Leases, Debt and Value

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Abstract

When analyzing or the value of a firm, there are three basic questions that we need to address: How much is the firm generating as earnings? How much capital has been invested in its existing investments? How much has the firm borrowed? In answering these questions, we depend upon accounting assessments of earnings, book capital and debt. We assume that the reported operating income is prior to any financing expenses and that all debt utilized by the firm is treated as such on the balance sheet. While this assumption, for the most part, is well founded, 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 payments are treated as part of operating expenses, but we will argue that they are really financing expenses. Consequently, the stated 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 far reaching implications for profitability, financial leverage and assessed value at firms.

Many firms that use long-lived, expensive assets for their operations have a choice of either buying these assets, often borrowing a significant portion of the costs, or leasing them. Since the firm puts the assets to use, generating revenues and operating profits, in either case, it seems logical to consider leasing as a financing choice and leasing costs as financing costs. Unfortunately, both US and international accounting standards choose to ignore this logic and allow a significant portion of lease expenses to be treated as operating expenses. Consequently, the operating income of a firm that has significant operating lease expenses will be misstated, as will the reported book values of debt and capital. If we use these reported numbers in analyzing the firm, we will arrive at skewed estimates of profitability, leverage and value.

In this paper, we will begin by examining the accounting and tax treatment of leases and follow up by presenting the argument for why leases should be treated as financing expenses. We will then follow through by examining the consequences of converting leases into debt, for widely used measures of financial leverage and profitability. In the next section, we will explore the effects of converting leases to debt on cash flows, costs of capital and firm value. In the final section, we will examine the factors that firms should consider in deciding on whether to lease or buy assets.

The issue is timely, now that recent news stories suggest that both the Financial Accounting Standards Board (FASB) and the International Accounting Standards Board (IASB) are considering changing the treatment of operating leases and moving it in the direction that we suggest it should be in this paper. If and when this shift occurs, the changes that we list in this paper will be manifested in financial statements. Rather than wait for accounting statements to reflect reality, we should be making these changes already, when analyzing companies. As with employee option expenses, another long-term mis-categorized item in accounting statements, we should be doing what is right in valuation and corporate financial analysis, rather than bending our assessments to fit accounting rules that do not make sense.

The Accounting and Tax Treatment of Leases

When assets are leased, the accounting treatment of the lease expenses can vary depending upon how leases are categorized, and this can have a significant effect on measures of profitability and financial leverage. In this part of the paper, we will begin by

looking at the accounting and tax treatment of leases and how this treatment affects reported operating earnings, capital and profitability.

Operating versus Financial Leases: Basis for Categorization

For much of the last few decades, US accounting standards have categorized leases into operating leases and financial/capital leases, with profoundly different consequences for income statements, balance sheets and even statements of cash flows.

- 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, sometimes at a cost. Thus, the ownership of the asset in an operating lease resides with the lessor, with the lessee bearing little or no risk, if the asset becomes obsolete. Most leases at retail firms and restaurants, two sectors where leasing is common place, are operating leases.
- 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 clear, 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.

As we look at the distinction between operating and capital leases, it is clear that it is driven primarily by who effectively owns the asset rather than the nature of the lease commitment.

Accounting For Leases – Reporting and Tax Categorization

While both the accounting regulators and tax authorities share the ownership driven view of lease classification, there are differences in how they put this view into practice. Driven largely by its desire to prevent companies from using operating leases to take assets off the books and as a source of off-balance sheet financing, 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.

The tax authorities on the other hand, care less about off-balance sheet financing and more about the consequences for tax collection. 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 operating leases and hence fully 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. Since the tax authorities and the accounting regulators have different considerations, when making their classifications, there are some cases where they will diverge. In other words, there can be scenarios where a firm is allowed to treat a lease as an operating lease by the accounting standards but is forced to recognize it as a loan by tax laws.

