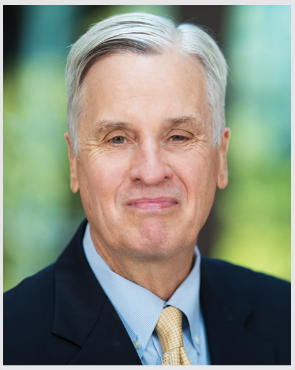
SPECIAL REPORT

tax notes federal

Interest Ceiling Must Be Adjusted Basis Times Interest Rate

by Calvin H. Johnson



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Calvin H. Johnson is the John T. Kipp Chair Emeritus at the University of Texas Law School. He thanks Bret Wells, Steven Shay, Daniel Halperin, and participants in the Texas Tax Scholarship Workshop for their comments on a prior version of this report.

In this report, Johnson argues that the deduction of interest on debt, combined with the tax treatment of low-basis investment, creates a harmful negative tax or subsidy, and that the most practical way to stop it is to limit the interest deduction to no more than the interest rate times adjusted basis.

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I. Overview

Current law sets up a mismatch between the tax treatment of investments and the deduction of interest. Together, they generate a negative tax or subsidy that is even better for the transaction than no tax at all. The negative tax is a mistake, neither defensible nor defended.

Theoretically, this mistake could be fixed on the investment side by reaching the high goal of economic depreciation — that is, capitalizing costs to keep adjusted basis up to the net present value of the future cash flow that the costs produce. Still, consistent economic depreciation would be hard to reach, both for administrative and political reasons, and we need to stop the negative tax now. The negative tax can also be fixed by moving to a cash-flow consumption tax, which either taxes borrowing or disallows any interest deduction. However, neither of those competing ideas will come to Earth in our times, and it is crucial to fix the negative tax now.

How? The deduction of interest needs a ceiling that is equal to interest times the debtor's adjusted basis in all the assets the creditor can reach. Adopting this remedy is simple and compelled.

The negative tax is a mistake. The general mission of tax accounting is to measure economic income without favor or penalty — without "an effort to use the tax law to serve ancillary purposes."[1] Subsidies generated by the mismatch waste capital by diverting investment into transactions that are not justified by their pretax demand or any other merit. Certainly, some subsidies (other than the mismatch result) might be justified by externalities beyond the willingness-to-pay demand curve, but a justification should not be presumed when the subsidy diverts capital into inferior investments. A subsidy needs to be delivered purposefully under a process that requires a finding that the benefits are worth the cost. The negative tax from the mismatch of tax on investment and the deduction of interest has no deliberation or justification behind it. The purpose of tax is to collect revenue. Negative tax goes in the opposite direction and makes revenue collection that much harder.

The argument here is simply an application of the principle underlying section 265, which disallows the deduction of interest on debt traced to the purchase or carrying of tax-exempt bonds. Section 265 is an old idea, going back to 1917 legislation, not long after the dawn of the modern income tax.[2] Without section 265 and its predecessors, a taxpayer tiring of tax could borrow enough to bear interest to wash out taxable income from any source whatsoever and invest the borrowing in tax-exempt bonds.[3] Taxable income would be replaced with tax-exempt income. Tax-exempt bonds bear a modest discount reflecting the exemption, but much below the top brackets. This report extends the section 265 point to the exemption of income caused by upfront expensing of the capital invested, and to the partial exemption that arises because adjusted basis is less than fair market value.

The logic — indeed, the proof of the necessity — of a ceiling limiting interest deductions to the interest rate times adjusted basis can be outlined as follows.

First, under what is sometimes called the Cary Brown thesis, the ability to get into an investment with soft money, which is not subject to tax before investment, is a privilege that is typically at least as valuable as an exemption from tax on the subsequent income or gain from the investment. The interest cost of borrowing to make that investment is properly matched with tax-exempt money and hence not properly deductible under neutral accounting. By contrast, if the cost of the investment creates basis rather than a deductible expense, the interest cost needs to be subtracted from the taxable income from the investment to reflect net income. If interest has to be deductible, that forces the capitalization of investment and a slow depreciation that maintains adjusted basis equal to the remaining value of the asset.

Second, an investment can be broken down in any year into (1) a hard money (post-tax) basis segment and (2) a soft money (no prior tax) no-basis segment. Interest on debt allocated to the hard money basis segment should be deductible to calculate net income, and interest allocated to the soft money, no-basis segment should not be deductible. The segments, viewed separately, can also be piled on top of each other, with a single investment aggregating both soft and hard money segments. This implies that interest should be partly deductible and partly not. The accounting calls for a ceiling on interest deduction that is equal to interest times adjusted basis.

Indeed, every tax year of a multiyear investment can be disassembled into separate years with a basis segment and a no-basis segment, regardless of what happens to basis in any other year. The segment of any investment not represented by basis can be ignored, and the interest deduction allowed would be limited to adjusted basis times the interest cost.

This report anticipates the following objections that might threaten its core argument:

- **Creditor tax.** Taxing the creditor on interest does not cure the investment distortions arising from the negative tax. First, the creditor cannot price-discriminate to raise interest rates above normal when the borrower is getting a negative tax. Moreover, interest rates in the market seem to reflect trivial, if any, tax on interest or the tax benefits of interest deductions. If a creditor tax were passed through to the debtor, it would be at only one equilibrium

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[1] *Portland Golf Club v. Commissioner*, 497 U.S. 154, 170 (1990).

[2] Revenue Act of 1917, section 1201(a).

[3] *See Denman v. Slayton*, 282 U.S. 514, 515 (1931) (upholding the disallowance of a deduction for interest paid to buy or carry tax-free bonds).

tax rate, leaving a windfall for any borrower above that rate or a penalty for any investor below that rate.

- **Fix with Samuelson[4] depreciation.** Interest deductions are appropriate if costs are capitalized and maintained in adjusted basis to the level of the discounted present value of future cash flows generated by the costs. Maintaining adjusted basis up to value has the considerable virtue of keeping the economic effective tax rate equal to the statutory tax rate and preventing investments from being more valuable to high-bracket bidders than to low-tax bidders. However, determining future cash flows and their discounted value is hard if not impossible, except in rare circumstances. Negative tax is a fire in the kitchen that needs to be put out now without waiting for the rehabilitation of this whole house with economic depreciation.
- **Use of tax savings.** For premium-return investments, the equivalence of expensing to no tax on profits depends on the assumption that investment reimbursed by tax savings can also be put into an expensed deduction with the same rate of return. However, the ceiling of the interest rate times adjusted basis remains a necessary, viable remedy, even if the assumptions are relaxed.
- **Current interest limitations.** Section 163(j), limiting the interest deduction to 30 percent of taxable income, as adjusted, is not an adequate remedy to prevent negative tax. The German Fiscal Court has suggested that interest must be deducted in full under an ability-to-pay computation of income, but the interest-rate-times-adjusted-basis ceiling is consistent with deep ability-to-pay tax norms.

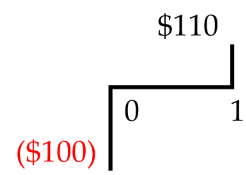
This report discusses details of handling short-term assets that vary within the tax year. It also argues that untaxed basis, especially the step-up in basis at death, should not be included in the calculation of the interest ceiling because that exemption does not imply subsidy.

