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Tax benefits of leasing

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HIGHLIGHTS

- We offer two general characterizations of the tax benefits of leasing.
- We rely on tax neutrality of present value or economic depreciation.
- One way compares actual tax depreciation with tax-neutral depreciation.
- The other compares actual rents with tax-neutral rents.

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ABSTRACT

Financial economists view the tax benefits of leasing as transaction-specific functions of the tax effects of rents, depreciation, and interest attributed to lessors and lessees facing different tax rates. We offer two conceptual ways to characterize those tax benefits.

In the popular press, the tax benefits of leasing are straightforward: taxes can be saved by transferring valuable depreciation deductions from low tax rate users of equipment to high tax rate lessors. Financial economists (e.g., Miller and Upton, 1976; Smith and Wakeman, 1985) have recognized, however, that the tax effects of leasing are more complex: lease rental payments generate taxable income to the recipient and deductions to the payer, and any funds borrowed generate interest deductions. While the interaction of tax effects for depreciation, rents, and interest can be modeled for specific transactions, a conceptual way to characterize the net tax benefit is missing. And while prior work recognizes that deferral of lease rents increases tax benefits, the benchmark against which deferral should be compared has also not been identified. We offer two ways to fill these gaps.

To develop those two ways of characterizing tax benefits, we build a simple transaction derived from actual tax-motivated sale/leaseback transactions (e.g., Ahlstrom and Engelson, 1999). The owner/user of an asset, facing a zero tax rate, transfers tax ownership of the asset to a taxpaying entity facing the top tax rate of 35% and immediately leases back the asset for its useful life (see Fig. 1, Panel A). Focusing on this lease, we refer to the taxpayer as the lessor and the zero-tax user as the lessee. The lessor borrows the purchase price from a lender and pays it to the lessee, and the lessee transfers that amount to a deposit earning interest. The contracted rents are set such that they are paid off exactly by principal plus interest accruing in the deposit, leaving the lessee indifferent. Because the interest rate earned on the deposit equals the rate charged by the lender, the rents received by the lessor equal the principal and interest owed to the lender.[1] The entire

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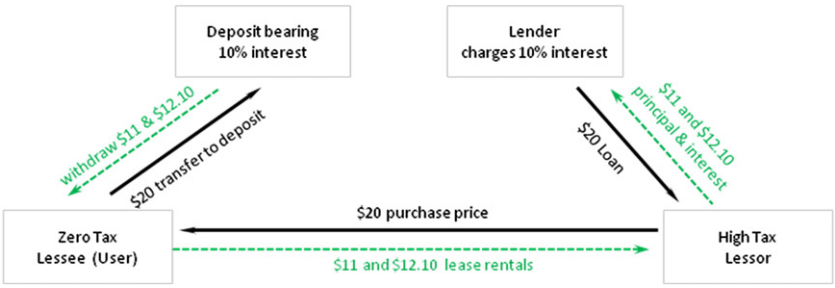
[1] Although we do not distinguish between risky and risk-free interest rates, because we do not model uncertainty, the risk-free rate is the appropriate interest rate for both the deposit and the loan, as all cash flows (rents and loan payoffs) are fully funded in advance.



Panel A: Flow of funds for sale/leaseback transaction. In year 0, a high tax-rate party (lessor) borrows $20 at 10% interest from a lender and purchases an asset from a zero tax-rate party (lessee), who transfers the $20 to a deposit bearing 10% interest. This path is shown by the black, solid line. The lessee immediately rents the asset back under a 2 year lease, agreeing to pay rent of $11 and $12.10 in years 1 and 2. The present value of those two rents is $20, discounted at 10%. In years 1 and 2, the lessee withdraws $11 and $12.10, respectively, from the Deposit and pays those amounts as rent to the lessor, who in turn pays those amounts as principal and interest to the lender. This path is shown by the dashed, green line. The transaction is self-financing and requires no funds from the lessor or lessee.