IAS 17, the International Accounting Standards Board (IASB) rule that governs international lease accounting specifies five conditions under which a lease will be categorized as a capital lease:

- The lease transfers ownership of the asset to the lessee by the end of the lease term;
- The lessee has the option to purchase the asset at a price which is expected to be sufficiently lower than fair value at the date the option becomes exercisable that, at the inception of the lease, it is reasonably certain that the option will be exercised;
- The lease term is for the major part of the economic life of the asset, even if title is not transferred;
- At the inception of the lease, the present value of the minimum lease payments amounts to at least substantially all of the fair value of the leased asset; and
- The lease assets are of a specialized nature such that only the lessee can use them without major modifications being made.

Note the similarity between these rules and the FASB criteria used for lease categorization. The one area of difference is in the disclosure requirements on operating leases. While FASB requires that lease commitments be disclosed for each of the next 5 years, IASB allows companies to report a combined lease commitment for years 2-5.

There are several markets, where companies are covered neither by FASB or IASB. In these markets, including most in Asia and Latin America, almost all lease and rental expense are treated as operating expenses and there is little or no disclosure about future commitments.

Effects on Financial Statements

The classification of a lease into either the operating or the capital column will have significant effects on both income statements and balance sheets. In general, treating

a lease as an operating lease will result in lower operating income, financial leverage and book capital for a firm, than if that same lease had been considered a capital lease.

a. Income Statement effects: If, under the criteria listed in the last section, a lease qualifies as an operating lease for both accounting and tax purposes, the lease payments are treated as operating expenses which are tax deductible. Thus, although lease payments reduce income, they provide a tax benefit. The after-tax impact of the lease payment on income can be written as:

After-tax Effect of Lease expenses on Earnings = Lease Payment (1 – tax rate)

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 pre-tax 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 of $3,798,787 is also depreciated over the 5-year 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. This, in turn, will mean that the firm will report higher net income in the early years (1-3), at least in this case, if the lease is treated as an operating rather than capital lease; the cash flow effect will be in the opposite direction. Treating a lease as an operating leases will almost always lower operating income, since it effectively moves a financial expense (imputed interest expense) above the operating income line.

b. Balance sheet effect: 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. As a consequence, the debt on the balance sheet will not reflect the lease commitments and there will be no asset to reflect that commitment either. In effect, both sides of the balance sheet will have shrunk, with both assets and debt being under stated. In a capital lease, the present value of the lease commitments is shown as debt, and thus adds to the conventional debt of the firm. At the same time, there is an item created on the other side of the balance sheet, representing the leased asset. Any measures that build on these balance sheet items, such as total assets or invested capital, will also be affected by whether a lease is treated an operating or capital lease.

Given the discretion, many firms prefer operating leases, since they hide the potential liability to the firm and understate 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 fine one, and firms can figure out ways to cross the line.

Effect on Financial Ratios

If the classification into operating and capital leases affects both income statements and balance sheets, it stands to reason that it also will affect financial ratios that are computed from numbers in those statements. Table 2 summarizes 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 Capital Lease*
Return on Capital or ROIC = $\frac{\text{EBIT}(1-t)}{\text{BV of Capital}}$	• Decreases operating income through lease expense • Capital does not reflect leases • ROC is generally higher	• Decreases operating income only through depreciation. • Capital increases through present value of operating lease. • ROC is generally lower
Return on Equity (ROE) = $\frac{\text{Net Income}}{\text{BV of Equity}}$	• 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 on leased asset. • BV of Equity unaffected • ROE effect depends on whether lease expense > (imputed interest + depreciation)
Interest Coverage= $\frac{\text{EBIT}}{\text{Interest Expense}}$	• Operating income generally decreases. • Interest expense does not include leases. • Coverage ratio generally higher	• Operating income decreases • Interest expense increases to reflect imputed interest on leases • Coverage Ratio generally lower
Debt Ratio = $\frac{\text{Debt}}{(\text{Debt}+\text{Equity})}$	• Debt includes only conventional debt (no leases) • Debt Ratio is lower, both in book and market terms.	• Debt increases (to account for capitalized leases) • Debt Ratio is higher

If we compare any of these ratios across firms in a sector, as if often the case, we have to recognize that differences in how firms account for assets can have profound effects on these ratios. For instance, a comparison of Abercombie & Fitch and Target on profitability and debt ratios will be contaminated by the fact that A&F leases almost all of its stores, whereas Target leases some stores and borrows and buys other store sites.

