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Calvin H. Johnson

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I. Introduction

In response to the Reagan Administration's proposals for more generous tax benefits for depreciable property,[1] Congress in 1981 enacted the Accelerated Cost Recovery System (ACRS).[2] ACRS allows a taxpayer to deduct his basis in depreciable property earlier than under prior law,[3] but retains the rule of prior law that the property's basis includes the indebtedness that the purchaser incurs to acquire the property.[4]

The thesis of this Article is that ACRS is inconsistent with the tax treatment of debt. ACRS creates a negative tax for a purchaser of depreciable property when the property is purchased with or through indebtedness. The concept of "negative tax" as used in this Article means that the profit from an investment after the imposition of federal

* Professor of Law, The University of Texas. B.A. 1966, Columbia University; J.D. 1971, Stanford University.

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1. The Economic Recovery Tax Bill of 1981, H.R. 3849, §§ 201-203, 97th Cong., 1st Sess., 127 CONG. REC. 2824 (1981).

2. Economic Recovery Tax Act of 1981, Pub. L. No. 97-34, § 201(a), 95 Stat. 172, 203-18 (1981) (enacting I.R.C. § 168); *id.* § 204, 95 Stat. 172, 222-23 (1981) (amending I.R.C. §§ 1245, 1250); *id.* § 211(a), 95 Stat. 172, 277 (1981) (amending I.R.C. § 46(c)).

For a description of the details of ACRS, including the rationales for its structure, see STAFF OF JOINT COMM. ON TAXATION, 97TH CONG., 2D SESS., GENERAL EXPLANATION OF THE ECONOMIC RECOVERY TAX ACT OF 1981 (Comm. Print 1981); Auerbach, *The New Economics of Accelerated Depreciation*, 23 B.C.L. REV. 1327, 1331-39 (1982). ACRS was amended in 1982 by the Tax Equity and Fiscal Responsibility Act of 1982, Pub. L. No. 97-248, §§ 205-206, 96 Stat. 324, 427-31 (1982) [hereinafter cited as TEFRA] (described *infra* text accompanying notes 49-52).

3. I.R.C. § 168(c)(2) (Supp. V 1981). *See, e.g.,* STAFF OF JOINT COMM. ON TAXATION, *supra* note 2, at 75-76.

For assets such as machinery and equipment, ACRS also allows the taxpayer an investment tax credit when the property is placed in service. For most machinery, the investment tax credit is 10% of the purchaser's basis. I.R.C. §§ 46(a)(2)(B), (c)(1), (7) (Supp. V 1981). In 1982, Congress changed ACRS to require the taxpayer either to reduce his investment tax credit or to reduce his depreciable basis by half of the credit taken. *See infra* note 51 and accompanying text.

4. I.R.C. § 168(d)(1) (Supp. V 1981) (defining unadjusted basis by reference in general to "cost" under prior law). *See, e.g.,* Crane v. Commissioner, 331 U.S. 1 (1947) ("cost" includes liabilities incurred to purchase property).

income tax is higher than its profit before tax or in the absence of tax. The investment receives better treatment under ACRS than it would if it were outside of the tax system completely, or if the income from the investment were merely tax exempt. Under ACRS, profitable debt-financed investments in depreciable property, instead of bearing tax, will save the tax that the investor would otherwise pay on his normally taxed sources of income.[5] The higher the investor's nominal tax rate, the greater the negative tax generated.

This Article describes the negative tax, in part algebraically, and illuminates some of its evils. The negative tax arises because ACRS is mismatched with the current tax treatment of indebtedness. One way of describing the mismatch is that ACRS gives a tax exemption to investment returns from ACRS property and also gives a tax deduction for the interest cost of the tax exempt returns. ACRS depreciation, combined with the investment tax credit, gives the taxpayer benefits that usually exceed the value of immediate expensing, that is, the value of immediately deducting the cost of ACRS property.[6] The expensed cost includes not only the cash paid, but also the indebtedness incurred to purchase the property. Immediately expensing the cost of property is economically equivalent to exempting the subsequent income from the property from tax.[7] The purchaser is permitted to deduct the inter-

5. As this Article explains, it is not economically rational to exempt low bracket income from tax. As a matter of law, however, the negative tax could exempt a taxpayer's income from all federal income tax otherwise owed in the year. Any net operating losses incurred by the taxpayer can be carried over to 20 other tax years. Under I.R.C. § 46(b)(1)(A) (Supp. V 1981), investment tax credits may be carried back for the three previous tax years, and under I.R.C. § 172(b)(1)(B) (Supp. V 1981), operating losses may be carried back to the five previous tax years. Refunds arising from the carrybacks are payable, on an expedited basis, during the year the losses arise. I.R.C. § 6411 (Supp. V 1981). Losses may be carried forward and used, in general, in the 15 years after they arise. I.R.C. §§ 46(b)(1)(B), 172(b)(2) (Supp. V 1981). Beyond the refund of taxes in the 21 total carryover years, the negative tax cannot lead to a check from the government. Under a provision known as safe harbor leasing, however, the negative tax can be sold to other taxpayers. I.R.C. § 168(f)(8) (Supp. V 1981). In 1982, Congress cut back on the benefits that could be transferred under safe harbor leasing. TEFRA, Pub. L. No. 97-248, §§ 208, 210, 96 Stat. 324, 438-42, 447-48 (1982). *See* Ferguson, *Profiting from Tax Losses*, 60 TAXES 1010 (1982). For a discussion of the minimum taxes imposed by I.R.C. §§ 55-56 (West Supp. 1982), see *infra* note 59.

6. *See infra* text accompanying notes 41-61.

7. The pioneering articulation was made in Brown, *Business-Income Taxation and Investment Incentives*, in INCOME, EMPLOYMENT AND PUBLIC POLICY: ESSAYS IN HONOR OF ALVIN H. HANSEN (1948). *See also* Andrews, *A Consumption-Type or Cash Flow Personal Income Tax*, 87 HARV. L. REV. 1113, 1123-28, 1136-39 (1974); Surrey, *The Tax Reform Act of 1969, Tax Deferrals and Tax Shelters*, 12 B.C. INDUS. & COMM. L. REV. 307 (1971).

For expensing to be equivalent to exemption of subsequent income, tax savings incurred by expensing must be invested in the property, and the tax rate used to compute tax saved by expensing must be the same as the rate used to compute tax saved by exemption. With those two assumptions, the taxpayer gets the same benefit from expensing the investment as he gets from tax exemption for its returns. A taxpayer who expenses the cost of property uses the government as a "fair" partner who funds a fraction of the investment, determined by the tax rate. If a "fair" partner funds the investment at the same rate that he takes profits out (through tax), the "fair"

est cost of acquiring income from ACRS property, notwithstanding that the income is effectively tax exempt. The negative tax arises, therefore, from the combination of immediate expensing, expensing for debt to be paid in the future, and deduction of interest on the debt-financing.[8]

ACRS and debt create tax shelter gain.[9] Many have assumed that unproductive tax shelters were the result of the high tax rates that the 1981 Act reduced.[10] This Article shows, however, that ACRS causes tax shelters. Tax shelters are those investments that create a negative tax; debt-financed investments in ACRS property are tax shelters because they generate negative tax. These tax shelters do not arise as a result of some extraordinary abuse of the tax system, but through the ordinary use of a tax system that has a serious structural flaw.

The predictable consequences of the negative tax produced by ACRS are disturbing. The negative tax is great enough to exempt from federal income tax all of the income of individuals that is normally subject to taxation at rates exceeding the highest corporate tax rate,[11] even when the taxpayer has and consumes millions of dollars of otherwise taxable income. All other things being equal, corporations are able to purchase ACRS property only after the 50% and 49% individual brackets have been stripped of all reported taxable income. The negative tax can also exempt a substantial amount of corporate taxable income that would have been reported in the maximum corporate tax bracket of 46%.[12] Corporations and individuals with taxable income in the higher brackets are able to exempt their income for every taxable year with debt-financed investments in depreciable property. ACRS encourages tax shelters so effectively that federal income tax has be-

partner has not reduced the rate of profit the investor can achieve. With both expensing and exemption, taxes do not reduce the investor's profit.

8. *See infra* notes 36-39 and accompanying text.

9. *See infra* p. 1028 (text following expression (9)).

10. *See, e.g.*, 1 *Tax Reduction Proposals: Hearings Before the Senate Comm. on Finance*, 97th Cong., 1st Sess. 257 (1981) [hereinafter cited as *Tax Reduction Proposals*] (statement of ABA tax section); *Tax Cuts: Democratic Members Suggest Expanding Reagan Capital Investment Incentives*, DAILY TAX REP. (BNA) No. 53, at G-5 (Mar. 19, 1981) (Sen. Russell Long stating that a 70% rate causes nonproductive tax shelters).

11. The maximum tax rate on corporate income is 46%. I.R.C. § 11(b)(5) (Supp. V 1981). The rate reduction, when fully effective in 1984, will impose a rate in excess of 46% for a married individual (*i.e.*, 49%), if taxable income is over $109,400. I.R.C. § 1(a)(3) (Supp. V 1981) (for taxable years beginning after 1984).

12. The Treasury Department and the staff of the Joint Committee on Taxation estimated that ACRS would create a revenue loss between $55 billion and $61 billion, compared with $65 billion collected from corporate tax in 1980. *See* Auerbach, *supra* note 2, at 1328. Not all revenue losses, however, go to corporations.

come an avoidable or voluntary tax in the highest brackets.[13]

The predictable market response to the negative tax artificially excludes lower bracket taxpayers from ownership of ACRS property. The negative tax is greater in higher brackets than it is in lower brackets. All other things being equal, higher bracket taxpayers are able to pay more for ACRS property than lower bracket taxpayers. Thus, the price of depreciable property, relative to returns, will rise beyond the price that lower bracket taxpayers can afford. The negative tax is not great enough in the lower brackets to offset the economic losses arising from market responses to the negative tax. Tax-forced barriers to ownership of property by lower bracket taxpayers are created, and these barriers should be high enough to eliminate lower bracket taxpayers from the ownership of any significant amount of ACRS property. Therefore, the low bracket taxpayer will continue to bear the tax burden; in fact, ACRS forces the federal government to collect revenue only from lower bracket taxpayers.

The negative tax subsidizes investments in depreciable property eligible for ACRS. This subsidy causes detrimental shifts in investment activity, that is, causes investments in property that yield returns inferior to prevailing interest rates. In some periods, the negative tax will allow investment in property that produces returns which do not even meet the rate of inflation. In all periods, the negative tax makes profitable investments that would not have been undertaken in absence of tax. Economics generally dictates that investments that would not be undertaken in the absence of tax should not be artificially encouraged. Absent market defect, the rate of return received from property represents the amount consumers are willing to pay for the products of the property and thus generally measures the utility of the property relative to other uses of resources.[14] The negative tax shifts the relative value of the property away from its real utility value and shifts real resources into investments with insufficient independent utility.[15] Positive taxes that distort the use of resources can be rationalized by the need to raise revenue. Negative taxes, however, distort the use

13. The analysis in the text ignores minimum tax, but see *infra* note 60 and accompanying text. Some qualification is also necessary because practice diverges from theory. For example, some taxpayers may be unwilling to undertake the steps necessary to obtain tax exemption for economic income in the highest tax brackets. In addition, transaction costs will probably prevent individuals with a small amount of income that could be sheltered from attempting to exempt it. Thus, uncertainties and transaction costs may slow down some of the effects that economic analysis implies. For an example of how the negative tax can lead to exemption in fact, however, see *infra* note 39.

14. *See infra* notes 72-73.

15. *See infra* note 74.

of resources without raising revenue. In fact, they compound the distortions created by positive taxes and intensify the government's revenue problems.

The negative tax appears to have been an accident rather than an intended part of depreciation or indebtedness policy.[16] A relatively small negative tax was built into ACRS because, at common discount rates, the present value of ACRS benefits exceeds the value of immediate expensing of the cost of the property.[17] Expensing the property's cost is equivalent to exempting its subsequent income from the property,[18] so benefits that exceed the value of expensing are better than a tax exemption for subsequent income.[19] During the deliberation over ACRS, proponents of the system argued that negative tax from this source was a minor matter, a mere rounding error, given high inflation.[20] ACRS is not better than expensing at very high discount rates.[21] Although there was some debate on the negative tax from the present value of ACRS benefits alone,[22] there was no significant debate about the far more important negative tax from the mismatching of ACRS depreciation and the treatment of indebtedness;[23] nor was there any indication that Congress understood the issue.

16. *See, e.g.,* 1 *Tax Reduction Proposals*, *supra* note 10, at 9, 35 (statement of Donald T. Regan, Secretary of the Treasury) (arguing that negative tax is an unintended result).

17. *See infra* notes 41-55 and accompanying text.

18. *See supra* note 7.

19. *See infra* note 74 and accompanying text (negative tax encourages investments that would not be undertaken in absence of tax).

20. *See* 2 *Tax Reduction Proposals*, *supra* note 10, at 350, 362, 574 (statements of David G. Raboy, Director of Research, Institute for Research on the Economics of Taxation) (arguing that ACRS "just about" equals expensing, but that ACRS should be less generous if inflation rates decrease); Auerbach & Raboy, *10-5-3 Versus First-Year Recovery: A Depreciation Debate*, 12 TAX NOTES 899, 902 (1981) (ACRS "approximates" expensing); *Slow Start for Ways and Means Markup*, 12 TAX NOTES 1385 (1981) (quoting testimony of John E. Chapaton, Assistant Secretary of the Treasury) (ACRS "slightly better" than expensing).

