Dealing with Operating Leases in Valuation

Aswath Damodaran

Stern School of Business

44 West Fourth Street

New York, NY 10012

adamodar@stern.nyu.edu

Abstract

Most firm valuation models start with the after-tax operating income as a measure of the operating income on a firm and reduce it by the reinvestment rate to arrive at the free cash flow to the firm. Implicitly, we assume that the operating expenses do not include any financing expenses (such as interest expense on debt). While this assumption, for the most part, is true, there is a significant exception. When a firm leases an asset, the accounting treatment of the expense depends upon whether it is categorized as an operating or a capital lease. Operating lease expenses are treated as part of the operating expenses, but we will argue that they really represent financing expenses. Consequently, the operating income, capital, profitability and cash flow measures for firms with operating leases have to be adjusted when operating lease expenses get categorized as financing expenses. This can have significant effects not just on valuation model inputs, but also on some multiples such as Value/EBITDA ratios that are widely used in valuation.

The operating income is a key input into every firm valuation model, and it is often obtained from an accounting income statement. In using this measure of earnings, we implicitly assume that operating expenses include only those expenses designed to create revenue in the current period, and that they do not include any financing expenses. For the most part, accounting statements separate out financing expenses such as interest expense and show them after operating income. There is one significant exception to this rule, and that is created by the accounting treatment of operating lease expenses, which are categorized as operating expenses to arrive at operating income. We will make the argument in this paper that these expenses are really financing expenses, and that ignoring this misclassification can create significant problems in measuring and comparing profitability. We also suggest two ways in which we can recategorize operating lease expenses as financing expenses.

The Accounting Treatment of Leases

Firms often have a choice between buying assets and leasing them. When, in fact, assets are leased, the treatment of the lease expenses can vary depending upon how leases are categorized and this can have a significant effect on measures of operating income and book value of capital. In this part of the paper, we will begin by looking at the accounting treatment of leases and how it affects operating earnings, capital and profitability.

Operating versus Financial Leases: Basis for Categorization

An operating or service lease is usually signed for a period much shorter than the actual life of the asset, and the present value of lease payments are generally much lower than the actual price of the asset. At the end of the life of the lease, the equipment reverts

back to the lessor, who will either offer to sell it to the lessee or lease it to somebody else. The lessee usually has the option to cancel the lease and return equipment to the lessor. Thus, the ownership of the asset in an operating lease clearly resides with the lessor, with the lessee bearing little or no risk if the asset becomes obsolete. An example of operating leases would be the store spaces that are leased out by specialty retailing firms like the Gap.

A financial or capital lease generally lasts for the life of the asset, with the present value of lease payments covering the price of the asset. A financial lease generally cannot be canceled, and the lease can be renewed at the end of its life at a reduced rate or the asset acquired at a favorable price. In many cases, the lessor is not obligated to pay insurance and taxes on the asset, leaving these obligations up to the lessee; the lessee consequently reduces the lease payments, leading to what are called net leases. In summary, a financial lease imposes substantial risk on the shoulders of the lessee.

While the differences between operating and financial leases are obvious, some lease arrangements do not fit neatly into one or another of these extremes; rather, they share some features of both types of leases. These leases are called combination leases.

Accounting For Leases

The effects of leasing an asset on accounting statements will depend on how the lease is categorized by the Internal Revenue Service (for tax purposes) and by generally accepted accounting standards (for measurement purposes). Since leasing an asset rather than buying it substitutes lease payments as a tax deduction for the payments that would have been claimed as tax deductions by the firm if had owned the asset (depreciation and interest expenses on debt), the IRS is wary of lease arrangements designed purely to

speed up tax deductions. Some of the issues the IRS considers in deciding whether lease payments are tax deductible include the following:

- Are the lease payments on the asset spread out over the life of the asset or are they accelerated over a much shorter period?
- Can the lessee continue to use the asset after the life of the lease at preferential rates or nominal amounts?
- Can the lessee buy the asset at the end of the life of the lease at a price well below market?

If lease payments are made over a period much shorter than the asset's life and the lessee is allowed either to continue leasing the asset at a nominal amount or to buy the asset at a price below market, the IRS may view the lease as a loan and prohibit the lessee from deducting the lease payments in the year(s) in which they are made.