Leasing as Financial Expenses

Accounting and tax authorities categorize leases into operating and capital leases, primarily based upon where the ownership rights to the asset reside. In this section, we will first make the argument that whether an item is an operating or a financing expense should be determined by the nature of the cash flow claims rather than ownership rights. We will then set up the process for converting operating leases from operating to financing expenses, and examine the mechanics involved.

The logic

The distinction between debt and equity, from a corporate finance standpoint, boils down to the differences in the cash flow claims associated with each type of financing. With debt, your cash flows claims are contractually set at the time of borrowing, and a failure to meet the claims can lead to bankruptcy or at least loss of control over an asset or even the entire firm. With equity, your claims are residual claims, i.e., you are entitled to any cash flow left over after all other fixed claims have been met. Thus, all interest-bearing liabilities clearly meet the debt test, whether short term or long term, fixed rate or floating rate., bank loans or corporate bonds.

Consider a lease agreement now. Assume that Abercombie & Fitch (A&F) enters into a ten-year lease on a store in midtown Manhattan. The lease agreement specifies the lease payments that have to be made each year and a failure to make those payments will result in the loss of the store site and other penalties. Consequently, it meets all of the requirements for debt: the payments are set at the time of the contract, these payments are tax deductible and failing to make them results in the loss of an asset. There are some who would argue that leases provide more flexibility than typical debt, insofar as they are tied to an individual asset (store site, for instance) and a failure to pay the lease results in the loss of only that asset rather than default for the firm, They may be right about the

flexibility, but that is really not an argument about whether to treat leases as debt but one about what type of debt they comprise. After all, even conventional debt can take the form of secured debt, unsecured debt or subordinated debt, with differences in flexibility and asset backing. The other argument uses is that you can sometimes get out of a lease by paying a penalty. The same can be said about a bank loan or callable corporate bonds, since you can often pay off a loan well before it is due or call back bonds before maturity, a fact that does not stop us from treating these as debt.

In summary, there is really no good rationale that can be offered for the current treatment of leases. Not only does it violate common sense rules about debt and equity, but it is also inconsistent with how accounting treats other liabilities, many of which are less onerous and rigid than lease commitments.

The process

Once we accept the argument that all lease expenses are financing expenses, the process of converting leases to debt follows a familiar pattern, one that accountants have used to deal with capital leases for decades.

Step 1: List out all existing lease commitments for the future. There are two key components to this statement. The first is that it is not the lease payment that might have been made last year that concerns us (at least from the perspective of debt) as much as the commitments that have been made for the future. A ten-year lease creates more of a commitment than a three-year lease. The second is that we stick with just existing commitments and should not expand our definition to include lease commitments that we expect to enter into, in the future. Thus, the fact that a firm is growing and will increase lease commitments in the future is irrelevant, at least for this part of the discussion.[1]

Step 2: Compute a pre-tax cost of debt for the firm, reflecting the rate at which it can borrow money today. There are three estimation issues that we will have to confront, while making this estimate. The first is the default spread that should be added on to the riskfree rate to estimate the cost of debt. If a firm has a bond rating, we could use this to

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[1] This is a rule we follow with all debt. Thus, with a growing manufacturing that we expect will be borrowing money in the future to build more factories, we still stick with the existing debt, when computing the cost of capital. The reason we do so is simple. Once debt is built into the debt ratio and used to compute a cost of capital, and we use that cost of capital to discount future cash flows, we are implicitly

estimate an appropriate default spread. Thus, in April 2009, the pre-tax cost of debt for a BBB rated firm would have been computed by adding the prevailing default spread of 3.50% (based upon the rating) to the riskfree rate. If the firm does not have a bond rating, our task is more difficult, but there are ways in which we can still estimate default spreads, using either recent borrowing or synthetic ratings as a guide. The second relates to whether we should be computing a short term or long term rate. In other words, should we be adding the default spread to the 3-month treasury bill rate or the 10-year treasury bond rate. The answer will depend upon how long the lease commitments run. If the lease commitments stretch over the 6, 8 or 10 years, as they usually do, the ten-year bond rate would be the better choice. The third issue concerns whether we should be using a slightly higher pre-tax cost of debt for leases than for other debt, reflecting the fact that the lessor's claims are only against the leased asset and not against the entire company's assets. In practice, this would require us to use a pre-tax cost of debt closer to the rate on unsecured debt than to the rate on secured debt.

