painting. Including these items has the analytical advantage of recognizing, first, that the taxpayer's market wealth extends beyond those items traditionally associated with marketplace transactions and, second, that failure to adjust the tax base for acquisition or loss of assets of this type is due to administrative, rather than conceptual, constraints. Moreover, using an expansive definition of assets when making the Haig-Simons ideal operational leads to more discrete observations about the acquisition and loss of market values in the taxing period, which in turn leads to more accurate timing determinations of income-producing costs and produced income.

37. The model assumes that taxpayers who suffer losses will either reduce that year's taxes by offsetting tax liabilities due on accretions or will receive a tax refund from the government. *See infra* notes 173-80 and accompanying text.

38. The analysis assumes that, at the time of a realization event, the taxpayer will pay a tax liability and the government will refund an overpayment instantaneously. Without changing the article's conclusions, this assumption avoids the complication of considering time-value-of-money issues resulting from delays beyond the realization-event.

Delaying tax payments until a realization event leaves the government vulnerable to taxpayers who are uncreditworthy. *See* Shakow, *supra* note 6, at 1170. The problem may be less severe than it first seems, however, because the appreciating asset itself provides some security, *see id.* at 1170 n.228, and because the imposition of interest will remove the incentive for taxpayers to retain investments for an extended time. For further discussion of this issue, see *infra* notes 181-86 and accompanying text, which proposes elimination of nonrecognition rules.

at different types of asset transactions. This analysis emphasizes the role the realization-event principle plays under the Code to demonstrate that it is the source of the tax law's most serious abuses, inequities, and complications. The realization-event principle disconnects the costs of producing income from the income produced and that disconnection necessitates specially designed — and frequently administratively complex — rules to reduce the opportunities for tax deferral or increase the system's fairness. Although TARET determines the taxpayer's liability or refund when a realization event occurs, time-value-of-money adjustments eliminate the need for these special provisions.

A. *Purchased Assets Devoted to Business or Investment Ventures*

One way the realization-event principle permits taxpayers to trigger interest-free loans from the government is by allowing taxpayers to hold appreciating property. TARET measures an asset's market price change between acquisition and disposition and then allocates part of that change to each of the taxing periods during which the taxpayer held the asset. A prerequisite to measuring and allocating market price changes accurately is to consider the wealth changes the taxpayer experiences at the time of purchase. A useful way to analyze the economic consequences of asset acquisition is by using the Haig-Simons approach of comparing market value changes between two points in time. For this purpose, the two points in time are immediately before and after the taxpayer purchases an asset.

Haig-Simons would deduct from the tax base the amount of cash the taxpayer expended for the asset and add to the base an amount equal to the market price of the asset purchased.[39] Isolating the disposition and acquisition components of a purchase may seem unnecessary because, for an arm's-length transaction, the amount of cash expended should equal the market price of the asset acquired, and thus the net change in the value of the taxpayer's asset holdings after the purchase should be zero. However, this conclusion assumes that the market price of the purchased asset is the same for the seller and the buyer. This does not correspond to marketplace experiences, except for some assets sold in highly organized markets, such as publicly

39. Limiting the discussion to transactions involving taxpayers transferring cash in return for assets isolates the tax consequences of the purchase from the tax consequences of transferring appreciated or depreciated property other than cash. If taxpayers purchase assets with property other than cash, then the tax rules pertaining to property dispositions, *see infra* notes 47-79, 101-16, and accompanying text, apply before considering any further tax consequences resulting from the purchase.

traded securities.[40] A buyer who purchases a truck from a dealer, for example, cannot typically sell the truck immediately afterwards for the same price. The resale market is thin, and the marketplace will treat the truck as used, leading to a price discount reflecting potential buyers' skepticism about the circumstances of the resale. Furthermore, in many contexts, the amount expended for an asset may be more than its market price because the taxpayer frequently pays for services along with the asset, and those services are exhausted immediately. For example, a person who invests in publicly traded stock transfers cash equal to the sum of the stock's market price and the brokerage services, but those services are exhausted upon acquisition.[41] Similarly, the truck purchaser pays for a truck as well as dealer services, such as the opportunity to choose among a variety of trucks and options, or product information from sales representatives. Like the brokerage fees, those services are exhausted upon acquisition of the truck.

Even though some purchasers cannot immediately resell at the same price, they are not necessarily less wealthy immediately after a purchase because acquiring one asset may produce another. The asset produced and its market value depends on the taxpayer's intended use and what other assets the taxpayer owns. For example, if the taxpayer owns a pizzeria and intends to use the truck to offer pizza delivery, acquiring the truck produced a pizza-delivery capability whose market value depends on the proven success and value of the taxpayer's pizza business.[42]

Some taxpayers, however, like the stock investor, may be less wealthy after a purchase. The investor makes the wealth-decreasing investment because she expects the return on the stock and brokerage services to exceed the return from other investment opportunities. Expecting a high rate of return relative to other available investments does not mean that the investor is as wealthy or wealthier after the purchase as she was before. Subjective expectations are not the equivalent of a produced asset like the pizza-delivery capability.

40. Even for frequently traded stock sold through a stock exchange, differences in ask-and-bid prices exist, and the purchaser cannot necessarily resell the stock instantaneously for the price paid at purchase.

41. The highly organized nature of the market makes it easy to segregate the stock's market value from the cost of other services purchased as part of the transaction, such as brokerage fees. The investor might be considered even less wealthy because any resale requires the purchase and exhaustion of further brokerage services.

Although the brokerage or other selling services are exhausted at the time of an asset purchase, the services may provide the taxpayer know-how and expertise that will prove useful when she engages in future purchases. The acquisition of know-how, like pizza-delivery capability discussed below, is a produced asset that requires separate tax consideration. *See infra* sections II.B.1 & II.B.2.

42. For a discussion of TARET's treatment of produced assets, see *infra* sections II.B.1-2.

Although both involve expected profits, the delivery capability attains marketplace recognition because the truck in conjunction with the restaurant provides objective evidence of the likelihood of increased profitability. Haig-Simons directs us to look to market values, and market values indicate that the stock investor is less wealthy.

Isolating the disposition and acquisition components of a purchase transaction may identify some services that the taxpayer acquires, but immediately exhausts, such as the truck dealer's product expertise or the stock broker's services. Although exhaustion is a sufficient realization event under the Code,[43] the Code denies the purchaser an immediate deduction.[44] The services' costs are added to the costs of the purchased asset, and eventually are deducted upon sale or amortization of the asset. Whether the purchaser enjoys a market price increase immediately upon purchasing an asset, such as pizza-delivery capacity, or whether the acquired asset allows the purchaser to postpone recognition of future market value increases, as with stocks and securities, postponing the deduction for exhausted services reduces the benefits derived from the tax deferral of these gains.[45]

Notwithstanding its justification, denying an immediate deduction for exhausted services creates inequities and potentially distorts taxpayers' economic choices. Taxpayers who invest their own effort and talent (referred to classically as imputed income from services), rather than paying others to perform services for them, obtain a tax advantage. The taxpayer's own services are performed and exhausted outside the marketplace, and are therefore beyond the Code's reach. Ignoring taxpayer-produced services, however, is the equivalent under the Code of taxing the value of the services as income and allowing their immediate deduction. Understood in this way, the Code provides an advantage to taxpayers who perform and exhaust their own acquisition services that is not available to those who buy those services, exhaust them immediately, and deduct their costs later.

TARET significantly reduces these inequities and economic distortions because, by curing tax deferral through time adjustments, it eliminates the need to delay deductions for realized market value decretions. Exhausted acquisition services remain nondeductible, however, when the services are provided by the seller of the purchased

43. *See* I.R.C. § 165 (1982 & Supp. IV 1986).

44. I.R.C. § 263 (1982 & Supp. IV 1986).

45. If the services are provided by the seller, the difficulty of separating the value of the asset from the value of the services provides another reason why the Code should deny the purchaser an immediate deduction. The parties' allocation of value among the assets and services has no economic consequence to the parties beyond its tax consequences and, therefore, provides no reliable evidence.

asset. The parties' allocation of value between the purchased asset and seller services is unreliable because it has no economic effect other than its tax consequences. Without a reliable transaction to determine the services' value, TARET must deviate from the Haig-Simons ideal by treating the services' value as unexhausted and allocating it to the purchased asset. This treatment risks encouraging taxpayers to seek more nonseller services, including providing those services themselves, but this potential economic distortion is administratively required.[46]

1. *Disposition of a Purchased Asset*

TARET's promise of increased fairness and economic neutrality depends on its ability to estimate accurately the accretions and decretions in an asset's market value for each period the taxpayer held it and to identify the appropriate tax rate and interest rate factors to determine the tax liability (or refund) due when a realization event occurs. This subsection develops and evaluates the estimating techniques and other components needed to make time-value-of-money adjustments when a taxpayer disposes of purchased assets devoted to business or investment activity.

Tracking an asset's market value changes while the taxpayer holds the asset is administratively unfeasible. Consequently, any tax based on periodic market price changes in the taxpayer's asset must rely on an accurate estimating technique using easily accessible information. TARET's estimating technique differs depending on whether the taxpayer purchases a nonexhaustible or an exhaustible asset. The price of a nonexhaustible asset changes each period according to marketplace phenomena such as fluctuating interest rates, tastes, and technological innovations. Marketplace phenomena affect the price of an exhaustible asset, but price changes also depend on the number of periods the asset is expected to produce profits and on the expected level of profits in those periods. The distinct profit-flow patterns that influence market price changes of these two types of investments require estimating techniques that take the differences into account.

a. Sale or exchange of a nonexhaustible asset.

(1) Estimating market price changes. At the time of a realization event, TARET uses the following three values to estimate the periodic

46. The potential for economic distortion is reduced by TARET's mechanisms that attribute some of the market value decretion resulting from the exhausted services to the period when the taxpayer purchased the asset. Moreover, the rule denying a deduction for seller-provided services may often not result in significant reallocation of resources because the efficiency of seller-provided services is sufficient to offset the tax disadvantages.

market price changes a taxpayer experiences while holding purchased nonexhaustible assets: (1) the asset's value at the time the taxpayer acquired it; (2) the length of time the taxpayer held the asset;[47] and (3) the asset's value at the time of the realization event. The best available market evidence of the purchased asset's value at the time of acquisition (referred to hereinafter as W_o) is the market value of the assets transferred to purchase another asset less the amount paid for acquisition services provided by persons other than the seller. As discussed above, this amount fails to reflect the asset's value when the taxpayer receives significant acquisition services from the seller and when market forces lead to an immediate price decline.[48] Using an amount that inflates the value of W_o overtaxes the taxpayer because the market value decretions incurred at acquisition are allocated to later periods and, therefore, delays when the tax refund is treated as owed.[49]

The best available evidence of the asset's value upon sale (referred to hereinafter as W_n) is the value of the assets received upon disposition. If the parties' relationship and dealings with each other suggest that they may not have exchanged equal values, then the Internal Revenue Service should inquire further into the nature of the transaction.[50] For instance, a bargain sale to an employee should be taxed as an asset sale and a compensation payment. W_n should not include the value of services acquired and exhausted to accomplish the sale if the taxpayer purchased them from persons other than the buyer.[51] If the

47. The number of periods the taxpayer owned an asset is not something the Code traditionally has measured.

48. *See supra* notes 40-41, 46, and accompanying text.

49. Taxpayer-provided acquisition services do not implicate W_o because ignoring the services is the same as taxing the imputed income from the services and then allowing a deduction for their exhaustion. *See supra* text following note 45.

50. The Code assumes that the parties act at arm's length unless evidence suggests otherwise. United States v. Davis, 370 U.S. 65, 72 (1962); *see also* Philadelphia Park Amusement Co. v. United States, 126 F. Supp. 184, 189 (Ct. Cl. 1954). When a transfer is made between related parties and appears to have no business purpose, the arrangement will be disregarded for tax purposes. Davis v. Commissioner, 585 F.2d 807, 813 (6th Cir. 1978), *cert. denied*, 440 U.S. 981 (1979); *see also* I.R.C. § 482 (Supp. IV 1986) (authorizing the Commissioner to reallocate income and deductions among businesses owned by related parties).

51. The taxpayer should obtain a deduction in the tax period when the selling services are exhausted. This rule differs from the Code's treatment of selling expenses. *See* Ward v. Commissioner, 224 F.2d 547 (9th Cir. 1955) (attorney fees); Washington Mkt. Co. v. Commissioner, 25 B.T.A. 576 (1932) (*acq.*, 1932 C.B. 7) (engineering fees, counsel fees, and expert witness expenses); Treas. Reg. §§ 1.263(a)-2(e) (commissions paid on sale of securities); Treas. Reg. § 1.1034-1(b)(4)(i) (commissions, advertising expenses, cost of preparing deed, and other legal services in connection with the sale of taxpayer's residence); 2 B. BITTKER, *supra* note 6, at 43-2 and 43-3. Although the Code's measurement of taxable income for the period the realization event occurs is the same whether the taxpayer treats these expenses as reducing the amount received or as deductions, the classification does make a difference when applying other Code provisions, such as the deductibility of realized capital losses. *See* I.R.C. § 1211 (1982 & Supp. IV 1986). The reason for this treatment is somewhat unclear and may result only from some symmetry-based notion that acquisition and disposition costs should remain tied to the property

buyer or taxpayer provides a selling service, W_n must include its value because the parties' cost allocation lacks economic significance.[52] Ignoring the value of taxpayer-provided selling services inflates the value of W_n, thus overtaxing the taxpayer because it taxes the market increases from the services as if they were earned in prior taxing periods.[53] Ignoring the value of buyer-provided services understates the value of W_n, resulting in undertaxation of the taxpayer because it taxes the costs of the services as if they were exhausted in prior taxing periods.

The ability to determine W_o and W_n with reasonable certainty allows us to determine the average periodic rate of market price change while a taxpayer holds an asset as shown in Formula 1.

$$R = [W_n/W_o]^{1/n} - 1 \quad (1)$$

n = number of periods since asset was purchased[54]

We can then use this average rate to generate the market price changes for each period that the taxpayer held the asset. R multiplied by W_o represents the market price change estimated to have occurred in Period 1. Period 2's market price change will differ from Period 1's by a factor of $(1 + R)$ because the taxpayer will have invested W_o plus the market price change that occurred in Period 1. The following notation describes the asset's market price change for each period:

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transactions. *See* Woodward v. Commissioner, 397 U.S. 572, 576 (1970) (discussing both types of costs). Under TARET, the selling expenses represent exhausted assets warranting an immediate deduction. The alternative of understating the value of W_n would result in an undertaxation of the taxpayer because it would tax the costs of the services as if they were exhausted in prior taxing periods.

52. *See supra* text accompanying note 46.

53. The accretion occurring by virtue of the taxpayer performing selling services for the buyer is the result of a series of transactions. For example, the taxpayer may have exhausted previously acquired assets, such as machines, supplies, or transferred assets, to acquire services from workers to perform the selling services. The exhaustion of assets, including the workers' services, results in a decretion of the taxpayer's assets that TARET accounts for by reducing the taxpayer's tax base when those exhaustions occur. *See infra* text accompanying note 106. The market price of those individually exhausted assets, including workers' services, is likely to be less than the market price of the selling services because they do not take into account the synergistic effect produced by bringing together these assets for the purpose of providing selling services. The difference between the market price of the exhausted assets and selling services provided represents a return on the taxpayer's assets that we might call "the going business."

If an individual taxpayer performs the selling services, the amount of the accretion under TARET is the market price of the selling services without any reduction for exhaustion of human capital. *See infra* section II.B.3. The overtaxation could be rationalized as a means of capturing some of the undertaxation of the accretion of human capital. The problem with this argument is that it operates idiosyncratically by only increasing the tax on human capital for those who use their human capital in selling assets.

54. This article does not specify the length of time in a period, and assumes that no partial periods occur. These simplifying assumptions make for easier exposition of the approach without compromising its validity.

Period 1's profit = RW_o
Period 2's profit = $RW_o(1 + R)$
Period 3's profit = $RW_o(1 + R)^2$
Period 4's profit = $RW_o(1 + R)^3$
. . .
Period n's profit = $RW_o(1 + R)^{n-1}$

Each period's estimated market price change can be specified more generally as:

$RW_o(1 + R)^{i-1}$ (2)
i = time period

One flaw of the averaging technique involves nonexhaustible assets that become worthless. With R indeterminate, estimates of the decretions in market value for each period are impossible. When worthlessness occurs, hopefully rarely, TARET should resort to historical data to allocate loss to the periods the taxpayer held the asset.

The more serious problem with the averaging technique is that it ignores volatility and discontinuity in market price changes. The more volatile and discontinuous the market value changes for an asset, the more inaccurate the estimates of periodic changes based on an average rate, and the more weak the claim that TARET replicates Haig-Simons. Indisputedly, some taxpayers will make some investments that experience wide market price changes between acquisition and disposition or have a substantial price change preceded or followed by a stagnant price level. Ignoring these patterns of price changes will lead to significant over- and undertaxation.[55] However, comparison

55. The over- and undertaxation of taxpayers resulting from using average rates of market price changes can be demonstrated by comparing TARET results to those under the Haig-Simons model when the actual price changes are either volatile or discontinuous.

Example: A buys an asset for $1000 at Time 0 and sells it for $1331 at Time 3. *A* is subject to a 30% tax rate between Time 0 and Time 3 and an interest-rate factor of 10% for any time-value-of-money adjustments. See *infra* notes 59-65 and accompanying text for a further explanation of how to choose an interest-rate factor.

1. TARET is $105, computed as follows:

$$R = (\$1331/1000)^{1/3} - 1$$
$$R = .1$$

Time 1: The profit is $100 ($1000 × .1), and the tax is $30 ($100 × .3). The time-value-of-money adjustment to account for the delay in payment between Time 1 and the realization event at Time 3 results in a Time-1 tax assessed at Time 3 of $34 ($30 × $[1 + .1(1 - .3)]^2$).

Time 2: The profit is $110 ($1000 × .1 × (1 + .1)) and the tax is $33 ($110 × .3). The time-value-of-money adjustment to account for the delay in payment between Time 2 and the realization event at Time 3 results in a Time-2 tax assessed at Time 3 of $35 ($33 × [1 + .1(1 - .3)]).

Time 3: The profit is $121 ($1000 × .1 × $(1 + .1)^2$) and the tax is $36 ($121 × .3). No time-value-of-money adjustment for the Time-3 tax is necessary because its payment is not delayed.

The TARET tax owed by *A* at Time 3 is the sum of these three time-adjusted tax assessments, or $105 ($34 + $35 + $36).

2. Haig-Simons tax depends on the appraised market price changes for each period.

a. Assume that *A* enjoyed volatile price changes with a relatively large market price increase at Time 1 as follows:

with the Code's realization-event model makes the over- and un-

CHART 1

Time	Market Price	Change in Market Price
0	$1000	0
1	$2000	$1000
2	$2200	200
3	$1331	(869)

A's Haig-Simons time-adjusted tax at Time 3 would be $146, computed as follows:

Time 1: The profit is $1000 and the tax is $300 ($1000 × .3). The time-value-of-money adjustment to compare the tax assessments of the Haig-Simons and TARET models results in a Time-3 tax liability of $343 ($300 × $[1 + .1(1 - .3)]^2$).

Time 2: The profit is $200, and the tax is $60 ($200 × .3). The time-value-of-money adjustment to compare the tax assessments of the Haig-Simons and TARET models results in a Time-3 tax liability of $64 ($60 × [1 +.1(1 − .3)]).

Time 3: The loss is $869, and the tax refund is $261 ($869 × .3). No time-value-of-money adjustment for the Time-3 tax refund is necessary.

The Haig-Simons tax owed by *A* at Time 3 is the sum of the three time-adjusted tax assessments, or $146 ($343 + $64 − $261), which is more than TARET, demonstrating that TARET can lead to undertaxation.

b. Assume that *A* enjoyed volatile price changes with a relatively large market price decline at Time 1 as follows:

CHART 2

Time	Market Price	Change in Market Price
0	$1000	0
1	$ 0	($1000)
2	$1210	1210
3	$1331	121

A's Haig-Simons time-adjusted tax at Time 3 would be $81, computed as follows:

Time 1: The loss is $1000, and the tax refund is $300 ($1000 × .3). The time-value-of-money adjustment to compare the tax assessments of the Haig-Simons and TARET models results in a Time-3 tax refund of $343 ($300 × $[1 + .1(1 - .3)]^2$).

Time 2: The profit is $1210, and the tax is $363 ($1210 × .3). The time-value-of-money adjustment to compare the tax assessments of the Haig-Simons and TARET models results in a Time-3 tax liability of $388 ($363 × [1 + .1(1 − .3)]).

Time 3: The profit is $121, and the tax is $36 ($121 × .3). No time-value-of-money adjustment for the Time-3 tax refund is necessary.

The Haig-Simons tax owed by *A* at Time 3 is the sum of the three time-adjusted tax assessments, or $81 (−$343 + $388 + $36), which is less than TARET, demonstrating that TARET can lead to overtaxation.

c. If *A* enjoyed discontinuous price changes with a market price increase at Time 1 of $331 and no further price changes, then *A*'s Haig-Simons time-adjusted tax at Time 3 would be $122, computed as follows:

Time 1: The profit is $331, and the tax refund is $99 ($331 × .3). The time-value-of-money adjustment to compare the tax assessments of the Haig-Simons and TARET models results in a Time-3 tax of $122 ($99 × $[1 + .1(1 - .3)]^2$).

Time 2 and Time 3 price changes are zero, and no tax is owed. The Haig-Simons tax owed by *A* at Time 3 is $122, which is more than TARET, demonstrating that TARET can lead to undertaxation.

d. If *A* enjoyed discontinuous price changes with no market price changes until Time 3 when the asset's price increases by $331, then *A*'s Haig-Simons time-adjusted tax owed at Time 3 would be $99 ($331 × .3), which is less than TARET, demonstrating that TARET can lead to overtaxation.

A review of aggregate historical data suggests that TARET closely approximates Haig-Simons, indicating that the major concern with TARET may be only one of equity among taxpayers and not over-or under-inclusion of income in its definition of the aggregate tax base. *See infra* Appendix.

Arguably, the averaging technique should not apply for those assets sold in highly organized markets where price changes are tracked easily. *See* Dawson, *Taxing as Ordinary Income the*

dertaxation produced by the averaging technique seem trivial. No one doubts that the Code's postponement of realized losses and deferral of unrealized gains creates significant inequities and tends to distort taxpayers' investment strategies; even rough estimates are likely to reduce the problems created by a realization-event model. Nevertheless, a comprehensive critique of TARET requires full consideration of how the averaging technique may lead to economic nonneutrality and unfairness among taxpayers.

The most important question is whether taxpayers can manipulate the computation of the average rate of market price change through their investment strategies to maximize their after-tax returns. Put differently, does the averaging technique only reduce, rather than eliminate, tax deferral of gains while permitting acceleration of losses? The answer to the manipulation issue is a simple "no," but the explanation is moderately complicated.

After acquiring a nonexhaustible asset, the taxpayer continually considers the possibility of liquidating the investment, paying the TARET model tax, and reinvesting or consuming the after-tax profits. If the taxpayer decides to defer consumption, we can predict that the taxpayer will decide whether to liquidate and buy another asset based on expected future after-tax profits. If the expected return on the previously acquired asset is less than the return previously experienced from this asset, but nevertheless higher than the expected return for any other investment opportunities available, the taxpayer has no economic incentive to liquidate.

If the rate of market price change for the previously acquired asset is expected to remain steady or increase, then the averaging technique does not discourage the taxpayer from liquidating and investing in a more attractive opportunity. The amount of profits allocated to prior periods under the averaging technique is expected either to remain unchanged or to increase and, therefore, avoiding liquidation will either leave prior accretions unchanged or increase them.[56]

Appreciation of Publicly Held Stock, 76 YALE L.J. 623 (1967) (proposing annual taxation of publicly held stock); Note, *Realizing Appreciation Without Sale: Accrual Taxation of Capital Gains on Marketable Securities*, 34 STAN. L. REV. 857, 871-76 (1982) (proposing annual tax on appreciation of publicly held corporate securities). However, I hesitate to endorse a two-pronged allocation approach, because it may create unplanned advantages for certain investments depending on whether they are subject to the averaging technique or period-to-period market tracking. *But see generally* Shakow, *supra* note 6 (demonstrating how annual taxation of market price changes is feasible with regard to a large number of assets and limiting a time-value adjusted tax to only a few types of assets; excluded from the analysis, however, is consideration of produced assets, *see supra* note 36 and *infra* section II.B).

56. This is true even if the taxpayer had experienced a negative rate of market price change in prior periods.

If the rate of market price change for the previously acquired asset is expected to decrease, the taxpayer could use the averaging technique to defer gains or accelerate losses. The after-tax profits expected from the alternative investment opportunity, however, will always exceed any tax deferral advantages produced by the averaging technique.[57] In summary, the averaging technique will not discourage a taxpayer from liquidating an asset if its expected profits are less than those available from other investment opportunities.