II. The Core Hypothetical

A. Pretax Cash Flows

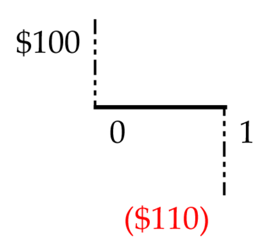
For the core hypothetical, assume that in the absence of tax, an investment will return $110 in one year. Also assume that the taxpayer-investor demands a 10 percent return rate, which incorporates some risk under current interest rates.[5] Because the $100 will grow to $110 at 10 percent — that is, $100 * (1 + 10 percent) = $110 — the discounted present value of the $110 is $110/(1 + 10 percent), or $100, which the taxpayer-investor will pay. Tax, once brought into the hypothetical, will be at 40 percent.

Figure 1. Investment at Present Value of Future Cash Flow



Assume the taxpayer borrows $100 to make the investment, repaying the debt at the end of year 1. The bank demands 10 percent interest payable in a year. The bank's investment is identical to the taxpayer's: $100 invested in year 0 and $110 positive cash flow in a year. For the borrower, however, the cash flows are the mirror image of the bank's position and of Figure 1's description of the investment.

Figure 2. Borrowing Cash Flow

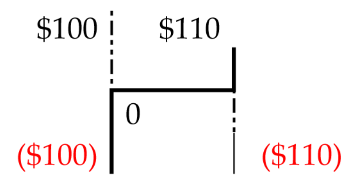


[4] *See* Paul A. Samuelson, "Tax Deductibility of Economic Depreciation to Insure Invariant Valuations," 72 *J. Pol. Econ.* 604 (1964).

[5] Of course, 10 percent also makes for easy, transparent arithmetic because I need only drop the last digit from outstanding principal to calculate interest.

Figure 3 simply combines figures 1 and 2, with the investment in solid lines and the borrowing in broken lines.

Figure 3. Investing/Borrowing Cash Flows Combined



Because borrowing and investing are mirror images, the investor that combines investing and borrowing has no net gain or loss, and no cost or benefit, in any period. A neutral tax system without favor or penalty will reflect no gain or loss for the figure 3 transaction in any period.

B. Capitalized Hard Money

If the $100 investment is capitalized so that basis equals the remaining value, interest should be deducted. The treatment of the investing and the borrowing then yields a perfect fit and nets to zero, both at the start in year 0 and at the end in year 1. The assumed tax rate is 40 percent, but it does not come up (yet) because there is no net income and no deductions.

Table 1 explains the tax results from borrowing, capitalization, return, and interest. The rationale of each step is explained after the table.

Table 1. Capitalized Investment

Year 0 (start)	Pretax Cash Flow	Taxable Income (deductions)	Notes
1. Borrowing	$100	None	
2. Investing	($100)	None	
3. Net of 1 and 2	0	None	
Year 1 (end)			
4. Repay borrowing	($110)	($10)	Interest paid

Table 1. Capitalized Investment *(Continued)*

Year 0 (start)	Pretax Cash Flow	Taxable Income (deductions)	Notes
5. End of investment	$110	$10 gain	$110 gross - $100 basis
6. Net of 4 and 5	0	0	

- **Line 1.** Borrowing is not taxable. The best rationale is that the obligation to repay the loan plus interest, enforced by a self-interested creditor, means the cash in hand from borrowing is offset economically by the present value of the loan repayments, so the cash does not represent overall gain in economic (present value) terms.
- **Line 2.** If an investment is capitalized, the taxpayer-investor gets basis, which is usable in year 1, at the end of the investment, but not as a year 0 deduction. Capitalization is required for neutral accounting if borrowing is not taxed and interest is deductible. Capitalization also describes the taxpayer-investor's situation: It has not lost anything; it has merely transformed cash wealth into property wealth. The self-interested investor demands an expected present value of $110, which is the year 1 cash flow from the $100 year 0 investment. A voluntary purchase of property or other investment is not a loss. If it were, the taxpayer-investor would not have done it.
- **Line 3.** The $100 outflow for the investment and the $100 borrowed inflow offset each other, so there is no net cash flow in year 0. Neither the positive nor negative year 0 $100 cash flows are recognized as tax events, so the net $0 pretax is also the after-tax result.
- **Line 4.** In year 1, at the end of the investment, the taxpayer-investor repays the bank the borrowed $100 plus 10 percent interest, so $110 cash flows out. Only the $10 interest is deductible, and not the repayment of $100 principal borrowed. Deductions represent losses, and paying $100 but ending a $100 obligation is not a net loss. The taxpayer needs an interest

deduction of $10 at year 1 to describe the economic position of $0 pretax net, which is allowed in line 4.

- **Line 5.** The $100 cost that was basis, not a deduction in year 0, is used at the end of the investment against the gross proceeds of the investment, the $110 that the taxpayer investor was bidding on. The gain is $110 less basis, or $10, which is taxable.
- **Line 6.** The $110 cash flow out and $110 cash flow in offset each other for $0 pretax net. The $10 gain and $10 interest deduction offset each other for zero effect on taxable income.

The taxpayer has neither net cash nor a net taxable event at either the start (year 0) or the end (year 1).

Table 1 is a simple case of economic or Samuelson depreciation. As noted, under economic depreciation, basis (and then adjusted basis in future years) is kept equal to the net present value — here $100 — of the future net cash flows the investment will produce. Economic depreciation is the only depreciation that is consistent with debt, as Table 1 shows. Indeed, the investment might itself be another debt. Internal rate of return (IRR) analysis treats all investments as debt, akin to a hypothetical bank account that has cash flows in and out, just like the investment under analysis. Economic depreciation is the only depreciation that identifies the IRR from the investment and taxes it according to a statutory tax rate. Economic depreciation is the depreciation that prevents taxpayers in higher brackets from bidding more for an investment than taxpayers in lower brackets do. Indeed, indifference of value to tax rate is one of its sterling virtues, as Paul Samuelson first observed.[6] Economic depreciation prevents debt-borrowing from generating tax deductions that shelter outside taxable income but are not real losses that impinge on the world. A slightly more complicated investment — three years, not one — is described in the appendix.

Table 1 shows that with economic depreciation, interest is properly deducted without generating a negative tax. The interest deduction in Table 1 is also necessary to reflect the taxpayer's pretax income of $0.

C. Expensed Soft Money Investment

By contrast, an expensed investment deducted immediately when made should not have an interest deduction. Assume now that the $100 investment is not capitalized and in year 0 is immediately deducted from unrelated income. Immediate expensing of investments is available sometimes by statute[7] and sometimes by accounting conventions.[8] Under the Cary Brown thesis, the ability to expense an investment — that is, deduct it when paid in year 0 — means within common assumptions that tax does not reduce the pretax return from the investment.[9] The tax savings upfront have the same present value as the tax ultimately paid. The pretax return is unaffected by tax and is thus effectively tax exempt.

Assume that $100 can be deducted from unrelated taxable income that would otherwise be taxed at 40 percent. The tax savings from the deduction acts as a reimbursement of 40 percent of the cost of the investment, reducing the net cost to the investor after a tax of $100 * (1 - tax rate), or $60, when the tax rate is 40 percent. The year 0 expensing uses up all of the taxpayer's basis, so all of the $110 cash inflow is subject to tax, also assumed to be at 40 percent. At 40 percent, the $110 pretax revenue is reduced by $44 to $66, as illustrated in Figure 4.