Step 3: Calculate the present value of the lease commitments. Using the pre-tax cost of debt computed in step 2, as the discount rate, we discount the lease commitments for the future back to today. We use the pre-tax cost of debt, since the lease commitments are also in pre-tax terms and the present value of the lease commitments will now be reflected on both sides of the balance sheet. On the liability side, it will be manifested as debt, adding to the other interest bearing and conventional debt that the firm may have. On the asset side, it will show up as an counter asset, reflecting the value that we are assigning to the assets that we have leased.

Step 4: Adjust operating income to reflect the shift: Once we capitalized operating leases, the existing operating income has to be adjusted to reflect the change. In making this adjustment, we need to consider two effects. The first is that the operating lease expense should be added back to the stated operating income, since it should have never been subtracted out in the first place. The second is that the leased asset will now have to be depreciated and the depreciation will reduce operating income:

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growing the dollar debt at the same rate as the firm is growing. In effect, we are already building in the expected increase in debt, through the use of a debt ratio in the cost of capital.

Adjusted Operating income = Stated Operating income+ Operating lease expense – Depreciation

Another way of thinking about the adjustment is to recognize that if leases had been treated as debt, they would have given rise to interest expenses. A measure of that imputed interest expense can be obtained by multiplying the present value of leases from step 3 by the pre-tax cost of debt in step 2.

Imputed interest expenses = Pre-tax cost of debt * PV of leases

Since operating income is before interest expenses, we could obtain an alternate estimate of the operating income by adding back this imputed interest expense.

Adjusted Operating Income = Stated Operating Income + Imputed Interest expenses on leases

While this approach is an approximation, it dispenses with the need for computing a depreciation number. Implicitly, we are assuming that the portion of the lease expense that is not interest is also equal to the depreciation that would have accrued on the asset.

Extending the Argument

While this paper focuses on operating leases, there are other contractual commitments that firms enter into that may have the same characteristics as leases, and therefore should be capitalized as well. Common examples include the following:

a. Sponsorship agreements: Companies sometimes enter into long-term agreements to sponsor entertainment or sporting events. GM, for instance, has been a major backer of NASCAR races in the United States and Under Armour, a manufacturer of athletic apparel, has sponsorship agreements stretching over many years for multiple sporting events (such as the X-Games). At the end of 2008, the operating lease and sponsorship commitments reported by Under Armour are summarized in table 3:

Table 3: Operating Lease and Sponsorship Commitments

Year	Operating leases	Sponsorships	Total commitments	Present value
2009	$12,758	$26,170	$38,928	$36,552
2010	$12,031	$21,842	$33,873	$29,864
2011	$11,449	$17,795	$29,244	$24,210
2012	$10,059	$6,483	$16,542	$12,858
Beyond 2013	$30,823	$4,130	$34,953	$25,512

				$128,996

The present value of these commitments, discounted back at Under Armour's pre-tax cost of debt of 6.5% is $129 million and should be considered debt, when analyzing the company.

b. Employee contracts: In most commercial enterprises, employee contracts are tied to employee performance and the firm's operating health. Consequently, they should be treated as operating expenses, even if they are very large contracts. In some cases, though, employee contracts represent fixed commitments to the employer, and are not a function of performance or profitability. This is especially so in professional sports, where superstars command not only outsized, long term contracts, but are often not accountable for failures. As the 2009 baseball season started, the New York Yankees had accumulated the most expensive infield in baseball history. Table 4 summarizes the salary commitments and the present value computed of each contract, computed using a pre-tax cost of debt of 6%:

Table 4: The Yankee Infield – Player Contracts as Debt

Player	*Position*	*Contract*	*Present value (millions)*
Mark Texeira	First Base	$22.5 million/ year for 8 years	$140
Robinson Cano	Second Base	$7.5 million/year for next 4 years	$26
Derek Jeter	Short Stop	$19 million/year for next 2 years	$35
Alex Rodriguez	Third Base	$27.5 million/year for next 9 years	$187
Jorge Posada	Catcher	$13.5 million/year for next 3 years	$36
C.C. Sabathia	Pitcher	$23 million/year for next 7 years	$128
Sum of the PV of commitments = Yankee Infield Debt =			$552