However, when the taxpayer expects the rate of market price change on a previously acquired asset to increase, the averaging technique may create economic inefficiencies. The problem does not arise because another investment opportunity is more attractive, but merely because the previously acquired investment is expected to do better in the future. The averaging technique then acts to allocate some of the higher profits in the later years to the earlier years, the equivalent of accelerating the recognition of gain. To avoid this result, some taxpayers may sell the asset, pay the tax or obtain a tax refund, and then rebuy the asset. Of course, tax savings should not turn on whether

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57. The proposition that TARET's allocation technique does not make a less profitable investment more profitable for a taxpayer deciding whether to remain in an investment whose profitability is expected to be lower than an alternative investment and lower than its previous performance, can be depicted as follows:

$$\{(1 + R_o)^n - TR_o \sum_{i=1}^{n} (1 + R_o)^{i-1} \quad [1 + R_o(1 - T)]^{n-i}\}(1 + R_x)^x -$$

$$TR_x\{(1 + R_o)^n - TR_o \sum_{i=1}^{n} (1 + R_o)^{i-1}[1 + R_o(1 - T)]^{n-i}\} \sum_{i=1}^{x} (1 + R_x)^{i-1}[1 +$$

$$R_x(1 - T)]^{n+x-i} >$$

$$(1 + R_o)^n(1 + R_n)^x - T\{[(1 + R_o)^n(1 + R_n)^x]^{1/n+x} - 1\} \sum_{i=1}^{n+x} \{[(1 + R_o)^n \cdot$$

$$(1 + R_n)^x]^{1/n+x}\}^{i-1} \{1 + [[(1 + R_o)^n(1 + R_n)^x]^{1/n+x} - 1](1 - T)\}^{n+x-i}$$

R_o = Rate of market price change between Times 0 and n on existing investment
R_x = Rate of market price change between Times n and x on new investment opportunity
R_n = Rate of market price change between Times n and x on existing investment
$R_x > R_n$

See *infra* note 77 for an introduction to the geometric average that is relied upon in the right-hand side of the inequality to account for the two rates of price change for the existing investment. The inequality assumes that the average periodic rate of market price change is the appropriate interest-rate factor for determining tax liability. *See infra* notes 62-65 and accompanying text.

The inequality expressed above can be simplified and expressed as:

$$[1 + R_o(1 - T)]^n[1 + R_x(1 - T)]^x >$$
$$\{1 + [[(1 + R_o)^n(1 + R_n)^x]^{1/n+x} - 1](1 - T)\}^{n+x}$$

If T is assumed to be zero, the inequality holds as shown below:

$$(1 + R_o)^n(1 + R_x)^x > (1 + R_o)^n(1 + R_n)^x$$

If any positive T is substituted into the simplified inequality and any rates of return are assumed, as long as R_x is greater than R_n, the inequality continues to hold.

taxpayers are willing to incur the transaction costs involved in selling and rebuying an asset.

One response to this problem is to allow taxpayers to elect to pay the tax or obtain a refund at any time, but no later than when they enter into a realization event. After all, the government has no interest in overtaxing a taxpayer because of increasing rates of market price changes. However, the election alternative is costly, both to taxpayers, who will have to monitor expected rates of market price changes and obtain asset appraisals, and to the government, which will have to monitor taxpayers' valuations to assure they are not too low, allowing deferral of gains to the later taxing periods. The cumbersomeness of an election provision and the inherent problems of valuations outside of a marketplace transaction indicate that the only practical response to this troubling aspect of the averaging technique is to ignore sales and repurchases.[58]

(2) Estimating the applicable tax rate. The second step in TARET's operation is to compute a tax liability (or refund) for each period based on the estimated accretion or decretion in the asset's market price for that period. To determine the taxpayer's tax liability accurately would require identifying the taxpayer's tax rate for each period. The rate would change under a progressive tax schedule depending on the amount of the taxpayer's income or on congressional modifications of the tax schedules. That level of accuracy would add greatly to the complexities of TARET. Fair alternatives might be to use a tax rate based either on the average of the taxpayer's highest marginal rates over the purchased asset's holding period or on a statistical determination of an average marginal tax rate for those taxpayers engaging in significant purchased property transactions for the relevant periods. Whatever method is adopted, it should not rely exclusively or substantially on the taxpayer's current marginal tax rate. An important goal of the proposal is to eliminate the influence of tax timing on taxpayers' economic conduct, and it is undermined if the tax rate depends on when the realization event occurs.

(3) Estimating the interest-rate factor. The last component necessary to accomplish TARET's time adjustment upon the sale or exchange of a purchased nonexhaustible asset is an appropriate interest-rate factor. From the Haig-Simons perspective — which, at least implicitly, indicates that a taxpayer should pay a tax whenever an asset's market price increases and that the government should refund tax

58. Policing these transactions should include the examination of repurchases by related parties.

whenever a decrease occurs[59] — delays in tax payments or refunds essentially represent borrowing transactions between the government and the taxpayer.[60] If an asset's market price increases unaccompanied by a realization event, then the government makes what is essentially a loan to the taxpayer equal to the amount of the computed tax. If the asset's market value decreases, unaccompanied by a realization event, then the taxpayer effectively makes a loan to the government equal to the amount of the computed tax refund. This analogy suggests that the proper approach to determining the interest-rate factor depends on whether the value of the taxpayer's investment increases or decreases, and, therefore, whether the taxpayer stands as a debtor to or a creditor of the government.

The tax on the allocative share of appreciation for each period essentially represents the principal amount the government loaned to the taxpayer, and the realization event marks the time that the taxpayer will be required to repay that principal amount along with accumulated interest to date.[61] The rate of interest that the government-lender charges should be either R or a yield rate determined by reference to U.S. Treasury Notes.[62]

Looking to the average rate of periodic market price change is conceptually appealing because the absence of a realization event resulting in unpaid taxes (the borrowing) suggests that the taxpayer invested the borrowed funds in the appreciating asset and earned R. By the government charging an interest rate equal to R, it exactly offsets the amount of benefit the taxpayer enjoyed from postponing the tax payment.[63] Although relying on R means that a decline in the asset's appreciation rate not only results in tax deferral on the gain but also reduces the taxpayer's borrowing costs, the value of these benefits is not sufficient to distort the taxpayer's investment decisions.[64]

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59. *See supra* notes 9-10 and accompanying text.

60. *See supra* notes 22, 31, and accompanying text.

61. The loan for a taxing period increases each year by the amount of interest that is owed but not paid.

62. I.R.C. § 7872 (Supp. IV 1986), concerning below-market loans, is precedent for using federal borrowing rates to value imputed interest on lending transactions. For an excellent discussion of choice of interest rate, see Blum, *supra* note 11, at 13-27. Arguably, the taxpayer should pay interest at commercial rates, which are likely to be in excess of federal borrowing rates. That level of interest charge generally has been rejected as too harsh. *See id.* at 19-23.

63. In effect, by charging R, the government becomes a partner in the taxpayer's investment venture, and the amount received by the government in excess of the principal amount depends on the success of the venture. R is an inaccurate rate, however, to the extent the tax deferral allows the taxpayer to carry or acquire other assets with a different rate of return. *See id.* at 15.

64. The potential economic benefits produced by the averaging technique used to determine R will not lead a taxpayer who has an otherwise more profitable opportunity to remain in an existing investment. *See supra* note 57.

Another advantage of using R rather than the federal borrowing rate is that it avoids the

The other way to determine the interest-rate factor is to look to U.S. Treasury Note yields. The rationale supporting this rate is that it represents the economic loss to the government caused by taxpayer's payment delay. If federal yields are used for the interest-rate factor, they should be based on short-term yields rather than on yields determined at the time of acquisition and reflecting the length of time the taxpayer held the investment. The theoretical argument for using short-term rates is that a realization event can occur at any time and, therefore, each period essentially represents a new short-term loan by the government to the taxpayer. Even more persuasive, however, is that to use historically determined long-term rates may lead to serious economic distortions. Taxpayers may forgo liquidating an investment to take advantage of a low government yield rate even though the investment is otherwise less profitable than other alternatives.[65] By always using current interest rates, TARET will minimize its interference with a taxpayer's investment decisions. Charging interest based on short-term rates will add some complexity to the computations, since the time adjustment for the tax computed for each period will be based on rates that change for each subsequent period, but user-friendly tables can be designed to eliminate this problem.

If the nonexhaustible asset has decreased in market value since the time of its purchase, TARET allocates a portion of the decrease to each taxing period based on the average rate of periodic market price change, R, and computes a tax refund for each period based on an appropriate averaging of tax rates. The tax for each period on the allocative share of depreciation essentially represents the principal amount the taxpayer loaned the government, and the realization event marks the time the government is required to repay that principal amount along with the accumulated interest.[66] Understood as a loan from the taxpayer to the government, the government's borrowing

potential hardship on the taxpayer of the time-adjusted tax exceeding the amount of the sale proceeds. Additionally, it avoids discouraging taxpayers from investing in risky ventures. *See* Blum, *supra* note 11, at 16-17.

65. For example, suppose a taxpayer owns an asset with a current market price of $30,000, subject to a time-adjusted tax based on a 4% long-term applicable federal rate of $15,000. Suppose further that this asset has an expected return of 10%. The taxpayer is not likely to sell and reinvest in another asset even if the alternative investment offers an expected return of 15%, because the attractive borrowing rate on the $15,000 provides the taxpayer with a higher after-tax return. With the assumption of a 30% tax, the taxpayer would have $30,000 invested at an after-tax rate of 7% (.1 × (1 − .3)) and $15,000 borrowed at an after-tax interest rate of 2.8% (.04 × (1 − .3)). The after-tax return at the end of one period would be $16,680 ($30,000 × 1.07 − ($15,000 × 1.028)). If the asset is sold and the after-tax return is reinvested at an after-tax rate of 10.5% (.15 × (1 − .3)), the taxpayer would have only $16,575 ($15,000 × 1.105) at the end of one period. *But see id.* at 17 (arguing for rates based on the length of deferral).

66. For a discussion of the treatment of net losses under TARET, see *infra* notes 173-80 and accompanying text.

rate reflected in U.S. Treasury Note yields is conceptually attractive and workable. R is not useful in this situation because it is negative and does not indicate the cost to the taxpayer of suffering a delay in receiving the tax refund.

A time-adjusted tax liability that uses R as the interest-rate factor for gains and the federal yields as the interest-rate factor for losses is asymmetrical. Nevertheless, the two-pronged approach is a rational response to the different investment situations and should not be rejected on grounds of inconsistency. Section II.A.1.a.(4), which demonstrates how the components of TARET are used to compute a tax, uses R as the interest-rate factor for assets that appreciated while the taxpayer held them and the applicable federal yield rates for assets that lost value.

(4) Computing TARET. The tax for each period is computed by multiplying each period's market price change (Formula 2) by the applicable tax rate T as shown below in Formula 3:

$$TRW_o(1 + R)^{i-1} \quad (3)$$

The conversion of the realization-event model into the Haig-Simons model results from adjusting each period's tax by the interest-rate factor to take the payment delay into account. Formula 4 specifies each period's time-adjusted tax when the nonexhaustible asset's value *increases* between the time the taxpayer acquired it and the time she sold or exchanged it.

$$TRW_o(1 + R)^{i-1}[1 + R(1 - T)]^{n-i} \quad (4)$$

In accordance with the Haig-Simons ideal, the interest-rate factor, R, is reduced by (1 − T) to lower the tax liability and reflect the reduced tax base resulting from the incurred interest costs.[67]

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67. The cost of borrowing is recognized generally as a market value decrease warranting a deduction. *See* I.R.C. § 163(a) (1982). The Code limits interest deductions to ameliorate the tax deferral advantages of the realization-event principle, *see, e.g.,* I.R.C. §§ 163(d), 469 (Supp. IV 1986), or to reduce the benefits of income exclusion rules, *see, e.g.,* I.R.C. §§ 163(h), 265(a)(2) (Supp. IV 1986). The latter has been interpreted to include interest incurred for federal income tax underpayments. *See* Prop. Treas. Reg. § 1.163-9T(b)(2)(i). These exceptions to deductibility are not precedent for nondeductibility of interest in TARET, which assumes the appropriateness of the borrowing and the timing of the deduction for the cost of borrowing. The government is not disadvantaged by a "return on the investment" based on an after-tax rate of interest. If the taxpayer paid the tax liability when it was incurred and the government invested the revenue by lending it to others, those debtors would be able to reduce their tax liability by deducting the interest owed the government-creditor. *But see* Blum, *supra* note 11, at 23 (arguing that government loses revenue because the tax rate is likely to be higher than "the average tax rate of lenders to the Treasury who finance the deferred tax receipts").

Accuracy requires that the tax rate used be the taxpayer's applicable rate for each period that she held the asset. Identifying that tax rate would add substantial complexity to computation of the tax liability. One alternative would be to apply the same tax rate used to determine the periodic tax. *See supra* section II.A.1.a.(2). Another alternative would be to apply the highest marginal rate available to the taxpayer for each period. Although this set of tax rates avoids disadvantaging all taxpayers, it also risks encouraging deferral because it reduces the borrowing

Formula 5 expresses the total time-adjusted tax liability due at the time of the sale or exchange, which is the sum of each period's time-adjusted tax.

$$TRW_o \sum_{i=1}^{n} (1 + R)^{i-1}[1 + R(1 - T)]^{n-i} \quad (5)$$

Example 1 and Table IV below demonstrate Formula 5's operation and how it replicates Haig-Simons.

Example 1: A purchases land at Time 0 for $100,000, sells it at Time 3 for $200,000, and is subject to a 30% tax rate between Time 0 and Time 3.

This information is sufficient to compute R (Formula 1) of .26,[68] which is then used to determine the gain and to adjust the tax liability for each period.[69] TARET is $34,883, and the after-tax return on the investment is $165,117 ($200,000 − $34,883). As Table IV shows, the estimate of periodic profits along with the time adjustments for each period's tax mimics the Haig-Simons model, assuming that for each period *A* experienced a 26% rate of periodic market price change, re-invested that return at 26%, and paid tax at a 30% rate.

TABLE IV: HAIG-SIMONS MODEL

	Time 0	Time 1	Time 2	Time 3
Investment	$100,000	$100,000	$118,194	$139,699
Profit	0	$ 25,992[1]	$ 30,721[3]	$ 36,311[5]
Tax	0	$ 7,798[2]	$ 9,216[4]	$ 10,893[6]
After-tax return	$100,000	$118,194	$139,699	$165,117

cost. This article uses the same tax rate to determine the periodic tax as it uses to determine the after-tax interest charges.

See *infra* Formula 6 for depiction of the time-adjusted tax that would apply to appreciated assets if the yield rates from U.S. Treasury Notes were used as the interest-rate factor.

68. $R = (\$200,000/100,000)^{1/3} - 1$
$R = .259922$

69. The operation of the time-adjustment summation found in Formula 5 is described below for each of the three periods that *A* owned the land.

Time 1: TRW_o is equal to $7798 (.3 × .26 × $100,000) and is the amount of tax owed at Time 1. The time-value-of-money adjustment to account for the delay in payment between Time 1 and the realization event at Time 3 results in a Time-1 tax assessed at Time 3 of $10,893 ($7798 × $[1 + .26(1 - .3)]^2$).

Time 2: $TRW_o(1 + R)$ is equal to $9824 ($7798 × (1 + .26)) and is the tax owed for Time 2. The time-value-of-money adjustment to account for the delay in payment between Time 2 and the realization event at Time 3 results in a Time-2 tax assessed at Time 3 of $11,612 ($9824 × [1 + .26(1 − .3)]).

Time 3: $TRW_o(1 + R)^2$ is equal to $12,378 ($7798 × $(1 + .26)^2$) and is the tax owed for Time 3. No time-value-of-money adjustment for the Time-3 tax is necessary because its payment is not delayed.

The tax owed by *A* at Time 3 is the sum of these three time-adjusted tax assessments, or $34,883 ($10,893 + $11,612 + $12,378).

1. $100,000 investment in asset at time of its acquisition multiplied by 25.992% rate of periodic market price change. This is RW_o.
2. $25,992 profit for period multiplied by 30% tax rate. TARET makes up for the fact that this tax is not paid at Time 1 by assuming that the taxpayer borrowed it from the government. The equivalent of having only $118,194 to invest is investing $125,992 and borrowing $7798 at a rate of 25.992%.
3. $118,194 investment multiplied by 25.992% rate of periodic market price change. TARET treats the taxpayer as investing the entire $125,992 by computing Time 2's profit in accordance with $RW_o(1 + R)$, or $32,748, but then assesses an interest cost on the $7798 borrowed amount, which before tax equals $2027 ($7,798 × .25992), for a net profit for Time 2 of $30,721.
4. $30,721 profit for period multiplied by 30% tax rate. See note 2 above for an explanation of how TARET treats the unpaid tax as an amount borrowed from the government and subject to interest, which is the equivalent of only having $139,699 to invest.
5. $139,699 investment multiplied by 25.992% rate of periodic market price change. See note 3 above for explanation of how TARET reaches similar results by first ignoring the unpaid tax and then separately accounting for the taxpayer's cost of borrowing from the government.
6. $36,311 profit for period multiplied by 30% tax rate.

Formula 6 specifies each period's time-adjusted tax refund when the nonexhaustible asset's price *decreases* between the time the taxpayer acquired it and sold or exchanged it. Formula 6 is the same as Formula 4 except that, rather than R, the U.S. Treasury Note yield is used as the interest-rate factor.

$$TRW_o(1 + R)^{i-1} \prod_{j=i}^{n-1} [1 + F_j(1 - T)] \tag{6}$$

The term $\prod_{j=i}^{n-1} [1 + F_j(1 - T)]$, which is a shorthand notation for $[1+F_i(1-T)][1+F_{i+1}(1-T)][1+F_{i+2}(1-T)][1+F_{i+3}(1-T)] \ldots [1+F_{n-1}(1-T)]$, means that the tax savings for any period is adjusted to reflect the U.S. Treasury short-term yield rates for each period for which the taxpayer delays the loss realization. Formula 7 expresses the total time-adjusted tax refund due at the time of the realization event, which is the same as that suggested by Formula 5 except that the U.S. treasury yield rate is substituted for R as the interest-rate factor.

$$TRW_o \sum_{i=1}^{n} (1 + R)^{i-1} \prod_{j=i}^{n-1} [1 + F_j(1 - T)] \tag{7}$$

Example 2 and Table V below demonstrate Formula 7's operation and how it replicates Haig-Simons.

Example 2: A purchases land at Time 0 for $100,000, sells it at Time 3 for $50,000, and is subject to a 30% tax rate between Time 0 and Time 3. The relevant applicable federal rates for adjustment of each period's tax are:

Time 1: 10% (short-term maturity)
Time 2: 8% (short-term maturity)

The TARET refund is $16,079 for the market value loss on the investment over the three years based on R (Formula 1) of approximately –20.6%, which, in accordance with Formula 7, is used to compute each period's loss.[70] The tax refund computed for each period is then adjusted by the applicable federal interest rate for each period, resulting in an after-tax return of $66,079 ($50,000 + $16,079).[71] As Table V shows, this after-tax return correlates with the Haig-Simons result assuming that *A* experienced a –20.6% rate of periodic market price change, reinvested each period's tax refund at the applicable federal rates of 10% between Times 1 and 2 and 8% between Times 2 and 3, and obtained tax refunds and paid tax at a 30% rate.

TABLE V: HAIG-SIMONS MODEL

	Time 0	Time 1	Time 2	Time 3
Investment:	$100,000	$100,000	$85,559	$74,530
Profit:	0	($ 20,630)[1]	($15,755)[3]	($12,073)[5]
Tax:	0	($ 6,189)[2]	($ 4,726)[4]	($ 3,622)[6]
After-tax return	$100,000	$ 85,559	$74,530	$66,079

1. $100,000 investment in asset at the time of its acquisition multiplied by −20.63% rate of market price change. This is RW_o.
2. $20,630 loss for the period multiplied by 30% tax rate. TARET makes up for the fact that this tax refund is not paid at Time 1 by assuming it was borrowed by the government from the taxpayer. After this adjustment the taxpayer has $85,559 invested.
3. $79,370 of the $85,559 remains invested in the asset suffering a market price decline at a 20.63% rate, resulting in a $16,374 further loss. The $6189 tax savings from Time 1's market price decline is invested for a positive return of 10%, resulting in a profit of $619 (10% rate of return on $6189 investment). The $16,374 loss plus the $619 profit produces a net loss of $15,755. TARET, by its adjustment of the tax refund, treats it as invested at 10% to replicate the Haig-Simons results.
4. $15,755 loss for the period multiplied by 30% tax rate. See note 2 above for an explanation of how TARET treats the unpaid refund as an amount borrowed by the government and subject to interest.

70. $R = (\$50{,}000/100{,}000)^{1/3} - 1$
$R = -.2063$

71. The operation of the time-adjusted summation found in Formula 7 is described below for each of the three periods that *A* owned the land.

Time 1: TRW_o is equal to $6189 (.3 × −.2063 × $100,000) and is the tax refund due *A* at Time 1. The time-value-of-money adjustment to account for the delay in payment between Time 1 and the realization event at Time 3 results in a Time-1 tax refund assessed at Time 3 of $6993 ($6189 × [1 + .1(1 − .3)] × [1 + .08(1 − .3)]).

Time 2: $TRW_o(1 + R)$ is equal to $4912 ($6189 × (1 − .2063)) and is the tax refund due *A* at Time 2. The time-value-of-money adjustment to account for the delay in payment between Time 2 and the realization event at Time 3 results in a Time-2 tax refund assessed at Time 3 of $5187 ($4912 × [1 + .08(1 − .3)]).

Time 3: $TRW_o(1 + R)^2$ is equal to $3899 ($6189 × $(1 - .2063)^2$) and is the tax refund due *A* at Time 3. No time-value-of-money adjustment for the Time-3 refund is necessary because its payment is not delayed.

The tax refund owed *A* at Time 3 is the sum of these three time-adjusted tax assessments, or $16,079 ($6993 + $5187 + $3899).

5. $62,996 ($79,370 − $16,374) of the $74,530 remains invested in the asset suffering a market price decline at 20.63% rate, resulting in a $12,996 further loss. The remaining $11,534, made up of $4727 of the tax savings from Time 2 and $6808 (which is the tax savings from Time 1 of $6189 and the profit earned at Time 2 from that tax savings) is invested for a positive return of 8% resulting in a profit of $923. The $12,996 loss plus the $923 profit produces a net loss of $12,073. See note 3 above for an explanation of how TARET reaches similar results by first ignoring the unpaid refund and then separately accounting for the government's borrowing.
6. $12,073 loss multiplied by 30% tax rate.

Showing that the Haig-Simons model obtains the same results as TARET in both the gain and loss examples is somewhat misleading. Reaching the same results depends on making the same assumptions about when and how the market prices of a particular investment changed over time. The Haig-Simons ideal assesses a tax in each period for gains and losses without needing to make any assumptions about the market price changes or return rates the taxpayer experienced. However, although the proposed model falls short of the ideal, it avoids most of the economic distortions and unfairness of the Code's realization-event approach.

b. Sale or exchange of an exhaustible asset. When a taxpayer acquires and exhausts assets for business and investment purposes within the same taxing period, TARET mimics Haig-Simons by reducing the tax base by the amount expended in acquiring the assets.[72] When a taxpayer acquires assets for business and investment purposes that lose market value through use but remain valuable over several taxing periods, the TARET method for replicating Haig-Simons is more complicated.

Formula 1's averaging technique for allocating market value decreases among taxing periods is inappropriate for exhaustible assets because it assumes a constant rate of market-value decline. That assumption is plausible for an asset whose market price is based on the discounted value of expected returns for an infinite number of periods. For an exhaustible asset, however, the market price reflects the discounted value of the asset's expected return for a limited number of periods. The limited duration means that the market price of the asset decreases each period as it has fewer periods to earn profits. Viewing the asset's market price at any time as reflecting expected returns over a term suggests that the periodic market price decreases should be correlated with decreases in the number of periods that the asset will produce returns.

72. The earlier discussion of discrepancies between the amounts expended and received, *see supra* notes 39-46 and accompanying text, has little relevance here because the situation contemplated is one in which the taxpayer exhausts all the assets received. As for the receipt of produced assets through purchase, see *infra* sections II.B.1-2.

Historical data concerning the market value of the taxpayer's return from the asset for each period is unlikely to be easily accessible when the realization event occurs.[73] The primary problem is that an asset's returns are difficult to measure. Even for relatively simple transactions like buying a building and renting it, the amount of rent the landlord earns in each period is difficult to know if, for example, services associated with the lease increase or decrease over the taxing periods. The problem becomes even more complex when the asset is part of a larger operation, such as a machine in a widget factory. The taxpayer and the marketplace determine returns from a venture dynamically and any attempt to isolate returns on individual assets leads to difficult estimations and rules that are arbitrary and manipulable. The most that might be determined is the change, and perhaps even the rate of change, in the level of returns between one period and another. Even that kind of information is administratively difficult to obtain retrospectively and speculative in nature. Because of these practical problems, the asset must be assumed to provide returns at a constant dollar value during the periods of the taxpayer's use.

The constant periodic dollar return is a function of the same three values used to determine market price changes for nonexhaustible assets: (1) the asset's value at the time the taxpayer acquired it, W_o; (2) the length of time the taxpayer held the asset, n; and (3) the asset's value at the time of the realization event, W_n.[74] Formula 8, which uses the annuity discount factor, specifies the relationship of W_o, W_n, and the constant periodic dollar return:

$$W_o = C[1 - 1/(1 + F)^n]/F + W_n/(1 + F)^n \quad (8)$$

C = Constant periodic dollar return

To solve for C and compute the amount exhausted each period that the taxpayer uses the asset requires the adoption of a discount rate, F. The taxpayer's willingness to invest the amount of the market price means that the taxpayer expected a return from this asset at least as good as that available from her other investment opportunities. In a sense, the returns from other opportunities represent the taxpayer's cost of borrowing or capital, sometimes referred to as an investor's internal rate of return. Although the taxpayer's cost of capital is the proper rate, F, to use in determining the taxpayer's periodic return, it

73. *See* Gann, *supra* note 16, at 110-11. Even if historical evidence of returns is available, its relevance to a market price based on expected returns is questionable theoretically.

74. W_n could be a positive amount or zero depending on the circumstances of the asset's disposition. If a disposition of an asset requires the taxpayer to expend more money, TARET treats W_n as zero and treats the increased costs in accordance with the rules for future costs. *See infra* section II.D.2. and accompanying text. For examples of how the TARET approach operates in all three of these situations, see *infra* note 79.

requires significant amounts of data to compute. Therefore, any interest-rate factor chosen will, at best, represent only a rough approximation of a taxpayer's cost of capital.