21. *See infra* note 46. David Raboy, Director of the Institute for Research on Economics of Tax, and a close associate of Norman Ture, Deputy Secretary of the Treasury during the consideration of ACRS, attempted to justify the high discount rates needed to make ACRS equal to expensing by pointing out the high rate of inflation. 2 *Tax Reduction Proposals*, *supra* note 10, at 589. *See also id.* at 362 (if inflation comes down, ACRS should be cut back). Raboy used a significantly higher discount rate than the after-tax borrowing or return rate actually faced by investors.

22. Auerbach & Raboy, *supra* note 20; 2 *Tax Reduction Proposals*, *supra* note 10, at 362-70 (exchange between Jorgenson and Raboy). *Compare* 2 *id.* at 589 (Raboy arguing that negative tax, if any, was tolerable), *with* Auerbach & Jorgenson, *The First Year Capital Recovery System*, 12 TAX NOTES 515, 519 (1981); Shannon, *The Ways and Means Plan for Business Incentive*, Wall St. J., June 30, 1981, at 20, col. 4; *and* 127 CONG. REC. S7644 (daily ed. July 15, 1981) (statement of Sen. Russell Long) (objecting to negative tax in ACRS being more valuable than expensing).

23. An earlier version of this Article was submitted to 3 *Tax Aspects of the President's Economic Program, Hearings Before House Ways & Means Comm.*, 97th Cong., 1st Sess. 2658 (1981), which, however, did not constitute debate. For a discussion by economists in 1981 about a negative tax from debt-financing and accelerated depreciation, see Hall, *Tax Treatment of Depreciation, Capital Gains, and Interest in an Inflationary Economy*, and Bradford & Fullerton, *Pitfalls in*

It is difficult to view the negative tax resulting from indebtedness as anything but an accident. Proponents of depreciation benefits that are as generous as expensing appeal to consumption tax theory,[24] but the advocates of the consumption tax would correct the negative tax that ACRS gives.[25] Accelerated depreciation is sometimes defended on the ground that it is necessary to mitigate double taxation of investments.[26] Property purchased with indebtedness, however, is not subject to double taxation because incurring a debt to buy property does not lead to taxation of the invested principal.[27] Accelerated depreciation is often viewed as a rough offset to the effects of inflation.[28] The borrower who buys ACRS property, however, is helped rather than hurt by inflation.[29] One cannot defend the negative tax from debt-financed investments as an appropriate subsidy to capital formation,[30] since neither borrowing nor promising to pay constitutes the formation of capital investment.[31] The negative tax allows an investor to maintain his normal consumption as if he had made no investment.[32] One cannot defend the negative tax as a contribution to productivity,[33] since the

the Construction and Use of Effective Tax Rates, both in DEPRECIATION, INFLATION AND TAXATION OF INCOME FROM CAPITAL 164, 255 (C. Hulten ed. 1981).

24. *See, e.g.,* Raboy, Woo & Schuyler, *The Business Tax Cut: Two Depreciation Approaches Compared*, 13 TAX NOTES 65, 66 (1981). *Cf.* Harberger, *Comments*, in WHAT SHOULD BE TAXED: INCOME OR EXPENDITURE? 117 (J. Pechman ed. 1980) (advocating that an increase in business incentives within an income tax would be more likely to approach the ideal of the consumption tax model than would designing a new consumption tax).

25. Advocates of the consumption tax would correct the error of the negative tax in one of the following ways: (1) Include borrowed proceeds in taxable income. U.S. DEP'T OF TREASURY, BLUEPRINTS FOR BASIC TAX REFORM 124 (1975); Graetz, *Implementing a Progressive Consumption Tax*, 92 HARV. L. REV. 1575, 1609-10 (1979); Kaldor, *Comment*, in WHAT SHOULD BE TAXED: INCOME OR EXPENDITURES? *supra* note 24, at 151; (2) Exclude debt and borrowed proceeds from the basis from which depreciation and other capital allowances are computed. U.S. DEP'T OF TREASURY, *supra*, at 124-25; (3) Disallow deductions for interest on indebtedness used to purchase deductible or depreciable property. Bradford, *The Economics of Tax Policy Toward Savings*, in THE GOVERNMENT AND CAPITAL FORMATION 42-50 (G. VonFurstenberg ed. 1980).

26. For a general discussion of the double tax, compare Gunn, *The Case for an Income Tax*, 46 U. CHI. L. REV. 370, 371-78 (1979), with Andrews, *supra* note 7, at 1167-69 (1974).

27. *See, e.g., In re* Diversified Brokers Co., 487 F.2d 355 (8th Cir. 1973); Woodsam Assocs., Inc. v. Commissioner, 198 F.2d 357 (2d Cir. 1952).

28. U.S. DEP'T OF TREASURY, TECHNICAL EXPLANATION OF H.R. 3849 (ECONOMIC RECOVERY TAX ACT OF 1981), *reprinted in* 120 DAILY TAX REP. (BNA) 13 (Special Supp. 1981). *See also* Gramlich, *The Economic and Budgetary Effects of Indexing the Tax System*, in INFLATION AND THE INCOME TAX 271, 282-86 (H. Aaron ed. 1976); Corcoran, *Inflation, Taxes and the Composition of Business Investment*, 4 FED. RESERVE OF N.Y. Q. REV. 13 (1979).

29. *See, e.g.,* Aaron, *Inflation and Taxes*, in INFLATION AND THE INCOME TAX 9-10 (H. Aaron ed. 1976) ("Whatever lenders lose, borrowers gain.").

30. STAFF OF JOINT COMM. ON TAXATION, 97TH CONG., 1ST SESS., 3 CAPITAL FORMATION/PRODUCTIVITY TAX INCENTIVES: A DEPRECIATION REVISION 1-4 (Comm. Print 1980) (overview of arguments for greater capital formation).

31. Borrowing is the use of saved amounts rather than the creation of savings.

32. *See infra* p. 1039.

33. U.S. DEP'T OF TREASURY, *supra* note 28, at 13.

negative tax hurts more than it helps productivity.[34] Taxation of the lender who provides debt-financing corrects neither the error nor the evils of the negative tax.[35]

The negative tax arises from the incompatibility of ACRS with the rules for the treatment of debt, established prior to the enactment of ACRS. Thus, the negative tax has been described as a mismatching of consumption tax treatment of investment with income or accretion tax treatment of borrowing.[36] The negative tax can be blamed on ACRS since it would not occur if depreciation deductions were limited to real declines in the value of property.[37] Nor would the negative tax occur if ACRS did not give the investor advanced credit for indebtedness to be paid in the future.[38] Congress could cure the negative tax by taking indebtedness incurred to pay for ACRS property out of ACRS basis or by creating an income item when debt is incurred, which would offset the benefit of including debt in basis. The negative tax could also be cured by disallowing a deduction for interest on indebtedness incurred to buy ACRS property.[39] The negative tax, in sum, is created by the concurrence of three factors: ACRS tax benefits are more valuable than deduction of economic depreciation; ACRS benefits extend to ob-

34. *See, e.g., infra* text accompanying notes 70-73.

35. *See infra* text accompanying notes 82-114.

36. Bradford, *supra* note 25, at 42-50.

37. Hall, *supra* note 23, at 164. Hall's formulation also shows that neutrality under our current regime for taxing indebtedness requires the taxation of unrealized capital gains as they accrue. Without denying this problem, one can treat unrealized capital gain as a separate problem in part because depreciable property has relatively little real appreciation. *See generally* Samuelson, *Tax Deductibility of Economic Depreciation to Insure Invariant Valuations*, 72 J. POL. ECON. 604 (1964) (showing that the value of property is independent of the investor's tax rate only if depreciation deductions measure loss of economic value; if depreciation deductions exceed economic losses, then higher bracket taxpayers pay more for investment or they have some economic income exempt from tax, or a combination of both).

38. *See, e.g.,* Mayerson v. Commissioner, 47 T.C. 340, 352 (1966) (purchaser given "advanced credit" for indebtedness to be paid 99 years in the future).

39. *See infra* text accompanying note 66. *See also* Bradford, *supra* note 25, at 42-50. The interest deduction generating the negative tax can be described as the misaccounting of allowing a deduction for the costs of property when the returns from the property are tax exempt. I.R.C. § 265(2) (Supp. V 1981) disallows the deduction of interest on indebtedness used to purchase or carry municipal bonds. The negative tax from debt-financed investment in ACRS property is like the target of § 265(2). *See* Denman v. Slayton, 282 U.S. 514, 519-20 (1931) (describing the misaccounting prevented by § 265(2)). An immediate deduction for an investment gives the taxpayer a benefit equivalent in value to a tax exemption of all the subsequent income from the property. *See supra* note 7. Since ACRS benefits are roughly equivalent to immediate deduction of the cost of ACRS property, *see infra* notes 41-55, the benefits are also effectively equivalent to a tax exemption for all of the property's income. In addition to the exemption for the income from ACRS property, the interest cost incurred to obtain that income is deductible.

The parallel between the target of § 265(2) and the negative tax from debt-financed investments in ACRS property indicates the power of the negative tax to reduce taxable income (and government revenue). Commercial banks have been exempted from § 265(2). Their use of the resulting privilege is the primary explanation for the low effective tax rates paid by the banks. *See infra* notes 93-97 and accompanying text.

ligations to pay in the future; and, interest on such obligations is deductible. Dislodging any leg of the tripod where the legs intersect would knock over the negative tax.

The presence of a negative tax can be shown both by a simplified algebraic description of debt-financed ACRS investment and by applying the actual ACRS system to a sample debt-financed investment. Part II of this Article develops a simple algebraic model showing the tax shelter gain. Part III then analyzes the economic consequences that one can expect from the investor's situation as described by the algebraic model. Part III also shows the negative tax available to the investor when the rate of return from the investment is at least as high as the rate of interest. The analysis then indicates that the return will decrease because of market response to the negative tax, but not by enough to take away all of the gain that the negative tax gives to high bracket taxpayers. Finally, Part IV shows that the tax paid by the lender on interest used to finance the purchase of ACRS property does not cure the error of the negative tax. An appendix to this Article shows one sample tax shelter investment that would not be undertaken in the absence of taxation but which becomes feasible with the negative tax.[40]

II. Algebraic Model

This Article develops a simple algebraic description of debt-financed investments in depreciable property eligible for ACRS, in order to demonstrate the negative tax. The model divides the borrowing and the investment process into three separate steps. First, the indebtedness is incurred and the investment is made; second, periodic returns of profit are received from the investment, and interest is paid on the indebtedness; last, the invested amount is returned and the loan is repaid. The "time value" of the payments is accounted for by interest and return rates. In the model, the investor has no cash cost or benefit when the indebtedness and investment occurs (step 1) and no cost or benefit when the loan is repaid (step 3). Thus, any advantage from debt-financed investment shows up as the periodic net return from the investment (step 2). The advantage is called the investor's tax shelter gain.

40. Both the text and appendix use tax rates adopted as a part of the Economic Recovery Act of 1981, Pub. L. No. 97-34, § 101(a), 95 Stat. 172, 176-82 (1981) (amending I.R.C. § 1 (1971)), in order to show that cuts in tax rates do not eradicate tax shelters. *See supra* note 10 (ABA statement arguing that high tax rates cause tax shelters).

A. Preliminary Assumptions

The algebraic model assumes that tax benefits afforded ACRS are equivalent in value to "expensing" (*i.e.*, deducting the basis of ACRS property as soon as it is purchased). Investments in ACRS property are considered expensed when the property is purchased; these investments are sometimes called deductible investments. The actual relationship between ACRS and expensing depends upon the purchaser's tax and discount rates along with the availability of the investment tax credit. ACRS depreciation deductions are in fact not immediate,[41] and the delay alone makes ACRS depreciation deductions less valuable than expensing. The higher the purchaser's discount rate, the more the purchaser is hurt by the delay.[42] If the property is eligible for the investment tax credit,[43] however, the benefit of the credit usually more than makes up for the detriment caused by the delay. The investment tax credit, which has the same value in all tax brackets, affects the balance between ACRS and expensing more heavily in lower tax brackets since expensing is less valuable in lower brackets.[44] In any event, for any tax rate and any given class of ACRS property eligible for the investment tax credit, there is a discount rate that makes the value of ACRS benefits exactly equal to expensing.[45]

41. I.R.C. § 168(c) (Supp. V 1981) classifies property as 15, 10, 5, or 3 year recovery property, and I.R.C. § 168(b) (Supp. V 1981) gives a depreciation deduction schedule for each class of property. "Recovery year 1" of the schedule is the tax year in which the property is placed in service, I.R.C. § 168(d)(1)(B)(i) (Supp. V 1981), although conventions of financial analysis commonly label the start of the investment as "year 0."

42. The present value of a deduction is the amount deposited in a savings account paying compound interest equal to the investor's discount rate that would grow to equal the value of the deduction by the time it is in fact available. The formula is

$$PV = \frac{D}{(1+i)^n}$$

in which PV is the present value, D is the value of the deduction (ignoring the time when it is taken), i is the discount rate per period, and n is the number of periods in which the investment would grow. The discount rate is the after-tax return rate from the investor's best alternative investment. The higher i is, the lower the current deposit (PV) can be and still grow to equal D.