[6] Samuelson, *supra* note 4.

[7] *See, e.g.*, sections 174, 179, and 263(c).

[8] *See, e.g.*, reg. section 1.263-4 (allowing the expensing of creation of intangibles that cannot be sold apart from the sale of the business as a whole). Calvin H. Johnson, "A Fair Income Tax on the Trillion-Dollar Behemoths," *Tax Notes Federal*, May 24, 2021, p. 1199, criticizes the expensing.

[9] The seminal article is E. Cary Brown, "Business Income Taxation and Investment Incentives," in *Income, Employment and Public Policy: Essays in Honor of Alvin H. Hansen* 300, 309-310 (1948). Treasury, "Blueprints for Basic Tax Reform" (1984), also has a useful explanation.

Figure 4. Expensing Does Not Reduce 10 Percent Pretax Return

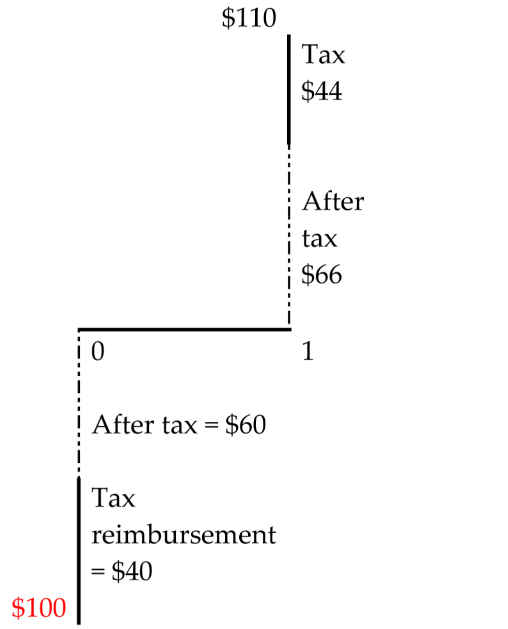
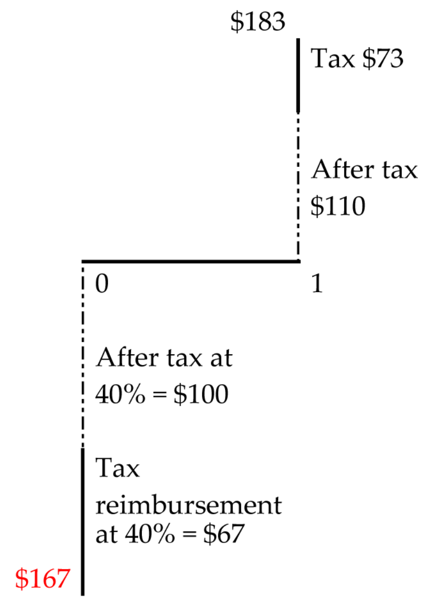


Figure 4 shows that both the pretax and post-tax cash flows generate a 10 percent return. Pretax $100 invested and $110 revenue equals a 10 percent return. The after-tax $60 post-reimbursement cost combined with the post-tax $66 revenue is also a 10 percent return. There is a lot of tax motion in Figure 4, with $40 savings at year 0 and $44 tax paid at the end, but the net impact is no reduction of the 10 percent pretax return.

In Figure 4, the federal government has become a fair partner, contributing the same 40 percent upfront as it takes in tax at the end. That fair 40 percent partner does not reduce the percentage return on the taxpayer's after-tax 60 percent share of the investment. The taxpayer-investor's share of the burden and return has shrunk from 100 percent to 60 percent, but the return percentage is the same.

If the taxpayer wanted to have the same pretax $100 invested rather than just a burden of $60 in year 0, it could gross up the investment to $100/(1 - t) to $166.67 and count on the reimbursement of 40 percent of $166.67 to reduce the after-tax cost to $100, where t is the tax rate. The amount invested will grow to $166.67 * (1 + i) to $183.33, which, after 40 percent tax, drops to $110, where i is the interest rate. The after-tax $100 in and $110 out is the same cash flow as pretax, as well as the same 10 percent return.

Figure 5. Gross-Up Reduces Neither 10 Percent Pretax Return Nor Size of the Investment



The results of Figure 5 can be generalized for any tax rate and return rate[10]: Where $100 * (1 + R) is the pretax return at rate R, the taxpayer grosses up the investment to $100/(1 - t), which gives [$100/(1 - t)](1 + R) before tax, which after tax becomes [$100/(1 - t)](1 + R) * (1 - t) after tax, which is equal to $100 * (1 + R).

Regardless of whether there is a gross-up, tax will reimburse 40 percent of cost upfront, and the after-tax cost is equal to the pretax cost times (1 - t). Going the other direction, pretax cost is post-tax cost divided by (1 - t). The reduction in upfront cost by (1 - t) offsets the tax that reduces revenue by (1 - t).

D. Tax Accrual Method

Tax reimbursement in figures 4 and 5 is not instantaneous with the investing. A deduction will not reduce tax, at least until quarterly payments of estimated tax are due — perhaps as

[10] This assumes that the taxpayer can get the same 10 percent from reinvestment of the tax portion as from investment of the after-tax portion. That might be treated as problematic if 10 percent were a premium return, but 10 percent is the normal publicly available return for the risks entailed.

long as three months away, and month and a half on average. The final reconciliation of estimated tax payments and actual tax due as reported is typically not made until April 15, or three and a half months after a fiscal tax year. Symmetrically, the tax payments due are deferred only to the due date for the quarterly estimated tax payment, and to three and a half months after the close of the tax year for final calculation. Thus, the t for tax rate should be understood as the statutory tax discounted a bit for the time value of money. Cash and tax on it (or tax savings from it) are within the same year but not simultaneous. Still, the deferral should not have much effect on the economics of a tax reimbursement, including the gross-up in reaction to the (slight) deferral.

E. Mismatch of Debt and Expensing

Deducting interest is mismatched with expensed investments, which leads to a negative tax in the amount of the value of the interest deduction. Negative tax means the rate return after tax is better than the return before tax.

The annual position, expressed algebraically, describes the pretax revenue, R, unreduced by tax, with subtraction of the after-tax interest, $i * (1 - t)$, where i is the interest rate and t is the tax rate:

$$R - i * (1 - t).$$

If R and i are the same, as in the core hypothetical at 10 percent, the after-tax result is 10 percent - 10 percent $(1 - t)$, which resolves to 10 percent $* t$. The subsidy to the break-even position is 10 percent $* t$, which is the value of interest deduction.

But even when R is greater than 10 percent $* i$, the mismatch still adds the value of the interest deduction to the transaction. And R can drop below i and still be rational when the $i * t$ subsidy turns the pretax loss into an acceptable break-even of gain. Investments with a return rate that is too low to be justified by real demand in the nontax world are made rational by the tax subsidy. That wastes capital by putting it into less worthy investments that are unable to yield the going market interest rate.

Table 2 gives the accounting history of an expensed investment and borrowing, with tax reimbursing the upfront cost, but no gross-up. The paragraph just above describes only one year and in algebraic form. The accounting in Table 2 shows the same thing in different form. In Table 2, the $40 tax reimbursement upfront means that less than $100 needs to be borrowed for the $100 investment. Table 2, like the algebra, shows a break-even core hypothetical morphs into a positive value investment by the amount of tax savings from deducting interest.