In effect, the Yankees have $552 million in debt outstanding on their balance sheet, at the start of 2009, in the form of player contracts.

c. Purchase obligations: Purchase obligations represent a third category of obligations that many firms divulge in their financial statements. These are long-term contracts with suppliers and producers of raw material to the firm. However, Purchase obligations are generally less binding than operating leases and have

more escape clauses built into them.[2] Consequently, we would not categorize them generally as debt, and compute the present value of the obligations.

Effects on Accounting Measures/Statements

Now that we have laid out the process for converting operating leases to debt, we will consider issues that typically arise in practice and the consequences of converting operating leases to debt for income statements, balance sheets and financial ratios.

The Capital Adjustment

If operating lease expenses are to be considered financing expenses, we argued in the last section that the present value of commitments to make such payments in the future has to be treated as debt. In this section, we will focus on the practical problems associated with making this conversion:

a. Disclosure on commitments: 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 compute the "debt" value of operating leases, the present value of actual lease commitments is computed over time. Since the lease commitments after year 5 are provided as a lump sum rather than as year-specific amounts, we can run into a discounting problem. One simple approximation that works is to use the average lease commitment over the first five 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.[3] An alternate approximation is to use the lease commitment in year 5 (rather than the average for the first 5 years) as the basis for computing the annual lease payment (and number of years embedded) in the lump-

[2] In effect, purchase obligations bind the firm to buy from the contracted supplier, if it needs the raw material. However, if the firm has to cut back production or cease production, the contracts do not apply.

[3] The average lease payment over the first five years should be used as an indicator, rather than as the final number. Thus, if the lump sum amount in this example had bee $12.6 million (instead of $ 12 million), we would have made the annuity $2.1 million a year for 6 years to cover the entire commitment.

sum commitment. As we noted in an earlier section, there are some markets where firms do not disclose future commitments. While many analysts argue that the lack of information makes it impossible to convert leases in these cases, and ignore them, we would argue that this is the equivalent of assuming no lease commitments in the future. A more sensible option would be to take the current year's lease payment (which is disclosed) and assume that the firm has similar commitments for a specified future period. (The length of the period will be a function of how long leases last in the market in question.)

b. Pre-tax cost of debt: For companies with bond ratings, we noted that the ratings could be used to compute the default spreads and the pre-tax costs of debt. For companies without bond ratings, we can estimate synthetic bond ratings, based upon financial ratios. One ratio that has proven effective in estimating ratings is the interest coverage ratio:

$$\text{Interest coverage ratio} = \frac{\text{Operating Income}}{\text{Interest Expenses}}$$

The higher this number, other things held constant, the less default risk and the higher the bond rating should be for a firm. One problem in using this ratio in the context of leases is that both the operating income and interest expenses can be affected by the capitalization of leases. The adjusted interest coverage ratio is therefore:

$$\text{Interest coverage ratio} = \frac{\text{Operating Income} + \text{Lease Expense} - \text{Depreciation on leased asset}}{\text{Interest Expenses} + \text{Pre-tax cost of debt} * \text{PV of leases}}$$

Using this ratio to compute the pre-tax cost of debt opens us to an exercise in circular logic, since we need the pre-tax cost of debt to compute the ratio. A judicious use of iterative analysis can still yield a solution.[4]

With the commitments and the pre-tax cost of debt in place, the present value of lease commitments can be computed. This number will be added on to the debt outstanding at the firm, and, by extension, to the capital invested at the firm.

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[4] This is a fancy way of saying that turning on the iteration box in Excel can take care of the problem for upi/

Illustration 1: Capitalizing Operating Leases: Three Examples

We will look at three companies with significant operating lease commitments – two retailers (Target and Abercombie & Fitch) and one restaurant chain (Starbucks). With each company, we began by looking at the most recent annual report (end of 2008) and obtaining the lease commitments for the next 5 years and beyond (reported as a lump sum). Table 5 summarizes the numbers.