Lease arrangements also allow firms to take assets off the balance sheet and reduce their leverage, at least in cosmetic terms; in other words, leases are sometimes a source of off-balance sheet financing. Consequently, the Financial Accounting Standards Board (FASB) has specified that firms must treat leases as capital leases if any one of the following four conditions hold:

1. The life of the lease is at least 75% of the asset's life.

2. The ownership of the asset is transferred to the lessee at the end of the life of the lease.

3. There is a "bargain purchase" option, whereby the purchase price is below expected market value, increasing the likelihood that ownership in the asset will be transferred to the lessee at the end of the lease.

4. The present value of the lease payments exceeds 90% of the initial value of the asset.

All other leases are treated as operating leases.

Effect on Expenses, Income and Taxes

If, under the above criteria, a lease qualifies as an operating lease, the lease payments are operating expenses which are tax deductible. Thus, although lease payments reduce income, they also provide a tax benefit. The after-tax impact of the lease payment on income can be written as:

After-tax Effect of Lease on Net Income = Lease Payment (1 - t)

where t is the marginal tax rate on income.

Note the similarity in the impact, on after-tax income, of lease payments and interest payments. Both create a cash outflow while creating a concurrent tax benefit, which is proportional to the marginal tax rate.

The effect of a capital lease on operating and net income is different than that of an operating lease because capital leases are treated similarly to assets that are bought by the firm; that is, the firm is allowed to claim depreciation on the asset and an imputed interest payment on the lease as tax deductions rather than the lease payment itself. The imputed interest payment is computed by assuming that the lease payment is a debt payment and by apportioning it between interest and principal repaid. Thus, a five-year capital lease with lease payments of $ 1 million a year for a firm with a cost of debt of 10% will have the interest payments and depreciation imputed to it shown in Table 1.

Table 1: Lease Payments, Imputed Interest and Depreciation

Year	Lease Payment	*Imputed*				
		Interest Expense	Reduction in Lease Liability	Lease Liability	Depreciation	Total Tax Deduction
1	$ 1,000,000	$ 379,079	$ 620,921	$ 3,169,865	$ 758,157	$ 1,137,236
2	$ 1,000,000	$ 316,987	$ 683,013	$ 2,486,852	$ 758,157	$ 1,075,144
3	$ 1,000,000	$ 248,685	$ 751,315	$ 1,735,537	$ 758,157	$ 1,006,843
4	$ 1,000,000	$ 173,554	$ 826,446	$ 909,091	$ 758,157	$ 931,711
5	$ 1,000,000	$ 90,909	$ 909,091	$ (0)	$ 758,157	$ 849,066
	$ 3,790,787					

The lease liability is estimated by taking the present value of $ 1 million a year for five years at a discount rate of 10% (the pre-tax cost of debt), assuming that the payments are made at the end of each year.

Present Value of Lease Liabilities = $ 1 million (PV of Annuity, 10%, 5 years)

= $ 3,790,787

The imputed interest expense each year is computed by calculating the interest on the remaining lease liability:

In year 1, the lease liability = $ 3,790,787 * .10 = $ 379,079

The balance of the lease payment in that year is considered a reduction in the lease liability:

In year 1, reduction in lease liability = $ 1,000,000 - $379,079 = $ 620,921

The lease liability is also depreciated over the life of the asset, using straight line depreciation in this example.

If the imputed interest expenses and depreciation, which comprise the tax deductible flows arising from the lease, are aggregated over the five years, the total tax deductions amount to $ 5 million, which is also the sum of the lease payments. The only difference is in timing — the capital lease leads to greater deductions earlier and less later on.

Effect on Balance Sheet

The effect of leased assets on the balance sheet will depend on whether the lease is classified as an operating lease or a capital lease. In an operating lease, the leased asset is not shown on the balance sheet; in such cases, leases are a source of off-balance sheet financing. In a capital lease, the leased asset is shown as an asset on the balance sheet, with a corresponding liability capturing the present value of the expected lease payments. Given the discretion, many firms prefer the first approach, since it hides the potential liability to the firm and understates its effective financial leverage.

What prevents firms from constructing lease arrangements to evade these requirements? The lessor and the lessee have very different incentives, since the arrangements that would provide the favorable "operating lease" definition to the lessee are the same ones under which the lessor cannot claim depreciation, interest, or other tax benefits on the lease. In spite of this conflict of interest, the line between operating and capital leases remains a thin one, and firms constantly figure out ways to cross the line.