Table 2. Interest Deduction and Expensing Creates Negative Tax

Year	0	1
(a) Investing cash flows	($100)	$110
(b) Tax savings at 40%	$40	
(c) Borrowing cash flows	$60	($66)
(d) Pretax cash flow (a + b + c)	$0	$44
(e) Taxable gain		$110
(f) Deductible interest		($6)
(g) Net taxable		$104
(h) Tax on (g) at 40%		$41.60
(i) After tax (d - h)		$2.40

The upfront tax reimbursement allows the same $100 investment to be made with only a $60 borrowing. The lesser borrowing for the constant amount invested gives the taxpayer-investor a gain even on a break-even 10 percent interest cost and 10 percent gain transaction. The added gain is $R - i * (1 - t)$, which becomes $i * t$ when R and i are equal. The $2.40 value added after tax to what is economically a break-even investment is the interest of $6 times the tax rate of 40 percent.

If the taxpayer had grossed up the investment to $166.67, relying on a reimbursement of $66.67 tax at 40 percent, the borrowing would be $100 (less than invested by the amount of the reimbursement), the $10 interest and the tax saving at 40 percent would be $4. That is still equal to $R * t$, but with a larger upfront investment and more borrowing in the expanded gross-up investment.

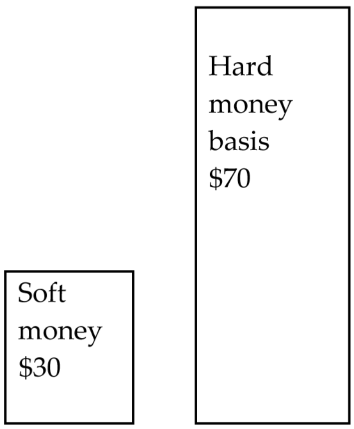
The conclusion that interest is appropriately deducted for a one-year hard money investment but yields a negative tax for a soft money one-year investment creates building blocks for more complicated investments that mix soft and hard money in a single year and multiple years.

III. Mixed Hard and Soft Money

A. Two-in-One Investment

Assume now that the $100 pretax investment is separated into two investments: a $30 expensed investment and a $70 capitalized investment.

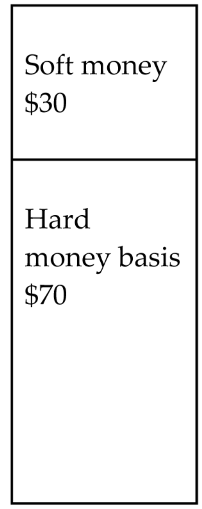
Figure 6. Mixed Soft and Hard Money



Interest matched with the hard money investment should be deductible, but interest matched with the soft money investment should not. It does not matter whether the soft money investment represents a gross-up in reliance on the reimbursement of the tax savings portion, or just a contraction of the cost of the investment without the gross-up expansion. Interest allocated to the soft money is not properly deductible in either case. Only the interest on hard money — that is, the interest rate times the basis — is justifiably allowed as a deduction. The soft money segment does not enter into the calculation.

Now put the soft money investment on top of the hard money investment in one aggregated investment. For example, assume the investor is allowed a 30 percent bonus depreciation in year 0 for equipment put into service in year zero. The aggregate investment, including the expensed 30 percent and the 70 percent remaining basis would look as shown in Figure 7.

Figure 7. 30 Percent Expensing



The conclusion for Figure 7 is no different from that of Figure 6. To prevent negative tax, interest is deductible only to the extent of basis times the interest rate.

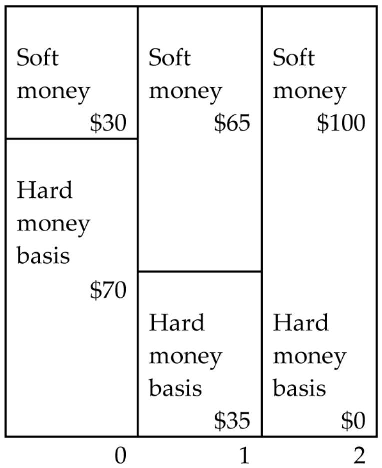
Figure 7 looks only at year 1, independent of whatever depreciation is allowed in subsequent years. The ceiling interest rate times adjusted basis is applicable for any tax year, however, independently of what happens in any other year.

B. Multiyear Investments

The ceiling rule that is appropriate for one year (interest rate times adjusted basis) is appropriate for any year, each independent of whatever is adjusted basis in another year. What is true for a one-year investment is true for a multiyear investment in Figure 8.

Assume now that the investment in Figure 7 is given a two-year tax life. With a bonus depreciation deduction of 30 percent as soon as the investment is made in year 0 and straight-line depreciation of the remaining basis in each of the following two years — all without regard to the economic life of the asset. The depreciation deductions from a $100 purchase price would be $30 in year 0, $35 in year 1, and $35 in year 2. The adjusted basis would thus decline as shown in Figure 8.

Figure 8. Multiyear Basis



To prevent negative tax in the Figure 8 investment, the ceiling is the interest rate times $70 for year 0 — the year the investment is made — the interest rate times adjusted basis of $35 for the year 1, and zero for each year thereafter.

C. Year-End Adjusted Basis

The ceiling is interest times adjusted basis as of the end of the year. Year 0 bonus depreciation reduced the adjusted basis immediately. Depreciation deductions save money upon estimated quarterly tax payments or a final computation basis only with the tax return three and half months after the close of the year. But tax is certain — as certain as death, as the expression goes — and the deferral is short. Any deduction allowed within a tax year is assumed to accrue tax savings simultaneously, which is off by only a trivial amount. That amount is small enough to be, in accounting language, immaterial — that is, unlikely to affect behavior. Symmetrically, the revenue is assumed to be instantaneously reduced to post-tax status, ignoring the short and non-risk lag.

The picture of Figure 8 also assumes noncritically that soft money investing increases every year and that the initial $100 investment does not disappear economically, despite the depreciation deductions. But the assumption is not critical. The soft money segment of the investment does not enter into the calculation. The soft money component might well be disappearing. Or perhaps the asset is appreciating above the initial $100 so that the soft money component is increasing. The ceiling is computed as the interest rate times basis; the hard money segment and the soft money segment, high or low, have no effect.

IV. Fundamental Attacks

A. Tax on the Creditor

Interest is ordinary income to the creditor.[11] If the negative tax saves $i * t$ for the borrower, a creditor would have to pay $i * t$ on the interest, and if the creditor's and borrower's tax rates are the same, the borrower's tax saved and the creditor's tax paid would be the same.

However, tax paid by the lender is a cure for the distributional and efficiency effects of negative tax only to the extent that creditors both pay tax on interest and are able to pass the tax back to the borrower.

Empirically market interest rates apparently do not reflect either the creditor's tax or the debtor's deduction for interest. One proof comes from increases in inflation. Interest payments that merely offset the creditor's loss because of inflation are taxed — a tax on inflationary payments that do not represent gain to the creditor. Thus, when inflation increases, a creditor needs to get an increase in interest to cover tax as well as compensation for the inflationary loss of value to the creditor of the dollars loaned before the inflation.