The most feasible manner of estimating that rate is to use the yield rate on U.S. Treasury Notes and add a premium that varies according to the type of investment involved, thus accounting for the added risk of investing in a particular venture. The rate should be reevaluated each taxing period to reflect changing market conditions. The changing rates will not only mirror market prices more accurately, but will also prevent the allocating technique from interfering with investment decisions because the market rates at the time of purchase were relatively high, leading to accelerated losses, or relatively low, leading to deferred losses. To mirror the taxpayer's investment decisions at the time they were made, each period's yield rates should be based on the remaining number of periods that the taxpayer held the investment.[75]

In the following formula, Formula 8 is rewritten in a form that solves for C and depicts the use of the risk-adjusted current federal rates as the interest-rate factor:[76]

$$C = \frac{\left[\prod_{i=0}^{n-1}(1 + P_i)^{1/n} - 1\right]\left[W_o - W_n / \prod_{i=0}^{n-1}(1 + P_i)\right]}{1 - 1/\prod_{i=0}^{n-1}(1 + P_i)} \quad (9)$$

P_i = Applicable federal interest rates with added risk premium for obligations with terms changing according to number of periods between n and i.[77]

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75. If, for example, a taxpayer acquired an asset at Time 0 and held it until Time 5, the following types of yield rates would be used:

CHART 3

Time	Yield rates for risky debt instrument with a term of:
0	5 periods
1	4 periods
2	3 periods
3	2 periods
4	1 period

76. Formula 9 is derived from Formula 8 as follows:

$$W_o = C[1 - 1/(1 + F)^n]/F + W_n/(1 + F)^n \quad (8)$$
$$C[1 - 1/(1 + F)^n]/F = W_o - W_n/(1 + F)^n$$
$$C = \{F/[1 - 1/(1 + F)^n]\}[W_o - W_n/(1 + F)^n]$$

See *infra* note 77 for a substitution in the formula computing the geometric average for F.

77. $\prod_{i=0}^{n-1}(1 + P_i)^{1/n} - 1$ represents the geometric average of the risk-adjusted applicable federal rates for each period and replaces the F in Formula 8. The

From Formula 8's assumption that the market price of an asset equals the discounted value of the periodic returns plus the discounted value of the amount received upon its sale, it follows that each period's market price decrease is the difference between the discounted value of the investment return at the beginning and the end of the period. That difference can be simplified and expressed as shown in Formula 10:[78]

$$W_{i-1} - W_i = \{C - W_n[\prod_{i=0}^{n-1}(1 + P_i)^{1/n} - 1]\}/[\prod_{i=0}^{n-1}(1 + P_i)^{1/n}]^{n-(i-1)} \quad (10)$$

Formula 11 depicts the tax refund for each period by multiplying each period's loss by the applicable tax rate T:

$$T\{C - W_n[\prod_{i=0}^{n-1}(1 + P_i)^{1/n} - 1]\}/[\prod_{i=0}^{n-1}(1 + P_i)^{1/n}]^{n-(i-1)} \quad (11)$$

Formula 12 depicts the time-adjusted tax for each period to account for the government's delay in paying the tax refund:

$$T\{C-W_n[\prod_{i=0}^{n-1}(1 + P_i)^{1/n}- 1]\}/[\prod_{i=0}^{n-1}(1 + P_i)^{1/n}]^{n-(i-1)}\prod_{j=i}^{n-1}[1 + F_j(1 - T)] \quad (12)$$

Formula 13 expresses the time-adjusted tax refund due at the time of the realization event, which is the sum of each period's time-adjusted tax:[79]

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geometric average is necessary to eliminate Formula 8's assumption of a constant interest-rate factor in each period.

78. The difference between the market price of an asset at the beginning and end of a period can be derived from the following formula:

$$W_{i-1} - W_i = \{C[1 - 1/(1 + F)^{n-(i-1)}]/F + W_n/(1 + F)^{n-(i-1)}\} - \{C[1 - 1/(1 + F)^{n-i}]/F + W_n/(1 + F)^{n-i}\}$$

In this formula, F is used to depict the applicable interest-rate factor until the equation is simplified further. The right-hand side of the equation can be rewritten and simplified as follows:

$$\begin{aligned}
&= C\{[1 - 1/(1 + F)^{n-(i-1)}]/F - [1 - 1/(1 + F)^{n-i}]/F\} + \\
&\quad W_n[1/(1 + F)^{n-(i-1)} - 1/(1 + F)^{n-i}] \\
&= C/F[1 - 1/(1 + F)^{n-(i-1)} - 1 + 1/(1 + F)^{n-i}] + \\
&\quad W_n[1/(1 + F)^{n-(i-1)} - 1/(1 + F)^{n-i}] \\
&= C/F[-1/(1 + F)^{n-(i-1)} + 1/(1 + F)^{n-i}] + \\
&\quad W_n[1/(1 + F)^{n-(i-1)} - 1/(1 + F)^{n-i}] \\
&= C/F[(1 + F)/(1 + F)(1 + F)^{n-i} - 1/(1 + F)^{n-(i-1)}] + \\
&\quad W_n[1/(1 + F)^{n-(i-1)} - (1 + F)/(1 + F)(1 + F)^{n-i}] \\
&= C/F[(1 + F)/(1 + F)^{n-(i-1)} - 1/(1 + F)^{n-(i-1)}] + \\
&\quad W_n[1/(1 + F)^{n-(i-1)} - (1 + F)/(1 + F)^{n-(i-1)}] \\
&= C/F[F/(1 + F)^{n-(i-1)}] - W_n[F/(1 + F)^{n-(i-1)}] \\
&= C[1/(1 + F)^{n-(i-1)}] - W_n[F/(1 + F)^{n-(i-1)} \\
&= (C - W_nF)/(1 + F)^{n-(i-1)}
\end{aligned}$$

This simplified form is found in Formula 10 in the text except for the substitution for F of the geometric average of the risk-adjusted applicable federal yield rates. The geometric average is used rather than the applicable rates for the periods in question because C is a function of the geometric average.

79. The operation of Formula 13 can be described through three examples.

Example 1 (worthless asset): A purchases a machine at Time 0 for $100,000, it becomes

$$T\sum_{k=1}^{n}\{C-W_n[\prod_{i=0}^{n-1}(1+P_i)^{1/n}-1]\}/[\prod_{i=0}^{n-1}(1+P_i)^{1/n}]^{n-(k-1)}\prod_{j=k}^{n-1}[1+F_j(1-T)] \quad (13)$$

Not all exhaustible assets lose market value while the taxpayer

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worthless at Time 3, and *A* then disposes of it at no cost. The risk-adjusted federal rates for the relevant periods are:

Time 0: 12% (3-period maturity)
Time 1: 15% (2-period maturity)
Time 2: 10% (1-period maturity)

The relevant applicable federal rates for adjustment of each period's tax are:

Time 1: 11% (short-term maturity)
Time 2: 9% (short-term maturity)

The tax refund is $31,209 computed as follows:

$C = \{[(1.12)(1.15)(1.1)]^{1/3} - 1\}\$100,000/[1 - 1/(1.12)(1.15)(1.1)]$
$C = \$41,861$

Time 1: The market price decrease is $29,546 ($41,861/$\{[(1.12)(1.15)(1.1)]^{1/3}\}^3$), and the tax refund for Time 1 is $8864 (.3 × $29,546). The time-value-of-money adjustment to account for the delay in payment between Time 1 and the realization event at Time 3 results in a Time-1 tax refund assessed at Time 3 of $9804 ($8864 × [1 + .11(1 − .3)] × [1 + .09(1 − .3)]).

Time 2: The market price decrease is $33,184 ($41,861/$\{[(1.12)(1.15)(1.1)]^{1/3}\}^2$), and the tax refund for Time 2 is $9955 (.3 × $33,184). The time-value-of-money adjustment to account for the delay in payment between Time 2 and the realization event at Time 3 results in a Time-2 tax refund assessed at Time 3 of $10,224 ($9955 × [1 + .09(1 − .3)]).

Time 3: The market price decrease is $37,271 ($41,861/$[(1.12)(1.15)(1.1)]^{1/3}$), and the tax refund for Time 3 is $11,181 (.3 × $37,271). No time-value-of-money adjustment for the Time-3 tax refund is necessary because its payment is not delayed.

The tax refund owed *A* at Time 3 is the sum of these three time-adjusted tax assessments, or $31,209 ($9804 + $10,224 + $11,181).

Example 2 (asset with salvage value): Same as Example 1, except *A* sells the machine for $40,000 at Time 3. The tax refund is $19,027 computed as follows:

$C = \{[(1.12)(1.15)(1.1)]^{1/3} - 1\}[\$100,000 - \$40,000/(1.12)(1.15)(1.1)/[1/(1.12)(1.15)(1.1)]$
$C = \$30,042$

Time 1: The market price decrease is $17,728 ($30,042 − $40,000$\{[(1.12)(1.15)(1.1)]^{1/3} - 1\}/\{[(1.12)(1.15)(1.1)]^{1/3}\}^3$), and the tax refund on the market price decrease is $5318 (.3 × $17,728). The time-value-of-money adjustment to account for the delay in payment between Time 1 and the realization event at Time 3 results in a Time-1 tax refund assessed at Time 3 of $5883 ($5318 × [1 + .11(1 − .3)] × [1 + .09(1 − .3)]).

Time 2: The market price decrease is $19,911 ($30,042 − $40,000$\{[(1.12)(1.15)(1.1)]^{1/3} - 1\}/\{[(1.12)(1.15)(1.1)]^{1/3}\}^2$), and the tax refund on the market price decrease is $5973 (.3 × $19,911). The time-value-of-money adjustment to account for the delay in payment between Time 2 and the realization event at Time 3 results in a Time-2 tax refund assessed at Time 3 of $6135 ($5973 × [1 + .09(1 − .3)]).

Time 3: The market price decrease is $23,362 ($30,042 − $40,000$[(1.12)(1.15)(1.1)]^{1/3} - 1\}/\{[(1.12)(1.15)(1.1)]^{1/3}$), and the tax refund on the market price decrease is $7009 (.3 × $23,362). No time-value-of-money adjustment for the Time-3 refund is necessary because its payment is not delayed.

The tax refund due *A* at Time 3 is the sum of these three time-adjusted tax assessments, or $19,027 ($5883 + $6135 + $7009).

Example 3 (asset with negative salvage value): Same as Example 1, except at Time 3 when the machine becomes worthless, it costs *A* $10,000 to dispose of it. The $10,000 payment at Time 3 reflects a cost that *A* incurred when she purchased the machine and made it operational. At that time, the machine was accompanied by the burden of its eventual removal, the equivalent of a market price decrease for *A* in the period of its purchase. The computation of the tax refund is the same as for Example 1, except that a market price decrease equal to the discounted amount of the $10,000 cost results in a tax refund at Time 0 that is adjusted for the payment delay until Time 3. In addition, a tax refund is computed for each period between Times 0 and 3 to account for the increasing cost to *A*, and those tax refunds are also adjusted for the payment delay. *See infra* section II.D.2 (discussing TARET's treatment of future costs).

holds and uses them. Taxpayers invest in exhaustible assets because they expect to obtain profits from using those assets that exceed the costs incurred through exhaustion. However, in some cases those profits may come not only from use of the exhaustible assets but also from increases in the market price of those assets. The notion of an exhaustible asset appreciating in value may seem oxymoronic, but it merely acknowledges the marketplace phenomenon in which increase in the value of an asset's expected use outstrips market value decreases due to wear and tear. Formula 1's averaging technique and Formula 5's time-value-of-money adjustment provide a satisfactory way of computing the taxpayer's tax liability if an exhaustible asset appreciates. Thus, if a purchased asset's market price increases between the time of acquisition and disposition, the TARET model treats the investment in the same way, regardless of whether the asset is exhaustible or nonexhaustible.

c. Other types of dispositions. TARET also changes the tax treatment of dispositions, other than sales or exchanges, involving purchased assets. The following discussion of casualty losses and donative transfers indicates how TARET leads to a reconsideration of familiar Code rules.

(1) Casualty losses. Internal Revenue Code section 165(a) allows a deduction for any casualty loss sustained during the year that is not compensated for by insurance or otherwise. Internal Revenue Code section 165(b) provides that "the basis for determining the amount of the deduction for any loss shall be the adjusted basis provided in section 1011 for determining the loss from the sale or other disposition of property." A regulation elaborates on this provision by stating that if property used in a business or investment venture is totally destroyed, the amount of the loss is the asset's adjusted basis.[80] The Code appropriately limits the casualty loss deduction to basis when the asset is totally destroyed because the realization-event principle makes market price changes in taxing periods before the casualty irrelevant.

Basis as a measurement of a casualty loss, unexplainedly, breaks down under the Code when the taxpayer's asset is only partially destroyed. The regulations indicate that the proper measurement of the casualty loss deduction is the difference between the asset's market price before and after the casualty, as long as that difference is less than the asset's adjusted basis.[81] Rather than using the measurement of market price loss to indicate the portion of the asset that was de-

80. Treas. Reg. § 1.165-7(b) (as amended in 1977).

81. *Id.*

stroyed and allowing a deduction for only that portion of the basis, the Code allows unrecognized gains and losses to control the measurement of the casualty loss. The effect of this computation is to allow a further deferral of gains or postponement of losses until the taxpayer otherwise disposes of the asset.[82]

TARET is not indifferent to when the market price changes and, therefore, a casualty event occurs, regardless of whether the asset is partially or totally destroyed, or requires an appraisal of the asset's market price immediately before the casualty occurred.[83] In effect, the casualty is treated as if it were a confluence of three events (1) a cash sale before the casualty; (2) a repurchase of the asset for the cash received; and (3) a casualty resulting in a loss, or partial loss, of the hypothetically repurchased asset. The asset's price immediately before the casualty represents W_n and is used to compute the taxpayer's tax

82. The effect of the Code's treatment of partially destroyed assets is illustrated below through examples.

Example 1: A's business asset is partially destroyed and has a market price immediately after the casualty of $2500. Its basis was $6000, and its market value immediately before the casualty was $7500.

According to Treas. Reg. § 1.165-7(b) (as amended in 1977), in the year of the casualty *A* may deduct $5000 ($7500 − $2500), and, according to I.R.C. § 1016(a) (1982 & Supp. IV 1986), the asset's basis is reduced to $1000 ($6000 − $5000). The adjustment to basis assures that the $1500 ($7500 − $6000) market price accretion that occurred before the casualty will be taxed eventually, but it delays taxing the accretion until *A* later disposes of the partially destroyed asset.

An alternative approach would be to use the comparison of market prices immediately before and after the casualty to measure the portion of the asset destroyed — in this case, two thirds ($5000/7500) — and deduct that portion of the basis — in this case, $4000 ($6000 × 2/3) — leaving a basis of $2000. This approach would treat the casualty event as the equivalent of a sale of a portion of the asset followed by the loss of the proceeds, as shown by the following computations:

Sale of 2/3 of asset:

Amount received	$5,000
Basis	4,000
Gain	1,000
Loss of proceeds	5,000
Net Loss	4,000

The same approach should apply when the asset decreases in value before the casualty, as shown in Example 2 below.

Example 2: A's business asset is partially destroyed and has a market price immediately after the casualty of $2500. Its basis was $6000, and its market price immediately before the casualty was $4000.

According to Treas. Reg. § 1.165-7(b) (as amended in 1977), in the year of the casualty *A* may deduct $1500 ($4000 − $2500), and, according to I.R.C. § 1016(a) (1982 & Supp. IV 1986), the asset's basis is reduced to $4500 ($6000 − $1500). The adjustment to basis assures that the $2000 ($6000 − $4000) market price decretion that occurred before the casualty will be deducted eventually, but it delays the tax refund until *A* later disposes of the partially destroyed asset. The alternative approach would allow a deduction for the casualty loss of $2250 ($6000 × ($1500/$4000)), and effectively permits a deduction for a portion of the market price decrease that occurred before the casualty.

83. The need to determine a totally destroyed asset's value immediately prior to the casualty is an administrative complexity that the Code avoids.

liability in accordance with the TARET methods previously described.[84] With this tax assessment accomplished, the appropriate amount allowed as a casualty loss under TARET is based on the asset's market price immediately before the casualty. If the asset were totally destroyed, the amount allowed for the casualty would be W_n. If the asset were partially destroyed, the deductible amount would be the difference between W_n and the asset's price after the casualty. The tax refund resulting from the deduction needs no time adjustment because the casualty occurred in the same period that it is recognized.

TARET's treatment of casualty losses highlights both the limitations of its allocation techniques and its continuing dependence on the definition of a realization event. The Haig-Simons ideal would assess a tax on all market price changes within a taxing period regardless of the reason for the accretions or decretions. A casualty loss does not represent a special kind of market price loss, but merely an event that results in a market price decrease warranting a tax base adjustment at the time it occurs. For TARET, a casualty provides not only the opportunity to assess a tax based on market price changes occurring between the time the taxpayer acquired the asset and suffered the casualty, but also sufficient objective evidence to avoid allocating some of the loss of the current period to prior periods. Recognizing that the TARET rules regarding casualty losses are essentially timing rules may affect how the definition of casualty develops. Courts applying TARET should continue to treat slow-eating termites as a noncasualty event,[85] but seriously consider treating events such as the stock market crash of October 19, 1987, as casualties.

(2) Gifts, bequests, and inheritances. The Code presently permits assignment of income by not treating a lifetime gift by the donor as a realization event, by not treating a gift as income to the donee, and by requiring the donee to take the donor's basis in property.[86] TARET can accomplish the same results by assessing tax, based on the asset's value at the time the donor acquired it, at the time the donee enters into a realization event.[87] Nothing about the model suggests that Congress must reconsider its policy of not treating a gift as income to the

84. *See supra* notes 47-79 and accompanying text.

85. *See* Rev. Rul. 63-232, 1963-2 C.B. 97.

86. *See* 1 B. BITTKER, *supra* note 6, at ¶¶ 10.1, 41.3; *see also* H. SIMONS, *supra* note 1, at 125-47, 163 (criticizing this rule and recommending taxing the donee upon receipt of gifts, bequests, and inheritances).

87. The Code limits assignment of losses by requiring the donee to compute losses by using the lesser of either the asset's value at the time of the gift, or the donor's basis. *See* I.R.C. § 1015(a) (1982). If TARET permits assignment, it should eliminate this indefensible limitation. *See* 2 B. BITTKER, *supra* note 6, at ¶ 41.3.1.

donee. However, eliminating the advantage of tax deferral makes it more difficult to justify postponing the realization event. With removal of the fairness question about whether tax deferral should be lost through a nonmarketplace transaction, allowing the assignment of income becomes harder to defend. The administrative difficulties of obtaining an appraisal must be weighed against the inequities of allowing property owners an advantage not available to taxpayers who earn income by selling their services.

TARET demands that Congress change its policy of allowing the taxpayer's heirs to take a basis in inherited property equal to its fair market value at the time of the taxpayer's death,[88] while not requiring the taxpayer's estate to recognize the unrealized gain.[89] The Code's treatment of inherited property converts tax deferral into tax exclusion. By eliminating the advantages of tax deferral, TARET increases the relative benefits of the exclusion available to taxpayers who die with appreciated assets. More importantly, without repeal of the step-up-in-basis rule, TARET's promise of increased economic neutrality and equity will remain unfulfilled.

2. *Retaining a Purchased Asset*

Section II.A demonstrated how TARET operates when the taxpayer purchases and disposes of an asset. This section analyzes TARET's operation with regard to transactions occurring while the taxpayer holds a purchased asset.

a. Corporate distributions to shareholders. Corporate distributions to shareholders present difficult problems under the Code because significant tax differences result from classifying a distribution as a dividend rather than a redemption or liquidation.[90] Under the Code, a

88. *See* I.R.C. § 1014 (1982 & Supp. IV 1986); 2 B. BITTKER, *supra* note 6, at ¶¶ 41.4.1, .7 (describing exceptions to the general rule that the taxpayer's heirs take a basis equal to the property's market price); *see also* I.R.C. § 469(g)(2) (Supp. IV 1986) (indirectly limiting the advantage of the step-up-in-basis rule by disallowing suspended passive losses to the extent that heirs enjoy a step-up).

89. I.R.C. § 1014 (1982 & Supp. IV 1986) also operates to reduce basis when the decedent's asset decreased in value between the time of acquisition and death. Nonrecognition of losses is a less serious problem, however, because most decedents can plan to dispose of those assets before death.

90. Partial liquidations, which focus on the corporation's change of investment strategy, create special difficulties. The case for capital-transaction treatment of partial liquidations has always been an uneasy one. As long as the distribution is pro rata among shareholders, the corporation has accumulated earnings and profits, and if it remains active after the distribution, it is hard to see why it is relevant whether the corporation reduced its cash holdings or ceased operating a portion of its business. The difference, at best, is one only of degree. *See* Surrey, *Income Tax Problems of Corporations and Shareholders: American Law Institute Tax Project — American Bar Association Committee Study on Legislative Revision,* 14 TAX L. REV. 1, 5-9 (1958). The Tax Equity and Fiscal Responsibility Act of 1982, Pub. L. No. 97-248, 96 Stat. 324

dividend is a noncapital transaction, which, in general, results in the entire amount being included in income without the benefit of any preferential tax treatment.[91] In contrast, classifying a distribution as a stock redemption, partial liquidation, or complete liquidation generally means that it is reduced by a portion or all of taxpayer's basis in the stock and enjoys preferential treatment.[92]

TARET changes the nature of the issues and alleviates many classification problems because it essentially taxes the shareholder on a corporation's increase in earnings and profits as they occur and is indifferent to whether the taxpayer-shareholders' return comes in the form of dividends, redemptions, liquidations, or sales or exchanges. If the corporation distributes a relatively small percentage of its value pro rata to shareholders, TARET taxes the distribution currently, without reference to the taxpayer's initial investment. If the taxpayer either receives a non-pro rata distribution, if the corporation makes a pro rata distribution to its shareholders that represents a relatively large percentage of its total value, or if the taxpayer sells or exchanges the stock, then the time-value adjustment detailed earlier in section II.A.1.a applies. The adjustment essentially treats a corporate distribution as if a portion of it had been distributed as a dividend in each of the prior years that the taxpayer held the stock and the after-tax distribution had been immediately reinvested in the corporation. Thus, TARET eliminates the preference for corporations retaining earnings and having stockholders enjoy investment returns through capital transactions.[93]

b. Interest earned by lenders. A taxpayer who lends money to another person enjoys interest income during each period the loan is out-

(1982), repealed the provisions of prior law relating to partial liquidations. The Code now provides that for corporate shareholders, distributions of property pursuant to a partial liquidation are governed by I.R.C. §§ 301 and 302 (1982 & Supp. IV 1986), having to do with dividends and redemptions. For noncorporate shareholders, the tax treatment of partial liquidations remains essentially the same. *See* I.R.C. § 302(b) & (e) (1982).

91. *See* I.R.C. § 301 (1982 & Supp. IV 1986); 3 B. BITTKER, *supra* note 6, at ¶¶ 92.1.1-.2. However, the special deduction available to corporate shareholders for dividends received under I.R.C. § 243 (1982 & Supp. IV 1986) may make classifying a distribution as a dividend rather more advantageous than classifying it as a redemption or liquidation.

92. *See* 3 B. BITTKER, *supra* note 6, at ¶ 93.1.1 (describing the tax treatment of redemptions and liquidations as equivalent to the tax treatment accorded an asset sale, which includes treating it as the equivalent of a capital transaction). Although the Tax Reform Act of 1986 repealed the capital gains deduction, the Code continues to prefer capital gains over other types of income. *See supra* note 34.

93. Comparing the after-tax results of Examples 1 and 2 below illustrates how TARET eliminates any tax preference for the manner that a shareholder incurs tax on corporate earnings. The examples rely on the averaging technique's strong assumption that the corporation earns a constant rate of return during the period the taxpayer holds its stock.

Example 1: A acquires stock of Corporation *XYZ* for $1000 at Time 0 and sells it for $1225 at Time 3. (The analysis would be the same if Corporation *XYZ* had redeemed *A*'s stock or had

standing; that interest income reflects market price increases that TARET taxes when they occur. Concerns about time value of money have led recently to significant Code changes to allow the accurate measurement of interest income on taxpayer's loans, in particular, for below-market loans and original-issue discount obligations, regardless of whether the taxpayer uses the cash- or accrual-method tax accounting system.[94] The recent reforms are wholly consistent with TARET's goals and are an essential component to its operation.

Related questions arise regarding transactions in which a party provides goods or services before receiving payment or makes a payment before receiving goods or services. The transactions contain a loan as well as a sales component, and identifying a loan indicates that an accurate measurement of income requires accounting for the implicit interest charge.

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liquidated its assets.) *A*'s applicable tax rate is 30%. *A*'s tax is $71 and after-tax return is $1154 ($1225 − $71), computed as follows:

$R = (\$1225/1000)^{1/3} - 1$

$R = .07$

Time 1: TRW_0 is equal to $21 (.3 × .07 × $1000) and is the amount of tax owed at Time 1. The time-value-of-money adjustment to account for the delay in payment between Time 1 and the realization event at Time 3 results in a Time-1 tax assessed at Time 3 of $23 ($21 × $[1 + .07(1 − .3)]^2$.

Time 2: $TRW_0(1 + R)$ is equal to $22 ($21 × (1 + .07)) and is the tax owed for Time 2. The time-value-of-money adjustment to account for the delay in payment between Time 2 and the realization event at Time 3 results in a Time-2 tax assessed at Time 3 of $24 ($22 × [1 + .07(1 − .3)]).

Time 3: $TRW_0(1 + R)^2$ is equal to $24 ($21 × $(1 + .07)^2$) and is the tax owed for Time 3. No time-value-of-money adjustment for the Time-3 tax is necessary because its payment is not delayed.