These conditions for classifying operating and capital leases apply in most countries; France and Japan are major exceptions — in these countries, all leases are treated as operating leases.

Effect on Financial Ratios

The effect of leases on the financial ratios of a firm depends on whether the lease is classified as an operating or a capital lease. Table 2 summarizes types of profitability, solvency, and leverage ratios and the effects of operating and capital leases on each. (The effects are misleading, in a way, because they do not consider what would have happened if the firm had bought the asset rather than lease it.)

Table 2: Effects of Operating and Capitalized Leases

Ratio	*Effect of Operating Lease*	*Effect of Capitalized Lease*
Return on Capital	· Decreases EBIT through lease expense · Capital does not reflect leases · ROC is higher	· Decreases EBIT through depreciation · Capital increases through present value of operating lease · ROC is lower
Return on Equity	· Net income lowered by after-tax lease expense · BV of Equity Unaffected · ROE effect depends on whether lease expense > (imputed interest + depreciation)	· Net income lowered by after-tax interest expense & depreciation · BV of Equity unaffected · ROE effect depends on whether lease expense > (imputed interest + depreciation)
Interest Coverage	· EBIT(1-t) decreases · Interest Exp. unaffected · Coverage ratio generally higher	· EBIT(1-t) decreases · Interest Exp. increases · Coverage Ratio generally lower
Debt Ratio	· Debt is unaffected · Debt Ratio is lower	· Debt increases (to account for capitalized leases) · Debt Ratio is higher

Since the level of financial ratios, and subsequent predictions, can vary depending on whether leases are treated as operating or capital leases, it may make sense to convert operating leases into capitalized leases when comparing these ratios across firms.

In Summary …

When a lease arrangement qualifies as an operating lease, there are profound consequences for the reported earnings, book value of debt and capital, and return ratios of that firm. In general,

· both the operating and net income of the firm will be lowered

· the debt and capital for the firm will be understated

· the return on equity and capital will be much higher

when a lease is treated as an operating lease rather than a capital lease.

The Financial View of Operating Lease

In finance, our view of all leases, operating as well as capital, is colored by whether the lease payment represents a commitment similar to interest payments on debt. If the answer is in the affirmative, leasing becomes an alternative to borrowing and buying the assets, and lease payments becomes financial expenses rather than operating expenses. This can have significant implications for the measurements of income, debt and overall profitability. In this section, we will explore two ways of adjusting valuation inputs for operating leases.

The Capital Adjustment

If operating lease expenses are to be considered financing expenses, it stands to reason that the present value of commitments to make such payments in the future has to be treated as debt. Accounting standards in the United States require that operating lease commitments for the next five years be reported as part of the footnotes to financial statements, and that any commitments beyond that period be cumulated and reported with the commitments five years from now.

To convert operating lease commitments into an equivalent debt amount requires that we discount these commitments back to the present. Again, consistency requires that we use a pre-tax cost of debt for the discounting, since the commitments are pre-tax and the lease expenses are being treated as financing expenses. The cost of debt can, however, vary depending upon whether debt is secured or unsecured. Since the claims of lessees are similar to the claims of unsecured debt holders, as opposed to secured debt holders, the firm's cost of unsecured debt should be used in discounting lease commitments.

To compute the “debt” value of operating leases, the present value of actual lease commitments is computed over time. The cumulation of all lease commitments after the fifth year into that year's amount does create a discounting problem. One simple approximation that works is to use the average lease commitment over the first four years as an approximate annuity in converting the final cumulated amount into annual amounts. Thus, a firm that has average lease commitments of $ 2 million for the next 4 years, and shows a cumulated commitment of $ 12 million in year 5, can be considered to have annual lease payments of $ 2 million a year for 6 years starting in year 5 for present value purposes.

The book value of equity should be unaffected by either adjustment, but the book value of capital will then be the sum of the debt, including converted operating leases, and the book value of equity.

Illustration 1: The Home Depot - Capital Estimation with Operating Income Recategorized

The Home Depot, as a retail firm which leases most of its store spaces, has considerable lease commitments outstanding. We begin by reporting the operating lease commitments that the Home Depot reports in its last annual report (February 28, 1998), and computing the capitalized value of these operating lease commitments: To compute the present value of the operating lease expenses, we use the pre-tax cost of borrowing for the Home Depot of 6.25%.