Assume that inflation has increased by delta "inf." A creditor subject to tax rate t would need to get (*delta inf*)/(1 - t) from the debtor to compensate for the creditor's inflation loss after tax because (*delta inf*)/(1 - t) minus tax of t * (*delta inf*) yields just *delta inf*. But interest rates responding to inflation come nowhere close to covering the necessary compensation for inflation and tax on inflation. Indeed, market interest rates do not always offset inflation even assuming no

[11] This section reflects Johnson, "Tax Shelter Gain: The Mismatch of Debt and Supply Side Depreciation," 61 *Tex. L. Rev.* 1013, 1039-1049 (1983).

coverage of the tax on inflation-offsetting interest.[12] The creditor tax is never passed back.

A partial explanation for a market that does not cover tax is that creditors and borrowers segregate themselves into tax bracket groups. High-bracket investors borrow, and high-bracket lenders get out of lending, because annual ordinary interest income is a lot worse tax treatment than what the high-bracket lenders can get from other sources. The market rate of interest suggests that globally creditors pay no tax on interest, or at least cannot charge debtors for their added tax. That is not fully explained by the segregation by tax bracket, but segregation would explain much of the phenomenon.

Even if tax and tax savings were reflected in the interest rate, there would be only one tax rate that the increase in interest could cover. Borrowers in brackets higher than the rate reflected in the interest rate could benefit from the negative tax even after paying the tax-ballooned interest, but taxpayers in brackets lower than the tax rate reflected in the interest rate would be priced out of borrowing, or at least penalized.

A creditor cannot plausibly offset the negative tax by raising interest only on soft money. It must generally offer its interest rates in the market for both hard and soft money investments. The creditor can ask for sufficient collateral to make payment likely, but the borrower's basis in the collateral assets has no effect on the assets that the bank can seize. Thus, if the negative tax distorts investment decisions and sends investment into transactions that are not justified by pretax demand, the investment is still available as collateral, which is enough for the bank. Tax on creditors is not a cure for negative tax from soft money investing and interest rates. Indeed, given the failure of market interest to reflect creditor tax, tax on creditors if any can be ignored when determining the distortions from negative tax or the fairness of the extent to which the borrower's income has been reduced by tax.

B. Economic Depreciation

The mismatch leading to harmful negative tax can be fixed either on the borrowing side — with a ceiling on interest equal to the interest rate times adjusted basis — or on the investment side — with Samuelson or economic depreciation. Samuelson depreciation capitalizes costs that produce future cash flows, and it maintains the costs in adjusted basis, without tax deductions, up to the level at which adjusted basis is always equal to the present value of the future cash flows. Samuelson depreciation is a perfect fit with debt financing that includes an interest deduction, and it prevents negative tax because it analyzes all investments as if they were debts owed to the taxpayer-investor, perfectly symmetrical to debt owed by the taxpayer-investor.

Table 1, *supra*, shows the simplest example of Samuelson depreciation, with one positive cash flow from investing, and it demonstrates how perfectly Samuelson depreciation fits with an interest deduction. The appendix shows a slightly more complicated case — three positive cash flows — and again demonstrates the perfect fit between Samuelson depreciation and debt financing. Samuelson depreciation fits debt hand in glove because it analyzes all investments as if they were debts owed to the taxpayer.

Samuelson depreciation has sterling virtues way beyond matching with debt to prevent negative tax. It identifies and taxes the IRR from the investment, and IRR is the standard yardstick by which rational investors measure and compare diverse investments. An effective (IRR-reducing) tax rate measures the reduction in IRR resulting from tax, and only Samuelson depreciation has an effective bank tax rate equal to the statutory income tax rate that Congress has decreed.

If an investor has a discount rate of $R * (1 - t)$, where R is pretax return or interest and t is the tax rate, only Samuelson depreciation will make the price bid for an investment invariant to the tax rate. The discount rate will be $R * (1 - t)$ because the investment is funded with debt deducted in the tax bracket of rate t or because the tax system is strong enough to reduce returns by tax rate t — either by actual tax or the drop in Rs that occur because an investment is tax favored. The indifference of purchase price to the tax bracket of the investor was the primary virtue of Samuelson

[12] Interest rates do not even keep up with inflation, ignoring the tax effects. *See, e.g.*, Eugene F. Fama, "Term-Structure Forecasts of Interest Rates, Inflation, and Real Returns," 25 *J. Monetary Econ.* 59 (1990) (stating that interest rates do not meet changes in inflation); Martin Feldstein, "Inflation, Income Taxes, and the Rate of Interest: A Theoretical Analysis," 66 *Am. Econ. Rev.* 809, 816 n.15 (1976) (finding increases in interest rates that just match the increase of inflation, without regard to tax).

depreciation to the author of the seminal article espousing it.[13] Samuelson depreciation prevents artificial account losses that reduce tax on outside income but do not reflect loss economically.

Although economic or Samuelson depreciation is ideal in many ways, it does require that adjusted basis be kept equal to the net present value of future cash flows. That is straightforward on Excel when future cash flows are given, such in the one-year (Table 1) or three-year annuity (appendix). In the real world, however, outside the model, future cash flows are not given and only rarely in fact are knowable or easily estimated. Much work would need to be done to the tax system to get adjusted basis up to FMV. Indeed, there may not be enough political will to increase taxes on investment to the statutory tax rate on IRR.

In the meantime, the evil of negative tax needs to be stopped. It is as if the old family grand manor needed much work to keep it standing for a duration. Economic depreciation would repair the negative tax. But in the meantime, there is a fire in the kitchen: revenue hemorrhaging from negative tax. Put out the fire before rebuilding the mansion with more complete taxation of investment. As the aphorism puts it, the perfect can not be used as the enemy of the good. The remedy on the debt side — a ceiling of adjusted basis times the interest rate — is the quick fix and mandatory.

C. Use of Tax Savings

The presentation in Table 2 and figures 4 and 5 shows expensing as equivalent to no tax on profit under the assumption that tax savings would increase the expensed investment. However, expensed investments might be unavailable, forcing the taxpayer-investor to use the tax savings to make an investment in a normal, publicly available investment like stock or debt that is not expensed. The investment would then have two fractions. The first fraction would reflect a hard money investment with basis of tax times the $100 unit assumed to be available for investment. At the 40 percent assumed tax rate, the investor-taxpayer would have a basis of $40. The other fraction would reflect a soft money investment with no basis: $100 * (1 - *t*), or $60 here — the taxpayer-investor burden after tax savings. It is proposed that the split investment be handled the same way as any other investment: part with basis and part without. Whatever the use of the amounts from reimbursed tax savings, the expensing allows $60 of borrowing to support $100 of investment. The interest deduction would still be limited to the interest rate times the $40 adjusted basis.

Sometimes the tax-reimbursed fraction of an investment gets a lower return rate than does the fraction that the investor bears. Alvin C. Warren Jr. has shown that if expensed investments are available even for the reimbursed tax savings but tax savings get an ordinary return — lower than an extraordinary return available for the remaining upfront burden — the whole expensed investment generates a result that is not equivalent to no tax on the extraordinary returns and is equivalent only to no tax on the lower ordinary returns.[14] Warren's results are still equivalent to no tax on profit of a lower level. The deduction of interest that is a cost of untaxed profit is still a mismatch that leads to a negative tax or subsidy. It is proposed that the ceiling of interest times adjusted basis continue to apply even if the investment fraction funded by tax savings yields a low ordinary return. Different use of the tax savings fraction and taxpayer burden fraction would have no effect.