	Tax-neutral Case A		Actual Case		Tax-neutral Case B
Lease Rentals	Actual		Actual	Second	Tax-neutral
Year 1	$11.00		$11.00	⟷	$14.00
Year 2	$12.10		$12.10	Comparison	$8.80
Tax Depreciation	Tax-neutral	First	Actual		Actual
Year 1	$9.00	⟷	$12.00		$12.00
Year 2	$11.00	Comparison	$8.00		$8.00

Panel B: Comparison of actual case with two tax-neutral cases. The actual case, described in the middle column below, requires the lessee to pay the lessor rents of $11 and $12.10 in years 1 and 2 (see Panel A). Under tax depreciation rules, the lessor is allowed to depreciate the $20 asset as follows: $12 in year 1 and $8 in year 2. Case A, described in the left column below, refers to a tax-neutral case where the rents equal those in the Actual Case, but the tax depreciation allowed is based on present value depreciation associated with actual rents. The present value depreciation of $9 and $11 in years 1 and 2 is the decline in "pre-tax" value for the lessor, where pre-tax value is the present value of remaining pre-tax rents, discounted at 10%. Pre-tax value at years 0, 1, and 2 is $20, $11, and $0, respectively. This case is tax-neutral because the after-tax position of the lessor is not a function of tax rates, and no tax benefits are generated for this case. Tax-neutral Case B, described in the right column below, is based on actual depreciation, but the rents of $14 and $8.80 have been altered from the actual case to be tax-neutral; i.e., present value depreciation for those tax-neutral rents equals actual depreciation of $12 and $8 in years 1and 2. The present value of tax neutral rents, discounted at 10%, is also $20, similar to the actual rents. The first (second) way to describe leasing tax benefits compares the depreciation (rents) in the actual case with those in the tax-neutral Case A (Case B).

Fig. 1. Example used to illustrate tax benefits of leasing.

transaction is self-financing, and requires no funding by the lessor or lessee.

By capturing the essential tax features of actual tax-motivated transactions, we are assured that the after-tax value created in our simple transaction represents the conceptual tax benefits of leasing. Note that these conceptual benefits apply to all leasing transactions, including, for example, the case where lessors purchase the asset directly and lease it to users. By overlaying our transaction on an existing situation and not perturbing any underlying cash flows, we are able to abstract from various tax and non-tax effects that are in practice commingled with the tax benefits of leasing. For example, our analysis is not affected by variation in costs of capital across lessors and across lessees (e.g., some lessees might access funding at preferential tax-exempt rates) or variation across lessees in operating cash flows they can generate from the same assets. Finally, by suppressing all market imperfections and frictions we are in effect identifying the maximum tax benefits available from leasing.[2]

Our analysis relies on the concept of "present value" depreciation, which equals the decline in an asset's "pre-tax value", where pre-tax value at any point in time equals the present value of remaining pre-tax cash flows, discounted at the pre-tax cost of capital. This definition of depreciation has also been labeled economic depreciation (e.g., Samuelson, 1964); we avoid that label, however, because it covers other types of depreciation too. In particular, it has been used to measure decline in actual asset values (e.g., Miller and Upton, 1976), which depend on *after-tax* cash flows and discount rates.

Assume that the asset in our transaction generates pre-tax cash flows of $11 and $12.10 at the end of years 1 and 2, respectively. Assuming a 10% pre-tax discount rate, its current pre-tax value is $20. A year later, the asset's pre-tax value is $11—the present value of $12.10 discounted back by one year. Present value depreciation for the first (second) year is thus $9 ($11) reflecting the decline in pre-tax value from $20 to $11 ($11–$0). The depreciation actually allowed by US tax rules, which is determined by tax policy, is

[2] Actual tax-motivated transactions are associated with imperfections/frictions along many dimensions. For example, tax authorities will disallow transactions such as ours that serve no non-tax purpose, will impose limits on rent deferral and depreciation deductions, and require that the lessor bear certain risks. Non-tax considerations, such as accounting rules and legal restrictions, as well as costs paid to third parties create additional imperfections/frictions.