Year	Operating Lease Expense	Present Value at 6.25%

1	$ 294	$ 277
2	$ 291	$ 258
3	$ 264	$ 220
4	$ 245	$ 192
5	$ 236	$ 174
Yr 6 -15	$ 270	$ 1,450
PV of Operating Lease Expenses		$ 2,571

The operating lease expenses after year 5 are treated as an annuity. The present value of operating leases can be treated as the equivalent of debt.

The following table summarizes the book value of capital, when operating lease expenses are capitalized, at the Home Depot:

	Home Depot
Book Value of Capital	$8,513
+ Present Value of Operating Leases	$2,571
= Adjusted Book Value of Capital	$11,084

The capitalization of operating leases increases the book value of capital substantially. There is no effect on the book value of equity.

The Income Adjustment

If operating lease expenses represent fixed commitments for the future, then they have to be treated as financing expenses rather than operating expenses. This will have a significant impact on operating income, since it is defined to be net of just operating expenses. Thus, the operating income for a firm will always increase when operating lease expenses are re-categorized as financing expenses. To obtain the adjusted operating

income, the operating income will be increased by the imputed interest expense on the capitalized debt.

Adjusted Pre-tax Operating Income = EBIT + Imputed Interest Expense on Capitalized Lease

Moving operating leases from the operating expense to the financing expense column, by itself, should have no effect on the net income. If we decide to treat operating leases as capital leases, and estimate imputed interest and depreciation on it, there can be timing effects on net income, with the net income in earlier years being lower and in later years being higher as a result of the recategorization.

$\text{Net Income}_{\text{comples}}$ = Net Income + Operating Lease Expenses – Imputed Interest Expense on Capitalized Lease – Depreciation on Capitalized Lease Asset

If we make the simplifying assumption that the operating lease expense is equal to the sum of the imputed interest expense and the depreciation, then the net income will be unaffected by this categorization.

Illustration 2: The Home Depot - Income Estimation with Operating Leases Recategorized

We will estimate the adjusted operating and net income for the Home Depot, using the information on operating leases provided in illustration 1. We use the capitalized value of operating leases of $2,571 million computed in the previous illustration to adjust the operating income. We compute the inputed interest expense, using Home Depot's pre-tax cost of debt of 6.25% and debt value of operating leases:

Imputed Interest Expense = $2,571 million * .0625 = $ 161 million

In the following table, we adjust the operating income, after-tax operating income and net income at Home Depot for operating lease expenses.

Adjusted Operating Income

	Home Depot
Operating Income	$2,016
+ Imputed Interest Expense on Operating Leases	$161
= Adjusted Operating Income	$2,177

Note that the adjusted operating income is higher than the reported operating income.

The after-tax adjusted operating income is computed in the table below for the Home Depot.

Adjusted After-tax Operating Income

Operating Income (1-t)	$1,311
+ Imputed Interest Expense (1- t)	$104
= Adjusted After-tax Operating Income	$1,415

The imputed interest expense added back here is the after-tax expense, obtained by multiplying the pre-tax interest expense by (1- marginal tax rate).

Alternatively, the adjusted operating income could have been multiplied by (1-t) to arrive at the same estimate of after-tax operating income.

The net income of $1,228 million of the Home Depot is unaffected by the capitalization of operating lease expenses, because we assume that the operating lease expense is equal to the sum of depreciation and imputed interest expenses.

The Profitability Adjustment

The conversion of operating lease expenses into financing expenses increases operating income and capital, and thus affects any profitability measure using one or both

of these numbers. The most directly affected estimate is the return on capital, which is the operating income divided by the book value of capital.

$$\text{Return on Capital} = \frac{(\text{EBIT} + \text{Operating Lease Expense})\,(1 - \text{tax rate})}{\left(\text{Book Value of Debt} + \frac{\text{Operating Lease Expense}}{k_d} + \text{Book Value of Equity}\right)}$$

The effect on return on capital will be determined by the present value of operating lease commitments over time (PVOL) and the method used to compute depreciation on the asset created. The return on capital can then be estimated as follows:

$$\text{Return on Capital} = \frac{(\text{EBIT} + \text{Operating Lease Expense} - \text{Depreciation}_{\text{PVOL}})\,(1 - \text{tax rate})}{(\text{Book Value of Debt} + \text{PVOL} + \text{Book Value of Equity})}$$