The tax owed by *A* at Time 3 is the sum of the three time-adjusted tax assessments, or $71 ($23 + $24 + $24).

Example 2: Assume the same facts as Example 1 except that Corporation *XYZ* distributes its after-tax earnings to its shareholders each period. If the appreciation in the market price of the stock enjoyed by *A* in Example 1 reflects the corporation's after-tax return each period, we can assume that the periodic distributions equal 7% of *A*'s investment for each period. At Time 1, the corporation's distribution to *A* is $70 ($1000 × .07), resulting in an after-tax return of $49 ($70 × (1 − .3)), which *A* reinvests in the corporation. At Time 2, the corporation's distribution to *A* is $73 ([$1000 + $49] × .07), resulting in an after-tax return of $51 ($73 × (1 − .3)), which again *A* reinvests in the corporation. At Time 3, the corporation's distribution to *A* is $77 ([$1000 + $49 + $51] × .07), resulting in an after-tax return of $54 to *A*. If *A* were to sell her stock, which has a value of $1100 ($1000 + $49 + $51) at Time 3, she would not owe any tax upon the sale because the stock did not appreciate from the time of her investments. The cash received upon the sale of the stock, $1100, plus her Time-3 after-tax distribution of $54 equals $1154.

The TARET system is also attractive because it eliminates the inequities of current Code provisions that tax distributions for corporate profits earned before a stockholder acquired the stock as dividends, and corporate profits earned while the stockholder held the stock as a capital transaction if the stockholder sells the stock before the corporation declares a dividend. *See* 3 B. BITTKER, *supra* note 6, at ¶ 92.1.1.

94. *See* I.R.C. § 1272(a) (Supp. IV 1986) (original-issue discount obligations); I.R.C. § 7872 (Supp. IV 1986) (below-market loans); *see also, e.g.*, Halperin, *supra* note 1, at 509-15 (discussing these types of transactions).

If a taxpayer sells a note or bond at a premium or a discount, TARET treats the increase or decrease in the loan's market price as it would an increase or decrease in the value of any other purchased asset. The loan's price changes reflect interest-rate fluctuations and the creditworthiness of the debtor, which are marketplace phenomena indistinguishable from the causes of price changes for any purchased asset, and, therefore, should be accorded the same tax treatment. If a taxpayer retains a note or bond until maturity, TARET, as well as the Code, are forced to ignore market value changes that may have occurred during the time the note or bond was outstanding. This result is contrary to the Haig-Simons ideal, but is unavoidable because of the absence of a realization event to trigger TARET's operation.[95]

c. Rents from using property. A taxpayer who purchases an asset and leases it to another person enjoys rental income during each period. The difficulty of determining market rental rates has made it unfeasible for the Code to police below-market leases as it has policed below-market loans, and that discrepancy remains under TARET.[96]

As market rents vary, a lessor or lessee who has entered into a long-term lease may experience market price changes in the value of the lease. If market rents are greater than the rents provided for in the lease, the value of the lease to the lessor decreases while its value increases to the lessee. If market rents are lower than the rents provided for in the lease, the value of the lease to the lessor increases while its value decreases to the lessee. If a lessor or lessee retains a lease for its full term, both the Code and TARET must ignore the changes in market value that may have occurred during the lease's term. Without a transaction to value the lease, contrary to Haig-Simons, the market changes are beyond the reach of either the Code or TARET.

Traditional Code analysis treats any lessor transaction relating to the leasehold as a noncapital transaction that changes the timing of the income stream.[97] The capital/noncapital distinction has no place under TARET, and, instead, the tax is based on an allocation of the lease's market price changes over the tax periods that the lessor or lessee had an interest in the lease.[98]

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95. See *infra* notes 136-42 and accompanying text for a further discussion of market value changes for notes and bonds when the debtor sells a debt or obtains a discharge of indebtedness.

96. *See infra* notes 130-31 and accompanying text.

97. *See, e.g.*, Commissioner v. Gillette Motor Transport, Inc., 364 U.S. 130 (1960); Hort v. Commissioner, 313 U.S. 28 (1941).

98. The TARET allocation techniques will differ depending on whether the parties enter into the lease initially or pay parties owning leasehold interests for the lease. If the lessor or lessee enters into the lease agreement, then the allocation technique described in *infra* section II.B, concerning produced assets, is used to determine the amount of market changes for each period either party held the lease. If the taxpayer pays a premium or obtains a discount for an existing

The analysis of property rents becomes more complex when taxpayers elect to use the property themselves in their business or investment ventures. Haig-Simons essentially ignores a taxpayer's imputed income in the form of rental profits acquired from using purchased assets for business or investment, since the market value increases attributable to the imputed rental income are accompanied by decreases as the imputed income is exhausted immediately. The Code also ignores imputed income from use of a business or investment asset because of the absence of a marketplace transaction. This treatment is appropriate except when the business or investment profits resulting from the use of the asset are deferred.

By not taxing the imputed rental income produced when it is earned and delaying its deduction, the Code enhances the benefits of tax deferral and creates horizontal inequities between taxpayers who lease assets from others and those who obtain imputed rental income from assets they acquire. For example, a taxpayer who purchases a bulldozer for the purpose of building a factory enjoys bulldozer services during the construction period. The Code postpones the deduction of all marketplace expenditures connected with the building of the factory, such as property taxes, machinery rents, machinery amortization, or employee salaries, by adding them to the factory's basis and amortizing them over the period that the factory is put to use.[99] It fails, however, to measure and tax the bulldozer services when earned and, therefore, effectively allows their immediate deduction. The effect is to favor taxpayers who acquire and use their own assets over those who lease other persons' assets and who cannot immediately deduct the costs of the rents.

TARET avoids the Code's inequities because it, like Haig-Simons, does not need to postpone the deduction for assets exhausted during a taxing period. The bulldozer services and any other expenditures that are exhausted in the production process are transformed into a factory. TARET accounts for the periodic market value increases in the factory during the construction process.[100] Eliminating tax deferral for market price increases resulting from the building of the factory means that postponing the deduction for exhaustion of the bulldozer services or any other exhausted assets is unnecessary and inappropriate.

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lease, then the rules for exhaustible assets found *supra* in section II.A.1.b apply to allocate market price changes to each period the lease is held.

99. *See* I.R.C. § 263A (Supp. IV 1986); Commissioner v. Idaho Power Co., 418 U.S. 1 (1974).

100. *See infra* section II.B.2.

B. *Produced Assets Devoted to Business or Investment Ventures*

A second way the realization-event principle allows taxpayers to trigger an interest-free government loan is by not taxing them on the increasing values reflected in the assets they produce until they sell or exchange them. The term "produced assets" is used to refer to assets acquired by the taxpayer through the acquisition or use of other assets. This section builds on section II.A's analysis and investigates in more detail the relationship of purchased assets to produced assets and the phenomenon of using purchased and produced assets to produce other assets. It explores the tax issues relating to produced assets by first explaining the complexity of market price changes that occur in the production process with reference to the Haig-Simons ideal and then showing how the Code's realization-event principle, when judged against that standard, potentially leads to tax deferral, inequities, and economic distortions. The remainder of this section describes how TARET mimics the Haig-Simons ideal and substantially reduces the Code's tax deferral opportunities.

In the Haig-Simons ideal, determining the tax consequences of producing assets requires identifying market price decreases from assets exhausted in production and market price increases from assets produced. Four different types of market price decretions occur during the production process. First, the taxpayer may use (exhaust) goods or services, such as electricity, scratch paper, truck fuel, or workers' labor. These depletions reduce the Haig-Simons tax base in the period the taxpayer uses them.[101] Second, the taxpayer may devote assets to the production process that remain differentiated from the produced asset, but would have no salvage value if removed from the production process. Examples include an artist's oil paint placed on the canvas, silk cloth cut and sewn to make a dress, or seeds planted on farmland. Their use also reduces the Haig-Simons tax base by the amount of their market values. Third, a taxpayer may devote assets to the production process that remain differentiated from the produced asset and have some salvage value if extracted from the produced asset. Examples include an artist's canvas after the artist has applied paint to it or mahogany panelling installed in a building. Haig-Simons would account for any market price decrease by comparing the asset's market price before and after the taxpayer devotes it to the production process. Fourth, there may be wear, tear, or obsolescence of assets that are used to produce another asset, such as the

101. This discussion assumes that the tax base has already been reduced for any difference in the market price of the assets transferred to purchase and the purchased assets, in accordance with the analysis described *supra* in section II.A. *See supra* notes 39-46 and accompanying text.

artist's brush, the excavator's bulldozer, or the writer's computer. Again, Haig-Simons accounts for market value decreases by comparing the exhaustible asset's market value at the beginning and end of a period.

In the Haig-Simons ideal, market price accretions from acquired assets increase the tax base, and that includes produced assets. In this context, the greatest difficulties are differentiating produced assets from purchased assets and determining when events occurred to produce those assets. The acquisition of a produced asset is relatively easy to identify when the taxpayer acquires services, goods, and machinery and devotes that capital to manufacturing a completed or partially completed asset, whether it be a painting, a building, or knowledge. Less obvious and more difficult to identify, but no different, is the situation in which a taxpayer obtains a produced asset through what might be called the "portfolio phenomenon." The taxpayer exhausts no more than is necessary to purchase an asset, yet acquires not only the purchased asset but also a produced asset. The pizzeria owner's purchase of the delivery truck examined earlier demonstrates this phenomenon,[102] as does a taxpayer's acquisition of a control premium by buying voting shares and adding them to those she already owned, acquisition of a rarity premium by buying an ancient vase that matches one the taxpayer already had to make a unique set, or acquisition of a going-concern premium by buying inventory to stock a fully equipped retail establishment. In whatever manner a taxpayer acquires a produced asset, the Haig-Simons ideal requires that the accretion increase the tax base in the period it is acquired.

Under the realization-event principle, market price increases during or upon completion of production of an asset are not taxed because production is an insufficient realization event. To lessen the tax deferral benefits, the Code generally postpones the deduction of realized costs incurred in the production of those assets.[103] The postponement of deductions creates administrative complexities as the Code attempts to reconnect income-producing transactions, or, if you will, match the income-producing costs to the taxing periods when the taxpayer realizes the produced income.[104]

Deferring tax on a taxpayer's periodic accretions from producing assets also creates inequities and economic distortions. The Code

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102. *See supra* text accompanying note 42.

103. *See, e.g.*, I.R.C. § 263A (Supp. IV 1986); *see also supra* note 45 and accompanying text.

104. For a discussion of the complexities of I.R.C. § 263A (Supp. IV 1986), see Garhwal, *Cost Capitalization Rules Applicable to Contractors, Manufacturers, Retailers and Wholesalers*, 66 TAXES 403 (1988).

taxes market price accretions of those who sell their assets, including their services, in the marketplace and use the proceeds to purchase other assets, while it defers tax on the income of those who use previously acquired appreciated assets and personal services outside the marketplace to produce assets. For example, a business that uses its assets to build its own factory is not taxed on the market value of those production efforts until the business sells the goods manufactured in its factory or sells the factory itself. The lower deductions for exhaustion of the factory do not offset the tax deferral advantages because the market value increase from the factory's production occurs in earlier taxing periods than the taxing periods involved when the Code allows a taxpayer to deduct for its exhaustion. In contrast, a business that hires someone to build a factory enjoys no tax deferral because the factory's market price is nearly equal to the amount the taxpayer paid for it and reflects relatively little untaxed effort by the taxpayer. The difference in treatment not only leads to different taxation of similarly situated businesses, but encourages taxpayers to devote their resources to producing assets that the market values less than the resources expended in their production. The favorable tax treatment makes what would otherwise be a less profitable venture more profitable.

TARET responds to the tax deferral concerns by allocating the market price increases attributable to the taxpayer's production efforts over the taxing periods when the production took place. The proposed allocation technique works reasonably well for produced assets that are sold or exchanged immediately after the taxpayer completes production.[105] By relying on some market appraisals, the allocation technique also operates reasonably well for produced assets that the taxpayer initially retains, but ultimately sells or exchanges. For assets that are produced, used, and exhausted entirely outside the marketplace, however, TARET avoids tax deferral only if production and exhaustion occur during the same taxing period. Thus, the critical question becomes whether the model's inability to tax some produced assets with reasonable accuracy or administrative ease means that the model fails. The remaining subsections are devoted to this question.

Sections II.B.1.a and II.B.1.b below describe the allocation technique for assets that are sold or exchanged immediately after the taxpayer completes production. Section II.B.1.a considers produced assets for which all materials devoted to the production process become worthless, and section II.B.1.b considers produced assets for which at least one capital item retains some value through the produc-

105. *See infra* section II.B.1.

tion process. With the easiest of the production situations analyzed, section II.B.2 then considers situations in which the allocation technique becomes administratively more difficult or unworkable.

1. *Disposition of a Produced Asset*

a. Sale or exchange upon completion of an asset for which none of the contributed capital that is integrally related to its production has a salvage value. If a taxpayer exhausts all of the capital devoted to production and if the taxpayer sells the asset shortly after producing it, then the sale price, W_n, reflects the total value of production. TARET can ignore production costs in determining the market price increases resulting from production because the taxpayer exhausted them, and they are not reflected in the asset's market price. Replicating Haig-Simons, TARET allows the taxpayer to deduct production costs in the taxing period when they are exhausted.

Viewing the asset's market price at any time as reflecting the total value of production that has occurred to date suggests that the appropriate allocation technique should correlate periodic market price increases with the amount of production that occurred in each period. That type of historical data is unlikely to be accessible when a realization event occurs, and, therefore, practicality requires the production rate to be presumed constant during the time that the taxpayer produces the asset. Formula 14, which uses the sum of annuity factor, specifies the relationship between the constant periodic value of production, E, the number of periods over which the taxpayer produces the asset, n, and W_n:[106]

$$W_n = E[(1 + F)^n - 1]/F \qquad (14)$$

To solve for E and compute the amount of market value accretion for each period the taxpayer produces the asset, it is necessary to adopt a discount rate, F. The considerations used to identify F for exhaustible assets are equally applicable for identifying market price increases for produced assets.[107] F should equal the yield rate on U.S. Treasury Notes adjusted by a risk premium for each period the taxpayer produced the asset, and those yield rates probably should be based on the remaining number of production periods. The varying multi-period rates acknowledge the fact that the taxpayer did not

106. Determining the time when the taxpayer produces an asset may be difficult. For example, the development period for a patent is nearly impossible to determine because of the amorphous character of the research and development efforts that may have led to the breakthrough. This aspect of the allocation technique may require the Internal Revenue Service to adopt a set of assumptions to avoid difficult and administratively costly disputes.

107. *See supra* note 75 and accompanying text.

transfer the partially produced asset.[108]

Formula 14 can be rewritten in a form that solves for E and depicts the use of the risk-adjusted current federal rates as the interest-rate factor:[109]

$$E = W_n\Big[\prod_{i=0}^{n-1}(1 + P_i)^{1/n} - 1\Big]\Big/\Big[\prod_{i=0}^{n-1}(1 + P_i) - 1\Big] \quad (15)$$

P_i = Applicable federal interest rates with added risk premium for obligations with terms changing according to number of periods between n and i.

Each period's market price increase is the difference between the produced asset's value at the beginning and end of the period, and, therefore, it follows from Formula 14 that each period's market value increase can be simplified and expressed by Formula 16:[110]

$$W_i - W_{i-1} = E/\Big[\prod_{i=0}^{n-1}(1+P_i)^{1/n} - 1\Big]\Big\{\Big[\prod_{i=0}^{n-1}(1+P_i)^{1/n}\Big]^i - \Big[\prod_{i=0}^{n-1}(1+P_i)^{1/n}\Big]^{i-1}\Big\} \quad (16)$$

Formula 17 depicts the tax for each period by multiplying each period's market price increase by the applicable tax rate T.

$$TE/\Big[\prod_{i=0}^{n-1}(1+P_i)^{1/n} - 1\Big]\Big\{\Big[\prod_{i=0}^{n-1}(1+P_i)^{1/n}\Big]^i - \Big[\prod_{i=0}^{n-1}(1+P_i)^{1/n}\Big]^{i-1}\Big\} \quad (17)$$

Formula 18 depicts the time-adjusted tax for each period to account for the taxpayer's delay in paying the amount owed the government:

$$TE/\Big[\prod_{i=0}^{n-1}(1+P_i)^{1/n} - 1\Big]\Big\{\Big[\prod_{i=0}^{n-1}(1+P_i)^{1/n}\Big]^i - \Big[\prod_{i=0}^{n-1}(1+P_i)^{1/n}\Big]^{i-1}\Big\}\prod_{j=i}^{n-1}[1+F_j(1-T)] \quad (18)$$

Formula 19 expresses the time-adjusted tax liability due at the time

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108. Each period's market price increase consists of both the average value of production of a new portion of the asset and a return on the investment of prior produced portions. Failure to take the latter into account would lead to different tax treatment of a taxpayer who sells a partially produced asset in the marketplace and reinvests the proceeds, and one who retains a partially produced asset and uses it in the next period or periods to complete the asset. The sum-of-annuity formula achieves this result and explains why the definition of F suggested in the text is appropriate.

109. $E = W_nF/[(1 + F)^n - 1]$. *See supra* notes 77-78 (discussing substitution of formula computing geometric average for F).

110. The difference between the market price of a produced asset at the beginning and end of a period is suggested by the following formula:

$$\begin{aligned} W_i - W_{i-1} &= E[(1 + F)^i - 1]/F - E[(1 + F)^{i-1} - 1]/F \\ &= E/F[(1 + F)^i - 1] - [(1 + F)^{i-1} - 1] \\ &= E/F[(1 + F)^i - 1 - (1 + F)^{i-1} + 1] \\ &= E/F[(1 + F)^i - (1 + F)^{i-1}] \end{aligned}$$

This simplified form is found in Formula 16 except for the substitution for F of the geometric average of the risk-adjusted applicable federal yield rates.

of the realization event, which is the sum of each period's time-adjusted tax:

$$TE/\left[\prod_{i=0}^{n-1}(1+P_i)^{1/n}-1\right]\sum_{k=1}^{n}\left\{\left[\prod_{i=0}^{n-1}(1+P_i)^{1/n}\right]^{k}-\left[\prod_{i=0}^{n-1}(1+P_i)^{1/n}\right]^{k-1}\right\}\prod_{j=k}^{n-1}\left[1+F_j(1-T)\right] \quad (19)$$

Example 3 and Table VI demonstrate Formula 19's operation and how it replicates Haig-Simons.

Example 3: At Time 0, *A* begins carving a sculpture out of marble that cost $1000 and completes the artwork at Time 3, when she sells it for $10,000. The marble has no salvage value. *A* is subject to a 30% tax rate between Time 0 and Time 3. The risk-adjusted federal rates for the relevant periods are:

Time 0: 12% (3-period maturity)
Time 1: 8% (2-period maturity)
Time 2: 10% (1-period maturity)

The relevant federal rates for each period for adjustment of each period's tax are:

Time 1: 6% (short-term maturity)
Time 2: 9% (short-term maturity)

The $1000 cost for materials deducted at Time 0 produces an immediate tax savings of $300 and is ignored in the consideration of the tax on the accretion resulting from *A*'s work. The tax on the accretion is $3159 and her after-tax return is $6841 ($10,000 − $3,159).[111] As Table VI shows, the after-tax return under TARET correlates (barring rounding errors) with the Haig-Simons ideal under the assumptions that the taxpayer produced the asset at a constant rate, reinvested the partially produced asset at the risk-adjusted geometric average rate of 9.99%,[112] paid tax at a 30% rate, borrowed

111. The operation of the time-adjusted summation is described below:
E = $10,000[(1.12 × 1.08 × 1.1)$^{1/3}$ − 1]/[(1.12 × 1.08 × 1.1) − 1]
E = $3021

Time 1: The market price increase is $3021 ({$3021/[(1.12 × 1.08 × 1.1)$^{1/3}$ − 1]}{[(1.12 × 1.08 × 1.1)$^{1/3}$]^{1} − [(1.12 × 1.08 × 1.1)$^{1/3}$]$^{1-1}$}), and the tax on the market price increase is $906 (.3 × $3021). The time-value-of-money adjustment to account for the delay in payment between Time 1 and the realization event at Time 3 results in a Time-1 tax assessed at Time 3 of $1004 ($906 × [1 + .06(1 − .3)] × [1 + .09(1 − .3)]).

Time 2: The market price increase is $3323 ({$3021/[(1.12 × 1.08 × 1.1)$^{1/3}$ − 1]}{[(1.12 × 1.08 × 1.1)$^{1/3}$]^{2} − [(1.12 × 1.08 × 1.1)$^{1/3}$]$^{2-1}$}), and the tax on the market price increase is $997 (.3 × $3323). The time-value-of-money adjustment to account for the delay in payment between Time 2 and the realization event at Time 3 results in a Time-2 tax assessed at Time 3 of $1059 ($997 × [1 + .09(1 − .3)]).

Time 3: The market price increase is $3654 ({$3021/[(1.12 × 1.08 × 1.1)$^{1/3}$ − 1]}{[(1.12 × 1.08 × 1.1)$^{1/3}$]^{3} − [(1.12 × 1.08 × 1.1)$^{1/3}$]$^{3-1}$}) and the tax on the market price increase is $1096 (.3 × $3654). No time-value-of-money adjustment for the Time-3 refund is necessary because its payment is not delayed.

The tax owed by *A* at Time 3 is the sum of these three time-adjusted tax assessments, or $3159 ($1004 + $1059 + $1096).

112. [(1 + .12) × (1 + .08) × (1 + .1)]$^{1/3}$ − 1.

cash to pay taxes at the relevant federal yield rates and sold the sculpture immediately after its completion.

TABLE VI: HAIG-SIMONS MODEL

	Time 0	Time 1	Time 2	Time 3
Investment:	$1000	$ 0	$2115	$4403
Production:	0	$3021	$3021	$3021
Interest Income:	0	0	$ 302[3]	$ 634[6]
Interest Deduction:	0	0	($ 54)[4]	($ 175)[7]
Tax:	($ 300)[1]	$ 906[2]	$ 981[5]	$1044[8]
After-tax return	$ 300	$2115	$4403	$6839

1. Immediate deduction of $1000 investment in marble results in a $1000 loss that is multiplied by the 30% tax rate. This tax refund is ignored for purposes of further comparisons.
2. $3021 market price of production multiplied by 30% tax rate.
3. $3021 uncompleted asset reinvested at 9.99%.
4. Cost of borrowing $906 at 6% rate to pay tax liability and avoid liquidating uncompleted asset.
5. Taxable income of $3269, which is the sum of $3021, $302 and ($54), multiplied by the 30% tax rate.
6. The uncompleted asset valued at $6344 at Time 2 (Time 1's production of $3021 plus interest earned on that production of $302 as of Time 2, plus Time 2's production of $3021), reinvested at 9.99%.
7. Cost of borrowing unpaid tax from Time 1 and Time 2, as well as unpaid interest, or $1941 ($906 + $54 + $981), at 9% rate to pay tax liability and avoid liquidating uncompleted asset.
8. Taxable income of $3480, which is the sum of $3021, $634, and ($175), multiplied by the 30% tax rate.

b. Sale or exchange upon completion of an asset for which some of the contributed capital that is integrally related to its production has a salvage value. If a produced asset's market price reflects the salvage value of the production materials as well as the value of the taxpayer's production efforts, TARET requires a method for segregating these two components of value. Formula 19, which provides the allocation method for determining periodic market price changes from production, depends on knowing the total value of production. That value can only be determined indirectly by subtracting the salvage value of the contributed capital from the produced asset's price when the taxpayer sells or exchanges it.

The only feasible manner of attributing a portion of the produced asset's market price to the salvage value of its materials is to rely on the materials' costs at the time the taxpayer acquired and contributed them to the production process. Although the materials might lose some value in the production process, that loss, unfortunately, is unmeasurable and, therefore, TARET must ignore it. The materials' costs cannot be subtracted from the market value of the produced asset to determine the total value of the taxpayer's production efforts because that computation fails to consider the investment return dur-

ing the production process for the taxpayer's salvageable capital contribution. Failure to account for an investment return would lead to different tax treatment of a taxpayer who sells the materials in the marketplace and reinvests the proceeds and one who retains the materials and uses them in the periods that follow to produce an asset. The considerations used to identify F for exhaustible assets are equally applicable for identifying the market price increases in the salvageable contributed capital.[113] The time-adjusted value of the contributed capital is depicted in Formula 20 as:

$$I \prod_{i=0}^{n-1}(1 + P_i) \tag{20}$$

I = amount of capital investment that retains a salvage value at the time taxpayer sells or exchanges the produced asset

By assuming that salvage value is a function of the initial cost of the materials, Formula 21 shows the relationship between the total value of the taxpayer's production reflected in the produced asset, or W_n, and the asset's value at the time the taxpayer sells or exchanges it, or W_N:

$$W_n = W_N - I \prod_{i=0}^{n-1}(1 + P_i) \tag{21}$$

When W_N is less than $I \prod_{i=0}^{n-1}(1 + P_i)$, that suggests that taxpayer's production efforts did not contribute to the produced asset's realization-event value and perhaps resulted in a loss in value. To assess a tax based on this inference is troubling because it seems to take too seriously the estimate of the portion of W_N that is attributable to capital. It is one thing to use that estimate to apportion accretions between the salvage value of materials used in the production and the production itself. It is quite another to use that estimate to conclude that the taxpayer's capital increased in value and that the taxpayer's production process caused a loss of capital without a more objective showing that the taxpayer's efforts led to market value decreases during the production period. Moreover, recognizing a production loss in the unique situation where some capital remains salvageable creates potential inequities. For taxpayers who negatively produce without using capital or who use capital that loses its entire value in the production process, no asset exists keeping the market price decreases

113. *See supra* note 75 and accompanying text; *see also supra* notes 39-46 and accompanying text (discussing differences between the market price of the assets transferred to purchase and the purchase assets that would have to be considered when determining the materials' costs).

from negative production beyond the reach of TARET. The more attractive solution is to assume that the production had no value, and to treat the produced asset in the same way as a purchased asset.[114]

If W_n is a positive amount, computing the time-adjusted tax liability is determined by modifying Formula 19 to take into account the

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114. Examples 1 and 2 below demonstrate how TARET operates when the amount attributable to the salvage value in accordance with Formula 20 exceeds the selling price.