43. The investment tax credit is a direct reduction of the tax owed. It is allowed when property eligible for the credit is placed in service. The definition of property eligible for the investment tax credit is complex, *see* I.R.C. § 48 (1976), but tangible personal property, including most equipment and machinery, generally qualifies. The credit is generally 10% of basis. I.R.C. § 46(a)(2)(B), (c)(1), and (c)(7)(A) (Supp. V 1981). Three year property gets an investment tax credit of 6% of basis. I.R.C. § 46(c)(7)(B) (Supp. V 1981). In 1982, Congress required taxpayers to reduce either their depreciable basis or their credit claimed. *See infra* note 51 and accompanying text.

44. The value of a tax deduction depends upon the tax actually saved, which equals the tax rate multiplied by the amount deducted. The investment tax credit has a value independent of tax rates because it is a direct subtraction from tax owed.

Lower bracket taxpayers have an offsetting detriment because their after-tax interest and returns are higher, so that deferral of depreciation deductions hurts them more than it hurts higher bracket taxpayers. *See infra* note 122 and accompanying text.

45. For instance, expensing has the same present value as ACRS (prior to amendment by

As originally enacted by the Economic Recovery Tax Act of 1981, ACRS gave depreciation and tax credit benefits that were more valuable than expensing for most taxpayers.[46] For example, a 46% bracket corporation purchasing five year recovery life equipment in 1982 would get more value from ACRS than from expensing, if its discount rate (after tax) were lower than 13.1%.[47] Thus, if the corporation were able to borrow money at less than a 24.3%[48] interest rate (or had a pre-tax return of less than 24.3% from ordinary business sources), then ACRS, as originally enacted, would be more valuable than expensing.

In the Tax Equity and Fiscal Responsibility Act of 1982 (TEFRA), Congress reduced the value of ACRS, intending to decrease the cases in which the system was more valuable than expensing.[49] TEFRA re-

TEFRA) for property eligible for investment tax credit and a five year recovery life when "i" is set so that:

$$T = 10\% + 15\%\ T + \frac{22\%T}{1+i} + \frac{21\%T}{(1+i)^2} + \frac{21\%T}{(1+i)^3} + \frac{21\%T}{(1+i)^4}.$$

T is the assumed constant tax rate and i is the discount rate. *See supra* notes 41-43. The taxpayer's basis factors out of the equation, as does any consistent delay between the time when amounts are deducted and the time when they become tax savings. See *infra* notes 46 and 51 for pre- and post-TEFRA solutions to the value of i for various properties.

46. The following table shows the after-tax discount rate at which an investor becomes indifferent to a choice between expensing the property and depreciating it under ACRS, prior to amendment by TEFRA, Pub. L. No. 97-248, § 206 (1982), for 3 and 5 year recovery life property:

5 Year Property

Marginal Tax Rate	1981-1984	1985	1986 on
50%	11.8%	15.7%	16.1%
46%	13.1%	17.5%	18.0%
40%	15.7%	21.1%	21.8%
30%	23.6%	32.4%	33.5%
20%	48.7%	70.9%	74.9%

3 Year Property

Marginal Tax Rate	1981-1984	1985	1986 on
50%	12.5%	15.0%	16.2%
46%	13.8%	16.6%	18.0%
40%	16.3%	19.7%	24.4%
30%	23.5%	28.7%	31.4%
20%	42.3%	52.9%	59.0%

At discount rates lower than those shown above, ACRS is better than expensing the property. See *supra* note 45 for the formula from which these figures were derived.

47. See the table, *id.*

48. $24.3\% - T\ 24.3\% = 13.1\%$, when T is 46%.

49. SENATE COMM. ON FINANCE, REPORT ON TAX EQUITY AND FISCAL RESPONSIBILITY ACT OF 1982, S. REP. No. 494, 97th Cong., 2d Sess. 122, 122-23, *reprinted in* 1982 U.S. CODE CONG. & AD. NEWS 781, 887-88 [hereinafter cited as TEFRA SENATE REPORT]. *See* 2 *Tax Reduction Proposals*, *supra* note 10, at 362 (Raboy arguing that if inflation comes down, ACRS should be cut back).

pealed the more generous depreciation schedules that were slated to come into effect after 1984.[50] Moreover, TEFRA required the purchaser either to reduce his depreciable basis by one-half of the investment tax credit or to reduce his investment tax credit by two percent.[51] The changes in 1982 lowered the discount rates at which ACRS becomes equivalent to expensing, but ACRS is still at least as valuable as expensing at common discount rates.[52] To adjust for inflation, a depreciation system could be made equivalent to expensing at a discount rate equaling the current rate of inflation,[53] but ACRS is more valuable than expensing using the current inflation rate as the discount rate. For

50. Pub. L. No. 97-248, § 206, 96 Stat. 324, 431 (1982) (repealing I.R.C. § 168(b)(1)(B), (C)).

51. *Id.* § 205, 96 Stat. 324, 427-31 (1982) (enacting new I.R.C. § 48(q) effective for years after 1982).

The Conference Committee Report on TEFRA, H.R. REP. No. 760, 97th Cong., 2d Sess. 481-82, *reprinted in* 1982 U.S. CODE CONG. & AD. NEWS 1190, 1260-61, characterized the option to take a 2% reduction in investment tax credit as useful for those taxpayers who could not use a full credit in the year the property is placed in service, but an election to reduce the credit is usually rational even when the full credit could be used immediately. For instance, all 46% bracket corporations should choose the reduction in investment tax credit for 5 year property if their discount rate (i) is less than 7.1% after tax. A 50% bracket taxpayer should choose the reduction in investment tax credit if his discount is less than 11.8%. The following equation shows indifference between the options:

$$2\%B = 5\%BT\left[15\% + \frac{22\%}{1+i} + \frac{21\%}{(1+i)^2} + \frac{21\%}{(1+i)^3} + \frac{21\%}{(1+i)^4}\right],$$

in which i is discount rate. B is basis, but it factors out.

52. The following table shows the after-tax discount rate at which an investor is indifferent between expensing and ACRS, after amendment by TEFRA, Pub. L. No. 97-248, § 205, 96 Stat. 324, 427-31 (1982), for 3 and 5 year recovery life property:

Discount Rate when ACRS = Expensing, post-TEFRA

Marginal Tax Rate	5 Year Property	3 Year Property
50%	9.0%	7.9%
46%	10.1%	8.7%
40%	12.5%	10.1%
30%	20.0%	14.2%
20%	43.4%	23.5%

At discount rates lower than those shown above, ACRS depreciation is better than expensing.

The 5 year property column is generally the value for i that satisfies the following equation:

$$(1)\quad T = 10\% + 95\%\left[15\%T + \frac{22\%T}{1+i} + \frac{21\%T}{(1+i)^2} + \frac{21\%T}{(1+i)^3} + \frac{21\%T}{(1+i)^4}\right]$$

when T is the tax rate. However, for the 50% bracket taxpayer, the option to reduce investment tax credit is more advantageous, *see supra* note 51, so that the value of i satisfies the following equation:

$$(2)\quad T = 8\% + \left[15\%\ T + \frac{22\%T}{1+i} + \frac{21\%T}{(1+i)^2} + \frac{21\%T}{(1+i)^3} + \frac{21\%T}{(1+i)^4}\right].$$

53. In an income tax adjusted for inflation, real returns from property would be subject to tax, but returns just balancing the inflation rate would be exempt. One could achieve that result by setting depreciation benefits equal to expensing at a discount rate equal to current inflation,

example, the current inflation rate is five percent,[54] and ACRS benefits for a 46% bracket corporation buying five year equipment are worth 108% of the value of expensing.[55]

The assumption that ACRS is equivalent to expensing is not accurate for real estate because real estate is not eligible for the investment tax credit. Using an after-tax discount rate of eight percent,[56] fifteen year recovery life real estate receives ACRS benefits that are equivalent to only sixty-eight percent of an immediate deduction.[57] Debt-financed real estate, however, still results in negative tax for reasons suggested by the algebraic model, as long as ACRS is greater than economic depreciation. However, the numerical results of the computations (for instance, for investment returns that will allow the investor to break even) are not accurate.

The model ignores the impact of the minimum tax imposed on ACRS depreciation by sections 55 and 56.[58] Although the burden imposed by minimum taxes is at most less than ten percent of the purchase price, the burden of the tax is not meaningless. For five year ACRS property, the minimum tax on individuals, at worst, has the same burden as a one time excise tax of 7.5% of the price of ACRS property; the minimum tax on corporations has the same burden as a one time excise tax of 5.6% of the price.[59] The burden imposed by state sales, property, or excise taxes is also ignored in this model.

since expensing is equivalent to an exemption from tax for the subsequent income from the property. *See supra* note 7.

The tax system plausibly uses dollars solely as a measure for a more basic ability to pay tax or utility; an investment that returns merely the inflation rate has no real income in inflation adjusted terms, although the project has nominal income when measured in inflated dollars.

54. The GNP price deflator averaged 5% during the second and third quarter of 1982. *Data Bank*, N.Y. Times, Oct. 24, 1982, § F, at 20, col. 5.

55. The ratio of present value of ACRS to expensing for 5 year recovery life property is:

$$10\% + 95\% \left[15\%T + \frac{22\%T}{1+i} + \frac{21\%T}{(1+i)^2} + \frac{21\%T}{(1+i)^3} + \frac{21\%T}{(1+i)^4} \right]$$

to T. If T is 46% and i is 5%, the ratio is 107.6%. If T is 20% and i is 5%, the ratio is 136%.

The staff of the Joint Committee on Taxation analyzed various depreciation proposals in 1981 and found a ratio of present value of depreciation to the value of expensing, using a 12% discount rate. STAFF OF JOINT COMM. ON TAXATION, *supra* note 30, at 18.

56. AAA municipal bonds yielded 8.45% on March 11, 1983. See *infra* note 95.

57. I.R.C. § 168(b)(2)(A) (ii) authorizes a 175% declining balance depreciation for real estate, under regulations prescribed by the Treasury Department. The prescribed schedules are found in Treasury News Release R-345, 1981 FED. TAXES (P-H) ¶ 55,480, or STAFF OF JOINT COMM. ON TAXATION, *supra* note 2, at 84-85. The ratio may be different for different tax rates because tax rates affect the after-tax discount rate.

58. I.R.C. §§ 55-56 (West Supp. 1983).

59. A depreciation deduction under § 168 for 5 year property is a "tax preference item" if the deduction is larger than the deduction generated by using straight line depreciation over 8 years (using the convention, which the § 168(b) tables also use, that all property placed in service during a year is treated as held for exactly 6 months). I.R.C. § 57(a)(12) (West Supp. 1983). Assuming

The appendix analyzes one hypothetical investment in equipment (railroad boxcars), using the actual depreciation allowances available under ACRS instead of relying on the assumption that ACRS gives benefits equal to expensing the property. As shown in part by the appendix, the assumption that ACRS is equivalent to expensing is conservative and contrary to this Article's conclusions in at least one case. In any event, the effects predicted by the model are strongly reinforced by other phenomena.[60]

The model also assumes that a taxpayer's tax rate is constant for the income, deductions, and years involved, that payment of tax occurs simultaneously as taxable income is generated, and that tax savings occur simultaneously with deductions.[61]

maximum depreciation (hence assuming that the taxpayer reduces his tax credit, *see supra* note 51 and accompanying text), the tax preference is the following percentage of basis:

Year	0	1	2	3	4
ACRS depreciation	15%	22%	21%	21%	21%
Less 8 year depreciation	(6¼%)	(12½%)	(12½%)	(12½%)	(12½%)
Tax preference item for 5 year property	8¾%	9½%	8½%	8½%	8½%

A tax preference item does not automatically lead to a minimum tax. For individuals there is a minimum tax of 20%, but it is imposed only after an exemption of up to $40,000 and only if the 20% tax is higher than regular income tax. I.R.C. § 55 (West Supp. 1983). For corporations, the minimum tax is 15% and is imposed only after exemption of $10,000 and one-half of regular corporate income taxes. I.R.C. § 56(a) (West Supp. 1983). To find a maximum tax burden, however, we must assume that the taxpayer has used up his exemptions and sheltered himself from regular tax. An assumption of an 8.45% discount rate, *see infra* note 95, leads to the following calculation of the net present value of the tax:

Year	0	1	2	3	4	NPV
Tax preference item	8¾%	9½%	8½%	8½%	8½%	
Individual (20%) tax	1.7%	1.9%	1.7%	1.7%	1.7%	
PV@8.45%	1.7%	1.8%	1.4%	1.3%	1.2%	7.5%
Corp. (15%) tax	1.3%	1.4%	1.3%	1.3%	1.3%	
PV@8.45%	1.3%	1.3%	1.1%	1.0%	0.9%	5.6%

Using the same procedures and discount rate, the minimum tax on 3 year recovery property can reach a maximum of 9.2% of the price of the property for individuals and 6.9% for corporations. The minimum tax on 15 year real property is as high as 2.1% of the price of the property for individuals and 1.6% for corporations.

60. The model, for instance, assumes that the indebtedness will be repaid, yet much of tax shelter debt is never paid. *See infra* note 64 and accompanying text. It also assumes that returns from investment are fully subject to ordinary income tax, although much of the return may be subject to capital gains tax. *See infra* note 63. The model assumes that expensing reduces the taxpayer's basis to zero, which requires higher taxes on later returns, while the investment tax credit involves no basis reduction. Also, a low adjusted basis may be stepped up by the death of the original investor. *See infra* note 65 and accompanying text.