If we assume that the difference between operating lease expenses and the imputed interest expense is equal to the depreciation on the asset created by operating leases, this computation can be simplified further:

$$\text{Return on Capital} = \frac{(\text{EBIT} + \text{Imputed Interest Expense on Capitalized Leases})\,(1 - \text{tax rate})}{(\text{Book Value of Debt} + \text{PVOL} + \text{Book Value of Equity})}$$

Whether return on capital will increase or decrease in this case will depend upon whether the unadjusted pre-tax return on capital is greater than the pre-tax cost of debt. Thus,

If	Unadjusted Pre-tax ROC > Pre-tax cost of debt	ROC will decrease
	Unadjusted Pre-tax ROC < Pre-tax cost of debt	ROC will increase

The comparison can also be made entirely in after-tax terms.

With our assumption that the operating lease expense is equal to the sum of the imputed interest expense and the depreciation on the capitalized lease asset, the return on equity should be unaffected by whether we capitalize operating leases or not.

Illustration 3: The Home Depot - Profitability Estimation with Operating Income recategorized

The following table summarizes the adjusted operating income and capital at the Home Depot.

	Home Depot	*Home Depot (Adjusted)*
After-tax Operating Income	$1,311	$1,415
BV of Capital - Beginning	$7,205	$9,776
BV of Capital - Ending	$8,513	$11,084
BV of Capital - Average	$7,864	$10,430
ROC (based on average)	16.67%	13.56%
ROC (based on beginning)	18.20%	14.47%

Note that the return on capital drops when operating leases are capitalized because the return on capital is well in excess of the cost of debt of 6.25%. The return on equity will be unaffected since neither the net income nor the book value of equity will be affected by the recategorization of operating lease expenses.

The Free Cash Flow Adjustment

In valuation, it is the free cash flows to the firm, defined as the cash flows left over after reinvestment needs have been met, that are discounted at the cost of capital to arrive at firm value. When operating lease expenses are treated as financing expenses, not only is operating income affected but so is the net capital expenditure. To be consistent with our treatment of operating leases as financing expenses in the course of acquiring an asset, we need to consider changes in the present value of operating lease expenses over time as the equivalent of capital expenditures. The net capital expenditures on operating

leases is determined by the increase in the present value of the operating lease commitments over time.

$$\text{Net Cap Ex}_t = (\text{PVOL}_t - \text{PVOL}_{t-1})$$

Thus, firms with increasing operating lease expenses over time will have a net capital expenditure reflecting this growth.

The final effect on free cash flow to firm of treating operating lease expenses as financing expenses will depend upon two factors –

- The reclassification of operating expense as financing expenses will increase the free cash flow to the firm because the imputed interest expense on the capitalized operating leases has to be added back to the operating income.
- Any increase in the present value of operating lease expenses over time will have a negative effect on cash flows because it will be treated as an additional capital expenditures.

There is no effect on free cash flow to equity of reclassifying operating lease expenses as financing expenses. This is because the increase in capital expenditures created by the change in the present value of operating lease expenses will be exactly offset by the increase in net debt created by this reclassification.

Illustration 4: The Home Depot - Free Cash Flow Estimation with Operating Income recategorized

The following table summarizes free cash flows to the firm at the Home Depot with operating leases reclassified as financing expenses:

	Home Depot	*Home Depot (with Operating Lease Adjustment)*
Operating Income (1-t)	$1,311	$1,415

+ Depreciation	283	283
- Capital Expenditures	1,396	$ 1,453
- Change in Working Capital	474	474
FCFF	($277)	($230)

The adjusted operating income is computed in illustration 2. The present value of operating leases at the Home Depot increased from $2,514 million to $2,571 million ove the year. The difference of $ 57 million is added on to the net capital expenditures. The free cash flows to the firm are more positive (less negative) if operating lease expenses are treated as financing expenses, because the imputed interest expense is now treated as a financing expense.

The table below summarizes the effect of capitalizing the operating lease expenses on the free cash flow to equity:

	Home Depot	Home Depot with adjustment
Net Income	$1,228	$1,228
+ Depreciation	$283	$283
- Capital Expenditures	$1,396	$1,453
- Change in Working Capital	$474	$474
+ Net Debt Issued	-25	$32
= FCFE	($384)	($384)

The increase in capital expenditures of $57 million, attributable to the increase in the present value of operating leases, also shows up as an increase to net debt issued, leaving the ultimate FCFE unaffected. Intuitively, this makes sense, since reclassifying an operating expense as a financing expense should not affect the FCFE, which is after financing expenses.