Example 1: At Time 0, *A* begins building a log cabin out of materials that cost $10,000 and completes it at Time 3, when it is sold for $12,000. The logs retain a salvage value. The risk-adjusted federal rates for the relevant periods are:

Time 0: 12% (3-period maturity)
Time 1: 8% (2-period maturity)
Time 2: 10% (1-period maturity)

The relevant applicable federal rates for adjustment of each period's tax are:

Time 1: 6% (short-term maturity)
Time 2: 9% (short-term maturity)

The portion of the sales price of $12,000 allocated to the salvage value would be $13,306, assuming that the capital investment was invested at the risk-adjusted Federal rates ($10,000 (1.12 × 1.08 × 1.1)). Rather than assuming that the production efforts had a negative value, TARET assumes they had no value and computes the tax on the market price increase in accordance with the averaging technique used for purchased assets. The tax on the market price increase is $626, computed as follows:

$R = [12{,}000/10{,}000]^{1/3} - 1$
$R = .063$

Time 1: TRW_0 is equal to $188 (.3 × .063 × $10,000) and is the amount of tax owed at Time 1. The time-value-of-money adjustment to account for the delay in payment between Time 1 and the realization event at Time 3 results in a Time-1 tax assessed at Time 3 of $205 ($188 [1 + .063(1 − .3)]^2).

Time 2: $TRW_0(1 + R)$ is equal to $200 (.3 × $188 × (1 + .063)) and is the tax owed for Time 2. The time-value-of-money adjustment to account for the delay in payment between Time 2 and the realization event at Time 3 results in a Time-2 tax assessed at Time 3 of $209 ($200 [1 + .063(1 − .3)]).

Time 3: $TRW_0(1 + R)^2$ is equal to $212 (.3 × $188 × (1 +.063)^2) and is the tax owed for Time 3. No time-value-of-money adjustment for the Time-3 tax is necessary because its payment is not delayed.

The tax owed by *A* at Time 3 is the sum of these three time-adjusted tax assessments, or $626 ($205 + $209 + $212).

Example 2: Assume the same facts as found in Example 1 except that at Time 3 the cabin is sold for $9000. Rather than assuming the production efforts had a negative value, TARET assumes that they had no value and computes the tax refund on the market price decrease in accordance with the averaging technique for purchased assets. The tax refund on the market price decrease is $318, computed as follows:

$R = [\$9000/\$10{,}000]^{1/3} - 1$
$R = -.035$

Time 1: TRW_0 is equal to $104 (.3 × .035 × $10,000) and is the amount of the tax refund due *A* at Time 1. The time-value-of-money adjustment to account for the delay in payment between Time 1 and the realization event at Time 3 results in a Time-1 tax refund assessed at Time 3 of $115 ($104 × [1 + .06(1 − .3)] × [1 + .09(1 − .3)]).

Time 2: $TRW_0(1 + R)$ is equal to $100 ($104 × (1 − .035)) and is the amount of the tax refund due *A* at Time 2. The time-value-of-money adjustment to account for the delay in payment between Time 2 and the realization event at Time 3 results in a Time-2 tax refund assessed at Time 3 of $106 ($100 × [1 + .09(1 − .3)]).

Time 3: $TRW_0(1 + R)^2$ is equal to $97 ($104 × (1 − .035)^2) and is the amount of the tax refund due *A* at Time 3. No time-value-of-money adjustment is necessary because its payment is not delayed.

The tax refund due *A* at Time 3 is the sum of these three time-adjusted tax assessments, or $318 ($115 + $106 + $97).

market price changes in salvage value for each period:[115]

$$\sum_{k=1}^{n}\{I[\prod_{i=0}^{n-1}(1+P_i)^{1/n}-1][\prod_{i=0}^{n-1}(1+P_i)^{1/n}]^{k-1}+$$

$$E/[\prod_{i=0}^{n-1}(1+P_i)^{1/n}-1]\{[\prod_{i=0}^{n-1}(1+P_i)^{1/n}]^{k}- \tag{22}$$

$$[\prod_{i=0}^{n-1}(1+P_i)^{1/n}]^{k-1}\}\}\prod_{j=k}^{n-1}[1+F_j(1-T)]$$

Although the allocation technique proposed for this type of produced asset is imperfect and inelegant, it satisfactorily reflects the economics of the circumstances to prevent taxpayers from distorting resource allocations in response to the tax law.[116]

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115. The difference in salvage value between the beginning and end of the period can be described as:

$I(1+F)^i - I(1+F)^{i-1}$

This notation can be simplified as follows:

$= I[(1+F)^i - (1+F)^{i-1}]$
$= I[1+F)^{i-1}(1+F) - (1+F)^{i-1}]$
$= I(1+F)^{i-1}[(1+F)-1]$
$= I(1+F)^{i-1}[F]$
$= IF(1+F)^{i-1}$

If the geometric average of the risk-adjusted current federal rates are substituted for the interest-rate factor F, the simplified formula for the periodic change in market value of the salvageable capital is:

$$I[\prod_{i=0}^{n-1}(1+P_i)^{1/n}-1][\prod_{i=0}^{n-1}(1+P_i)^{1/n}]^{i-1}$$

116. The example that follows demonstrates how TARET operates when the amount attributable to the salvage value in accordance with Formula 20 is less than the selling price.

Example: Assume the same facts as Example 1 in *supra* note 114 except that *A* sells the log cabin for $25,000. The tax liability is $4740, computed as follows:

The value of the capital investment at Time 3 is $13,306 ($10,000(1 + .12)(1 + .08)(1 + .1)), and the value of production at Time 3 is $11,694 ($25,000 − $13,306).

$E = \$11{,}694[(1.12 \times 1.08 \times 1.1)^{1/3} - 1]/[(1.12 \times 1.08 \times 1.1) - 1]$

$E = \$3533$

Time 1: The market price increase from production is $3533 ({$3533/[(1.12 × 1.08 × 1.1)$^{1/3}$ − 1]{[(1.12 × 1.08 × 1.1)$^{1/3}$]^1 − [(1.12 × 1.08 × 1.1)$^{1/3}$]$^{1-1}$ and the market price increase from the capital investment is $999 ($10,000[(1.12 × 1.08 × 1.1)$^{1/3}$ − 1][(1.12 × 1.08 × 1.1)$^{1/3}$]$^{1-1}$. The tax on the market price increases is $1360 (.3 × ($3533 + $999)). The time-value-of-money adjustment to account for the delay in payment between Time 1 and the realization event at Time 3 results in a Time-1 tax assessed at Time 3 of $1506 ($1360 × [1 + .06(1 − .3)] × [1 + .09(1 − .3)]).

Time 2: The market price increase from production is $3886 ({$3533/[(1.12 × 1.08 × 1.1)$^{1/3}$ − 1]{[(1.12 × 1.08 × 1.1)$^{1/3}$]^2 − [(1.12 × 1.08 × 1.1)$^{1/3}$]$^{2-1}$}), and the market price increase from the capital investment is $1099 ($10,000[(1.12 × 1.08 × 1.1)$^{1/3}$ − 1][(1.12 × 1.08 × 1.1)$^{1/3}$]$^{2-1}$. The tax on the market price increases is $1495 (.3 × ($3886 + $1099)). The time-value-of-money adjustment to account for the delay in payment between Time 2 and Time 3 results in a Time-2 tax assessed at Time 3 of $1590 ($1495[1 + .09(1 − .3)]).

Time 3: The market price increase from production is $4273 ({$3533/[(1.12 × 1.08 × 1.1)$^{1/3}$ − 1]{[(1.12 × 1.08 × 1.1)$^{1/3}$]^3 − [(1.12 × 1.08 × 1.1)$^{1/3}$]$^{3-1}$}) and the market price increase from the capital investment is $1208 (($10,000[(1.12 × 1.08 × 1.1)$^{1/3}$ − 1][(1.12 ×

2. *Retaining a Produced Asset*

TARET encounters serious administrative problems when the taxpayer produces an asset and uses it in a business or investment venture. The one exceptional situation when TARET operates with ease is when the taxpayer produces and exhausts an asset within one taxing period, because the market price increase from acquisition of the produced asset is immediately offset by its exhaustion.

For nondurable assets produced over more than one taxing period and exhausted immediately upon conversion to business and investment use rather than sold, TARET operates inadequately. Without a marketplace transaction there is no easily identifiable evidence that the taxpayer produced or used an asset in this manner. It is hopeless to think that a tax system could monitor these types of transactions and, therefore, TARET, dependent on a realization event for its operation, will fail to tax the market price increases that occur in the earlier periods of production.

For durable assets that the taxpayer produces over more than one taxing period and converts to business and investment use, the operation of TARET is also problematic. Three kinds of situations arise: (1) the durable asset is exhaustible and the taxpayer uses it until it is worthless; (2) the durable asset is exhaustible and the taxpayer ultimately disposes of it before it becomes worthless; and (3) the durable asset is nonexhaustible and the taxpayer ultimately disposes of it. The first situation is similar to the nondurable asset situation because the taxpayer produces and uses property outside the marketplace.

The second situation involves a marketplace transaction, suggesting that TARET's estimation rules allocating market price increases and decreases to prior taxing periods might be workable. The primary stumbling block, however, is that allocating the market price increases over the taxing periods that the taxpayer produced an asset is possible only if we are able to ascertain the value of the produced asset at the time the taxpayer completes it. If the taxpayer retains the produced asset after completing its production, the only way to estimate and allocate market price increases from production and market price changes occurring after production is to estimate the asset's market price at the time the taxpayer converts the produced asset into business or investment property.

For purposes of determining the proper basis for computing losses

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$1.08 \times 1.1)^{1/3}]^{3-1}$). The tax on the market price increases is \$1644 (.3 × (\$4273 + \$1208)). No time-value-of-money adjustment is necessary because its payment is not delayed.

The tax owed by *A* at Time 3 is the sum of these three time-adjusted tax assessments, or \$4740 (\$1506 + \$1590 + \$1644).

and amortization deductions, the Code requires an estimate of the market price when taxpayers convert consumption assets to business and investment use.[117] This appraisal rule is administratively feasible because taxpayers do not often convert their assets from consumption to business and investment use. Whether it would work for durable produced assets converted to business and investment use depends, in part, on how often taxpayers produce assets and retain them and how difficult it is to reconstruct the market price at the conversion date. With an appraisal, the tax liability due at the time the taxpayer disposes of the asset is based on a combination of: (1) the rules for computing the tax for a produced asset based on the appraised value at the time of the conversion and adjusting the tax liability due at the time of the conversion to take account of the delay in payment to the time of the disposition, and (2) the rules for computing the tax liability or refund due for an exhaustible asset based on the appraised value at the time of the conversion.[118]

The third situation is like the second one because it involves a marketplace transaction. The difference between the two is that the rules for computing the tax liability or refund due for a nonexhaustible, rather than an exhaustible, asset apply.

To the extent that the market price increases resulting from the production of assets retained and devoted to business and investment purposes avoid taxation under TARET, economic distortions and inequities are likely to arise. Excluding the production profit from tax means that TARET favors taxpayers who produce the assets they use in business or investment over those who must use after-tax dollars to purchase or rent them. Taxing the market price increases from production upon a marketplace transaction will lead to further economic distortions. A taxpayer who produced an exhaustible asset may thus be deterred from selling or exchanging the asset because the transaction will lead to a tax that would be avoided if the taxpayer extracts all of its value by using it herself. Although market price increases allocated to earlier periods would be offset by market price decreases in later periods, the time-value adjustments will inevitably lead to a tax

117. *See* Treas. Reg. §§ 1.165-9(b), 167(g)-1.

118. *See supra* notes 72-79, 106-16, and accompanying text. If a casualty occurs to a produced asset, three appraisals will be necessary: (1) the value of the produced asset when the taxpayer completed it; (2) its value immediately before the casualty occurred; and (3) its value immediately after the casualty occurred. These three values allow allocation of the market price changes for each period before the casualty and determination of the amount of the casualty for the current period. *See supra* notes 80-85 and accompanying text.

A gratuitous transfer of a produced asset should be a realization event. *See supra* notes 86-87 and accompanying text.

liability unless the taxpayer's rates in the later periods are significantly higher.

The benefits of deferral might be reduced by postponing the deduction of incurred costs. The postponement, however, injects a matching rule that creates different economic distortions and inequities between produced and purchased assets and between purchased and rented assets, as well as adding administrative complexities.[119] Thus, postponement of production costs is not an appealing response to TARET's inadequacies.

Another alternative would be to require taxpayers to pay a tax upon completing production of any durable exhaustible asset that exceeds a certain minimum value, such as $50,000. Completion would be treated as a realization event for this group of produced assets, and Formulas 19 or 22 would apply to compute the amount of tax liability. This approach increases reliance on appraisals and may cause liquidity problems for taxpayers. However, the advantage of avoiding these inequities and economic distortions may warrant increased administrative complexity, at least when the tax deferral advantages are likely to be substantial.

If the appraisal alternative proves unworkable, the question arises whether the inability to tax market price increases resulting from this set of produced assets means that TARET is not a viable system. Undoubtedly, in comparison to the Code, TARET increases the incentive for taxpayers to produce exhaustible assets and to hold them until they become worthless. Whether the costs of the economic distortions and inequities created by this tax incentive are worth the advantages of more effectively taxing periodic market price increases for other types of produced assets and for all types of purchased assets requires empirical investigation.

3. *Human Capital*

Human capital is a produced asset that raises unique issues warranting a separate analysis. It reflects "the present value of the flow of future satisfactions that an individual can command in the course of his life."[120] The value of a taxpayer's human capital depends on three phenomena: (1) endowment of talent based on biological and social circumstances of birth and upbringing; (2) human and nonhuman capital investment in education, training, migration, and health care; and (3) exogenous factors such as technology or cultural tastes.

119. *See supra* notes 103-05 and accompanying text.

120. Stephan, *supra* note 1, at 1358.

The Haig-Simons ideal suggests that the tax base for each period should be decreased for assets exhausted in the production of human capital and increased for the accretions resulting from its production.[121] TARET cannot mimic this tax ideal because no obvious time exists when a taxpayer completes production of human capital, and, even if some arbitrary time were chosen, human capital defies valuation because the taxpayer retains and uses it rather than disposes of it. TARET is left taxing the income from human capital, *i.e.,* the profits the taxpayer derives from using human capital by selling services in the marketplace or by performing services outside the marketplace that lead to the production of an asset that is sold or exchanged, and not human capital itself. The model's failure to tax the market price increases from the production of human capital is offset partially by the fact that it ignores the exhaustion of human capital. Unless the taxpayer's tax rate in later taxing periods rises significantly, ignoring the later periods' decreases fails to compensate for ignoring earlier periods' increases, in view of time-value-of-money considerations.

Further, TARET cannot reach all income generated from human capital. To the extent that the taxpayer uses human capital for consumption, it escapes taxation.[122] The combination of tax deferral benefits, along with potential and probable consumptive use, explains why the Code severely limits the deductibility of expenditures incurred in

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121. *But see* Klein, *supra* note 1, at 466-67 (disagreeing that this treatment would be ideal); *accord* Kelman, *supra* note 1, at 839-42; Warren, *supra* note 9, at 1114-17; *see also* Shakow, *supra* note 6, at 1158-60 (evaluating the various arguments).

122. Simons recognized the difficulties raised by the production of human capital:

> At the outset there appears the necessity of distinguishing between consumption and expense . . . . Given items will represent business expense in one instance and merely consumption in another, and often the motives will be quite mixed. . . . Even the professional artist may use some of his materials for things he intends or hopes to sell, and some on work done purely for his own pleasure. In another instance, moreover, the same items may represent investment in training for earning activity later on.
>
> The latter instance suggests that there is something quite arbitrary even about the distinction between consumption and accumulation. On the face of it, this is not important for the definition of income; but it must be remembered that accumulation or investment provides a basis for expense deductions in the future, while consumption does not. The distinction in question can be made somewhat definite if one adopts the drastic expedient of treating all outlays for augmenting personal earning capacity as consumption. This expedient has little more than empty, formal, legalistic justification. On the other hand, one does well to accept, here as elsewhere, a loss of relevance or adequacy as the necessary cost of an essential definiteness. It would require some temerity to propose recognition of depreciation or depletion in the measurement of personal-service incomes — if only because the determination of the base, upon which to apply depreciation rates, presents a simply fantastic problem. It is better simply to recognize the limitations of measurable personal income for purposes of certain comparisons (e.g., by granting special credits to personal-service incomes under income taxes).

H. SIMONS, *supra* note 1, at 54-55; *see also id.* at 74 (identifying differences between treatment of deductions incurred to earn income from services and those incurred to earn income from property, and noting the difficulty of distinguishing consumption from business expenses for the former).

the production of human capital. Although generally I have argued against adopting the Code's matching principle to compensate for TARET's failures, I believe that TARET should deny or delay deductions for costs of producing human capital. Abandoning the Haig-Simons rule of allowing a deduction whenever the taxpayer experiences a market price decrease makes sense here because taxpayers put human capital to consumptive as well as business and investment use. The only means of taxing even a portion of the consumptive income from human capital is to deny a deduction for its costs.[123] Denying these costs raises the risks of creating economic distortions and inequities because the rule operates to favor producers over purchasers and renters. For example, a taxpayer who builds a home gymnasium avoids tax on the value of the gymnasium as well as tax on the increased health produced by exercise. In contrast, the taxpayer who buys a gymnasium or pays health club dues must use after-tax dollars to get exercise and produce health. The risk of economic distortions is minimized, however, because one of the major components of human capital is education and training, and formal schooling typically is sought and required.

A further way of neutralizing the tax deferral benefits a taxpayer enjoys under TARET for the production of human capital is to impose higher tax rates on income earned from services.[124] This proposal is particularly attractive because it would counteract the inequities and economic distortions created between taxpayers who invest in nonhuman capital and those who invest in human capital. The higher the taxpayer's realized income from personal effort and talent in any one period, the higher the tax rate should be, because a high periodic income suggests a high value of the taxpayer's human capital wealth and, therefore, a greater benefit from tax deferral. Provision for income averaging should accompany this aspect of TARET, however, to adjust for those cases where the presumption that human capital was highly valuable is rebutted by a significant decrease in periodic realized income from personal effort and talent.[125] The higher tax rates might justify allowing deductions for capital expenditures incurred in

123. *See infra* notes 128-30 and accompanying text.

124. The higher tax rates would apply to the sale of services in the marketplace as well as the sale of assets produced by the taxpayer with her services. Higher tax rates for income from services adds administrative complexity to TARET because a business or investment venture in which the taxpayer contributes services, as well as nonhuman capital, will produce profits that will have to be attributed in part to services and in part to capital.

125. Income averaging would correct the presumption when the taxpayer suffers a premature death. It would also more accurately tax the high but short-lived profits experienced by persons who profit from fads, such as teen idols, pet rock inventors, or persons with a short-lived ability to earn high incomes, such as professional athletes.

the production of human capital, especially where the expenditures have only a tangential consumption component, such as tuition for professional or technical education. On the other hand, the higher tax rates on realized income from effort and talent may increase the economic incentives for taxpayers, especially those at the highest periodic income levels, to devote their human capital to consumption uses that are beyond the reach of the tax system.[126] By denying a deduction for the cost of professional or technical education, the tax system indirectly taxes the leisure of those persons who are most likely to choose leisure over compensated work. In short, the higher tax rates do not necessarily mean that the limitations on the deductibility of capital invested in human capital should be relaxed.

A proposal to tax earnings from services at a higher rate seems to contradict the widely accepted tax policy allowing tax deferral of earnings set aside in qualified pension plans or other types of retirement accounts. This form of tax relief for earners suggests that tax deferral on human capital has not been recognized or viewed as important. Once TARET eliminates the investors' tax deferral benefits, the continuing benefits of tax deferral through the acquisition of human capital are likely to gain more attention, warranting the proposed measures to counteract the potential for economic distortions and unfairness.

C. *Assets Devoted to Consumption Purposes*

Sections II.A and II.B above showed how the realization-event principle permits taxpayers to enjoy interest-free loans from the government by holding or producing assets and how TARET eliminates some of that advantage. In contrast, this section shows how the realization-event principle leads to the nontaxation of income earned from human and nonhuman capital devoted to consumption purposes and how TARET inadequately prevents this tax avoidance.

The market price of services derived from using human and nonhuman capital for consumption purposes, commonly referred to as imputed income, should increase the Haig-Simons tax base, but their immediate exhaustion should not decrease it. Unless the taxpayer devotes imputed income to business or investment purposes, the first component of the Haig-Simons definition (including in income "the

126. A widely held view is that high tax rates are likely to reduce labor output significantly. *See* Bankman & Griffith, *Social Welfare and the Rate Structure: A New Look at Progressive Taxation,* 75 CALIF. L. REV. 1905, 1919-21 (1987). Empirical studies estimating compensated elasticity, however, suggest that taxation has only a minimal effect on compensated work effort. *See id.* at 1921-25.

market value of rights exercised in consumption") requires that its value be included in the ideal tax base.[127]

Both the Code and TARET adequately tax the imputed income from assets that have a short useful life by denying a deduction for their costs. An asset with a short useful life, such as food or clothing, produces all its profit almost immediately so that the market price of the asset and the value of the profit produced are nearly equal, making the market price a good proxy for the exhausted imputed income.[128] The failure of the Code and TARET to tax imputed income produced by a taxpayer's investment in durable assets devoted in whole or in part to consumption purposes results from three different phenomena. First, the market price for a durable asset devoted to, and exhausted by, consumption represents the present value of the future imputed income stream. The difference between the present value of the future income stream and the value of the income stream produced in the future is imputed income that neither the Code nor TARET captures by denying the taxpayer a deduction for the cost of the durable asset.[129] The second phenomenon that leads to untaxed imputed income occurs when a taxpayer purchases a durable asset that enjoys market

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127. *See supra* note 2. Neither the Haig-Simons ideal nor TARET avoids having to make difficult distinctions between consumption and business or investment purposes. *See* H. SIMONS, *supra* note 1, at 54 ("At the outset there appears the necessity of distinguishing between consumption and expense; and here one finds inescapable the unwelcome criterion of intention. A thoroughly precise and objective distinction is inconceivable.").

128. *See id.* at 118-19 ("the error involved in ignoring consumption income from property varies directly with the durability or service life of the kind of property in question"). Market price effectively measures consumption income only because the Haig-Simons ideal assumes that market prices are the appropriate measures and that psychic benefits or costs should always be ignored. *See id.* at 119-20. The principle of ignoring consumer surplus and deficits raises serious questions about the appropriateness of allowing casualty losses for property used for consumption purposes. *See* Goetz, *Some Real Property Casualty Losses and Consumption Preferences: Double Indemnification?,* 60 TAXES 507 (1982); Kelman, *supra* note 1, at 859 n.87.

129. The following example illustrates the amount of imputed income escaping taxation.

Example: At Time 0, *A* purchases a personal car for $5000 which becomes worthless at Time 3. *A* uses the car at a constant rate over the three periods; the market rate of interest during the three periods is 10%. The imputed income for each period is $2011 (.1 ($5000)/[1 − 1/(1 + .1)^3]). The present value of each period's $2011 income return is as follows:

Time 1: $1828 ($2011/(1 + .1))
Time 2: $1662 ($2011/(1 + .1)^2)
Time 3: $1511 ($2011/(1 + .1)^3)

By denying any deduction for the $5000 cost of the car, the Code and TARET indirectly tax the present value of the imputed income, but fail to reach the interest income earned each period on the market price of the car in that period. That income amounts to:

Time 1: $500 ($5000 × .1)
Time 2: $349 [($5000 − $1511) × .1]
Time 3: $183 [($5000 − ($1511 + $1662)) × .1]

The Code denies a taxpayer a deduction for the cost of the durable good by disallowing depreciation deductions. I.R.C. § 167(a) (1982). If the taxpayer sells the asset before it becomes worthless but for less than its basis, the Code denies a deduction because it assumes that the loss is mostly the result of consumption rather than a market-price phenomenon. More appropriate treatment would be to reduce the car's basis to reflect its exhaustion from use and to allow a loss

price increases while it produces imputed income. If the asset does not lose value from use, the cost of the asset was not a cost of the imputed income. Indirect taxation of imputed income depends on the taxpayer incurring market price decreases and, without a decrease, the imputed income remains untaxed. The third phenomenon that leads to untaxed imputed income occurs when a taxpayer fails to place assets into their highest economic use based on market prices.

Frequently, the taxpayer acts in a manner sufficient to suggest a profit-making motive warranting a deduction for all market price decreases incurred, so that the imputed income is not indirectly taxed but nevertheless is enjoyed. For example, a taxpayer who lives above a storefront and leases that storefront to an art gallery owner rather than to a saloon-keeper who is willing to pay higher rent, has untaxed imputed income from enjoying a quiet neighborhood. A taxpayer who accepts a lower rate of return by investing in socially conscious corporations also has untaxed imputed income. Only when the taxpayer enters into a transaction that lacks sufficient indicia of profit-making, such as when the parties are related or the taxpayer continually fails to earn a profit from the business, does the Code start reaching imputed income. It usually responds by limiting the deduction of the taxpayer's costs of producing income, thus reaching the imputed income indirectly.[130] In the case of below-market rate loans, however, the Code includes rules for estimating the amount of forgone income.[131] TARET neither prevents the exclusion of this type of imputed income from the tax base nor interferes with Code provisions that operate to include at least a portion of it in the tax base.