61. I.R.C. § 6153 (West Supp. 1983) (individuals) and I.R.C. § 6154 (West Supp. 1983) (corporations) require payments of one-fourth of the total estimated income taxes in four payments over the course of the year. With various safe havens from the penalty, however, the payments of estimated tax are not perfectly responsive to taxable income in a quarter. *See* I.R.C. §§ 6654-6655 (West Supp. 1983).

B. Step One: Investment from Borrowing

When investments are deducted immediately from income subject to tax rate T, borrowing of an amount B supports an investment of $\frac{B}{1-T}$, without further out-of-pocket cost to the taxpayer. If the taxpayer makes a deductible investment of $\frac{B}{1-T}$, he saves $T\frac{B}{1-T}$ in taxes and his after-tax cost for the investment is

(1) $\frac{B}{1-T} - T(\frac{B}{1-T})$ or (2) $\frac{B-BT}{1-T}$ or

(3) $\frac{B}{1-T}$ $(1-T)$ or (4) B.

The taxpayer, in other words, makes an investment of $\frac{B}{1-T}$ and he receives reimbursement through tax savings so that his only cost is B, the amount borrowed. The taxpayer has no cost for his investment except for amounts borrowed and amounts reimbursed by tax.

To illustrate, assume that a taxpayer has $100,000 in taxable income from dividends, salary, or some other source, nominally subject to tax at a 40% rate. He could expect $60,000 cash from that income after paying his tax if he indeed paid tax on it. Instead of paying his tax, however, the taxpayer borrows $60,000 at year end and purchases an investment for $100,000. The investment is deducted immediately. Deduction of the $100,000 investment saves him $40,000 in tax that he would otherwise pay. The tax savings reduces his after tax cost for the $100,000 investment to $60,000. That $60,000 is funded by his borrowing. Hence, borrowing of $60,000 alone supports an investment of $\frac{B}{1-T}$ or $\frac{\$60{,}000}{1-40\%}$ or $\frac{\$60{,}000}{60\%}$ or $100,000.

The $100,000 investment thus consists of two components: $40,000, the amount reimbursed by tax savings, and $60,000, the amount funded by borrowing. The taxpayer has $60,000 of consumable cash in hand, the same amount he would have had if he had paid tax on his $100,000 taxable income, without making an investment. His $60,000 liability is the only economic burden generated by his $100,000 investment.

C. Step Two: Periodic Returns from the Investment and Payment of Interest

Assume R in the model represents the annual rate of pretax return that is generated by the depreciable asset. Rate R is the interest-like

profit from the asset, after subtracting all expenses except interest. Rate R is, accordingly, the fixed interest rate given by a savings account that is economically equivalent to the depreciable asset, ignoring tax. There are, however, several differences between the return produced by a savings account and the return generated by a depreciable asset, and it requires analysis to translate cash returns from actual investments in ACRS property into a fixed annual rate of return. The concept of "interest", in the context of a savings account or bond, requires that the principal of the savings account or bond remain intact and be returned in full to the investor at the end of the investment. A depreciable asset, however, deteriorates over the course of the investment until the asset is worthless at the end of its life. Depreciable property also returns its principal, but over the life of the investment, in receipts that combine interest and return of principal. Investments in depreciable property, moreover, produce receipts that vary from year to year. Nevertheless, return from depreciable property can be analyzed in terms of fixed interest, similar to interest on a savings account. A depreciable investment is economically equivalent to a hypothetical savings account that gives annual interest at some fixed rate and returns the full invested principal at the end. When referring to the pretax return rate (R) given by the ACRS property, the discussion refers to the interest rate on the hypothetical savings account that is equivalent to the value of ACRS investment, but which gives fixed interest and returns its full principal.[62]

If R is the annual rate of pretax return available from the asset, then the taxpayer's annual return from the investment of $\frac{B}{1-T}$ is $(\frac{B}{1-T})R$. The taxpayer bears interest costs on the amount borrowed (at rate I). The interest cost is computed, however, only on the borrowed amount (B), and not the full investment, which includes amounts reimbursed by tax savings. The taxpayer's annual interest cost is BI. His net profit in any year of return, before taxes, is

(5) $(\frac{B}{1-T})R - BI.$

The investor pays tax on his net income. The tax rate in the year of the return is assumed to be equal to the rate (T) that gave the tax

62. R is the rate at which the present value of all net benefits from the depreciable asset is equal to the present value of the net costs of the property. The benefits from the asset include the sales proceeds if the asset is sold. The interest rate is the "solving rate," which makes the returns from the costs of depreciable assets equal to a net present value of zero. This is often called the "internal rate of return." Adjustments must be made when interim cash from the asset is not reinvestable in the depreciable assets. *See* Krane, *Economic Analysis of Tax Sheltered Investments*, 54 TAXES 806, 808-16 (1976).

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savings upon the deduction of the investment. Therefore, the taxpayer pays a total tax of T multiplied by expression (5).[63] The investor is left, after tax, with

(6) $[(\frac{B}{1-T})R - BI] - T[(\frac{B}{1-T}R) - BI]$ or

(7) $(1-T)[\frac{BR}{1-T} - BI]$ or (8) $BR - (1-T)BI$ or

(9) $B(R-I+IT)$.

Expression (9) is the algebraic description of the taxpayer's after-tax periodic return from indebtedness B used to make an investment with no net cash cost, when the tax treatment of the investment is economically equivalent to a deduction of the investment in the year made. Expression (9) is repeated every year in which the investment and loan continue.

The advantage of expression (9) to the investor may be called the investor's "tax shelter gain." Expression (9) can be negative when interest rates (I) greatly exceed the rate of return on the investment (R), in which case the investor's position might be better labelled a tax shelter loss. It is possible, however, for the investor to have a positive after-tax periodic return from a debt-financed investment (*i.e.*, a tax shelter gain), even when the interest rate paid by the investor (I) is higher than the economic return (R) generated by the asset.

To illustrate, assume that the 40% bracket taxpayer who made a $100,000 investment with $60,000 of borrowed funds pays 15% interest on his indebtedness and that the investment gives a pretax return of 12%. The 12% received on the investment of $100,000 gives the investor a $12,000 return per year. The taxpayer must pay 15% interest, but only on the indebtedness of $60,000. Accordingly, he pays only $9,000 in interest per year. The taxpayer's net return for the year is thus $3,000. Even after his 40% tax payment on his net return, he has $1,800 in income. The taxpayer receives $B(R-I+IT)$, or $60,000 (12%−15%+(40%)(15%)), or $60,000 (−3%+6%), or $60,000(3%), or $1,800. Thus, although his interest rate was higher than his return rate before tax, the taxpayer has a gain in every year the debt is outstanding because his investment is higher, due to earlier tax savings, than his borrowing.

63. The return rate (R) in the model includes sales proceeds. If the investor sells the property, sales proceeds in excess of the basis amount often receive capital gain treatment under § 1231 and are subject to tax rates that are at most only 40% of T. *See* I.R.C. § 1202(a) (Supp. V 1981). The assumption that the entire R is subject to ordinary tax is a conservative one contrary to the conclusions here. Correcting this assumption to account for part of the investor's return as capital gain would reinforce the conclusions in this Article.

D. *Step Three: Repayment of the Loan and Return of the Invested Principal*

Repayment of the loan and return of the investment principal do not change an investor's periodic tax shelter gain. The algebraic model assumes that the investment "principal" of $\frac{B}{1-T}$ is returned in full. That assumption follows automatically from the definition of return rate R. If the principal is not returned in full, the return rate would decrease, possibly even below zero, to a negative rate of return. Any investment of $\frac{B}{1-T}$ can be described as returning $\frac{B}{1-T}$, if the return rate is adjusted appropriately. For the purposes of this Article it is assumed that B, the amount borrowed, is repaid.[64]

This model also assumes that the investment principal of $\frac{B}{1-T}$ is fully subject to ordinary income taxation.[65] Although the function of depreciation deductions is to allow a taxpayer to recover his capital investment free of tax, under the model, depreciation deductions are reflected at the time of investment. Once depreciation deductions are taken, the taxpayer has no basis to use against the return of his investment $\frac{B}{1-T}$.

Under the assumption that the investor's tax rate T is constant, the investor pays a tax of $T(\frac{B}{1-T})$ when the investment is returned. After tax he has

$$(10)\quad \frac{B}{1-T} - T\left(\frac{B}{1-T}\right) \text{ or } (11)\quad (1-T)\left(\frac{B}{1-T}\right) \text{ or } (12)\quad B.$$

The investor returns B to the lender as repayment of the amount B originally borrowed, and thus incurs neither out-of-pocket cost nor net benefit at the time of repayment.

In the previous illustration, the investment principal was $\frac{B}{1-T}$ or

64. In fact a large amount of tax shelter indebtedness is never paid. *See, e.g.,* Mayerson v. Commissioner, 47 T.C. 340 (1966) (litigation over shelter indebtedness that was never paid). It is difficult, however, to predict nonpayment of the indebtedness, and nonpayment of B is considered as a separate problem. Nonpayment of the indebtedness would reinforce the conclusions made in this Article.

65. The assumption that the investor pays tax at ordinary rates on return of principal is conservative and contrary to conclusions reached in this Article. At death, the heirs receive a stepped-up basis in the asset. I.R.C. § 1014 (Supp. V 1981). Therefore, $\frac{B}{1-T}$ might be proceeds from sale of the investment that are exempt by reason of the stepped up basis at death. Taxpayers can control the year of sales, and the tax rate in that year might be lower than T, the rate at which tax savings were computed. For property with incomplete recapture under I.R.C. § 1245 (1976), some of the principal might be taxed at capital gains rates. *See supra* note 63. Although a discussion of these possibilities is outside the scope of this analysis, accounting for them would reinforce the conclusions in this Article.

$\frac{\$60,000}{1-40\%}$ or $100,000. The full $100,000 is subject to tax since depreciable basis was reflected in the earlier years, so that the investor pays $40,000 of tax, assuming a 40% tax rate on the $100,000. The taxpayer is left with B or $60,000, which is returned to the lender in repayment of his loan.

E. Overview of the Model

In conclusion, under the model, the investor has no out-of-pocket cost either at the time of borrowing and investment or at the time the investment is returned and the debt is repaid. In the years of periodic return he receives, after tax,

(9) $B(R - I + IT)$

for every year the loan and investment are outstanding. Expression (9) arises because the tax savings from expensing allows the investor to invest more than he borrows. Since there is no out-of-pocket cost or benefit involved in other steps of the transaction, it is only expression (9), the investor's "tax shelter gain," that makes any difference in the taxpayer's overall economic position after the investment.

III. Economic Consequences of Tax Shelter Gain

This Part shows that there is a negative tax on debt-financed investment in ACRS property and demonstrates the effect of the negative tax. The investor retains the benefit of the negative tax, as tax shelter gain, if the rate of return generated by the depreciable property is at least as high as the interest rate borne by the investor. The negative tax, however, induces the investor to purchase debt-financed investments in ACRS property, even when the pretax rate of return from the property is less than his rate of interest. If the rate of return generated by the ACRS investment is just enough to leave the investor with no gain on his investment, the negative tax is passed on to the investment as a subsidy and the investor has no tax shelter gain. If the rate of return on the investment drops below the interest rate, but not to the break-even point, the negative tax is retained in part by the investor and passed on in part to the investment. This Part shows that the negative tax, whether retained by the investor or passed on to investments, is an unfortunate policy.

A. Interest Rates and Rates of Return are Equal

If the rate of return produced by a depreciable asset is at least as high as the interest rate borne by the investor, then there is a strong

negative tax available to the investor who borrows money to purchase ACRS property. As noted above, the investor has an annual after-tax rate of return from debt-financed investment in ACRS property of

(9) $B(R - I + IT)$.

When the rate of return (R) from the property is equal to the interest rate (I) then R and I cancel each other in expression (9), and expression (9) becomes

(13) BIT.

Expression (13), BIT, is the negative tax from debt-financed investment in ACRS property. When interest rates and rates of return are equal, the investor has a tax shelter gain equal to BIT in every year of his investment. This tax shelter gain arises solely because of the tax system. It occurs when there is no economic profit in the investment because interest rates and return rates are equal, and it is available even though the investor has no net cost for his investment. The treatment afforded the taxpayer is better than a complete exemption from tax; it creates a subsidy for the investment, and the investor retains the benefit.

Tax shelter gain and negative tax, of course, can occur even when the investment gives a rate of return higher than the rate of interest. The portion of the investor's profits attributable solely to the tax system, however, should be separately identified. Tax shelter gain can also occur at levels below BIT, when interest rates exceed return rates. Setting the economic return (R) equal to the interest rate (I), however, identifies the portion of the investor's periodic gain that is contributed by the tax. The negative tax arising from the treatment of debt-financed investments in ACRS property can be identified with an after-tax periodic return of BIT.

The gain of BIT in expression (13) is the investor's tax rate multiplied by the interest rate multiplied by the amount borrowed. The resulting amount equals the amount of tax saved by deducting interest on the indebtedness. In the previous illustration, the 40% bracket investor had an investment of $100,000 and a loan of $60,000. If we assume that interest is 15%, then BIT is $60,000 (15%) (40%) or $3,600. Because BIT is the tax shelter gain when interest rate (I) is equal to the return rate (R), the investment return is also assumed to be 15%. With a return of 15% and interest at 15%, the investor has an annual return of $15,000 (on $100,000) and pays annual interest of $9,000 (on $60,000). His pretax profit in one year is $6,000, and after paying 40%, or $2,400, in tax, he has $3,600 remaining. That $3,600 is his tax shelter

gain and is equivalent to the tax savings attributable to deducting interest of $9,000 at his 40% tax rate.