The Effect on Discounted Cash Flow Value

Looking back at the last three sections, converting operating lease expenses into financing expenses affects firm cash flows by changing both the operating income and the net capital expenditures, and the cost of capital by altering the debt ratio. It can also affect expected growth in the operating income to the extent that it has an impact on both the reinvestment rate and the expected return on capital. Once firm value has been estimated with the modified inputs, the debt that is netted out to arrive at the market value of equity should include the debt value of operating leases.

Converting operating lease expenses into financing expenses should have no impact on equity valuation. The free cash flows to equity are after both operating and financing expenses, and are thus unaffected by recategorizing operating lease expenses, especially since there is no tax effect from the recategorization. The cost of equity is not affected by the treatment of the present value of operating lease expenses as debt.

Illustration 5: The Home Depot - DCF Value with Operating Income recategorized

Converting operating lease expenses affects both cash flows and discount rates. In the following illustration, we will value Home Depot twice, once with the unadjusted operating income and cost of capital and one with the adjusted operating income and cost of capital.

We will begin by summarizing the estimates for cost of capital and operating leases with and without the operating lease adjustments:

	Current	Adjusted
Revenues	$24,156	$24,156
Operating Income (1-t)	$1,310	$1,415

+ Depreciation	$283	$283
- Capital Expenditures	$1,396	$1,453
- Change in Working Capital	$474	$474
FCFF	($277)	($230)
Market Value of Equity =	51379	51379
Debt Outstanding =	1205	3776
Debt/Capital Ratio =	2.29%	6.85%
Cost of Equity	9.80%	9.80%
Cost of Debt	4.06%	4.06%
Cost of Capital	9.67%	9.41%

To do the valuation, we will assume that revenues, operating income and depreciation will grow at 15% a year for the next 5 years and 5% thereafter. Capital expenditures and capitalized leases are assumed to grow 5% a year for the next 5 years. After year 5, we will assume that capital expenditures (not counting capital leases) after year 5 will be 150% of depreciation, and that capitalized leases will continue to grow at 5% a year.

In the following table, we summarize the expected cash flows to the firm on an annual basis for the next 5 years and the terminal year (year 6) with unadjusted operating income. We also compute the present value of the cash flows at the unadjusted cost of capital:

	Base	*1*	*2*	*3*	*4*	*5*	*Terminal Year*
Revenues	$24,156	$27,779	$31,946	$36,738	$42,249	$48,586	$51,016
EBIT(1-t)	$1,310	$1,507	$1,733	$1,993	$2,292	$2,636	$2,767
+	$283	$325	$374	$430	$495	$569	$598

Depreciation							
- Cap Ex	$1,396	$1,466	$1,539	$1,616	$1,697	$1,782	$897
- Change in WC	$474	$ 290	$ 333	$ 383	$ 441	$ 507	$532
FCFF	($277)	$77	$235	$424	$649	$916	$1,936
Terminal Value						$ 41,475	
PV		$70	$195	$321	$449	$26,722	

Summing up the present values of the cash flows gives us an estimate for the value of the firm, and netting out the unadjusted debt gives us the value of equity:

Value of Firm = $27,757

- Value of Debt = $1,205

Value of Equity = $26,552

In the following table, we estimate the value of the firm using the adjusted cash flows to the firm and the adjusted cost of capital:

	Base	*1*	*2*	*3*	*4*	*5*	*Terminal Year*
Revenues	*$24,156*	*$27,779*	*$31,946*	*$36,738*	*$42,249*	*$48,586*	*$51,016*
EBIT(1-t)	*$1,415*	*$1,627*	*$1,871*	*$2,152*	*$2,475*	*$2,846*	*$2,988*
+ Deprec'n	*$283*	*$325*	*$374*	*$430*	*$495*	*$569*	*$598*
- Cap Ex	*$1,453*	*$1,594*	*$1,674*	*$1,758*	*$1,846*	*$1,938*	*$1,061*
- Δ WC	*$474*	*$290*	*$333*	*$383*	*$441*	*$507*	*$532*
FCFF	*($230)*	*$68*	*$238*	*$441*	*$683*	*$970*	*$1,993*
Terminal Value						*$45,218*	
PV		*$62*	*$199*	*$337*	*$477*	*$29,465*	
Capitalized Leases	*$2,571*	*$2,700*	*$2,835*	*$2,976*	*$3,125*	*$3,281*	*$3,445*