As indicated in the discussion of human capital, neither the Code nor TARET effectively taxes imputed income derived from the taxpayer's devoting human capital to consumption purposes.[132] Whether

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to the extent the taxpayer receives less than the adjusted basis in the sale or exchange. *See* Epstein, *supra* note 1, at 457-62.

Like the Code, TARET denies any tax refund if the amount received upon sale is less than the cost of the durable consumer asset. One difference between the Code and TARET, however, is the treatment of expenditures related to acquiring a durable consumption asset. Under the Code, a taxpayer may add expenditures related to the acquisition of an asset to basis, even though those expenditures do not contribute to the value of the asset. *See, e.g.*, Treas. Reg. § 1.1034-1(c)(4). In contrast, TARET treats those expenditures as decretions when incurred, and, if evidence shows that the taxpayer intends to use the purchased asset exclusively for consumption, disallows a deduction for those expenditures when incurred. *See supra* note 46 and accompanying text. Depending on the asset's value at the time of disposition, the Code's deferred deduction may increase the exclusion for imputed income.

130. *See* I.R.C. §§ 183, 280A (1982 & Supp. IV 1986).

131. *See* I.R.C. § 7872 (Supp. IV 1986).

132. For practical reasons, Simons would not include many produced assets used for consumption purposes within the ideal tax base. He emphasized that "[t]o conceive of income in terms of things is to invite all the confusion of the elementary student in accounting who insists

a taxpayer bakes a cake, grows vegetables, or builds a personal residence, so long as those produced assets are not sold in the marketplace the services are beyond the reach of the tax system, except to the extent the taxpayer incurs training costs in learning how to cook, garden, or build.[133]

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upon identifying 'surplus' and 'cash.' " H. SIMONS, *supra* note 1, at 51 (footnote omitted). For Simons, the critical, and unanswerable, question was "where or how a line may be drawn between what is and what is not economic activity." *Id.* The examples he used to illustrate the problem are instructive:

> If a man raises vegetables in his garden, it seems clearly appropriate to include the value of the product in measuring his income. If he raises flowers and shrubs, the case is less clear. If he shaves himself, it is difficult to argue that the value of the shaves must also be accounted for. Most economists recognize housewives' services as an important item of income. So they are, perhaps; but what becomes of this view as one proceeds to extreme cases? Do families have larger incomes because parents give competent instruction to children instead of paying for institutional training? . . .
>
> A little reflection along these lines suggests that leisure is itself a major item of consumption; that income per hour of leisure, beyond a certain minimum, might well be imputed to persons according to what they might earn per hour if otherwise engaged. Of course, it is one thing to note that such procedure is appropriate in principle and quite another to propose that it be applied.

Id. at 51-52.

Ultimately, Simons concluded that, for purposes of measuring relative incomes, ignoring imputed income from services would not lead to significant distortions. *See id.* at 52-53. The discussion in the text indicates that ignoring imputed income from services can result in inequitable tax treatment. The effect of nontaxation encourages taxpayers to produce their own consumption assets rather than purchasing them from others. *See id.* at 110-12, 113 (recognizing inequitable treatment and the practical constraints of eliminating it except in the most "flagrant" cases).

133. *See supra* note 123 and accompanying text. If an asset is the subject of a marketplace transaction after it is put into consumption use, however, TARET's favorable tax treatment of taxpayers who produce their own consumption assets is no longer necessary. If the taxpayer sells a produced durable asset before it is exhausted, an appraisal of its value at the time the taxpayer began consuming it allows for a valuation of the taxpayer's effort and a time-adjusted tax liability assessment. If the production is taxed, then exhausted costs that were denied a deduction when incurred should be allowed, and the taxpayer's tax liability should be reduced by the time-adjusted tax refund. If the sale price is less than the asset's appraised value at the time it is put into consumption use, TARET should ignore the loss and attribute it to the cost of the imputed income from the taxpayer's use of the durable asset, as an indirect way of taxing the asset's services. If the sale price is more than the asset's appraised value at the time it is put into consumption use, a time-adjusted tax should be assessed on the market price increase between the time the taxpayer completed its production and the time taxpayer sold it. In this situation, the imputed income derived from use of the asset remains untaxed.

The advantage of this approach is that it treats purchased and produced consumption assets in the same manner. Its disadvantage is that the sale of an asset at a low price relative to its value immediately after it is produced may result in a tax assessment that exceeds the sale price. A special rule that TARET must never exceed a designated percentage of the sale price, say 50%, might be a fair compromise between treating purchasers and producers equally and assuring that the tax system does not interfere with resource allocations through transfers of consumer durable goods. The following example demonstrates how TARET treats sales of produced consumer durables:

Example: At Time 0, *A* purchases $3000 of materials, begins building a vacation cabin that he completes at Time 3, and uses it for personal purposes until Time 5, when he sells it. The market value of the cabin at Time 3 is appraised at $10,000, and the materials have no salvage value. Materials costing $2000 are exhausted in Time 1, and the remaining $1000 of materials are exhausted at Time 2. The risk-adjusted federal rate for all of the relevant periods is 10%, *A* is subject to a 30% tax rate between Time 0 and Time 5, and the relevant applicable federal rate

D. *Debt*

A third way the realization-event principle permits taxpayers to trigger interest-free loans from the government is by not taxing them on changes in the market value of their outstanding liabilities until they are sold to third persons or creditors discharge them. TARET's approach of considering transactions at the time of the realization event and identifying when the Haig-Simons ideal would have included the accretions or decretions in the tax base works as well for debt transactions as it did for asset transactions. The realization-event principle, however, is implicated in the area of debt beyond the question of sale or discharge. Throughout the article, the overriding concern has been tax deferral. However, debt also raises an issue of tax acceleration when the realization-event principle operates to delay a deduction for a liability. TARET's approach provides insight into the analysis and solution of this overtaxation problem. Although applying TARET's approach to debt sales and discharge-of-indebtedness transactions is unfamiliar to the literature, it is unlikely to be controversial. However, analyzing future costs as realized debt that occurred earlier is a more contestable proposition.

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for adjustment of each period's tax is 8%. The tax on *A*'s building a cabin assessed at Time 5 is computed as follows:

$E = (\$10{,}000 \times .1)/[(1 + .1)^3 - 1]$

$E = \$3021$

Time 1: The market price increase is \$3021 ($(\$3021/.1) \times [(1 + .1) - (1 + .1)^{1-1}]$). The market price decrease from exhaustion of the materials is \$2000, and the tax on the net market price increase is \$306 ($(\$3021 - \$2000) \times .3$). The time-value-of-money adjustment to account for the delay in payment between Time 1 and the realization event at Time 5 results in a Time-1 tax assessed at Time 5 of \$381 ($\$306 \times [1 + .08(1 - .3)]^4$).

Time 2: The market price increase is \$3323 ($(\$3021/.1) \times [(1 + .1)^2 - (1 + .1)^{2-1}]$), the market price decrease from exhaustion of the materials is \$1000, and the tax on the net market price increase is \$697 ($(\$3323 - \$1000) \times .3$). The time-value-of-money adjustment to account for the delay in payment between Time 2 and the realization event at Time 5 results in a Time-2 tax assessed at Time 5 of \$821 ($\$697 \times [1 + .08(1 - .3)]^3$).

Time 3: The market price increase is \$3655 ($(\$3021/.1) \times [(1 + .1)^3 - (1 + .1)^{3-1}]$) and the tax on the market price increase is \$1097 ($\$3655 \times .3$). The time-value-of-money adjustment to account for the delay in payment between Time 3 and the realization event at Time 5 results in a Time-3 tax assessed at Time 5 of \$1223 ($\$1097 \times [1 + .08(1 - .3)]^2$).

The tax owed by *A* for the building of the cabin at Time 5 is the sum of the three time-adjusted tax assessments, or \$2425 (\$381 + \$821 + \$1223).

If *A* sells the house for less than \$10,000, TARET denies *A* a tax refund for the loss because she put the cabin to consumption use. If the amount received is less than \$4850, the TARET exception would limit the tax assessed on the production profits to 50% of the amount received. If the amount received exceeds \$10,000, then TARET uses the averaging technique for nonexhaustible appreciating assets to determine the time-adjusted tax on the market price accretions occurring between Times 3 and 5.

If a taxpayer suffers a casualty regarding a produced consumer asset, TARET should assess a tax on the market value increases resulting from the production and for the market value increases that occur while the asset is put to consumption use, as well as allow a loss for the difference between the asset's value immediately before and after the casualty. If the amount of the tax refund for the casualty is less than the amount of tax liability for prior accretions, perhaps an exception should provide that no tax is due.

1. *Borrowing, Sale, and Discharge of Indebtedness*

Haig-Simons and the Code treat borrowing as a nontaxable event because the receipt of borrowed funds is offset by the taxpayer's obligation to repay the loan, leaving the taxpayer's net worth unchanged.[134] TARET treats borrowing in the same manner. All three systems converge because a taxpayer realizes the accretions and decre-

134. *See* H. SIMONS, *supra* note 1, at 168. Professor Andrews seems to suggest that the Code's treatment of debt, recourse or nonrecourse, increases the opportunity for tax avoidance. *See* W. ANDREWS, BASIC FEDERAL INCOME TAXATION 618-20 (3d ed. 1985). *But see* Andrews, *supra* note 1, at 1138 (acknowledging that problem is created because "taxpayers can set off the near perfect accretion-type treatment of the debt side of a transaction against the much less true accretion treatment of the investment side."). Any mistaken notion that tax avoidance is attributable to borrowing is based on an analysis that conflates the effects of borrowing and the tax rules that allow for deductions in excess of the market price decreases the taxpayer experiences in a taxing period. If borrowing and accelerated deductions are segregated, however, the time lag between the incurring of a cost and paying it is shown to be irrelevant.

In a no-tax world, an investor who uses $150 of savings at Time 0 to acquire an asset that increases in value by 10% each period would have an asset with a market price of $165 at Time 1. If, instead of paying for the asset at Time 0 from savings, assume the investor borrows $50 of the $150 at a 10% periodic rate. To eliminate any confusion arising from profits or losses resulting from the cost of borrowing itself, the borrowing rate is assumed to be the same as the investment rate. Although tax arbitrage opportunities exist, these opportunities are a product of the tax treatment of investment return and not the cost of borrowing. *See* Gann, *supra* note 16, at 116-19. As shown in Table C, the borrowing does not affect the investor's rate of return.

TABLE C: NO-TAX WORLD: $100 INVESTMENT; $50 BORROWING AT 10%

	Time 1
Asset	$165
Interest Cost	$ 5
Repayment of Loan	$ 50
Return	$110
Profit (Return - investment)	$ 10
Rate of Return (Profit/Investment)	10%

If the same investor lived in a tax world that assesses tax of 30% on income, the after-tax rate of return would be only 7% because of the additional cost of taxes, regardless of whether the investor borrowed. If the investor could take a deduction at Time 0 equal to the value of the asset acquired, even though the asset was not exhausted at Time 0, then the after-tax rate of return would change depending on the amount borrowed. However, the change in the rate of return is attributable exclusively to the accelerated deduction and the unearned tax savings. Consider an investor, subject to a 30% tax rate, who incurs no debt when acquiring an asset at Time 0 with a value of $150. The after-tax rate of return is 10% as shown in Table D.

TABLE D: TAX WORLD: $150 INVESTMENT; NO BORROWING

	Time 0	Time 1
Asset	$150	$165
Tax	($45)	$ 49.50
Return	0	$115.50
Profit (Return - Investment)	0	$ 10.50*
Rate of Return (Profit/Investment)	0	10%

*Investment = $150 from savings less $45 tax refund, or $105.

The increase in the rate of return from 7% to 10% is due to the premature deduction of $150 at Time 0. The deduction is the equivalent of an interest-free loan from the government of $45 that, based on a market rate of 10% and a tax rate of 30%, saves the investor (after taxes) $3.15 between Time 0 and Time 1. Had the investor been charged $3.15 in interest, her profit of $10.50 would have been only $7.35, which results in an after-tax rate of return of 7% ($7.35/$105).

The same results occur when the investor borrows a portion of the acquisition price of the asset. If the investor borrows $50 of the $150 price and is allowed a deduction at Time 0 for the entire $150, then the after-tax rate of return is 12.7%, as shown in Table E.

tions associated with debt creation when they occur.[135]

After acquiring a debt, changing market rates, as well as changes in the taxpayer's creditworthiness, can lead to increases and decreases in the debt's value. If the taxpayer retains the debt to maturity and repays the entire loan, the Code treats the repayment as nontaxable. The decrease in the taxpayer's obligation, based on its value at the time of acquisition, is offset by the transfer of funds to repay the loan. Without a transaction to value the obligation, the Code ignores any changes in the debt's value. TARET, contrary to Haig-Simons, would also fail to reach any valuation changes in the debt if the taxpayer retains it through maturity, because no marketplace transaction occurs that leads to a market valuation. In a sense, a taxpayer retaining a debt to maturity is analogous to a taxpayer producing and exhausting an asset outside of the marketplace.

TARET, however, can mimic Haig-Simons if the taxpayer enters into a sale of the debt because the realization-event results in a marketplace valuation. Upon sale, TARET would allocate the market price changes to each period the taxpayer held the debt and accordingly assess a time-adjusted tax liability. TARET can also mimic Haig-Simons if a creditor discharges the taxpayer's debt.

When a creditor discharges a recourse debt for less than the funds borrowed, the Code treats the discharge as a realization event and taxes as income the difference between the amount borrowed and the

TABLE E: TAX WORLD: $100 INVESTMENT; $50 BORROWING AT 10%

	Time 0	Time 1
Asset	$150	$165
Interest Cost	0	$ 5
Repayment of Loan	0	$ 50
Tax	($ 45)	$ 48
Return	0	$ 62
Profit (Return - Investment)	0	$ 7*
Rate of Return (Profit/Investment)	0	12.7%

*Investment = $100 from savings less $45 tax refund, or $55.

Borrowing appears to be the source of the increased rate of return from 10% to 12.7%. A more accurate explanation, however, is that borrowing reduced the amount invested, which made the savings from the government's interest-free loan on the premature deduction more valuable, as a larger percentage of the amount invested. If the $3.15 advantage of the premature deduction were accounted for by reducing the profit from $7 to $3.85, the rate of return falls from 12.7% to 7%, the appropriate rate with a market rate of return of 10% and a tax rate of 30%.

135. Arguably, a taxpayer who adopts the cash method of accounting realizes the receipt of the borrowed cash or other property but not the obligation. The cash method is based on the general rule that receiving or making a promise to pay is ignored, and only the receipt or payment of cash or other property represents a taxable event warranting inclusion or exclusion of an amount in the tax base for the taxable year. *See* 4 B. BITTKER, *supra* note 6, at ¶¶ 105.2.2.—.2.4. Although loan obligations are substantively indistinguishable from any other promise to pay, the cash method of accounting always has allowed the taxpayer to deduct the obligation to repay when it arises out of a formalized borrowing transaction.

amount paid.[136] Haig-Simons would also treat a decrease in the taxpayer's obligation by an amount greater than the amount transferred in repayment as a net accretion to the tax base. However, given its focus on market price changes between two points in time, Haig-Simons would treat the accretion as occurring before the creditor's discharge. From the borrower's viewpoint, the market reasons for price changes in the debt replicate those affecting assets and affect the value of the outstanding obligation each period.[137] Analogizing a debtor's discharge to the sale of an asset for a gain makes it easy to see why TARET uses its averaging techniques to allocate the increases to each period over which the taxpayer-debtor incurred the obligation and adjusts the tax for each period accordingly.[138]

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136. *See* United States v. Kirby Lumber Co., 284 U.S. 1 (1931); 1 B. BITTKER, *supra* note 6, at ¶¶ 6.4.1 -.3.

137. The reference to assets is not merely an analogy, because, for the lender, the claim for payment against the borrower is an asset. *See supra* text accompanying note 95.

138. *Example:* At Time 0, *A* borrows $10,000 from *B* at a 10% periodic interest rate, promising to pay interest on the outstanding principal each period and to pay the principal at Time 10. At Time 3, *A* pays *B* $9000, and *B* cancels the debt. *A*'s tax rate between Times 1 and 3 was 30%. The tax liability owed by *A* at Time 3 is $308, computed as follows:

$R = [\$9{,}000/\$10{,}000]^{1/3} - 1$

$R = -.0345$

The reduction of debt requires that the negative R be treated as positive and used as the interest-rate factor for adjusting the tax liability.

Time 1: TRW_0 is equal to $104 ($.3 \times .0345 \times \$10{,}000$), and is the amount of tax owed at Time 1. The time-value-of-money adjustment to account for the delay in payment between Time 1 and the realization event at Time 3 results in a Time-1 tax assessed at Time 3 of $109 ($104 $[1 + .0345(1 - .3)]^2$).

Time 2: $TRW_0(1 + R)$ is equal to $100 ($104 $\times$ $(1 - .0345)$), and is the amount of tax owed at Time 2. The time-value-of-money adjustment to account for the delay in payment between Time 2 and the realization event at Time 3 results in a Time-2 tax assessed at Time 3 of $102 ($100 $\times [1 + .0345(1 - .3)]$).

Time 3: $TRW_0(1 + R)^2$ is equal to $97 ($104 $\times (1 - .0345)^2$), and is the amount of tax owed at Time 3. No time-value-of-money adjustment for the Time-3 tax is necessary because its payment is not delayed.

The tax owed by *A* at Time 3 is the sum of these three time-adjusted tax assessments, or $308 ($109 + $102 + $97).

Treating an obligation as the equivalent of an asset and tracking its changing value avoids the net-worth analysis that the courts have adopted, which led to the rule that an insolvent debtor realizes income only to the extent that the value of the debtor's assets exceeds the amount of outstanding indebtedness immediately after a debt is discharged. *See* Lakeland Grocery Co. v. Commissioner, 36 B.T.A. 289 (1937); *see also* I.R.C. § 108 (1982 & Supp. IV 1986) (providing for deferral rather than permanent exclusion of gain resulting from discharge of indebtedness of insolvent or bankrupt taxpayers). The question whether the approach under I.R.C. § 108 (1982 & Supp. IV 1986) should become part of TARET, so that a bankrupt or insolvent taxpayer avoids a tax assessment upon discharge, needs serious consideration. *See infra* notes 181-86 and accompanying text (discussing generally the role of nonrecognition provisions under TARET); *see also* Shakow, *supra* note 6, at 1164 (favoring tax relief for financially troubled debtors).

TARET's treatment of discharge cases implicates the claim-of-right and tax-benefit doctrines. Under the claim-of-right doctrine, if a taxpayer receives money or property from another person and either does not know or disputes any obligations to return it, the taxpayer should report the money or property received as income in the taxing period when received. North American Oil Consol. v. Burnet, 286 U.S. 417 (1932). If the taxpayer has to repay any portion of the amount received later, she is allowed a deduction at that time. *See* United States v. Lewis,

The realization event and market price changes also do not coincide for transactions involving discharge of nonrecourse secured debt. Under the parties' contractual agreement, a debtor can be expected to repay the obligation whenever the security's value is equal to or greater than the amount of the outstanding obligation and relinquish the security to the creditor rather than repay whenever its value is less than the obligation. This suggests that, under Haig-Simons, when the security's value is less than the debt, the taxpayer's market price loss in the security for any period is offset by an equivalent amount of gain attributable to the decrease in the outstanding obligation.[139] TARET mimics Haig-Simons by allocating the gain from the discharge to those periods when the security's market price decreases. When the taxpayer relinquishes the security, that realization event triggers TARET for purposes of allocating market price changes for both the security and the outstanding nonrecourse obligation.[140]

The Haig-Simons and TARET approaches to discharges of nonre-

340 U.S. 590 (1951); *see also* I.R.C. § 461(f) (1982 & Supp. IV 1986) (extending doctrine to disputed payments); I.R.C. § 1341 (1982) (relief provision from claim-of-right doctrine); 1 B. BITTKER, *supra* note 6, at ¶ 6.3.1 — .4; 4 *id.* at ¶ 105.3.5.

The tax-benefit principle requires recoveries of previously deducted amounts to be taxed. *See* Hillsboro Natl. Bank v. Commissioner, 457 U.S. 1103 (1982); *see also* I.R.C. § 111 (Supp. IV 1986) (relief provision for taxpayers to the extent their tax liabilities were not reduced by the previously deducted amount); 1 B. BITTKER, *supra* note 6, at ¶ 5.7.

TARET would continue current law while the receipts and payments are contested, but, upon settlement, would allow time adjustments to the tax liability to correct any over- or underpayment of tax. This approach does not replicate Haig-Simons because the ideal would be to determine the market price of the disputed claim for each taxing period. Nevertheless, by relying on the settlement and adjusting the tax liability accordingly, TARET eliminates the Code's reliance on the realization events of receipt, repayment, payment, and recovery to measure income for a taxing period.

139. The analysis also would apply for a taxpayer who acquires property subject to a nonrecourse debt when the property's value is less than the face amount of the debt. *See, e.g.,* Estate of Franklin v. Commissioner, 544 F.2d 1045 (9th Cir. 1976). The nonrecourse nature of the debt means that the taxpayer's obligation is equal to the value of the property when it is acquired. Under Haig-Simons, if the property decreases in value, that market price loss is offset by a gain attributable to the decrease in the outstanding obligation. If the property increases in value, that market price gain is offset by a loss attributable to the increase in the outstanding obligation up to the face amount of the debt.

TARET can mimic Haig-Simons by allocating the gain or loss attributable to the debt in the same manner that it allocates the gain or loss attributable to the property. The realization event occurs when the taxpayer relinquishes the property. If the property's value ultimately exceeds the face amount of the debt, however, the taxpayer will not relinquish the property, but instead will repay the entire loan. Payment of the nonrecourse debt should be treated as a realization event that triggers TARET's operation. In other words, nonrecourse provides a unique opportunity to treat payment at maturity as a realization event. *See supra* text following note 135.

140. *Example 1:* At Time 0, *A* purchases Blackacre, which has been appraised as having a fair market value of $1 million, subject to a nonrecourse debt of $1 million. (Note that appraisals are unavoidable when property subject to nonrecourse debt is involved. *See, e.g., Estate of Franklin,* 544 F.2d 1045 (9th Cir. 1976).) At Time 3, *A* transfers the land to *B* subject to the debt. Appraisals show that Blackacre's value at Time 3 is $800,000. The $200,000 loss in the land's value over the three periods is offset by the $200,000 gain reflected in the reduced obligation. Although the increase and decrease over the three periods is the same, a difference in the

course debt differ from the Code's, because the Internal Revenue Service resisted analyzing the transaction as a sale of the security and a discharge of the debt. Instead, it insisted on treating the relinquishment of the secured property with a market value less than the outstanding debt as purely a sale, and the Supreme Court deferred to the Service's view.[141] The difference in classification of the transaction has significant consequences under the Code and accounts for the Court's and the Service's reluctance to acknowledge the discharge-of-indebtedness component.[142] That artifact of the Code's approach obscures our understanding of the transaction, and its survival serves no purpose or policy.

2. *Future Costs*

The second type of debt transaction in which market price changes and realization events do not coincide concerns a controversial set of liabilities that have been called future costs, future obligations, premature accruals, and reverse investments, and which I will refer to as future costs.[143] A deferred payment agreement in which a taxpayer receives goods or services before having to pay for them is a future cost. When the seller provides the goods and services without requiring immediate payment, the buyer is also a borrower. The payment that the buyer ultimately makes will represent not only the value of

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interest-rate factor for adjusting the tax liability and the tax refund means that a TARET computation for each market value change is necessary.

Example 2: Same facts as in Example 1, except that at Time 5 *B* transfers Blackacre subject to the nonrecourse debt to *C* for $200,000. Appraisals indicate that Blackacre's value at Time 5 is $1.2 million. *B* suffers a loss between Times 3 and 5 of $200,000 as the obligation increases from $800,000 to $1 million. *B* enjoys a gain during that same time of $400,000 as Blackacre increases in value from $800,000 to $1.2 million. TARET determines both the time-adjusted tax refund due on the increased debt and the time-adjusted tax liability due on Blackacre's appreciation.

141. Commissioner v. Tufts, 461 U.S. 300, 310 n.11 (1983); *see also* I.R.C. § 7701(g) (Supp. IV 1986) (codifying *Tufts* by providing that "in determining the amount of gain or loss . . . with respect to any property, the fair market value of such property shall be treated as being not less than the amount of any nonrecourse indebtedness to which such property is subject").

142. The primary difference is that the Code treats the gain as ordinary income if it is viewed as a discharge of indebtedness and as capital gain if viewed as a part of the disposition of the underlying security. *See Tufts*, 461 U.S at 319 (O'Connor, J., concurring). TARET abandons the distinction between ordinary and capital transactions and thereby liberates the analysis.

143. *See, e.g.*, Cunningham, *A Theoretical Analysis of the Tax Treatment of Future Costs*, 40 TAX L. REV. 577 (1985); Jensen, *The Deduction of Future Liabilities by Accrual-Basis Taxpayers: Premature Accruals, The All Events Test, and Economic Performance*, 37 U. FLA. L. REV. 443 (1985); Kiefer, *supra* note 11; Sunley, *supra* note 11; Klein, *Tax Accounting for Future Obligations: Basic Principles*, 36 TAX NOTES 623 (1987); *see also* Land, *Contingent Payments and the Time Value of Money*, 40 TAX LAWYER 237 (1987) (By examining proposed regulations for contingent-payment debt obligations, the author uses basic tax principles defining when income is earned to develop a yield-based approach with many of the attributes of the TARET proposal.).

the goods and services, but also interest on the loan. The Code and TARET may have difficulty monitoring these transactions, but, upon segregation of the sale and loan components, their proper tax treatment is obvious.[144]

Controversy over future costs has focused on obligations to perform in the future for which no lenders are identifiable. Examples of this kind of future cost include a statutory obligation on a strip miner to reclaim land scarred by its mining operations and a contractual obligation on a lessee to return property to its original condition when the lease terminates.