Since the gain of *BIT* in expression (13) equals the tax on periodic interest, one could offset the gain in the model by disallowing a deduction for the interest of *I*.[66] That would impose a tax per period equal to *BIT*. The anomaly of the negative tax can be described as an error of allowing interest on debt to be deducted when the principal of the debt, although deducted under ACRS depreciation, has not been lost and continues to generate returns.

Expression (13), although ignoring market responses, implies that any taxpayer can achieve tax shelter gain of *BIT* for any tax rate (*T*). As explained below, however, it is doubtful that tax shelter gain will remain at *BIT*, given market responses to negative taxes. It is also doubtful that tax shelter gain will remain positive for *T* in the lower tax brackets.

B. Rates of Return Drop to the Break-Even Point

Within the boundaries of the taxpayer saving taxes at rate *T*, the negative tax (*BIT*) allows the taxpayer to accept a lower rate of pretax return from the depreciable property. Ignoring tax, the taxpayer loses money when rates of return are lower than his interest rate, but the negative tax is high enough to make up the loss.

Rates of return on depreciable property tend to drop to the point where the investor just breaks even on his last debt-financed investment. The taxpayer has no net cost for deductible investments, considering his tax savings and borrowing, and he has sufficient cash in the year of investment to maintain his normal posttax levels of consumption. Under the model, investment in deductible property requires no diminution in consumption when the taxpayer invests or when he liquidates and repays the indebtedness. An investor rationally expands his deductible investments to the point where he just breaks even on his last investments, if that occurs before he has run out of taxes to save, because at that point he maximizes his tax shelter gains. He receives gain from the negative tax on most of his investments, but he will receive no net gain on the last dollar. At that point, he will stop borrowing to make deductible investments.

66. Interest must be identified in order to disallow the deduction. Identification of interest at an appropriate rate and schedule is often a difficult problem. *See, e.g.,* TEFRA SENATE REPORT, *supra* note 49, at 209 (explaining the 1982 amendments' application of compound interest concepts to original issue discount); McKinney, Jetter & Sobeloff, *Interest on Deferred Payments—Section 483*, in 155-3rd TAX MGMT. (BNA) (1982 & Supp. 1983).

In algebraic terms, expression (9) (after-tax net periodic return) defines a break-even investment when set equal to zero:

(14) $B(R - I + IT) = 0$ or (15) $BR = BI - BIT$ or

(16) $R = (1-T)I$.

Equation (16) says that the taxpayer can break even with a pretax return rate of R that is $(1-T)$ percent of his interest rate. To return to the previous illustration, the investor was in a 40% bracket and he borrowed $60,000 to make an investment of $100,000 at no further cost. If he pays 15% interest on his $60,000 debt, he will pay $9,000 per year in interest. He will break even with $9,000 from his investment, which is a 9% return on his $100,000 investment. The required 9% rate of return is $(1-T)$ or (1−40%) or 60% of the 15% rate.

The rates of return on investments will drop, if the taxpayer simply pays more for existing assets than he would pay without the negative tax. Assume, for instance, that there is a depreciable asset that generates $15,976 in cash, net of expenses, for each year for twenty years. Assume the taxpayer will use the asset for its entire twenty year economic life, and at the end of the twenty years the asset will be worthless. If we use 15% as the prevailing interest rate in the economy and the normal rate of return on investments, a taxpayer in the absence of tax would pay $100,000 for the asset because $15,976 for twenty years gives the investor a 15% annual return on $100,000.[67] When the negative tax is taken into account, however, the investor does not need a 15% pretax return from the asset to break even. The investor can accept a return of $(1-T)$ 15% from the asset. If the taxpayer is in the 50% bracket, the necessary return is (1−50%) of 15%, or 7.5%. A 50% bracket taxpayer can pay $162,869 for the asset (one-half from borrowing and one-half from savings), because the $15,976 in annual receipts that the asset generates for twenty years gives him a 7.5% pretax annual return on his $162,869. The negative tax would allow the investor to pay over $60,000 more than he would have paid had there been no tax.[68]

67. The relationship between the annual receipt of a constant amount of cash (k) and the rate of return from the property (R) is computed using the standard formula for the value of an annuity:

$$k = P \frac{R}{1 - \frac{1}{(1+R)^n}}$$

P is the price paid for the asset and n is the number of years k is given.

68. A drop in the acceptable rate of return does not necessarily indicate a rise in the historical prices of depreciable property. Any projected increase in the price of ACRS property, for in-

Prices will increase (and return rates will drop) toward what is a break-even investment for the highest (50%) bracket taxpayer. No investor, of course, willingly pays more for an investment than he must. Nonetheless, if buyers are expanding investments and if the seller knows what the investor can afford to pay and still break even, and other potential investors can pay as much, prices will go up (and return rates drop) toward what the highest bidder can pay. If sellers were able to sell exclusively to 50% bracket buyers, then both sellers and buyers could settle at a break-even return rate equal to one-half of the prevailing interest rate.

Logically, it is possible that rates of return will drop to offset all of the tax shelter gain that an investor in the highest bracket receives. In one sense, that drop in the rate of return would be the best possible result of the ACRS. The benefit of the ACRS is supposed to be passed on to investments; the intended beneficiary of the ACRS is the investment, not the investor.[69] The higher the relative price of the asset (or the lower the pretax return it gives), the lower the negative tax that the 50% bracket investor will retain and the more the revenue loss from the negative tax will go to investments or at least to the seller of investments. If the price of depreciable assets did increase enough to remove all tax shelter gain for the 50% bracket taxpayer, the negative tax would be an efficient subsidy in this sense: All of the revenue cost of the negative tax would be reflected as a subsidy to ACRS assets and as a drop in the return rate required from those assets.

The negative tax, however, does not disappear merely because the investor has passed on the negative tax and has no tax shelter gain. The government still loses revenue in the negative tax that would not be lost if there were no tax consequences from the investment. The investor can still become exempt from tax on income within tax bracket T, which defined his break-even return rate, by expanding his debt-financed investments in ACRS assets, and the government will have to collect its revenue from another source. Still, a subsidy that passes efficiently to investments is undoubtedly better than one that does not.

Merely because the negative tax is efficient in the limited sense that it is passed to investments, however, does not mean that the sub-

stance, undoubtedly attracts a greater supply of such property, and the added supply suppresses the rise. A drop in the return rate, however, necessarily implies an increase in price relative to the return rate, since the return rate is defined as a percentage of price invested. A rise in price, relative to returns, is just another way of describing a drop in the return rate.

69. *See, e.g.,* SENATE COMM. ON FINANCE, REPORT ON ECONOMIC RECOVERY TAX ACT OF 1981, S. REP. NO. 144, 97th Cong., 1st Sess. 47, *reprinted in* 1981 U.S. CODE CONG. & AD. NEWS 105, 152.

sidy improves allocation of resources, productivity, or any other economic goal of investments. The negative tax causes investments in properties that have a return rate less than the prevailing interest rate. In general, it does not make sense to subsidize investments that are identified by the sole criterion of having returns inferior to interest.[70] The prevailing interest rate is derived from the opportunity cost of not using the borrowed money for other purposes, and hence, it is generally a proxy for the rate of return available in the economy for investment. The negative tax thus makes it possible for the investor to put his resources into assets that generate less than the average rate of return. The prevailing interest rate, moreover, is derived from the return demanded by the saver of money, and the negative tax makes it possible for the investor to put the saved resources into assets that give returns inferior to those demanded by the the saver of money.

It makes little sense to encourage investments with such inferior returns. The subsidy diverts resources from investments or activities yielding a higher utility to society.[71] As a general rule, investment profit measures the utility and merit of the investment. Profit is derived from the amount buyers are willing to pay for the products of the investment. This, in turn, is further derived from the utility the consumer receives from the product. Our economic system is based on the assumption that consumer demand marks the relative merit of any product.[72] Because of market imperfections and the maldistribution of wealth, private profit often fails to measure the relative utility of investments.[73] There is nothing to suggest, however, that the subsidy in negative tax will mitigate rather than compound market errors. It is safe to assume that when the negative tax makes some investments possible that would not be justified in the absence of the tax, it encourages investments that are not justified by consumer demand or utility. As the Staff of the Joint Committee on Taxation stated: "A negative effective tax rate encourages businesses to invest in assets which would not pay for themselves even if there were no taxes at all. Such investments are inefficient uses of scarce productive resources."[74]

70. *See infra* note 72.

71. *See, e.g., infra* note 74 and accompanying text.

72. *See, e.g.,* R. POSNER, THE ECONOMIC ANALYSIS OF LAW 4 (1972).

73. For a discussion of market defects, see, for example Markovitz, *The Causes and Policy Significance of Pareto Resource Misallocation: A Checklist for Micro-Economic Policy Analysis*, 28 STAN. L. REV. 1 (1975).

74. STAFF OF JOINT COMM. ON TAXATION, *supra* note 30, at 7. See TEFRA SENATE REPORT, *supra*, note 49, at 122, which states: "[Because ACRS is more generous than exemption from tax], investments that would not be undertaken in the absence of an income tax become worthwhile because of the excess benefits they generate. The allocation of scarce capital resources

Moreover, the subsidy works by increasing the price of ACRS property, relative to the return it earns. The more efficiently the subsidy operates in this way, the more harmful it is to lower bracket taxpayers. The negative tax of BIT depends on T, the investor's tax rate. Thus, higher bracket taxpayers can break even with a lower rate of pretax return than can lower bracket taxpayers. The higher the tax rate in the negative tax of BIT, the greater the difference between interest rates and rates of return. Thus, solely because of tax, higher bracket taxpayers can afford to pay a higher price for ACRS property than can lower bracket taxpayers.

If the investment price, relative to return, captures the full revenue cost of the negative tax in the highest tax bracket, then lower bracket taxpayers are forced out of the market. The property's benefit from the negative tax of BIT is not high enough in the lower tax bracket to make up for the drop in the pretax rate of return. Assume, for example, an individual who has a marginal tax rate of 33%.[75] His after-tax position is described by expression (9) as $B(R-I+IT)$. If the current 13% average corporate interest rate[76] is used as an example for the value of I, a 50% bracket taxpayer will break even with (16) $R = (1-T)I$ or a 6.5% rate of return on his asset. The 33% bracket taxpayer, however, will lose money on a debt-financed depreciable asset priced to give a 6.5% return, even if his negative tax is included. Substituting the values for I, R, and T in expression (9) leads to $B[(6.5\%-13\%) + (33\%)(13\%)]$ or $B[(-6.5\%) + (4.3\%)]$ or $B(-2.2\%)$. The 33% bracket investor is unable to bid for the asset at the price the 50% bracket taxpayer can afford. If he did, he would lose 2.2% of the amount borrowed in every year the debt is outstanding. The tax system has driven up the price of the asset, relative to its return, to exclude purchasers in the 33% bracket.[77] In lower tax brackets, the loss would be even larger.[78]

is distorted and economic efficiency is reduced." *See also* Field, *CEA Sees Negative Tax Rates on Some Investments*, 14 TAX NOTES 426 (1982).

75. Under the tax cuts in the Economic Recovery Tax Act of 1981, as fully phased in, the annual taxable income of a married person in the 33% bracket is between $35,200 and $45,800. Pub. L. No. 97-34, § 101(a), 95 Stat. 172, 177 (1981) (amending I.R.C. § 1 (1976)).

76. 75 MOODY'S BOND SURV. 3266 (Mar. 21, 1983) lists a high of 13.12% and a low of 12.67% for average corporate bond yield in 1983.

77. The taxpayer can avoid the loss by foregoing debt-financing, but even so, investment in depreciable property would be unwise. If the taxpayer became a lender, he could expect a 13% pretax return, *see supra* note 76, while an investment in depreciable property would yield only a 7.5% pretax return.

78. For example, the loss suffered by an 11% bracket taxpayer would equal $B[(6.5\%-13\%) + (11\%)(13\%)]$, or $B(-6.5\%+1.4\%)$, or $B(-5.1\%)$. This 5.1% loss would be suffered in every year that the 11% bracket taxpayer had an outstanding debt.

C. *Return Rates Drop but Not to Break-Even Point*

In the case discussed in Subpart III(A), the investor retained the full negative tax of *BIT* as his tax shelter gain. In the case discussed in Subpart III(B), a negative tax of *BIT* existed, but the investor, even in the highest bracket, passed on the full benefit of the negative tax to the investment by accepting a lower rate of pretax return. These situations represent the outer limits of possible consequences of the negative tax. In fact, one could expect the negative tax to be retained in part as tax shelter gain by high bracket investors and to be passed on in part as a subsidy to depreciable assets.

As noted previously, if sellers of depreciable property were able to sell depreciable property exclusively to investors in the highest tax bracket, one would expect the price of depreciable assets to approach the level that would leave the highest bracket investor with only a break-even investment. A price for depreciable assets that breaks even for a 50% bracket taxpayer, however, forces a corporation, which is subject to a maximum tax rate of 46%, into a loss position. For example, if pretax interest is 13%, then the break-even rate of return in the 50% bracket is 6.5%. Under the formula $B(R-I+IT)$, the corporation with a T of 46% has a position of B(6.5% − 13% + 46%(13%)), or $B(-0.5\%)$. Although investment in the depreciable asset, without debt, would give a 6.5% pretax return, the corporation could get a 7% return, after paying tax at 46% rates on 13% interest, by becoming a lender at prevailing interest rates. If all of the government's revenue cost for negative tax were passed on to the depreciable assets as an efficient subsidy, then corporations could not afford the depreciable assets unless they had some nontax advantage.