Change in Cap Leases	*$129*	*$135*	*$142*	*$149*	*$156*	*$164*

The change in the capitalized leases from year to year is added on to capital expenditures each year. The value of the firm and the value of the equity can then be estimated, using the adjusted value of debt outstanding:

Value of Firm = $30,540

- Value of Debt = $3,776

Value of Equity = $26,764

Note that the value of the firm increases but so does the value of the debt. The value of equity is very close to the value of equity estimated using the unadjusted operating income and the unadjusted cost of capital. This should not be surprising. As long as the debt ratio stays stable, and the operating leases are fairly valued, treating operating leases as debt should have a neutral effect on the value of the equity in the firm.

Under what conditions will the two values diverge significantly? If the present value of the operating leases increases at a rate different from other capital expenditures, the value of the firm computed using the adjusted cashflows and cost of capital will change because the debt ratio will change. Under those conditions, the value obtained using the adjusted estimates will be more precise.

The value of the equity will be unaffected by the treatment of operating leases as debt, as long as the leverage is not expected to change over the valuation period. If it is, there will be an effect, because only because the cost of equity will change as the leverage changes.

The Adjustment to Multiples

Much the same analysis applies when we look at the impact of capitalizing operating lease expenses on widely used multiples. If the multiple is an equity multiple, such as price/earnings or price/book value, there should be no effect from recategorizing operating lease expenses. If the multiple, however, is a firm value multiple, there can be significant shifts in the value once operating lease expenses are recategorized, because of the effects on both operating income and capital. As an example, the Value/EBITDA multiple with operating lease expenses recategorized would be:

$$\frac{\text{Value}}{\text{EBITDA}} = \frac{\text{MV of Equity + MV of Debt + PV of Operating Leases}}{\text{EBITDA + Operating Lease Expenses}}$$

Whether the Value/EBITDA multiple will increase or decrease will depend, again, on whether the unadjusted Value/EBITDA is greater than or lesser than the ratio of the present value of operating lease expenses to the annual operating lease expense.

With the value/sales multiple, converting operating leases to equivalent debt value will always increase the multiple, since the firm value will increase to include the present value of operating leases while the denominator will remain unchanged.

The implications for analysis where firm value multiples are compared across companies can be profound in any of the following scenarios:

- When some firms lease assets and other firms buy them, converting operating leases to equivalent debt will make the firm value multiples more comparable.
- When some firms treat leases as capital leases, while other firms qualify for operating leases, there can be significant changes in how companies rank on firm value multiples after operating leases are converted into equivalent debt.

· Even if all firms treat all leases as operating leases, there can be significant differences across firms in how large these lease commitments are as a percent of operating expenses. In these cases, again, the conversion of operating lease expenses to debt will give more realistic assessments of where these firms stand.

Illustration 6: The Home Depot - Multiples with Operating Income recategorized

In the following table, we summarize the firm value multiples for the Home Depot with and without the operating lease adjustments:

	Home Depot	*Home Depot (with adjustments)*
Market Value of Equity	$51,379	$51,379
Value of Debt	$1,205	$3,776
EBITDA	$2,299	$2,593
EBIT	$2,016	$2,177
EBIT(1-t)	$1,310	$1,415
Value/EBITDA	22.87	21.27
Value/EBIT	26.08	25.34
Value/EBIT(1-t)	40.13	38.98

Note that the adjusted value multiples are consistently lower than the unadjusted multiples when operating leases are capitalized.

Conclusion

Firm valuation can be impacted by how we deal with operating leases. While the accounting distinction between capital and operating leases may seem reasonable, there seems to be no reason, from a financial standpoint, to maintain that distinction when it

comes to estimating operating income, capital and profitability. Operating lease expenses need to be reclassified as financial expenses and this will affect our estimates of operating income. The present value of future operating lease expenses need to be treated like debt, and this will have an impact on assessments of capital and leverage for firms. Finally, in estimating free cash flows for valuation purposes, expected increases in operating lease commitments over time have to be shown as capital expenditures.