D. Current Interest Limitations

Section 163(j) creates a ceiling, limiting the deduction of interest to 30 percent of taxable income, as adjusted in ways not relevant here.[15] Disallowed interest deductions are carried forward to future years until there is room under the 30 percent annual ceiling to allow the deductions.[16] The limitation was enacted because debt-financed investment has a lower effective tax

[13] Samuelson, *supra* note 4 (espousing his system as tax-rate invariant).

[14] Warren, "How Much Capital Income Taxed Under an Income Tax Is Exempt Under a Cash Flow Tax?" 52 *Tax L. Rev.* 1, 5 (1996).

[15] Taxable income is adjusted to take out carryovers of losses from prior tax years and to take out the 20 percent section 199A deduction, which was enacted to cut rates, not to define the tax base.

[16] Section 167(j)(4).

rate than equity investment, and section 163(j) narrows the disparity.[17]

Section 163(j) arose as a coverage idea, from a banker's measure used to reduce the creditor's risks of nonpayment. As applicable before 2022, section 163(j) added depreciation deductions back into taxable income to raise the 30 percent allowance. Adding back depreciation is called EBITDA — earnings before interest, taxes, depreciation, and amortization — which is used by banks to measure whether the debtor would have enough cash coming in (coverage) to make the required debt repayments. EBITDA is a dubious idea,[18] picked up by section 163(j) from a German tax model[19] as a halfway measure to raise the effective tax rate on debt-financed investments, but apparently not by too much. Risk of nonpayment is an equity feature, and higher risk pushes debt toward recharacterization as equity.[20]

Preventing harmful negative tax is not about coverage — that is, asking whether there is enough cash to pay debt repayments. The ceiling of interest times adjusted basis denies a deduction of interest that has no risk of nonpayment because it has already been paid.

The German Fiscal Court has expressed skepticism that the German limitation on interest deductions, on which section 163(j) was modeled, is constitutional, and it has referred the issue to the constitutional court for resolution.[21] The fiscal court said that the limitation was inconsistent with the fundamental norm that taxable income needed to describe ability to tax, and that disallowing interest was inconsistent with allowing other business costs as deductions. The negative tax explained here, however, is not a description of ability to pay tax, and stopping the negative tax by disallowing the interest costs that create the deductions is consistent with fundamental norms. The fiscal court simply did not see or understand the point explained here.

V. Details

A. Which Assets?

In general, the adjusted basis that determines the deduction ceiling would be the taxpayer's basis in all the assets that the creditor can reach. The debt might well have been incurred to buy just one asset. Still, the balance sheet has it right: The credit liabilities are claims against all the assets on the debit (left) side of the balance sheet. Borrowed funds are like a swimming pool, with water put in and taken out without any special identification between sources and uses. Thus, the taxpayer's basis in any asset it holds that the creditor can access to pay the debt would raise the ceiling.

The exception is nonrecourse liability, in which the creditor can reach only the asset specifically securing the debt. In that case, only the adjusted basis of the asset securing the liability would be used to determine the interest ceiling of interest times adjusted basis.

All the assets of a subsidiary corporation would be reachable by debt incurred by the subsidiary, but given limited liability for corporations, the assets of the parent corporation or other affiliated corporations would not be reachable by the creditor, and their adjusted basis would not raise the interest ceiling. If the parent guarantees the subsidiary debt, by contrast, the assets of the parent would be accessible by the creditor and the adjusted basis in parent assets would raise the interest limitation ceiling.

Strictly speaking, creditors of the parent can reach only the stock of a subsidiary, not its assets. So only the basis of the subsidiary stock would count. A parent can access the assets of the subsidiary by commanding it to make distributions, but a creditor cannot force that

[17] H.R. Rep. No. 115-409, at 247 (2017).

[18] Adding back in depreciation to measure coverage is a dubious idea because it assumes a business can keep afloat generating current cash inflows for the full term of the debt with no cost of capital. Depreciation is the expiration of an investment by the passage of time or wear and tear on physical capital, which is a real cost of making income. EBITDA ignores the depletion of old capital. The banks figure, on dubious grounds, that they can come out ahead of any capital costs, including upkeep or replacement of investments. However, income from capital will shrivel and die over the years unless investments maintain the capital at current levels. Capital costs can not be ignored for long-term debt.

[19] PWC, "Tax Summaries" (accessed July 6, 2022).

[20] Johnson, "Corporate Meltdowns and the Deduction of Credit Risk Interest," *Tax Notes*, May 2, 2011, p. 513, argues that only risk-free interest rates are true debt that should be allowed as a deduction and that the insurance premiums inherent to cover risk of nonpayment in the interest above risk-free rates are equity payments at risk in the enterprise's success.

[21] Norton Rose Fulbright, "German Federal Court of Finance Questions Constitutionality of German Interest Limitation Rule" (Feb. 2016).

command. The subsidiary's basis in its assets thus does not count. Again, subsidiary guarantees would give the parent's creditors access to the assets, and adjusted basis would raise the interest deduction ceiling.

Cash and cash equivalents are assets with a basis equal to face value. Cash assets listed on a balance sheet usually are invested short-term in some low-interest transaction. They are investments. Even if not so invested, cash is a lubricant to make the whole company's profit gears turn a little easier, so cash is an investment in the whole business. Cash balances would raise the interest-rate-times-basis ceiling.

Similarly, inventory is an asset with basis, unless the inventory has been deducted. Any basis in inventory would increase the ceiling.

Receivables with basis should also increase the ceiling. Before payment, a cash-method taxpayer has no accounting cognizance of money owed to it and not basis in the receivables. But an accrual-method taxpayer pays tax on fixed liabilities owed to it. The accrual-method taxpayer gets basis when it pays tax on receivables at year-end when posted, and it has a recovery of basis in the receivable, which makes the receipt of the cash tax-free. For an accrual-method taxpayer, receivables would be included in the adjusted basis to calculate the interest-times-adjusted-basis ceiling.

Symmetrically, payables would be deductible for an accrual-method taxpayer and would reduce its overall basis, but a cash-method taxpayer that gets no deduction for merely owing the expense would not. Adjusted basis generally is a debit-side balance sheet account synonymous with the nontax accounting term "asset balance." However, deducted payables would reduce overall asset basis even though they are liabilities — credits closed to the right side of the balance sheet — and not treated as a reduction of asset balances. Accrued payables would frustrate the neatness of saying that basis is the same as asset balance, but the adjustment seems correct nonetheless.

B. Which Interest Rates?

The interest rate ceiling needs to consider the weighted average of interest on borrowings at various periods. Again, borrowing is an addition to a pool that does not identify inputs and outputs. If interest rates have risen, the interest rate applied for the ceiling would be lower than current FMV. Surely, the ceiling should not be composed of interest that the taxpayer has not in fact borne. If interest rates have dropped, the higher-than-current-value interest would be taken into account in computing the weighted average interest rate. The exception is again nonrecourse liability, in which both the collateral and the interest rate of the deal govern the computation of the ceiling.