Table 5: Lease Commitments for next 5 years and beyond

	Target	A&F	Starbucks
Lease expense: Current year	$169	$301	$741
Next year (+1)	$245	$315	$741
Year 2	$216	$319	$707
Year 3	$157	$306	$661
Year 4	$146	$288	$605
Year 5	$143	$268	$564
Beyond year 5	$2,950	$1,302	$1,839

To compute the present value of the lease commitments, we need a long-term cost of debt for each firm. For Target and Starbucks, we used the current bond rating for the firm from Standard and Poor's, whereas for A&F, we estimated a synthetic rating, based upon an interest coverage ratio. In computing the coverage ratio, we began with a crude measure of the interest coverage ratio, treating the entire lease expense as an interest expense and adding to both the numerator (operating income) and denominator (interest expense) of the coverage ratio, but we then proceeded to iterate to a consistent solution.[5] Once we had the ratings, we estimated a default spread (based upon what bonds with similar ratings were commanding in the market in April 2009) and added it to the US treasury bond rate at the time (3%). Table 6 summarizes our estimates of the ratings and pre-tax costs of debt for each firm.

Table 6: Cost of Debt and Ratings

	Target	A&F	Starbucks
Actual Rating	A	Not rated	BBB
Unadjusted Interest coverage ratio	4.92	129.12	12.30
Crude lease-adjusted coverage ratio	4.30	2.43	1.76
Final lease adjusted coverage ratio	4.44	3.94	2.95
Synthetic Rating	A	BB+	B+

[5] We used the iteration function in Excel to arrive at the final number.

Rating used	**A**	**BB+**	**BBB**
Default Spread	2.50%	4.25%	3.50%
Pre-tax cost of debt	5.50%	7.25%	6.50%

Finally, we tried to determine the number of years of lease payments embedded in the lump sum commitment reported for year 6 by looking at the average commitment over the next 5 years. Table 7 reports on our estimates for each company:

Table 7: Lump Sum Commitment Annuity Computation

	Target	A&F	Starbucks
Year 1	$245	$315	$741
Year 2	$216	$319	$707
Year 3	$157	$306	$661
Year 4	$146	$288	$605
Year 5	$143	$268	$564
Average: Years 1-5	$181	$299	$656
Lump sum in year 6	$2,950	$1,302	$1,839
Number of years of lease commitments	16	4	3
Annualized lease payment (Lump sum/ Number of years)	$184	$326	$613

Finally, we compute the present value of the lease commitments, using the pre-tax cost of debt for each firm, from table 6, as the discount rate. Table 8 reports on the cumulated value of these computations for each firm.

Table 8: Present Value of Lease Commitments

	Target	A&F	Starbucks
Year 1	245	315	741
Year 2	216	319	707
Year 3	157	306	661
Year 4	146	288	605
Year 5	143	268	564
Annualized payment (after year 5)	$184	$326	$613
Number of years	16	4	3
Pre-tax cost of debt	5.50%	7.25%	6.50%
Present value of commitments	$2,263	$1,998	$3,933

Since this present value of lease commitments is treated as debt, it has a significant effect on the book value of capital invested at each firm. Table 9 reports on the change in book capital, when leases are treated as debt:

Table 9: Capital Invested – With and Without Leases

	Target	A&F	Starbucks
Book value of equity	$15,307	$1,618	$2,284

Book value of debt	$17,090	$43	$1,261
- Cash	$2,450	$648	$439
Book capital (as reported)	$29,947	$1,013	$3,106
+ Capitalized PV of leases	$2,263	$1,998	$3,933
Book capital (adjusted)	$32,210	$3,011	$7,040

The capitalization of operating leases increases the book value of capital substantially, with the entire increase accruing to debt.

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 an impact on operating income, since it is defined to be net of just operating expenses. Thus, the operating income for a firm has to be adjusted, when operating lease expenses are re-categorized as financing expenses. As noted earlier, there are two ways of making this adjustment:

a. The full adjustment: In the full adjustment, we first add back the entire operating leases expense to operating income (because it is being treated as a financing expense) and then subtract out the depreciation we would have on the leased asset (which is created when the leases are capitalized).