The price of depreciable assets, however, will undoubtedly have to be low enough to continue attracting corporate taxpayers. There will probably never be enough individual income subject to rates higher than 46% for individuals with such rates to purchase all of the available depreciable assets at the price that their high rate would allow. The prices of depreciable assets will probably have to attract at least some corporations, if all available assets are to be sold.

On the other hand, it seems doubtful that the price of depreciable assets will be low enough to allow taxpayers in brackets lower than the highest corporate tax rate to achieve tax shelter gains. A large percentage of corporate taxable income is subject to the 46% tax rate,[79] and it seems likely that corporations subject to this rate will bid for all avail-

79. In 1975, corporations with annual earnings in excess of $100,000 received $133 billion of

able depreciable assets at a price that allows them at least to break even when the negative tax is computed at a 46% rate. A 46% bracket corporation breaks even with a return of $(1-T)I$ or 54% of the interest rate it pays. With such a low return, lower bracket taxpayers cannot afford to buy depreciable assets. Loss corporations and corporations with taxable income of less than $100,000 face tax rates of less than 46% and would lose money with debt-financed investments in depreciable property. Under the Economic Recovery Tax Act of 1981, married individuals with a combined taxable income of less than $109,400 and single individuals with taxable income of less than $55,300 will have rates of less than 46%.[80] All of these taxpayers will face tax-created barriers against their purchase of depreciable property since corporations in the 46% bracket will bid up the price of the assets to a level at which individuals will be unable to avoid a loss. All other things being equal, investors in tax brackets below 46% will respond rationally by limiting their investing to lending. The 46% bracket corporations will absorb all of the energy that the negative tax can radiate; below that bracket the spectrograph of ownership of depreciable property will be dark.

It is difficult to see any policy justification for any tax shelter gain that remains for investors. Tax shelter gain is government revenue loss that does not help investments in any way; since the intended beneficiary of a subsidy policy is the investment and not the investor, the investor's gain is wasted in terms of the program. In a progressive tax system, the revenue loss in negative tax that arises for buyers in different tax brackets can never be captured in full by the investment, as long as the investment is priced to be available to some taxpayer not in the highest bracket. If depreciable assets are priced to 46% bracket taxpayers, however, the amount of tax shelter gain available for the 50% bracket taxpayer will be fairly small. He will have a tax shelter gain of $B(R-I+IT)$ or $B[.54(I) - I + .50(I)]$ or $B[.04(I)]$ or only 4% of his interest costs.

As noted above,[81] whenever tax shelter gain is positive, it is rational for a taxpayer to expand debt-financed purchases of depreciable property to exempt himself from tax. Every taxpayer has some low bracket income, starting at 11%, and it is not rational to exempt low bracket income when the pretax rate of return has dropped to give

taxable income. INTERNAL REVENUE SERVICE STATISTICS OF INCOME—1975—CORPORATIONS, table 12, col. 6.

80. Economic Recovery Tax Act of 1981, Pub. L. No. 97-34, § 101(a), 95 Stat. 172, 177 (1981) (amending I.R.C. § 1 (1976)).

81. *See infra* pp. 1032-33.

losses in the lower brackets. As long as it is rational for a 46% bracket taxpayer to take advantage of debt-financed ACRS investments, one would expect income normally subject to rates above 46% to become exempt from tax through debt-financed investments. An individual taxpayer has the same after-tax income available for consumption after a debt-financed investment as he did before. Thus, for individuals, the exemption from tax will not change consumable amounts. One would expect high consumption by taxpayers who have high economic, but no taxable, income. ACRS property is affordable by corporations, then, only after tax brackets higher than the corporate rate are stripped of all reported income. Taxpayers in brackets lower than the corporate rate, by contrast, do not have tax shelter gains available to them.

The subsidy to investments that give an inferior rate of return is not significantly altered when depreciable assets are priced to 46% bracket taxpayers as opposed to 50% bracket taxpayers. The negative tax still permits investments that would not be made in the absence of a tax system and, therefore, should not be encouraged. With the aid of the negative tax, a 46% bracket corporation can make investments that return 54% of prevailing interest rates. Those investments are inferior to the average investments available in the economy and often do not even meet the rate of inflation.

The results of splitting the negative tax between the investment and the investor seem as indefensible as the results of allowing negative tax to be retained in full by the investor or to be passed on in full to the asset. Inferior investments will become rational solely because of the negative tax. Higher bracket taxpayers will be able to exempt their high bracket income from tax without diminution of their normal post-tax consumption. Lower bracket taxpayers will be priced out of the market for ACRS assets; they will continue to pay tax on the full amount of their income.

IV. Negative Tax and Taxation on the Lender

From one perspective, the negative tax can be described as a deduction for interest.[82] Disallowing a deduction for interest on debt incurred to finance purchase of ACRS property would turn the negative tax on income from ACRS property into a "mere" tax exemption. Interest deducted by the borrower, however, is symmetrically includible in the gross income of the lender. It is arguable that the includibility of

82. *See supra* text accompanying notes 37-39, and *supra* p. 1031 (text following expression (13)).

interest received cures the problem of deductibility of interest paid and solves the negative tax problem. Looking at the equity owner but not the lender ignores part of the impact of tax on investment in ACRS property.[83] The lender and borrower can be viewed as copartners in the ownership of ACRS property sharing in the real return from the asset; the interest deduction arguably just shifts the taxability of the return from the borrowing partner to the debt-holding partner.[84] In the absence of an interest deduction, there would be double taxation because the interest portion of the return would be subject to tax in the equity owner's hands, notwithstanding his payment of interest to the lender, who again pays a tax on it. The interest deduction can be viewed as a logical extension of the taxation of interest received, rather than as an explicit subsidy for debt-financed ACRS investment.[85]

This Part shows that the evils of negative tax to the equity owner are not cured merely because, as a matter of legal doctrine, lenders must include interest received in their income. First, lenders usually pay tax at lower rates than borrowers with tax shelter gain. Because many lenders are tax exempt or nearly so, the revenue lost to the negative tax is not made up on the lender's side. Second, revenue loss is only part of the problem, and the lender's tax, even if significant, does not moderate the impact of the negative tax on either the efficiency or distribution of investments, unless interest rates rise (due to a lender's tax or some other cause) to reduce tax shelter gain. In the past, lenders apparently have been unable to use interest rates to pass on their tax costs to borrowers, and it seems doubtful that they will succeed in doing so in the future. Last, even if interest rates rise, they can remedy negative tax at only one tax rate. High interest rates exclude low bracket taxpayers from ownership of ACRS property in exactly the same way as do low returns from or high prices for ACRS property. The argument that interest deducted is symmetrically included in the lender's tax may mean that disallowing interest is not a politically feasible way to fix the negative tax. But the includibility of interest, however, seems to do little to cure the consequences of the negative tax.

83. *See* Feldstein & Summers, *Inflation and the Taxation of Capital Income to the Corporate Sector*, 32 NAT'L TAX J. 445, 448 (1979); S. Fiekowsky, On the Deductibility of Interest Paid Creditors in Fiscal Regimes Yielding "Zero Effective Tax Rates" on Capital Income 8-9, 36-41 (June 23, 1982) (unpublished manuscript on file with the *Texas Law Review*).

84. I.R.C. § 704(a), (b) (1976), which allows partnership income to be allocated and taxed to one partner instead of the others, has the same effect as a deduction. Neither the deducted amounts nor the amounts allocated to other partners are ultimately included in the taxable income of the partner who does not end up with the payments.

85. Bradford & Fullerton, *supra* note 23, at 255.

A. Revenue from Lenders

In order for tax on the lender to make up for the revenue loss in the negative tax, the lender must pay in fact, as well as in theory, an amount of tax that approximates the negative tax to borrowers. The negative tax saved by a borrower is *BIT* per period or the interest paid multiplied by the borrower's tax rate.[86] If the lender pays tax on the interest received at rate *T*, equal to the borrower's tax rate, then the government collects revenue of *BIT* from the lender. With both negative and positive taxes of *BIT*, the government has no net revenue loss in the aggregate. The tax from both the borrower and the lender equals zero, but it will not be negative when calculated from the borrower's position alone. In order to leave the government with zero tax from ACRS property, the weighted average of the lenders' tax rates would have to be as high as the tax rates on borrowers. But if, for example, the weighted tax rate on lenders were as high as the corporate tax rate, the revenue loss from the negative tax would not be a large percentage of income.

In a 1979 study of the effect of inflation on the taxation of corporate income, Feldstein and Summers argued that the tax paid by lenders on interest received was slightly greater than the tax saved by corporations paying interest.[87] "Since the difference between the relevant tax for borrowers and lenders is quite small," they argued, the effect of the interest deduction on measurement of corporate income could be ignored.[88] The study, however, understated the tax saved by corporate payment of interest and overestimated the tax paid by lenders. First, Feldstein and Summers made a mistake in the calculation of tax saved by interest payments. The study included shareholder taxes and found that there was a double tax on corporate recipients of interest.[89] Yet quite inconsistently, it ignored the fact that corporate payors avoid the same double tax on interest paid. The erroneous conclusion was that corporate payors saved 40% tax, instead of 56% tax. Feldstein and Summers made an adjustment in the wrong direction for taxes paid by the shareholders of the borrowing corporation.[90] Because the

86. *See supra* p. 1031 (expression (13) and accompanying text).
87. Feldstein & Summers, *supra* note 83, at 445, 450.
88. *Id.* at 445.
89. *Id.* at 454.
90. Feldstein and Summers argued that the tax saved by the corporation from the then 48% corporate tax rate increased the tax paid by its shareholders (at a 15.7% adjusted average tax rate) by 15.7% of 48%, or 7.6%. *Id.* at 452. Hence, they argued, the total tax saved by interest payment was 48% minus 7.6%, or 40.4%. In fact, a corporate payment of one dollar in interest (whether nominal or real interest) will mean that the shareholders will avoid taxes (at 15.7% tax rate) on the 52¢ the corporation expends on interest (after a 48¢ tax savings). The corporation will save 48¢,

study argued that lenders pay tax at 42% rates on average, correcting only the error of the direction of adjustment for shareholder tax would lead to a conclusion that the tax saved exceeded the tax paid on interest by 14% of interest.

Moreover, Feldstein and Summers significantly overestimated the tax paid by interest recipients. They found that commercial banks are the largest single recipient of interest,[91] and their study assumed that commercial banks paid tax on interest at the highest statutory corporate tax rate.[92] In fact, commercial banks apparently are able to become tax exempt, or nearly so, at their option. The staff of the Joint Committee on Taxation recently found that the twenty largest commercial banks paid tax at an effective tax rate of 2.7% on United States income during 1981.[93] The largest cause of this low tax rate was the privilege, denied to other taxpayers, of deducting the interest on debt used to hold tax exempt municipal bonds.[94]

Thus, the banks can create tax losses to wipe out otherwise reportable income by deducting the interest cost of obtaining tax free income. Even with a low or negative overall tax rate, the banks' tax rates on marginal dollars could be very high. Nevertheless, the availability of tax losses through state and local bonds creates a ceiling, considerably below statutory rates, on marginal effective rates as well as on overall tax rates. Municipal bonds yield interest that is between 20% and 30% below the interest on bonds of comparable risk and yield.[95] The 20% to

the shareholders will save 15.7% of 52¢, or 8.2¢, for a total of 56.2¢ tax saved per dollar of interest the corporation pays. This figure is appreciably higher even than the 42% rate that Feldstein and Summers estimated for tax paid by lenders.

91. *Id.* at 453.

92. *Id.* at 454.

93. STAFF OF JOINT COMM. ON TAXATION, 98TH CONG., 1ST SESS., TAXATION OF BANKS AND THRIFT INSTITUTIONS 13, Table 3 (Comm. Print 1983), *reported in* 18 TAX NOTES 1087 (1983). *See also Effective Corporate Rates in 1980*, 14 TAX NOTES 882, 900-01 (1982) (finding *negative* 1.9% rate for 1980).

94. STAFF OF JOINT COMM. ON TAXATION, *supra* note 90, at 16-17. I.R.C. § 265(2) (1976) disallows deduction of interest on debt used to purchase or carry tax exempt bonds. The immunity from § 265(2) for commercial banks is found, for instance, in New Mexico Bancorporation v. Commissioner, 74 T.C. 1342, 1352 (1980); H. REP. NO. 704, 73rd Cong., 2d Sess. 21-22 (1934); Rev. Proc. 70-20, 1980-2 C.B. 499. *See* STAFF OF JOINT COMM. ON TAXATION, *supra* note 93, at 34-43; Wolfman, *The Supreme Court in the* Lyon*'s Den: A Failure of Judicial Process*, 66 CORNELL L. REV. 1075, 1095-98 (1981).

95. On March 11, 1983, municipal AAA bonds yielded 8.45%, and corporate AAA bonds yielded 11.8%. 75 MOODY'S BOND SURV. 3266 (1983). Therefore, the discount on AAA municipal bond interest was 28.75% of the AAA corporate bond interest. On the same date, higher risk BAA corporate bonds yielded 13.07%, and BAA bonds yielded 10.15%. *Id.* The higher risk BAA municipals, therefore, had a discount of 22.3% of the BAA corporate bond interest. A possible explanation for the higher discount on AAA bonds was that banks were bidding up the price of AAA municipal bonds more than BAA municipal bonds because of "prudent man" investment restrictions.