The accrual method of tax accounting generally permits a taxpayer to deduct a cost equal to the amount that is owed when the fact of a liability that is reasonably estimatable arises.[145] This realization rule, frequently referred to as the "all events" rule,[146] ignores the time gap between when the taxpayer incurs the cost and pays for it. Ignoring the payment delay leads to an overstatement of the expense that provides accrual-method taxpayers tax deferral advantages. Congress curtailed the tax savings opportunities for some kinds of future costs by enacting section 461(h) in the Tax Reform Act of 1984,[147] which allows a taxpayer to deduct a cost only upon "economic performance."[148] Although section 461(h) does not make payment a condition for a deduction except for a tort liability or a worker's compensation claim, the economic performance requirement means that a taxpayer must defer a deduction for a future cost until the taxpayer or another person provides goods or services for the purpose of meeting the obligation.[149] Congress apparently assumed that any gaps between the receipt of the goods or services and payment would be minimal, eliminating any need for discounting to account for a sale contract's borrowing component.[150]

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144. *See* Fellows, *Future Costs Reconsidered: A Reevaluation of IRC Section 461(h)*, 44 TAX NOTES 1531, 1532-37 (1989); Halperin, *supra* note 1. TARET's approach to future costs not involving an identifiable lender may be useful for taxing typical deferred-payment transactions, such as delayed payments for professional services, or employee bonuses. *See infra* note 163 and accompanying text. *Cf.* Blum, *supra* note 11, at 57-60 (discussing benefit of hindsight determination with these types of transactions). TARET's approach also would be useful for taxing long-term contracts. *See id.* at 63-64.

145. *See* United States v. Anderson, 269 U.S. 422 (1926); Treas. Reg. § 1.461.1(a)(2).

146. *See, e.g.*, M. GRAETZ, *supra* note 11, at 903-04.

147. Tax Reform Act of 1984, Pub. L. No. 98-369, § 91(a), 98 Stat. 494, 598-601 (codified at 26 U.S.C. § 461 (1986)).

148. I.R.C. § 461(h)(1) (Supp. IV 1986).

149. I.R.C. § 461(h) (Supp. IV 1986) is not the only provision that addresses issues regarding future costs. *See, e.g.*, I.R.C. § 404(a)(5) (1982) (denying an employer's deduction until the employee includes the compensation in income).

150. For discussion of the statute's intricacies, exceptions, and deficiencies, see Cunningham,

Although no one defends the "all events" rule, a number of analysts believe that the 1984 Act's "economic performance" requirement leads to overtaxation of the obligor of a future cost.[151] Others, most notably Professor Halperin, believe that concern about the fairness of section 461(h) may be misplaced.[152] The first step in his analysis is to introduce the concept of surrogate taxing. Surrogate taxing operates when the Code ignores the time gap between when one party provides goods and services and the other party pays for them. The time gap arises either by the buyer prepaying the seller for the goods and services or by the buyer deferring payment. An accelerated payment effectively is a loan by the buyer to the seller that the seller discharges by delivering goods and services. A delivery of goods and services before payment effectively is a loan by the seller to the buyer that the buyer discharges upon payment. Halperin shows that when one party pays for goods or services at a different time than when the other party provides them, ignoring the loan between them overtaxes the borrower and undertaxes the lender.[153] The second step in his analysis uses surrogate taxing to explain how section 461(h) taxes interest income that would otherwise escape taxation altogether.[154]

Analysts have criticized Halperin for viewing the two kinds of future costs in the same way.[155] They agree that his argument is persuasive regarding deferred payment agreements. Imputing a borrowing relationship between the identifiable taxpayers fairly reflects the economics of the transaction. Where a lender cannot be identified, how-

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supra note 143, at 585-87; Jensen, *The Supreme Court and the Timing of Deductions for Accrual-Basis Taxpayers,* 22 GA. L. REV. 229, 252-69 (1988); Jensen, *supra* note 3, at 477-89.

151. *See, e.g.,* Aidinoff & Lopata, *Section 461 and Accrual-Method Taxpayers: The Treatment of Liabilities Arising from Obligations to Be Performed in the Future,* 33 TAX LAW. 789 (1980); Kiefer, *supra* note 11; Sunley, *supra* note 11.

152. Halperin, *supra* note 1.

153. Halperin also shows that if they face the same tax rates, contracting parties obtain the same after-tax returns from the sale had the Code separately taxed it without regard to the loan because they "can be expected to take care of themselves by altering the purchase/sale price." Halperin & Klein, *Tax Accounting for Future Obligations: Basic Principles Revised,* 38 TAX NOTES 831, 836 (1988); *accord* Halperin, *supra* note 1, at 520-24. In response to a critique of the Halperin & Klein article by Professor Thuronyi, see *Letters to the Editor,* 39 TAX NOTES 265-66 (1988), Professors Halperin and Klein acknowledge that the parties cannot be expected to adjust to section 461(h)'s scheme when a prepaying buyer acquires the goods or services for use in a business or investment venture. *See id.* at 266; *see also* Fellows, *supra* note 144, at 1532-37 (identifying other types of deferred and accelerated payment transactions where surrogate taxing fails).

154. *Accord* Cunningham, *supra* note 143, at 600-09, 610-15; *see* Halperin, *supra* note 1, at 529-30; Halperin, *supra* note 11, at 759; S. Fiekowsky, Income Measurement and Time Value of Money (Apr. 9, 1984) (unpublished manuscript).

155. *See, e.g.,* Aidinoff & Lopata, *supra* note 151; Kiefer, *supra* note 11; Sunley, *supra* note 11.

ever, they argue that the future cost represents a negative salvage value that should be treated as a capital cost.

I reach the same conclusion as Halperin's critics, but adopt a different, albeit related, rationale. The distinction between incurring costs and meeting the cost's obligation through economic performance requires that the two kinds of future costs be treated differently. Nevertheless, section 461(h) may achieve the right tax result under the Code because it avoids having to estimate when and how much the taxpayer will pay to meet the obligation. It also ameliorates the benefits of tax deferral that the taxpayer enjoys on income earned from incurring the future cost. Neither of these reasons justifies extending the economic performance rule to TARET.

A deferred payment agreement, such as a deferred tort settlement, is economically equivalent to the parties entering into two agreements: (1) the payment of damages to compensate the victim for losses and (2) the victim loaning the tortfeasor the amount of damages to be repaid at some specified date. The thrust of Halperin's argument regarding the proper treatment of a deferred tort settlement pertains to the borrowing component. He reasons that Code rules excluding the interest income from the loan from the victim's tax base explains why section 461(h) denies the tortfeasor a deduction for the interest cost by postponing the deduction for damages until payment.[156]

That Halperin extends this reasoning to a future cost like mining reclamation is not too surprising because the amount of the cost increases over time based on market interest rates. The periodic increases are consistent with viewing the transaction as if it contained a borrowing component and raise the concern that some interest income is being left untaxed merely because no identifiable lender exists. Another explanation for why these costs increase at market interest rates unrelated to borrowing, however, has to do with the fact taxpayers, such as the strip miner, are less wealthy by having incurred the future costs, but the value of the assets they own remain undiminished while the obligation remains outstanding.

At the time the parties agree to a deferred tort settlement, the tortfeasor has already become less wealthy by having earlier incurred a tort liability. The settlement represents economic performance of the tort obligation because it results in the victim obtaining rights and

156. *See* Halperin, *supra* note 1, at 526-27. Arguably, this justification is unpersuasive because surrogate taxation is too inexact a solution. *See* Fellows, *supra* note 144, at 1532-37. Also arguably, this justification is applied inappropriately for deferred tort settlements because, by denying tortfeasors interest deductions, we can expect that they will negotiate with victims for lower settlement amounts to offset the lost tax savings, *see infra* note 157, and thereby undermine congressional intent to enhance the after-tax compensation to tort victims.

ownership over the tortfeasor's money or property. Any investment income earned on the money or property after the agreement is owned by the victim and justifies Halperin's concern over untaxed income.[157]

In contrast, for future costs, such as mining reclamation, the strip miner does not transfer ownership of any money or property to another person at the time the obligation arises. The strip miner's loss of wealth is represented only by an obligation without a reduction of the amount of property the strip miner owns or has invested. The fact that the mine operator has not met the obligation by economic performance after incurring it and the fact that the operator could economically perform indicate how the Code should measure the obligation over time.

At the time a taxpayer incurs a future cost, some form of economic performance is always possible, including selling the business or paying someone else to assume the obligation.[158] If a strip miner sells its mining operation or pays someone else to assume the obligation, it loses money or property and, therefore, earns less investment income in the future than if it had continued to carry the obligation. To provide similar tax treatment for taxpayers who incur future costs and those who incur and economically perform future costs, the Code must allow a deduction based on market interest rates for each period between when taxpayers incur future costs and when they meet those obligations through economic performance.[159]

Explaining why measurement of a taxpayer's income for an unper-

157. The effect of section 461(h) regarding tort liabilities is to allow the tortfeasor a deduction at the time of payment equivalent to the amount of damages that would have been paid to meet the obligation at the time of the agreement. If the parties face similar tax rates and the tortfeasor would have had the right to deduct the interest costs each period and the damage payment when the parties settled, the parties can be expected to agree to a settlement amount that gives each the after-tax equivalent of what they respectively would have received and paid at the time of the agreement. For example, if the amount of damages, as of Time 0, is $1000, and payment is delayed until Time 2, the parties would agree to $1145 as the amount of the deferred payment assuming a pretax interest rate of 10% and a tax rate of 30%. The victim would agree to this amount because it is equivalent to receiving $1000 at Time 0 and investing it at a 7% after-tax rate for two periods. The tortfeasor would agree to this amount because it will result in, according to Section 461 (h), an after-tax cost at Time 2 of $801 ($1145 $\times$ (1 $-$ .3)), which is equivalent to the after-tax cost of $700 ($1000 $\times$ (1 $-$ .3)) at Time 0 ($801/[1 + .1(1 $-$ .3)]^2).

158. A taxpayer may economically perform by receiving goods and services for the purpose of meeting an obligation and either paying for the goods and services immediately or agreeing to a deferred payment. Neither of these two forms of economic performance may be feasible when the taxpayer incurs the cost, however, because the goods and services may be of no use until the taxpayer completes other aspects of its operation. If a taxpayer were to prepay for goods or services, the issue of untaxed investment income arises. Prepayments, however, merely represent changes in the form taxpayers hold their wealth. Instead of owning money, prepaying taxpayers own claims of right against other persons, but they suffer no reductions in the amount of property they have invested. Thus, a prepayment of an obligation should not be considered economic performance.

159. *See* Halperin, *supra* note 11, at 529-30.

formed future cost includes accounting for periodic interest deductions does not mean necessarily that the Code should allow interest deductions or that section 461(h) is wrong for deferring a deduction for an unperformed future cost until it is economically performed. To allow a deduction for a future cost when it is incurred and periodic interest deductions while it remains unperformed requires reliance on estimates of when and how much a taxpayer will pay to discharge an obligation.

Moreover, the operation of the realization-event principle, even for taxpayers using accrual-method accounting rules, disconnects the costs of producing income from the income produced. That disconnection necessitates rules to reduce the benefits of tax deferral on market value increases by postponing the deductions of associated market value decreases until the taxpayer realizes the increases.[160]

Many situations in which future costs arise involve deferred gains, and, therefore, deferring the deductions to tax periods when the taxpayer realizes those gains is warranted. For example, for the strip miner to begin its operations, it uses capital to acquire land, equipment, and labor. The market value of an established mining facility is probably greater than the value of the capital invested, because the strip miner has brought elements of production together to create the "capacity to mine." The value of that mining capacity is not taxed when it is created because it is unrealized. It is taxed at a later time when the strip miner sells either the operation or the mine's extracted minerals. Section 461(h) may be criticized fairly for deferring the deduction of future costs beyond the taxing periods when the taxpayer has realized related gains and for ignoring the Code's general approach of accelerating deductions for capital investments.[161] Nevertheless, section 461(h)'s approach, which defers the deduction, is a reasonable response to this complex area because it avoids estimating future costs that will produce income that the taxpayer will not realize until later taxing periods.

Without the need under TARET to defer deductions to offset the advantages of deferred gains, section 461(h) should be abandoned. Instead, TARET's treatment of asset market price changes should be extended to future costs. By viewing the taxpayer's payment of the cost as the realization event triggering a tax assessment, the time and amount of the payment are determined. TARET discounts the amount paid using a well considered interest-rate factor to the tax pe-

160. *See supra* text immediately following note 38.

161. *See* Kiefer, *supra* note 7, at 931.

riod when the taxpayer incurred the cost,[162] allocates that discounted cost to the period when it occurred, and allocates the increases in the cost due to the payment delay based on the applicable interest-rate factor to each taxing period between when the taxpayer incurred and paid the cost. TARET then adjusts the tax refunds computed for each of the taxing periods based on the market value decreases to adjust for the delay between when the tax refund obligations arose and when the government pays them.[163] TARET's approach is attractive because it

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162. *See supra* note 75 and accompanying text.

163. TARET's computation of the time-adjusted tax refund is depicted by the following formula:

$$T[-W_n/\prod_{i=0}^{n-1}(1+P_i)]\{\prod_{i=0}^{n-1}[1+F_j(1-T)]$$

$$+\ [\prod_{i=0}^{n-1}(1+P_i)^{1/n}-1]\}\sum_{k=1}^{n}[\prod_{i=0}^{n-1}(1+P_i)^{1/n}]^{k-1}\prod_{j=k}^{n-1}[1+F_j(1-T)]$$

This formula is derived in the following manner:

The discounted cost, $-W_o$, is equal to:

$$-W_n/\prod_{i=0}^{n-1}(1+P_i)$$

W_n = the amount paid at Time n for cost incurred at Time 0.

The increase in the cost for each period after the taxpayer incurs the cost is depicted by the following notation:

$$[-W_n/\prod_{i=0}^{n-1}(1+P_i)][\prod_{i=0}^{n-1}(1+P_i)^{1/n}-1][\prod_{i=0}^{n-1}(1+P_i)^{1/n}]^{i-1}$$

The sum of the costs for Time 0 and each period that follows is depicted by the following notation:

$$[-W_n/\prod_{i=0}^{n-1}(1+P_i)][1+\prod_{i=0}^{n-1}(1+P_i)^{1/n}-1]\sum_{k=1}^{n}[\prod_{i=0}^{n-1}(1+P_i)^{1/n}]^{k-1}$$

The tax rate, T, and the time-adjustment to the tax refund components are added to the previous formula to complete the computation of the time-adjusted tax refund.

$$\prod_{j=i}^{n-1}[1+F_j(1-T)]$$

The operation of this formula is illustrated through the following example.

Example: At Time 3, *A* pays $5000 to dispose of toxic wastes from a manufacturing process started at Time 0. The risk-adjusted federal rates for the relevant periods are:

Time 0: 12% (3-period maturity)
Time 1: 15% (2-period maturity)
Time 2: 10% (1-period maturity)

The relevant applicable federal rates for adjustment of each period's tax refund are:

Time 0: 8% (1-period maturity)
Time 1: 11% (1-period maturity)
Time 2: 9% (1-period maturity)

The tax refund due *A* is $1764, computed as follows according to Formula 10:

Time 0: The market price decrease is equal to $3529 ($5000/(1.12 × 1.15 × 1.1)), and the tax refund on the market price decrease is $1059 (.3 x $3529). The time-value-of-money adjustment to account for the delay in payment between Time 0 and the realization event at Time 3 results in a Time-0 tax refund assessed at Time 3 of $1280 ($1059 [1 + .08(1 − .3)] × [1 + .11(1 − .3)] × [1 + .09(1 − .3)]).

Time 1: The market price decrease is equal to $447 ($3529[(1.12 × 1.15 × 1.11)$^{1/3}$ − 1]), and the tax refund on the market price decrease is $134 (.3 × $447). The time-value-of-money

eliminates any concern about basing a current deduction on an estimate of when and how much a taxpayer will pay for a cost and because it incorporates time-value-of-money principles. The one disadvantage of the approach, however, is that it requires a determination of when the taxpayer incurs a cost.[164]

The Haig-Simons standard directs that the appropriate time for deducting a cost is when the marketplace acknowledges that the taxpayer incurred a market price decrease. The focus on the marketplace suggests that so long as the taxpayer could take some action to avoid payment no decrease occurs, but the possibility of that action cannot be so remote that the marketplace would ignore it.

The two latest Supreme Court pronouncements concerning the "all events" rule demonstrate the slipperiness of a standard that requires a distinction between remote and nonremote contingencies. In *United States v. Hughes Properties, Inc.*,[165] the Court allowed a deduction to a Nevada gambling casino for the amount of guaranteed jackpots indicated on its slot machines at the end of the casino's tax year. The casino could have avoided payment by surrendering its license or filing for bankruptcy, but those possibilities were viewed as too remote to consider.

What qualifies as a remote contingency became more unclear the next Term, however, when the Court decided *United States v. General*

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adjustment to account for the delay in payment between Time 1 and the realization event at Time 3 results in a Time-1 tax refund assessed at Time 3 of \$153 (\$134 × [1 + .11(1 − .3)] × [1 + .09(1 − .3)]).

Time 2: The market price decrease is \$504 (\$3529[(1.12 × 1.15 × 1.11)$^{1/3}$ − 1][(1.12 × 1.15 × 1.11)$^{1/3}$]$^{2-1}$), and the tax refund on the market price decrease is \$151 (.3 × \$504). The time-value-of-money adjustment to account for the delay in payment between Time 2 and the realization event at Time 3 results in a Time-2 tax refund assessed at Time 3 of \$161 (\$151 × [1 + .09(1 − .3)]).

Time 3: The market price decrease is equal to \$567 (\$3529[(1.12 × 1.15 × 1.11)$^{1/3}$ − 1][(1.12 × 1.15 × 1.11)$^{1/3}$]$^{3-1}$), and the tax refund on the market price decrease is \$170 (.3 × \$567). No time-value-of-money adjustment of the tax refund is necessary because its payment is not delayed.

The tax refund due *A* at Time 3 is the sum of these four time-adjusted tax assessments, or \$1764 (\$1280 + \$153 + \$161 + \$170).

164. *See supra* note 106 and accompanying text (raising a similar difficulty with regard to when a taxpayer produces an asset). The problem will be exacerbated because of misunderstandings about future costs. If a taxpayer unconditionally commits herself at Time 0 to rent office space between Times 10 and 11, no deduction for the discounted value of the rental payment should be allowed at Time 0 because that obligation is offset by the increase in wealth represented by the claim to office space between Times 10 and 11. *But see Hearings on Timing and Measurement of Taxpayer Deductions for Obligations to be Paid in the Future Before the Subcomm. on Oversight of House Comm. on Ways and Means,* 98th Cong., 2d Sess. 70 (1984) (statement of Emil M. Sunley) (also concluding that the rent in this example should not be deductible at Time 0, but reaching that conclusion by relying on matching principles and arguing that the rental payment is not a cost attributable to Time 0's income).

165. 476 U.S. 593 (1986).

Dynamics Corp.[166] General Dynamics was obligated to reimburse employees for medical expenses under its collective bargaining agreement. At the end of its taxable year, it estimated, based on insurance industry actuarial principles, its liability for claims for medical services that had been performed, but not yet filed, or, if filed, not yet approved. The Court held that the liability did not occur until an employee filed a claim because failure to file was not an "extremely remote and speculative possibility."[167] The Court failed to explain why an employee's failure to file was sufficiently likely to support the conclusion that the taxpayer had not incurred a cost, while a gambler neglecting to claim jackpot winnings was not.[168] Haig-Simons and the "all events" rule require something less than legal certainty, but how much less continues to defy clear statement.[169]

Even when remoteness is not at issue, when a taxpayer incurs a future cost may remain administratively difficult to determine. Future costs arise in a number of different contexts that require factual inquiries to determine when and how much should be deducted for any taxing period. Some future costs arise as a result of a single economic event, such as removal costs for a newly installed machine. Other future costs are incurred incrementally over a number of taxing periods, such as toxic waste disposal expenses that increase depending on the taxpayer's production level. Still others may defy accurate allocation among taxing periods because the amount of a future cost depends on variables that are difficult to identify for any taxing period. For example, if a lumber company acquires the right to harvest trees from rented land with the obligation to reforest, the amount of future costs incurred each taxing period may depend on whether the company needs to build access roads to reach and remove lumber in a particular area and on weather conditions, as well as the amount of lumber harvested.

166. 481 U.S. 239 (1987).

167. 481 U.S. at 244 (quoting U.S. v. Hughes Properties, 476 U.S. 593, 601 (1986)).

168. *See* Jensen, *supra* note 6, at 238-46.

169. The problem of deciding when a taxpayer incurs a cost will increase with technological advances that allow more accurate prediction of events. If the marketplace takes this information into account when valuing a business and its ventures, any tax system committed to emulating the Haig-Simons ideal must reflect market responses. For example, before a firm starts manufacturing widgets, it will estimate employee injuries in the workplace and consumer injuries from defective products. Those costs of operations are part of the investment decision to start the business and would be considered by a prospective buyer of the operation. The Tax Reform Act of 1984 avoids these issues by providing that taxpayers can deduct tort claims only upon payment. *See* I.R.C. § 461(h)(2) (C) (Supp. IV 1986). However, the TARET approach requires the Internal Revenue Service and the courts to consider whether claims for employee or consumer injuries are costs incurred when manufacturing operations begin, when the particular injury occurs, when the injured person files a claim, or when the taxpayer concedes liability.

The more accurate the determination of when a taxpayer incurs a cost, the closer TARET will mimic Haig-Simons. If the Internal Revenue Service adopts rules that unduly delay deductibility, it will potentially deter taxpayers from engaging in economic activities that involve future costs. Similarly, premature deductibility will potentially encourage taxpayers to overinvest in these economic activities. The burden will be on the Service to adopt a set of assumptions that reflect the economic environment and periodically to reassess those assumptions in view of economic changes.

E. *Summary of TARET's Implications*

One of the two most significant achievements of TARET is that it eliminates any difference in taxation among types of profit from property. It makes investors indifferent, from a tax point of view, to whether they receive interest, dividends, rents, or capital appreciation, because capital appreciation no longer enjoys the opportunity for tax deferral.[170] Concerns may arise that the proposal will discourage investment because it increases the tax on investment profits. But tax incentives that reintroduce a distinction between capital appreciation and other income from nonhuman capital will be difficult to defend once tax deferral on gain is no longer seen as an inevitable cost of the tax regime.

The second significant achievement of TARET is that it eliminates differences in tax treatment of taxpayers who acquire assets and those who produce assets used in business or investment if the producer eventually disposes of the asset in a marketplace transaction. Although practical limitations may prevent taxing produced assets exhausted through use in business or investment activities, TARET nevertheless substantially reduces tax incentives for taxpayers to use their economic resources to produce rather than acquire assets. Moreover, TARET's scheme eliminates the need for the Code's complex rules deferring deductions for realized costs until income related to those costs is realized.

Eliminating the tax deferral impact of the realization-event principle for purchased and many produced assets requires rethinking many aspects of the Code. The Code's most controversial provisions — like

170. The question of the disparate treatment of a corporation's dividend distribution to its shareholders and interest payments to its lenders is not addressed. The tax rules allowing a corporation to deduct interest but not dividends generate both economic distortions and legal problems, but proposals for reform are beyond the scope of this article. For a discussion of these problems and possible solutions, see American Law Institute, Federal Income Tax Project, Subchapter C, Proposals on Corporate Acquisitions and Dispositions and Reporter's Study on Corporate Distributions, Appendix (1982).

accelerated depreciation, percentage depletion, capital gains deductions, and deferred compensation plans — are predictable byproducts of the realization-event model. Each can be excused as congressional attempts to reduce the tax differences between taxpayers retaining investments and those changing their investment strategies, and between taxpayers who earn profits by selling their services and those who earn profits by providing capital. With tax deferral no longer viewed as a necessary component of an income tax system, these Code provisions make less sense.

Code rules that defer deductions also need reconsideration. For example, the limit on the amount of capital losses that a taxpayer may deduct in one year[171] should be abandoned. This limitation is designed to prevent taxpayers from enjoying tax deferral on their gains without delaying their losses. TARET eliminates the need for a special capital loss rule because it eliminates the benefit of the tax deferral on gains. Taxpayers' after-tax returns no longer depend on avoiding a realization event and, therefore, there will be no incentive for undue delay of gains. Moreover, it makes little sense to delay deduction of an incurred loss beyond the time that it is easily measurable. Time-value-of-money analysis makes it easy to assume, mistakenly, that both the government and the taxpayer should be indifferent to when tax assessment occurs. From that logic, one might conclude that TARET allows the government to delay recognition of any loss for any amount of time. To account for such delays in assessing the tax refund, TARET assumes that the taxpayer would make a loan to the government at U.S. Treasury Note yield rates. That assumption is imperfect and should not be relied upon unless administratively necessary. By delaying the deduction of a realized loss, the government is unjustifiably requiring taxpayers to lend it money even though they may have more attractive investment opportunities elsewhere.[172]

Related to the question of allowing time-adjusted tax refunds once a market value decrease becomes easily measurable is whether the government should provide a refund when the amount of time-adjusted tax refunds exceeds the time-adjusted tax liabilities for the tax accounting period. Simons never addressed what response the government should make when a taxpayer suffers a net decrease in wealth for the period.[173] That no tax is due is an insufficient response because we

171. I.R.C. §§ 1211, 1212 (1982 & Supp. IV 1986).

172. Unless some constraint is placed upon the government's ability to postpone tax refunds, the government yields would no longer reflect the market.