C. Intra-Accounting Year

Both tax and SEC accounting are computed on the basis of a whole year, which generally works for computing the ceiling of the annual interest rate times the year-end adjusted basis. Thus, for example, if cash held at the start of the year is expensed by year-end, the adjusted basis is zero. The analysis anticipates the upfront tax savings that occur only with reduced estimated tax payments and final tax return, but not by much.

The whole-year assumption used by both tax and nontax accounting is justified in part by the expense of closing the books and posting to compute profit and loss (an audit for SEC reporting might cost $25 million for a large company). But both tax and accounting income need to be understood as round figures, with a large plus-or-minus error range. Accounting may report debits as equaling credits down to the dime to keep double-entry booking in line, but it would be false precision to try to be more accurate than the rounding errors built into the process. There is "permissible accuracy," which includes lots of rounding errors, but more precision than allowable is a waste of resources.

Still, some adjustment might be made for intra-year events if the adjustment is easy enough. For instance, investments expire or fluctuate in a period shorter than a year. If the taxpayer is selling strawberries, for example, the strawberries had better leave inventory in three days or the inventory will be worthless. Inventory, however, is a pool with, for example, strawberries coming in and leaving it. The pool of assets, and not the continuously replaced individual items, sets the adjusted basis at year-end for the ceiling. Cash balances also fluctuate dramatically as cash comes in and is spent, but the cash balance can be viewed as a single river, without decomposing the balance into individual drops passing by.

If overall inventory balances change materially, it is simple enough within the annual accounting convention to treat the increase as occurring midyear. Thus, half an increase in inventory from one year to the next would be used in the basis part of the ceiling of interest times adjusted basis. Half of decreases in inventory from year to year would reduce the basis in the ceiling. Similarly, cash balance changes from the start of the year to year-end could be included at half of basis. Indeed, multiyear investments are often reported by a midyear convention, unless the convention yields material distortion of income. It would be reasonable to dip deeper into the interior of the accounting year with computations. Section 956, for instance, determines the interest that a controlled foreign corporation has in U.S. property by looking at the quarterly average.[22]

A midyear convention is consistent with the assumption that tax savings or payments are accrued instantaneously. On an estimated basis, tax effects show up in the quarterly payments — a shorter period than even midyear. And if it is accuracy of either the quarterly estimate or the April 15 return that counts, the period for discounting is short but unknown. The importance of the accrual of tax is that that the reimbursement will affect investment and borrowing behavior, which occurs even if the tax effect is deferred (for a short time and in an inevitable amount). But if the midyear convention is easy and helps describe the investment, it seems to be within permissible accuracy.

D. Expenses

Under the assumption that tax savings are simultaneous with deductions in a tax year, expenses are not included in the basis for the basis-times-interest-rate ceiling rule. Expenses are short-term investments with all the revenue anticipated to be produced by the expense expected by year-end. Costs that are not expected to expire by year-end are capitalized, at least in theoretical accounting, yielding greater assets or asset balance on the left side of the balance sheet for nontax purposes and becoming basis for tax purposes. There are also de minimis or incentive-motivated exceptions that allow expensing of costs that might well be expected to last beyond the year. Still, the analysis of operating expenses is no different from the soft money analysis of any other investment.

E. Untaxed Sources

Basis needs to represent taxed amounts. For cash obtained by contribution to equity or borrowing, we can presume that the lender or equity provider paid tax on the cash to have it to loan or contribute. No other assumption would be workable. Cash from operations is not taxed until the close of the books at year-end, but with quarterly payments of tax — estimates of final tax liabilities for sure, but still tax paid — the tax paid is treated as simultaneous with the receipt of the cash, more or less.

Basis step-up at death should not be the source of basis for the interest-rate-times-basis ceiling. Step-up in basis is conceptualized as an exemption for capital passed down to an heir — the castle and manor belong to the next heir no matter what they are worth. But exemption should not turn into a negative tax that is better than no tax at all on the transfer. The step-up in basis at death is an accounting error that distorts behavior because investors avoid realization when they should sell and move on. Three-quarters of capital gain are sucked into death and never taxed. The step-up prevents the sovereign from reaching the wealth of the nation for tax revenue. Even if the core rule of step-up remains, it should not extend into the territories beyond the core of a capital interest, akin to the castle and manor that had to be retained for the next heir.[23] If a grand simplicity is needed, no asset received by reason of death of the transferor should not be included in basis.

[22] Section 956(a)(1)(A) and (b)(3). Section 956 allows a foreign subsidiary's ownership of U.S. property to be treated as a taxable repatriation or distribution of the controlled foreign subsidiary.

[23] *See, e.g.*, Johnson, "Step-Up at Death but Not for Income," *Tax Notes*, Aug. 21, 2017, p. 1023; Johnson, "Gain Realized in Life Should Not Disappear by a Step-Up in Basis," *Tax Notes*, Sept. 4, 2017, p. 1305; and Johnson, "Cut Negative Tax Out of Step-Up at Death," *Tax Notes*, Aug. 7, 2017, p. 741.

Table A.1. Loan Repayment Schedule: Earning 10 Percent by Three $100 Repayments

End of Year	0	1	2	3
(a) Loan balance	$248.69	$173.55	$90.91	0
(b) 10% of prior row (a)		$24.87	$17.36	$9.09
(c) Constant repayment		$100	$100	$100
(d) Loan repayment then reduces row (a)		$75.13	$82.64	$90.91

VI. Appendix: Samuelson or Economic Depreciation for Three-Year Annuity

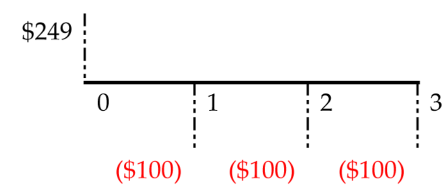
Table 1 in the text showed economic depreciation and how it fit with interest deduction for a one-year $100 cash flow. This appendix shows a slightly more complicated, three-year $100 annuity and a pattern of investment income under economic depreciation and matching interest deductions.

Assume a three-year annuity of $100 per year. The investor- taxpayer bids for the cash flows at a price to make a 10 percent annual return, which is $248.69. The bid of $248.67 is the present value of $100/(1 + 10 percent) + $100/(1 + i)^2 + $100/(1 + i)$^{-3}$ or, under the standard annuity formula, $100 * [1 - (1 + 10 percent)$^{-3}$] / 10 percent. The $248.67 will be funded by borrowing, and the bank will demand repayment in equal payments over three years, with 10 percent interest on the outstanding balance of the loan and full repayment by the last payment. Table A.1 shows the logic that the bank will make 10 percent interest on the outstanding balance with three $100 year-end payments.

In Table A.1, row (a) is the principal of the loan due to the bank. Row (b), interest, is 10 percent of the loan balance at the end of the prior year. Row (c) is the constant repayment of $100 a year at year-end. Row (d) is the portion of the constant repayment after interest is paid. Row (d) reduces the outstanding balance of the loan to zero. The bank is insisting on 10 percent return, and row (a) is thus always the present value of the $100 cash flows yet to come for the bank.