30% discount is a cost of generating losses by incurring deductible interest to obtain tax exempt income. Still, no bank would bear marginal tax on any taxable income above the discount, except for public relations purposes or by miscalculation, as long as it has the option to suffer only the discount on municipal bonds.[96] Banks that actually shelter out their interest income, whatever the cost, provide no revenue to the federal government to offset the borrower's negative tax.[97]

Individuals have the option of receiving interest in a way that is tax exempt. Trusts established to support qualified pension plans and qualified individual retirement accounts are tax exempt entities that do not pay tax on interest received.[98] The law governing these qualified pension trusts is complicated,[99] and there are significant restrictions on access to funds once they are in trust.[100] The tax exemption of qualified plans is thus not a free and ready option. Still, as with banks, the availability of tax privileges sets a ceiling on the effective marginal rate that individuals pay.

An important group of lenders gets the economic equivalent of tax exemption for interest received, because they are able to lend from principal that is not reduced by any tax while the loan is outstanding. Under section 453 of the Internal Revenue Code, a seller of ACRS property for debt of the buyer need not pay tax on his gain until the debt is paid. The seller, therefore, can provide the debt for the purchaser to finance the property without paying any tax on the principal amount while the debt is outstanding.[101] Most investments must be made after the amount that can be invested has been reduced by tax. Yet, before payment of a purchaser's installment notes covered by sec-

96. Darby, *The Financial and Tax Effects of Monetary Policy on Interest Rates*, 13 ECON. INQUIRY 266, 272 (1975); Wolfman, *supra* note 94, at 1098.

97. Interest on state and local bonds, "although not taxable when received by a corporation, is taxable to the same extent as other dividends when distributed to shareholders in the form of dividends." Treas. Reg. § 1.312-6(b) (1960). As long as the tax rate of shareholders of borrowers approximates the tax rate of shareholders of lenders, however, no distortion is caused by ignoring the effect of shareholder tax.

98. I.R.C. §§ 401, 501(c) (1976). Hall, *supra* note 23, at 150, uses an assumption that individuals are tax exempt because of the availability of tax exempt qualified pension trusts, although he recognizes that income distributed from a pension trust at retirement is taxed at distribution and that not all individual recipients of interest are literally untaxed. *Id.* at 162.

99. *See, e.g.*, 2 BITTKER, FEDERAL TAXATION OF INCOME, ESTATES AND GIFTS 61-1 to 62-51 (1981).

100. *See, e.g.*, I.R.C. § 408(f)(1) (1976) (imposing a 10% penalty on withdrawals from Individual Retirement Accounts); Rev. Rul. 56-693, 1956-2 C.B. 282 (prohibiting withdrawals from qualified pension plans prior to retirement or disability even in the case of financial hardship).

101. The discussion in the text assumes that the seller has fully depreciated his basis in ACRS property sold. Without that assumption, the seller has some part of his principal investment that is presumably posttax, since basis, at least by presumption, arises from posttax sources. The text applies without qualification to the gain the seller would have if he had sold for cash.

tion 453, the seller of ACRS property has a source of investment that has not borne tax in anyone's hands.[102] The installment notes generate investment return as interest on the notes, without reduction by tax. If tax rates are constant, the privilege of making an investment from pretax sources is as beneficial to the seller as an exemption from tax for the interest returned.[103] The section 453 privilege of deferring tax on principal is economically equivalent to an exemption from tax for interest paid while the principal is outstanding.

The same principle applies to banks to the extent that they make loans that are a multiple of money received from depositors.[104] The money borrowed from depositors may have been reduced by tax in depositors' hands, but the multiple in excess of the depositors' money is not reduced by any tax before the loan is made. Once again, the privilege of having an investment from untaxed sources is as valuable as an exemption for the subsequent returns. In conclusion, since a significant body of lenders have tax rates approaching tax exemption or its economic equivalent, government revenue lost to negative tax is not recovered by tax on interest received.

B. Lender Tax and Interest Rates

Tax paid by the lender, moreover, is a cure for the distributional and efficiency effects of negative tax only to the extent that it affects the borrower. The borrower acts independently of the lender, and it is the borrower's reaction to negative tax that accounts for its consequences. If, in some metaphorical sense, the lender is a partner of the borrower,[105] still the borrower determines where the borrowed proceeds are directed and the price to be paid for ACRS property. In reaction to negative tax, high bracket borrowers invest in ACRS property with low real rates of return and bid up the price to exclude lower bracket taxpayers. The lender affects the use of loan proceeds and the price paid for property only to ensure that the risk of default is below some threshold. If the relationship of interest rates and return rates allows

102. At its most extreme application, § 453 can mean that the seller has twice as much to invest as he would from normal posttax sources. Assume the seller is selling property with zero adjusted basis, gain on which is ordinary and that the seller is in a 50% bracket. If he took cash to invest elsewhere, tax at 50% would reduce the investable amount by one-half, but his principal investment in the form of installment notes is not so reduced. Tax from other taxable sources would also be reduced by one-half. *See* M. CHIRELSTEIN, FEDERAL INCOME TAXATION: A LAW STUDENTS' GUIDE TO THE LEADING CASES AND CONCEPTS 242 (2d ed. 1979).

103. *See supra* note 7.

104. For a discussion of a bank's ability to make loans that are a multiple of deposits, see, for example, J. DUSENBERRY, MONEY AND CREDIT: IMPACT AND CONTROL 17-19 (3d ed. 1972).

105. *See supra* text accompanying note 83.

the borrower to achieve tax shelter gain, the borrower will retain the gain, since the lender cannot participate in the profits from negative tax beyond his fixed interest.

Ultimately, the lender's tax has only as much relevance to the problem of tax shelter gain as a whole host of other factors affecting interest. The lender's tax can moderate the evils of tax shelter gain, other than the revenue loss, only by affecting the borrower's tax shelter gain. The lender can reduce tax shelter gain only by increasing the interest rate that the borrower pays.

The empirical evidence indicates that interest rates do reflect the tax paid by the lender. When inflation rises, interest rates do not rise enough to reimburse the lender for the added tax he must pay. When inflation rises by Δf (the change in the inflation rate), a lender wishing to be as well off after his tax as he was before the Δf rise in inflation must receive increased nominal interest (ΔI), which is equal to Δf divided by one minus the lender's tax rate (t):

$$(17) \quad \Delta I = \frac{\Delta f}{1-t}.^{106}$$

To illustrate, when inflation rises by one percentage point, a 50% bracket lender must receive a nominal interest increase of $\frac{1\%}{1-.5}$ or 2%, or twice the rise in inflation in order to be left whole after both tax and inflation. The lender pays a tax of 50% of the increased nominal interest and he is left with 1% after tax, which is just equal to the inflation rate and just enough to compensate him for the inflationary shrinkage of the dollars of the debt.

Notwithstanding the amount needed by the lender to be whole after tax, the empirical evidence indicates that the nominal rate of interest on corporate borrowing increases by an amount less than[107] or equal to[108] the increase in inflation. The market interest rate does not appear to give the lender enough money to pay his increased taxes.

106. Darby, *supra* note 96, at 272. *See also* Feldstein, *Inflation, Income Taxes, and the Rate of Interest: A Theoretical Analysis*, 66 AM. ECON. REV. 809 (1976).

Expression (17) is a rearrangement of $\Delta I - t\,(\Delta I) = \Delta f$. Taxes ($t$) are imposed on ΔI, so that the taxpayer is left with $\Delta I - t(\Delta I)$ after tax. If the taxpayer is to be left whole after the change in inflation, he must receive Δf after tax. See also the example following expression (17) in the text.

107. Friedman, *Who Puts the Inflation Premium into Nominal Interest Rates?*, 33 J. FIN. 833 (1978) (finding an increase in bond yield of approximately 0.64% in response to a 1% increase in expected inflation).

108. Feldstein, *supra* note 106, at 816 n.15 (citing Feldstein & Chamberlain, *Multimarket Expectations and the Rate of Interest*, 5 J. MONEY, CREDIT & BANKING 873 (1973), and Feldstein & Gordon, *Inflation in Recession and Recovery*, in 1 BROOKINGS PAPERS ON ECONOMIC ACTIVITY 105-58 (A. Okun & G. Perry eds. 1971)).

There are some weak nontax forces restraining the rise in interest rates,[109] and it is possible that the empirical data are the net result of a high lender tax pushing up interest rates and some counteracting force restraining them. A plausible explanation is that the interest rate is set on the lender's side by a marginal lender who pays no tax (or at least no significant tax) on the interest he receives, since a significant body of lenders are tax exempt (or its equivalent) or nearly so.[110] In any event, the borrower can see only net interest rates. If interest does not reflect lender tax, lender tax cannot affect tax shelter gains. Ultimately, it does not matter whether the lender pays a tax but does not shift it to the borrower,[111] or in fact pays no tax; it does not matter whether interest reflects lender tax, but that there is some offsetting factor, or that interest does not reflect lender tax at all. The impact on the borrower's tax shelter gain is the same.

Studies measuring the reaction of interest rates to inflation rates predate ACRS,[112] but ACRS itself seems as likely to suppress interest rates as to generate interest increases. Under ACRS, an investor in ACRS property can certainly afford to pay higher interest on debt-financing than he could have paid without the ACRS benefits. This could push up interest rates. An investor breaks even on debt-financed ACRS investment if

$$(14) \quad B(R-I+IT) = 0,$$

which is equivalent to

$$(18) \quad I = \frac{R}{1-T}.$$

109. *See* Feldstein, *supra* note 106, at 815 (discussing the suggestion in Tobin, *Money and Economic Growth*, 33 ECONOMETRICA 671 (1975), that interest rate increases are suppressed by inflation-induced increases in the supply of loans as savers shift the form of their savings out of money and into investments giving returns). Feldstein argues that the phenomenon is not important because so little of the capital stock is ever in money.

Friedman suggests that corporations borrow less when their retained earnings increase. *See* Friedman, *supra* note 107, at 841. Inflation can increase the nominal returns a corporation receives, but it can increase real retained earnings only if shareholders let distributions to them fall behind the corporation's increased returns.

110. *See supra* text accompanying notes 93-104. If the marginal lender setting interest rates pays no significant tax, then the interest rate will not reflect any significant tax. Lenders who bear tax are like lenders who bear unusually high costs not borne by others: the costs reduce profit. The lenders remain in business either because they have offsetting cost savings or because they can tolerate lower rates of return on their investments. It is plausible, however, that lenders expect and accept lower returns caused by tax. *See infra* note 111.

111. Even if the marginal lender does pay tax, that does not mean that the tax can be shifted in full to interest rates. There is undoubtedly some level of tax that cannot be shifted, even if all lenders paid tax at the same rate. The tax system is intended to burden recipients of interest with a share of the federal tax burden. If all of their taxes are shifted to the lenders, recipients of interest will bear no part of the tax burden. Lenders, however, are undoubtedly worse off because of a tax system aimed at suppressing their profits and their profit expectations.

112. *See supra* notes 107-08.

A 50% bracket taxpayer, for instance, could break even if his interest cost is $\frac{R}{.5}$ or twice the rate of return from the ACRS investment.

The investor's increased ability to pay, however, does not necessarily lead to an increase in market interest rates. First, the market for debt for investment in ACRS property is largely the same market for debt for consumption (such as houses and cars), nondepreciable inventory, intangibles (such as stock, copyrights, and patents), and for speculative nondepreciables (such as gold, currency, and raw land). Lenders cannot price-discriminate on the basis of the tax bracket of the borrower deriving the negative tax or even (except for changes in risk of default) on the basis of the borrower's use of the loan.

Moreover, ACRS works to suppress rises in interest rates. It first satisfies the demand for tax shields. ACRS depreciation and investment tax credit are available without borrowing. The tax benefits of the interest deduction, on the one hand, and ACRS depreciation and investment tax credit, on the other hand, are together limited by the tax owed by the investor. With the increase in tax shields provided by the adoption of ACRS, the optimal level of debt for a firm decreases because the tax shield from interest is no longer needed.[113] A diminished demand for debt should decrease interest rates. Second, ACRS drives lower bracket taxpayers out of investment in ACRS property and into alternatives such as providing indebtedness. The shift of lower bracket taxpayers into creditor positions should at least suppress any rise in interest rates. If interest rates do not rise in response to ACRS property, then low bracket taxpayers excluded from the purchase of ACRS property by the negative tax will have no improvement in their welfare from ACRS.

C. Distributive Impact of an Interest Rate "Cure"

The final consideration of the effect of lender tax on tax shelter gain is that interest can cure tax shelter gain only at one value for T, the borrower's tax rate. An interest rate that cures tax shelter gain for one value of T excludes lower bracket borrowers from the purchase of ACRS property and leaves windfall tax shelter gain for higher bracket borrowers.[114] With negative tax, an investor in debt-financed ACRS property breaks even when

113. De Angelo & Masulis, *Optional Capital Structure Under Corporate and Personal Taxation*, 8 J. FIN. ECON. 3, 4 (1980). *Cf.* Ferguson, *supra* note 5, at 1024-15 (companies lacking taxable income to shield with ACRS losses derive economic advantage by reducing their debt).

114. *See supra* pp. 1033-39.

(14) $B(R-I+IT) = 0,$

that is, when

(18) $I = \frac{R}{1-T}.$

Under equation (18), higher bracket borrowers can afford higher interest relative to the return rate R from ACRS property:

Tax Bracket of Borrower	Break-Even Interest Rate In Relationship to R
50%	200% R
46%	185% R
30%	143% R
20%	125% R

If interest rates were to rise to 150% of return rates from ACRS property, taxpayers in the 30% and lower brackets would be excluded from the market for debt-financed ACRS property because the return from the property would be insufficient to allow them to break even, even with the negative tax. Taxpayers in the 46% and 50% brackets would still have tax shelter gain.