173. *See* H. SIMONS, *supra* note 1, at 50 (emphasis in original):

> The measurement of income implies allocation of consumption and accumulation to specified periods. In a sense, it implies the possibility of measuring the results of individual

are left wondering how to measure and tax accretions in subsequent taxing periods. Even if a prior period's net decretions are considered in determining net accretions in a subsequent period, that adjustment would fail to account for the difference in the time value of a tax refund in the period of the decretion and the period it was available to reduce the taxpayer's tax liability on an accretion. The right answer under Haig-Simons is that net decretions should result in a refund from the government to the taxpayer at the time they occur. That result preserves the periodic accounting principle implicit in the Haig-Simons ideal and eliminates idiosyncratic results obtained by a confluence or lack of confluence of unrelated economic events during the period.

The Code's treatment of net losses is a controversial area for which no complete or satisfactory solution has yet emerged.[174] If a taxpayer realizes a loss, it is available to offset related, and in many cases, unrelated gains realized during the same period.[175] If the taxpayer's realized losses exceed realized gains during the period, she owes no tax, but obtains no tax refund. The Code provides some relief for this "annual accounting" problem,[176] but these rules are flawed. They add administrative complexity by requiring prior year's returns to remain open for long periods of time and violate the principle of tax neutrality by disfavoring risky investments.[177] The net operating loss rules are especially pernicious because they favor conglomerate corporations over nondiversified ones and old firms with prior profit years over new ones.[178] Moreover, even if the losses ultimately reduce a taxpayer's future tax liability, no adjustment for the time value of money is made to take account of the postponement.

The Code's harsh treatment of net losses is attributable primarily to the realization-event principle. Underlying the restrictions on reducing taxes from net losses is the view that the taxpayer is probably enjoying tax deferral on unrealized gains while recording artificial tax

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participation in economic relations *for an assigned interval* and without regard for anything which happened before the beginning of that (before the end of the previous) interval or for what may happen in subsequent periods.

Perhaps this omission is explainable by Simons' view that "[t]he essential connotation of income . . . is *gain* — gain *to* someone during a specified period and measured according to objective market standards." *Id.* at 51 (emphasis in original).

174. *See generally* Campisano & Romano, *Recouping Losses: The Case for Full Loss Offsets,* 76 NW. U. L. REV. 709 (1981) (demonstrating the inequities, inefficiencies, and administrative costs of the existing system).

175. The Code contains some provisions that allow costs only to the extent that the taxpayer realizes income related to those costs. *See, e.g.,* I.R.C. §§ 163(d), 469 (Supp. IV 1986).

176. *See, e.g.,* I.R.C. §§ 111, 172, 186, 1016(a)(2) (1982 & Supp. IV 1986).

177. Campisano & Romano, *supra* note 174, at 729.

178. *See id.* at 730-36.

losses through advantageous amortization rules and the like.[179] This skepticism about the authenticity of the net losses makes a refund rule politically unacceptable.

The basic premises underlying TARET that eliminate tax deferral demand a refund rule for all taxpayers. The amount of the refund should be based on the taxpayer's average tax rate or some other designated tax rate.[180] Failure to accompany TARET with a refund rule will reinfect taxpayers' economic decisions with tax considerations about timing. Some concern might be raised that net losses might increase, straining government revenues, because of increased instances of deductions for costs in periods before the income produced by those costs is recognized. Countering this tendency, however, is the fact that taxpayers will not avoid recognizing gains because the tax law eliminates the advantage of doing so.

The last major Code area that would require reassessment if TARET were adopted is the set of rules allowing or requiring postponement of realized gains or losses.[181] Nonrecognition rules are sometimes justified as alleviating the differences in tax treatment of people who remain in the same investment and enjoy tax deferral and those who change investment strategies or experience an "involuntary" marketplace transaction, such as a fire or divorce, leading to a realization event.[182] If the advantages of tax deferral are eliminated, the purpose of these provisions is less clear. The time-value-of-money adjustment makes the taxpayer indifferent as to when the tax is assessed, and the nonrecognition rules seem to provide the taxpayer no economic benefit except a certain borrowing source. A taxpayer might value the opportunity to borrow the tax liability — for example, if she had a low credit rating and could otherwise not borrow or could borrow only on unattractive terms. This very case, however, should make the government reluctant to delay tax collection, since it suggests a risk of default upon a later tax assessment.

A second justification for these nonrecognition provisions is that delaying the tax assessment relieves the taxpayer of the hardship of liquidating investments or borrowing to pay a tax bill.[183] To some, TARET might make the hardship argument more persuasive because the government is at least requiring the taxpayer to borrow at a mar-

179. *See id.* at 737-40.

180. *See id.* at 713, 713 n.18.

181. *See, e.g.*, I.R.C. §§ 453, 1031, 1033, 1034, 1041 (1982 & Supp. IV 1986).

182. *See* Kornhauser, *Section 1031: We Don't Need Another Hero*, 60 S. CAL. L. REV. 397, 407-10 (1987).

183. *See id.* at 407, 410-11.

ket interest rate. On the other hand, this argument is less persuasive because the government's role as lender is more obvious and raises the question why the government, rather than private parties, is providing this service. Moreover, if the nonassessment is not required by administrative constraints, a more rational rule would allow all taxpayers to demand loans upon a showing of liquidity hardship rather than presuming liquidity hardship through a blunt discriminatory rule.

The third standard justification for the nonrecognition rules is that they avoid valuation difficulties.[184] In many instances, however, the nonrecognition rules do not avoid difficult valuations. For example, a like-kind exchange in which the taxpayer receives cash or other nonlike-kind property requires an appraisal of the like-kind property received to determine how much gain, if any, should be taxed at the time of the exchange.[185] Once the taxpayer and the government are forced to appraise the value of an asset, no reason for delaying a tax assessment remains. Thus, the nonrecognition rules should be retained, if at all, only for transactions where neither the valuation of the asset received nor the valuation of the asset transferred is necessary.[186]

Because of its comprehensiveness, TARET will make taxpayers attach more value to the government's decision to exclude or postpone taxing market price changes. Therefore, Congress and the President can expect increased political pressure for special tax relief provisions. Whether certain industries, expenditures, or groups should obtain tax relief is a matter for national debate. What the near conversion of the realization-event model to the Haig-Simons ideal provides is the opportunity to rethink these issues free of a taxing system in which tax deferral is the norm.

III. COMPARISON WITH A CONSUMPTION TAX

In 1974, Professor Andrews published an article exploring the consumption tax, which marked the beginning of a cottage industry for legal scholars, economists, and policymakers investigating the advantages and disadvantages of this alternative system.[187] The following

184. *See id.* at 407, 409.

185. *See id.* at 409.

186. This standard could become the core of TARET's definition of a realization event.

187. Andrews, *supra* note 1. The consumption tax had been discussed and advocated earlier by a number of economists. *See* I. FISHER, THE INCOME CONCEPT IN THE LIGHT OF EXPERIENCE (n.d.) (pamphlet); I. FISHER, THE NATURE OF CAPITAL AND INCOME (1906); I. FISHER & H. FISHER, CONSTRUCTIVE INCOME TAXATION (1942); T. HOBBES, LEVIATHAN ch. 30 (1651); N. KALDOR, AN EXPENDITURE TAX (1955); J.S. MILL, PRINCIPLES OF POLITICAL ECONOMY bk. V, ch. II, § 4 (Laughlin ed. 1884); A. PIGOU, A STUDY IN PUBLIC FINANCE 118-26 (3d ed. 1951); W. VICKREY, AGENDA FOR PROGRESSIVE TAXATION 329-66 (1947); A. MARSHALL, *The*

discussion will not detail the operation of the consumption tax or attempt to resolve the continuing debate about either its fairness or workability.[188] Instead, this discussion will simply compare the consumption tax to TARET and show what the consumption tax can do that TARET cannot, and vice versa.

The consumption tax provides a more elegant and complete response to tax deferral than TARET. It takes the opposite tack from TARET by extending tax deferral to all transactions and imposing a tax only when a taxpayer exhausts economic resources for consumption purposes. This approach makes the consumption tax indifferent to the questions that have occupied this article, such as when an asset's market price changes or when (or whether) a taxpayer produces an asset for business or investment purposes. Instead, its only concern is whether resources are devoted to business or investment purposes, on the one hand, or to consumption, on the other. If to the former, no tax is assessed until the taxpayer uses those resources (or the profits from those resources) for consumption purposes.

The consumption tax eliminates the economic distortions and unfairness that TARET tries to correct, but it does so by *not* taxing, rather than taxing, periodic accretions and decretions. For example, it taxes neither corporate dividends, rents, nor capital appreciation so long as the taxpayer continues to devote wealth accumulation in any

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Equitable Distribution of Taxation, in MEMORIALS OF ALFRED MARSHALL 347-52 (A. Pigou ed. 1956).

188. *See, e.g.*, 1 OFFICE OF THE SECRETARY, DEPT. OF TREAS., TAX REFORM FOR FAIRNESS, SIMPLICITY, AND ECONOMIC GROWTH: THE TREASURY DEPARTMENT REPORT TO THE PRESIDENT (1984), *reprinted in* [1984] Stand. Fed. Tax Rep. (CCH) 29-33 (Nov. 29, 1984) (extra ed.) [hereinafter U.S. TREASURY DEPT.]; DEPT. OF TREAS., BLUEPRINTS FOR BASIC TAX REFORM (1977) [hereinafter TREASURY BLUEPRINTS]; THE BROOKINGS INSTITUTION, ECONOMIC CHOICES 1984 (A. Rivlin ed. 1984); MEADE REPORT, *supra* note 16, at 33; P. MIESZKOWSKI, THE CASH FLOW VERSION OF AN EXPENDITURE TAX (Office of Tax Analysis, Dept. of Treas.) (1977); D. BRADFORD, UNTANGLING THE INCOME TAX (1986); Andrews, *Fairness and the Personal Income Tax: A Reply to Professor Warren*, 88 HARV. L. REV. 947 (1975); Boskin, *Taxation, Saving, and the Rate of Interest*, 86 J. POL. ECON. 53 (1978); Bradford, *The Case for a Personal Consumption Tax*, in WHAT SHOULD BE TAXED: INCOME OR EXPENDITURE? 75 (J. Pechman ed. 1980) [hereinafter WHAT SHOULD BE TAXED?]; Bradford, *The Economics of Tax Policy Toward Savings*, in THE GOVERNMENT AND CAPITAL FORMATION 11 (G. Von Furstenberg ed. 1980); Bradford & Toder, *Consumption vs. Income Base Taxes: The Argument on Grounds of Equity and Simplicity*, 69 NATL. TAX ASSN. PROCEEDINGS 25 (1976); Committee on Simplification Section of Taxation, American Bar Association, *Complexity and the Personal Consumption Tax*, 35 TAX LAW. 415 (1982); Davies, *Income-Plus-Wealth: In Search of a Better Tax Base*, 15 RUTGERS L.J. 849 (1984); Feldstein, *The Welfare Cost of Capital Income Taxation*, 86 J. POL. ECON. S29, S37-S39 (1978); Goode, *The Superiority of the Income Tax*, in WHAT SHOULD BE TAXED?, *supra*, at 49; Graetz, *supra* note 29; Gunn, *The Case for an Income Tax*, 46 U. CHI. L. REV. 370 (1979); Jones, *Treatment of Gratuitous Transfers: Unraveling the Case for a Consumption Tax*, 29 ST. LOUIS U. L.J. 1155 (1985); Minarik, *The Future of the Individual Income Tax*, 35 NATL. TAX J. 231 (1982); Posin, *Toward a Theory of Federal Taxation: A Comment*, 50 J. AIR L. & COMM. 907 (1985); Warren, *Fairness and a Consumption-Type or Cash Flow Personal Income Tax*, 88 HARV. L. REV. 931 (1975); Warren, *supra* note 9.

of these forms to business and investment purposes. Likewise, it taxes neither funds used to acquire or rent assets nor the assets the taxpayer produces so long as they are devoted to business and investment purposes. The consumption tax even successfully avoids the economic distortions created by the nontaxation of imputed income from property acquired for consumption purposes because it taxes neither the income from consumption assets nor the income from business or investment assets. The reason for the equivalent tax treatment is explained by recalling that one way to describe the benefit of tax deferral is by characterizing it as a tax exemption on investment income.[189] Taxing income used to acquire consumption assets and not the imputed income earned on these assets leads to the same tax burden as not taxing income used to acquire business and investment assets and only taxing that income and accumulated profits when the taxpayer dissaves and devotes the funds to consumption. Thus, the consumption tax eliminates the incentive present under the Code (and that would continue under TARET) to acquire consumer goods rather than save.[190]

The consumption tax potentially distorts resource allocation in only two ways. One distortion results from the continuing tax advantage accorded imputed income from services. A taxpayer who sells her services in the marketplace and acquires consumption assets pays a consumption tax, but a taxpayer who forgoes working in the marketplace and produces her own consumption assets successfully avoids the tax.[191] The second distortion results from the proposals to make the consumption tax progressive on an annual basis. For individuals who have large variations in consumption rates over time, a progressive tax causes intertemporal distortions if expenditures in different taxing periods fall into different tax brackets.[192]

The advantages of relative economic neutrality suggest that the consumption tax is clearly a more attractive alternative than TARET.

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189. *See supra* notes 26-27 and accompanying text.

190. The effect of a consumption tax on the level of savings is uncertain. *See, e.g.*, Howrey & Hymans, *The Measurement and Determination of Loanable-Fund Savings*, in WHAT SHOULD BE TAXED?, *supra* note 188; Minarik, *supra* note 188, at 234-35; Minarik, *Income Versus Expenditure Taxation to Reduce the Deficit*, 22 TAX NOTES 1257, 1258 (1984).

191. The consumption tax's inability to reach imputed income from services suggests that many expenditures for the production of human capital should be classified as consumption to ameliorate the tax advantage. For further discussion of investments in human capital and how these should be treated under the consumption tax, see D. BRADFORD, *supra* note 188, at 204-06; Andrews, *supra* note 1, at 1145-46.

192. MEADE REPORT, *supra* note 16, at 37-39; Bradford, in WHAT SHOULD BE TAXED?, *supra* note 188, at 96 n.39; Veall, *A Note on the Expenditure Tax and Progressivity*, 40 NATL. TAX J. 259 (1987).

The focus on economic neutrality, however, ignores the impact of the tax system on wealth distribution. Taxpayers who save rather than consume will be able to get wealthier faster under the consumption tax than under TARET because they will enjoy the benefits of tax deferral. The concern about wealth accumulation is heightened if Professor Andrews' recommendation is followed and donative transfers during life and at death are not treated as consumptive acts.[193] By excluding donative transfers from the consumption tax, tax deferral becomes tax exclusion. The taxpayer and the taxpayer's donees are no longer choosing between immediate and postponed consumption, but are also given the opportunity to avoid consumption permanently. Not only is the consumption tax likely to increase wealth disparity, it also fails to account for the benefit that people can obtain from wealth without ever having to consume it.

Professor Andrews' response is that Congress should supplement the consumption tax with an effective wealth tax.[194] The politics surrounding federal wealth taxes, however, have historically prevented them from being used constructively either to eliminate large concentrations of wealth or to make the taxing system significantly more progressive. Further, with current interest in the consumption tax sparked by its promise of encouraging Americans to increase their level of savings,[195] any increase in wealth taxes would likely be resisted on grounds that it would undo the consumption tax's benefits by discouraging accumulations of wealth.[196] Moreover, even if the political will existed to enact a significant wealth tax, a considerable challenge would remain to design a workable system to prevent tax avoidance.[197]

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193. *See* Andrews, *supra* note 1, at 1162-64; *see also* TREASURY BLUEPRINTS, *supra* note 188, at 30, 35, 123-25 (discussing inclusion and exclusion of gifts and bequests from the donor's and donee's tax bases and adopting for its model a rule including them in the donee's and excluding them from the donor's tax base under the assumption that large gifts and bequests would be subject to some sort of transfer tax). *But see* Aaron & Galper, *A Tax on Consumption, Gifts, and Bequests and Other Strategies for Reform,* in THE BROOKINGS INSTITUTION, OPTIONS FOR TAX REFORM 106, 121, 131 (J. Pechman ed. 1984) (proposing including gifts and bequests in both the donor's and donee's tax base). For further discussion of this issue, see Jones, *supra* note 188; Gunn, *supra* note 188, at 390-91.

194. *See* Andrews, *supra* note 1, at 1169-73.

195. *See, e.g.,* Sheppard, *Consumption Taxes and Capital Investment,* 32 TAX NOTES 934 (1986).

196. Gunn, *supra* note 188, at 380-81 (attributes reluctance to impose a wealth tax on the illogical but real and pervasive perception that taking property from citizens is more oppressive than preventing them from acquiring it); *see also* H. SIMONS, *supra* note 1, at 229 (predicting political resistance will arise if donatively transferred property is taxed heavily under a gift and estate or inheritance tax and then taxed again when the beneficiaries consume the donatively transferred capital).

197. *See* G. COOPER, A VOLUNTARY TAX? NEW PERSPECTIVES ON SOPHISTICATED ESTATE TAX AVOIDANCE (1979). The most recent attempt has focused on an accessions tax. *See* Halbach, *An Accessions Tax,* 23 REAL PROP., PROB. & TR. J. 211 (1988).

TARET's claim to serious consideration is that it eliminates many unplanned economic distortions from the tax structure without shrinking the tax base through tax deferral and without risking greater wealth disparities within society. It addresses the major criticisms of the Code by eliminating tax deferral on realized gains and the related complexities of provisions concerning nonrecognition, capital gains and losses, cost recovery, and debt.[198] If either tax system is implemented, serious consideration should be given to repeal of the corporate income tax. The reason to eliminate the corporate tax under a consumption tax regime is that whatever the corporation distributes to shareholders will be taxed unless reinvested and whatever the corporation retains represents savings and, therefore, should not be taxed.[199] Under TARET, the reason to repeal the corporate tax is that it presently serves to offset the deferral available to shareholders associated with accumulated earnings.[200] By eliminating deferral, TARET makes the corporate income tax less justifiable. The only capital income measurement problem TARET fails to solve is the effect of inflation. Full indexing of the TARET tax base, however, should be administratively feasible and, therefore, inflation-related problems are not a clear reason to favor the consumption tax over TARET.[201]

TARET's strength comes from the fact that it does not rely on the hope of designing an effective wealth tax to redistribute wealth accumulations. By eliminating most tax deferral opportunities, TARET eliminates the need for any wealth tax or consideration of rules including gifts and bequests in the income tax base of the donor or donee. As a number of scholars have indicated, the principal reason for a wealth tax under the current federal system is to reach some of the wealth that escapes income taxation through rules providing for accelerated depreciation, tax-free retirement accounts, and step-up-in-basis at death.[202] Without these incursions on the tax base, the administration of a wealth tax may prove undesirable and unnecessary.[203]

198. *See* Andrews, *supra* note 1, at 1129-39.

199. But see MEADE REPORT, *supra* note 16, at 227-68 (arguing that a corporate tax should continue under a consumption tax to preserve a revenue source and avoid the windfalls to corporate owners that will occur as a result of the tax's repeal).

200. *See* American Law Institute, *supra* note 170, at 358-66.

201. For discussion of inflation adjustments, see U.S. TREASURY DEPT., *supra* note 188, at 177-200; MEADE REPORT, *supra* note 16, at 99-123; Durst, *supra* note 32, at 1222-26, 1238-45, 1251-60, 1272-90; Gann, *supra* note 16, at 123-35, 140-42.

202. *See* Graetz, *To Praise the Estate Tax, Not to Bury It,* 93 YALE L.J. 259, 273 (1983); Gutman, *Reforming Federal Wealth Transfer Taxes After ERTA,* 69 VA. L. REV. 1183, 1189-92 (1983). Death will remain a taxable event under TARET because market value changes that occurred from the time assets were acquired or produced until death will be taxed. *See supra* notes 88-89 and accompanying text.

203. *See* Galvin, *supra* note 16, at 33, 43.

The consumption tax offers tax deferral accompanied by a promise of an effective wealth tax while TARET offers no tax deferral accompanied by a promise of no wealth tax. The consumption tax and TARET are two very different approaches designed to accomplish the same tax goals of economic neutrality, fairness, a healthy and growing economy, and administrability. Both offer tax structures that are far superior to the present Code. A good deal more study is necessary before we can make an informed judgment about which approach we should implement. The development in some detail of TARET at least permits a comparison of the consumption tax with an income tax system other than one in which the realization-event principle and tax deferral are viewed as necessary constraints.

CONCLUSION

One major purpose of this article has been to demonstrate the feasibility of creating an income tax system that prevents taxpayers from arranging their economic affairs to enjoy the benefits of tax deferral. At the outset, the article acknowledges the administrative importance of a marketplace transaction and, therefore, provides solutions to tax deferral based on information known at the time a taxpayer enters into a realization event. The first step was to identify various kinds of economic transactions and the challenges each presents to crafting an allocation technique for assigning market price increases over the taxing periods a taxpayer holds or produces an asset. After feasible, reasonably accurate, and nonmanipulable allocation techniques were designed, the solution to tax deferral took the obvious form of charging interest for the delay in tax payment between the time the market price increases were deemed to have occurred and the realization event that triggered the tax assessment. Fairness, of course, demands that the same approach apply to market price decreases, and the article proposes similar rules for computing tax refunds.

The allocation techniques and time-value adjustments are expressed in seemingly complex summation formulas. Those formulas, however, provide a linear description of the tax system and demonstrate how Haig-Simons' one-period model can be made to work in a multi-period context. All that further needs to be considered to make TARET fully operational are inflation adjustments and transitional rules. Much work has already been done regarding indexing of the Code, and TARET can easily adapt it.[204] The transitional rules may

204. *See supra* note 201. Indexing requires record-keeping of when a taxpayer acquired and sold an asset and if or when she increased her investment in the asset by making improvements or the like. TARET requires the same information, reducing the marginal cost of introducing an

also be relatively easy to accomplish. The time-value-of-money adjustments essentially change the tax rate, and tax rate changes are one of the easiest reforms to accomplish quickly and smoothly.[205]

A second and equally important purpose of the article was to highlight the realization-event principle's role under the Code and demonstrate that it is the source of the most serious abuses, inequities, and complications found in the law. Consideration of TARET as an operating system provides a different perspective for understanding the Code and its operation. To reiterate Simons, exploring TARET allowed us "to consider fruitfully the problem of bettering the system of presumptions."[206]

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inflation adjustment. Moreover, linking TARET with indexing should significantly reduce the impact TARET might have on the relative prices of assets. Indexing will reduce the amount of gains while TARET will increase the tax rate on those inflation-adjusted gains.

205. The breadth of the proposal has the advantage of limiting the change that might occur in the relative values of assets. *Cf.* Shakow, *supra* note 6, at 1180-81 (discussing transitional issues regarding an accrual taxing proposal).

206. *See supra* note 18.

APPENDIX: $1000 INVESTMENT IN COMMON STOCKS FROM 1965-1984

TABLE I: HAIG-SIMONS MODEL

Year-by-Year Total Returns on Standard & Poor 500 Common Stocks*	Return	Tax Liability for Each Year (30%)	Time-Adjusted Tax Liability (1.0545%)
Investment:	$1000.00		
1965 .1245	124.50	$37.35	$102.39
1966 −.1006	(113.12)	(33.94)	(88.35)
1967 .2398	242.53	72.76	179.38
1968 .1106	138.68	41.60	97.26
1969 −.0850	(118.37)	(35.51)	(78.73)
1970 .0401	51.10	15.33	32.23
1971 .1431	189.65	56.90	113.44
1972 .1898	287.54	86.26	163.09
1973 −.1466	(264.25)	(79.28)	(142.15)
1974 −.2647	(407.18)	(122.15)	(207.69)
1975 .3720	420.76	126.23	203.53
1976 .2384	369.96	110.99	169.71
1977 −.0718	(134.99)	(41.40)	(60.03)
1978 .0656	117.02	35.11	48.28
1979 .1844	350.51	105.15	137.11
1980 .3242	729.89	218.97	270.76
1981 −.0491	(146.38)	(43.91)	(51.49)
1982 .2141	606.94	182.08	202.47
1983 .2251	774.75	232.43	245.10
1984 .0627	264.38	79.31	79.31
Total:	$4480.92		$1415.62

* Interest-rate factor assumed to be the average after-tax rate of return earned over 20-year period to permit comparison with TARET model

Source of data: IBBOTSON ASSOCIATES, STOCKS, BONDS, BILLS, AND INFLATION 1986 YEARBOOK 29 (1986).

TABLE II: TARET MODEL

$R = [\$4480.92/\$1000]^{1/20} - 1 = .077875$
After-tax interest-rate factor: $[1 + .077875(1 - .3)] = 1.0545$

Year	Return $[R(\$1000)(1+R)^i]$	Tax Liability for Each Year (30%)	Time-Adjusted Tax Liability (1.0545)
Investment:	\$1000.00		
1965	77.87	\$23.36	\$64.04
1966	83.94	25.18	65.46
1967	90.48	27.14	66.91
1968	97.52	29.25	68.39
1969	105.12	31.53	69.91
1970	113.30	33.99	71.46
1971	122.13	36.63	73.04
1972	131.64	39.49	74.66
1973	141.89	42.56	76.31
1974	152.94	45.88	78.00
1975	164.85	49.45	79.73
1976	177.68	53.30	81.50
1977	191.52	57.45	83.30
1978	206.44	61.92	85.15
1979	222.51	66.75	87.03
1980	239.84	71.94	88.96
1981	258.52	77.55	90.93
1982	278.65	83.59	92.95
1983	300.35	90.10	95.01
1984	323.74	97.11	97.11
Total:	\$4480.92		\$1589.85

Haig-Simons model: \$1415.62
TARET model: \$1589.85
TARET model amount of overtax: \$174.23
Percentage of overtaxation: 12.30%