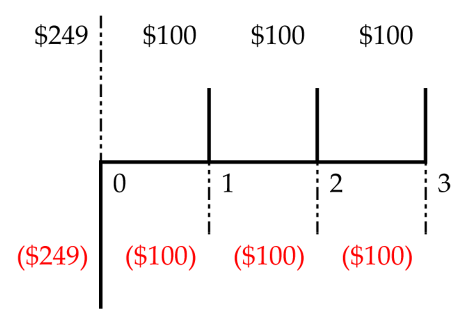
To the borrower-investor, the cash flows are the mirror image of banks' investment.

Figure A.1. Borrowing Cash Flow



Borrowing and investing are mirror images, so the taxpayer that combines investment and borrowing has no net gain or loss, cost, or benefit in any period. Figure A.2 combines Figure A.1 with investing cash flows, exactly the mirror image of A.1.

Figure A.2. Investing/Borrowing Cash Flow



The transaction in Figure A.2, combining investing and borrowing, has no net cash flow nor net economic change in any period. The tax accounting for this transaction should simply measure economic income — without favor or penalty — and not reflect "an effort to serve ancillary purposes."[24] A tax gain or loss generated from this transaction is a penalty or subsidy. Even if early losses are offset by later gains, tax savings can be invested at a positive return and have a

[24] *Portland Golf Club*, 497 U.S. at 170.

Table A.2. Investment Earning 10 Percent by Three $100 Repayments

End of Year	0	1	2	3
(a) Investment adjusted basis	$248.69	$173.55	$90.91	0
(b) 10% of prior row (a)		$24.87	$17.36	$9.09
(c) Positive cash flow		$100	$100	$100
(d) Recovery of basis (depreciation) then reduces row (a)		$75.13	$82.64	$90.91

time value, which that means that overall net zero over the three years leaves subsidies that have no justification.

The bank reports its interest at 10 percent of the outstanding balance — row (b) of Table A.1. The taxpayer's investment might not be debt, but some other kind of investment. The standard IRR yardstick, however, reanalyzes investments of widely diverse kinds as if the return were a bank debt. Bank debt with cash flows equal to the investment under consideration is always a framework, invisible but powerful in analyzing the investment in terms of banklike interest. For the hypothetical, the IRR analysis is a piece of cake because the investment's cash flow is just the mirror image of the bank debt and identical to the debt from the bank's perspective. The purchase price of the investment was derived from the same 10 percent return that the bank insisted on. Table A.2 is identical to Table 1.A, describing the investment as if it were debt, but switching the language to tax accounting for investing. The loan balance — row (a) — is now for remaining investment or investment balance, or in tax accounting what is called adjusted basis. The 10 percent of row (b) is now non-interest income, still 10 percent of the adjusted basis. The constant debt payments are now called cash from investing. The drop in amount owed is now called depreciation or recovery of basis, but it serves the same function of reducing the capital that generates the 10 percent interest.

Row (a) of Table A.2 is always the net present value of the remaining cash flows from the investment. The present value[25] of three years of $100 at 10 percent is $248.69; the present value of two years of $100 is $173.55; the present value of one year's $100 is $90.91; and when there are no more cash flows to come, the investment has zero value. If the tax accounting is to be neutral and identify the economic income of 10 percent — row (b) — the adjusted basis of the investment must be kept equal to row (a). Depreciation deductions, allowing tax-free recovery of capital against the $100 revenue, must be kept equal to the decline in the present value of the cash flows shown in row (d). The logic of Table A.2 is that depreciation deductions, row (d), will generate the real 10 percent return from the investment only if they are limited to the decline in present value of the investment, row (a). If the tax accounting is to identify the 10 percent IRR adjusted basis, row (a) must be kept up to the remaining present value of the investment — that is, the discounted value of future cash flows discounted at the IRR. The logic of row (d) is called economic depreciation because it allows depreciation deductions if and only to the extent that the taxpayer has lost value. The analysis of Table A.2 sometimes looks like rolling back the movie to get to the initial purchase price at 10 percent, but the logic follows like a proof from net present value to depreciation and basis necessary to reach the proper IRR.

The taxpayer, subject to tax accounting generated by the IRR analysis of Table A.2, would have zero taxable income or tax loss in every period. Investing $249 generates basis of $249, not deductions, and borrowing $249 is symmetrically not taxable, so year 0 has no tax consequences. The taxpayer would take interest deductions of 10 percent of the outstanding loan — namely, $24.87, $17.36, and $9.09 in years 1, 2, and 3, respectively (Table A.1, row (b)) — and would have income of the same $24.87, $17.36, and $9.09 (Table A.2, row (b)), so there is no income or deduction on net in

[25]The standard formula for present value of an annuity is $PMT * [1 - (1 + i)^{-n}/i]$, where PMT is the payment and i is the interest rate, and n is the number of periods of payments. The formula is derived from series analysis of the sum of each $100 discounted by compound interest $\$100/(1 + i)^n$.

any year. This is how it should be; the tax accounting then (and only then) reflects the economic income from the transaction without favor or penalty. The taxation of debt, including the interest deduction, forces the identification and taxation of IRR.

The depreciation schedule shown in Table A.1, row (d), is properly a decelerated depreciation schedule. The recovery of basis is larger at the end because the interest at 10 percent yields smaller interest payments as the bank account balance gets smaller and takes up less of the constant payment.

Even straight-line depreciation, considered conservative, generates artificial accounting losses at the beginning of the transaction and fake gains at the end. Straight-line depreciation would yield $249/3 or $83 worth of depreciation a year, faster in the first year and slower in the last year than the economic decline in the value of the investment. Straight-line depreciation also cannot maintain the true 10 percent on the remaining investment. The depreciation that is too large in the first year means that the interest or income is too small. Combined with debt financing, straight-line depreciation produces a negative tax subsidy better than no tax. For example, the profit reported with straight-line depreciation in year 1 is $100 less $83 depreciation, or $17, and the interest deduction in year 1 is $24.87, for a usable $7.87 loss. The loss is fake; the cash is always break-even. The early loss makes the transaction a tax shelter worth more after tax than before.

Locating IRR with economic depreciation is wonderful even beyond a fully debt-financed investment. Table A.2 follows from the initial decision to bid for the cash flows at their net present value. Economic depreciation taxing IRR is the only system that will make the purchase price of an investment independent of the purchaser's tax bracket. More generous depreciation means that higher-bracket taxpayers pay more for the property. Only economic depreciation will reduce the pretax return, arising from the taxpayer's own discount rate, by the statutory tax rate that Congress enacted. Departures from identifying IRR as taxable income are tax expenditures that need to be justified as budgeted subsidies, and they undoubtedly cannot be justified.[26]

The burden of locating IRR is that it requires a determination of FMV. Typically, that is not an impossible burden. There are markets for publicly traded stocks, used equipment, and real estate that allow reasonable estimates of value that are plausible to would-be investors. Final results can be back-apportioned so that the final tax burden is the same as if the correct IRR were taxed annually. But FMV is an underlying theory; the discounted present value of future cash flows are often hard to fix. Even market values are merely collective guesses about future cash. In any event, whereas economic depreciation taxing IRR is the perfect fit, tax law at least needs a stopgap remedy to fix the negative tax from the mismatch of debt and adjusted basis that drops too low because of depreciation that is not perfect. ■

[26]Johnson, "Measure Tax Expenditures by Internal Rate of Return," *Tax Notes*, Apr. 15, 2013, p. 273.