It is difficult to see how eliminating tax shelter gain at only one rate for T, the borrower's tax rate, can be considered a cure for the negative tax. Equation (18), $I = \frac{R}{1-T}$ is just another way to state equation (16), $R = (1-T)I$. For example, to say that a 50% bracket borrower can break even with interest rates that are twice as large as return rates is only to say that a 50% bracket borrower can break even with return rates that are one-half of interest rates. The discussion of equation (16) emphasized a drop in return rates on ACRS property, whereas the discussion of lender tax emphasized a rise of interest rates, but both represent the same relationship between interest and return rates for various tax brackets. A lender's tax "cures" the evils of the negative tax for debt-financed investments only in the same way that a rise in the price of ACRS property can be said to cure negative tax. A rise in interest rates excludes low bracket taxpayers from debt-financed ACRS property as efficiently as a rise in property prices. Rises in interest rates can be expected to leave windfall tax shelter gain for high bracket investors just as effectively as ACRS rises in the price of ACRS property.

Tax paid by the lender seems to have no relevance to the consequences of negative tax available to the borrower purchasing ACRS property.

V. Conclusion

The tax benefits of the investment tax credit and depreciation under the Accelerated Cost Recovery System, when combined with the previous tax treatment of debt, create a negative tax for debt-financed investments in depreciable property. The negative tax predictably means that high levels of income are exempt from tax even though the exempt income is available for consumption by high bracket taxpayers. If the government is to collect revenue from the investment subsidies that it funds, it must collect more revenue from middle and low bracket taxpayers. Because high bracket taxpayers will bid up the price of depreciable property relative to its return, lower bracket taxpayers will be barred from ownership of depreciable property, unless they can find nontax advantages to overcome the tax-forced barriers. High bracket taxpayers will divert resources to investments that would never have been made in an economy free of tax and that should not be made if economic efficency is a goal of the tax system.

Appendix

Sample Tax Shelter Investment: Railroad Boxcar

The Accelerated Cost Recovery System (ACRS) gives those who invest in depreciable property a negative tax because it allows the taxpayer to use investment tax credit and depreciation benefits on property purchased with indebtedness and to deduct interest paid on the indebtedness. The negative tax allows investors to accept a pretax rate of return from depreciable assets that is less than the prevailing interest rate.

The model presented above assumes for the purpose of simplicity that the combination of depreciation deductions and the investment tax credit is economically equivalent to an immediate deduction of the purchase price of the asset. In fact, ACRS gives depreciation deductions that occur largely in years after the investment is made. The value of the deductions, in terms of equivalent immediate deductions, depends on the investor's tax rate and his after-tax discount rate. The model assumes that the discount rate on tax savings is the after-tax return on the asset because the tax savings are invested in the asset. When the return rate is lower than the interest rate, however, the investor would be better off using his savings to reduce his indebtedness. The algebraic description of the model may lead one to question the model's application to real world investment. This appendix supplements the model by showing one reasonably representative tax shelter investment. The investment breaks even under ACRS, even though the depreciable asset produces a pretax return that is only forty-six percent of the prevailing interest rates. The investor in the sample tax shelter uses the tax savings, as they arise, to repay the indebtedness.

Railroad boxcars have been a popular tax shelter in recent years. An investor acquires tax ownership of the railroad boxcar, but he is a passive owner. The cars are actually used and managed by another party. Boxcars have a useful economic life, under the midpoint of the guidelines published by the Internal Revenue Service, equal to fifteen years.[115] The sample investment assumes that the boxcar is leased during its fifteen year life to various lessees by a third-party management company working on behalf of the tax owners.[116] The owner of the car

115. Rev. Proc. 77-10, 1977-1 C.B. 548, 551.

116. If the boxcar were subject to a single lease, or the management agreement constituted a lease, the investor would be unable to use the investment tax credit. I.R.C. § 46(e)(3) (Supp. V 1981).

receives a fixed annual rent. The fixed rent is 10.26% of the price of the boxcar. If $100,000 is the unit or round number price for a boxcar, then the various lessees pay the investor $10,264 per year on the $100,000 purchase price. The annual rent of $10,264 for fifteen years is equivalent to a return of 5.95% of the purchase price of $100,000, assuming that the boxcar has no salvage value at the end of the lease term. The investor purchases the boxcar with full recourse indebtedness of $100,000, which bears interest at 13%. This 13% rate is approximately the average interest rate currently paid by corporations on their long-term unsecured loans.[117] The boxcar itself can be security for the loan.

The pretax rate of return of 5.95% on the boxcar is not a good return since it is only forty-six percent of the interest rate the investor bears. Borrowing at 13% to invest at 5.95% would obviously be silly in absence of the negative tax phenomena.

ACRS, however, makes it rational for the investor to purchase the boxcar with borrowed proceeds because of the negative tax. During the lease, the investor will have no cost for the boxcar. His payments on the debt needed to acquire the boxcar are offset by the tax savings and by the relatively low return received from the boxcar. Thus, the investor can maintain his normal after-tax consumption notwithstanding the acquisition of the boxcar. If the boxcar has any trivial salvage value at the end of the fifteen year lease, that value returns to the investor. Since the acqusition of the boxcar costs the investor nothing and requires no diminution of his cash or consumption, any trivial or speculative benefit beyond the lease makes the acquisition rational.

In the sample investment, the investor is in the 50% tax bracket for all deductions throughout the lease. Under the Economic Recovery Tax Act, as fully phased in, a married individual in the 50% bracket has taxable income sufficiently in excess of $162,400 to get 50% tax savings from his deductions. A married individual with less taxable income cannot afford this boxcar, since his tax savings are less valuable. No corporation can afford this boxcar.

Under ACRS, assets with a fifteen year economic life, such as the boxcar,[118] are given a five year class life for depreciation computations.[119] In the year of the investment, the investor will have a depreciation deduction of 15% of 95% of the purchase price. The following

117. 75 MOODY'S BOND SURV. 3266 (Mar. 21, 1983) (listing the average corporate bond yield as reaching a high of 13.12% and a low of 12.67% during 1983).
118. *See supra* note 115.
119. I.R.C. § 168(c)(2)(A), (B) (Supp. V 1981).

year there will be a deduction of 22% of 95% of the purchase price. For the three subsequent years there will be depreciation deductions of 21% of 95% of the purchase price.[120] The schedule has no special internal logic but arises from an accounting convention and political compromise. The asset purchase will also give the taxpayer a 10% investment tax credit in the year the asset is put into service.[121]

The sample investment occurs at year-end, and the boxcars are put into service at that time. For simplicity this model assumes that returns are received and interest is paid at year-end. The tax savings from deductions and the tax costs on income are assumed to occur simultaneously with the deduction of income. The investor finances the investment completely by borrowing $100,000. Immediate tax savings of $17,125, however, reduce the principal to $82,875. The following cash flow chart shows how the investor pays off his $82,875 indebtedness over the life of the boxcar and, therefore, acquires the boxcar with no cash from his own resources.

Railroad Boxcar: 15 Year Lease Giving 5.95% Return
Debt-Financed at 13% Interest

Part 1: Years 0 through 5

	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5
(1) Opening Principal	$100,000	$82,875	$72,680	$62,297	$51,239	$39,462
(2) Boxcar Rent [5.95% return]	0	10,264	10,264	10,264	10,264	10,264
(3) Interest [13% of (1)]	0	10,774	9,448	8,099	6,661	5,130
(4) Pretax Cash [(2)-(3)]	0	(510)	816	2,165	3,603	5,134
(5) Depreciation	(14,250)	(20,900)	(19,950)	(19,950)	(19,950)	0
(6) Tax Income (Loss) [(4)+(5)]	(14,250)	(21,410)	(19,134)	(17,785)	(16,347)	5,134
(7) ITC	10,000	*	*	*	*	*
(8) Tax Cost (Saved) [50% of (6)-(7)]	(17,125)	(10,705)	(9,567)	(8,893)	(8,174)	2,567
(9) Reduction of Principal [(4)-(8)]	17,125	10,195	10,383	11,058	11,777	2,567
(10) Accumulated Investor Cost	0	0	0	0	0	0

* Investment tax credit is available only in Year 0, the year the property is placed in service. *See* I.R.C. §§ 46, 48 (Supp. V 1981).

120. The schedule of annual percentage ACRS deductions on which the preceding example is based can be found at I.R.C. § 168(b)(1) (West Supp. 1982) (five year property). The taxpayer can recover only 95% of the purchase price because of the new limits on the investment tax credit. *See* I.R.C. § 48(q) (West Supp. 1982).

121. *See* I.R.C. § 46(a)(2)(A), (b), (c)(2)(A) (Supp. V 1981).

Part 2: Years 6 Through 11

	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11
(1) Opening Principal	$36,895	$34,161	$31,249	$28,148	$24,845	$21,328
(2) Boxcar Rent [5.95% Return]	10,264	10,264	10,264	10,264	10,264	10,264
(3) Interest [13% of (1)]	4,796	4,441	4,062	3,659	3,230	2,773
(4) Pretax Cash [(2) - (3)]	5,468	5,823	6,202	6,605	7,034	7,491
(5) Depreciation	0	0	0	0	0	0
(6) Tax Income (Loss) [(4)+(5)]	5,468	5,823	6,202	6,605	7,034	7,491
(7) ITC	*	*	*	*	*	*
(8) Tax Cost (Saved) [50% of (6)]	2,734	2,911	3,101	3,302	3,517	3,745
(9) Reduction of Principal [(4) - (8)]	2,734	2,912	3,101	3,302	3,517	3,746
(10) Accumulated Investor Cost	0	0	0	0	0	0

Part 3: Years 12 Through 16

	Year 12	Year 13	Year 14	Year 15	Year 16
(1) Opening Principal	$17,582	$13,593	$ 9,344	$ 4,819	0
(2) Boxcar Rent [5.95% return]	10,264	10,264	10,264	10,264	
(3) Interest [13% of (1)]	2,286	1,767	1,215	626	
(4) Pretax Cash [(2) - (3)]	7,978	8,497	9,049	9,638	
(5) Depreciation	0	0	0	0	
(6) Tax Income (Loss) [(4) + (5)]	7,978	8,497	9,049	9,638	
(7) ITC	*	*	*	*	
(8) Tax Cost (Saved) [50% of (6)]	3,989	4,248	4,524	4,819	
(9) Reduction of Principal [(4) - (8)]	3,989	4,249	4,525	4,819	
(10) Accumulated Investor Cost	0	0	0	0	

* Investment tax credit is available only in Year 0, the year the property is placed in service. *See* I.R.C. §§ 46, 48 (Supp. V 1981).

Different tax and interest rates require different pretax rates of return from the sample investment in order for the investor to break

even. The formula for the break-even return (R) from debt-financed property subject to ACRS is:

$$(19) \quad k_{Rn} = \frac{1-T}{1-T_D} Pk_{i(1-T),n,}$$

where k_{Rn} is the pretax constant annuity (rent) of n years that the asset must produce to allow the investor to get return rate R; n is the number of years the asset gives the rent and the period the debt is outstanding; T is the investor's tax rate; i is the pretax interest rate on the borrowing; T_D is the present value of the investment tax credit plus the depreciation deductions at tax rate T, using a discount rate of $i\ (1-T)$; P is the price of the investment and the principal amount borrowed (before reimbursement by tax savings); and $k_{i(1-T),n}$ is the constant needed to pay off one dollar over the n years of the asset's life at an interest rate of $i(1-T)$. The formula assumes that the discount rate is entirely the after-tax cost of interest i, deducted from income subject to tax rate T.

The following graph compares text equation (16), $R = (1-T)I$, with Appendix equation (19), for varous interest rates and tax rates.

The graph and supporting table[122] demonstrate that the more precise mathematical description of debt-financed ACRS investments used in the Appendix supports the essential conclusions of this Article. In fact, the more refined description reinforces the conclusion more dramatically than the model in the text.[123] In both the text and the Appendix, pretax return rates from property eligible for ACRS can be significantly below pretax interest rates on debt used to finance the property, and the investor can still break even. The higher the taxpayer's tax rate, the less pretax return the taxpayer needs from the property.

122. The graph is based on the following table:

Break-Even Return Rates

	5% Interest		13% Interest		20% Interest	
Tax Rate	App.(19)	Text (16)	App.(19)	Text (16)	App.(19)	Text (16)
50%	1.1%	2.5%	6.0%	6.5%	10.3%	10.0%
46%	1.3%	2.7%	6.4%	7.0%	11.0%	10.8%
40%	1.6%	3.0%	7.1%	7.8%	11.9%	12.0%
30%	2.2%	3.5%	8.2%	9.1%	13.4%	14.0%
20%	2.7%	4.0%	9.2%	10.4%	14.9%	16.0%
11%	3.0%	4.5%	10.0%	11.6%	16.1%	17.8%

123. ACRS is more or less valuable than expensing, depending upon the discount rate used to value deferred depreciation deductions. *See supra* note 52. In the Appendix, the discount rate is after-tax interest, $(1-T)i$. When ACRS is more valuable than expensing, the graphed break-even return rate is lower for ACRS than the text model would imply, assuming expensing. Expensing is more valuable than ACRS only for 46% and 50% bracket taxpayers facing pretax 20% interest rates. *See supra* note 122.

Break-Even Return Rates