   Adjusted Pre-tax Operating Income = Stated Operating Income + Operating lease expense during the year – Depreciation on leased asset

   While elaborate depreciation methods can be employed, it is prudent to stick with simple methods (such as straight line) and to use the life of the operating lease commitments as the life of the asset.

b. The approximation: If we treat the present value of lease commitments as debt, we would have had to make interest payments on that debt. Multiplying the present value of lease commitments by the pre-tax cost of debt should yield an estimate of these payments. 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 expenses 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 re-categorization.

$\text{Net Income}_{\text{comples}}$ = 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: Income Estimation with Operating Leases Treated as Debt

Building on the computation of the present value of leases in illustration 1, we will adjust the operating income for Target, A&F and Starbucks. In table 10, we make the full adjustment to operating income, adding back the entire lease expense and subtracting out an estimated depreciation on the leased asset (computed based upon the book value of the leased asset and straight line depreciation over the life of the lease).

Table 10: Full Operating Income Adjustment

	Target	A&F	Starbucks
Stated Operating Income	$4,402	$439	$657
+ Current year lease expense	$169	$301	$741
- Depreciation on leased asset	$108	$222	$492
Adjusted Operating income	$4,463	$518	$906
Leased Asset	$2,263	$1,998	$3,933
Lease life	21	9	8
Depreciation	$108	$222	$492

In table 11, we use the approximate adjustment, by computing the imputed interest expense at each of the three firms and adding it to the operating income:

Table 11: Approximate Income Adjustment

	Target	A&F	Starbucks
Stated Operating Income	$4,402	$439	$657
+ Imputed Interest Expense	$124	$145	$256
Adjusted Operating income	$4,526	$584	$913

PV of leases	$2,263	$1,998	$3,933
Pre-tax Cost of Debt	5.50%	7.25%	6.50%
Imputed interest expense	$124	$145	$256

With this approximation, the net income 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 (EBIT) divided by the book value of capital. In the standard computation, we derive the following:

$$\text{Return on Capital} = \frac{\text{EBIT (1 - tax rate)}}{\text{(Book Value of Debt + Book Value of Equity - Cash)}}$$

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:

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

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:

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

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: Profitability Estimation with Operating Income Capitalized

In illustration 1, we examined the effect on capital of treating leases as debt and illustration 2, we considered the implications for operating income. Since both capital and operating income change, it should as come as no surprise that profitability measures shift as a result of the capitalization. The first profitability measure we examine is return on invested capital. In table 12, we estimate the return on invested capital for each of the three firms, using conventional (or unadjusted) operating income and capital invested and the numbers after the adjustment:

Table 12: Return on Invested Capital

	Target		A&F		Starbucks	
	Stated	Adjusted	Stated	Adjusted	Stated	Adjusted
Capital Invested	$29,947	$32,210	$1,013	$3,011	$3,106	$7,040
Operating income	$4,402	$4,463	$439	$518	$657	$906
Pre-tax ROC (ROIC)	14.70%	13.86%	43.34%	17.20%	21.15%	12.88%
After-tax ROC (ROIC)	9.11%	8.59%	26.87%	10.66%	13.11%	7.98%

For all three firms, the return on capital drops as a result of lease capitalization, but the impact is much greater for A&F and Starbucks than it is for Target, reflecting the fact that they have larger lease commitments and much higher (unadjusted) returns on capital (than their pre-tax costs of debt). As we noted earlier, since neither the net income nor the book equity should change as a result of the capitalization of leases, the return on equity should remain unchanged. We follow up by examining the effects on pre-tax and after-tax profit margins of the lease capitalization in table 13:

Table 13: Pre-tax and Post-tax Operating Margins

	Target		A&F		Starbucks	
Revenues	$64,948	$64,948	$3,540	$3,540	$10,383	$10,383
Operating income	$4,402	$4,463	$439	$518	$657	$906
Operating margin	6.78%	6.87%	12.40%	14.63%	6.33%	8.73%
After-tax Margin	4.20%	4.26%	7.69%	9.07%	3.92%	5.41%

Since revenues are unaffected, the effect on margins comes purely from changes in the operating income. Since operating income increases as a result of the capitalization at all three firms, their operating margins reflect that improvement.

Sector Effects

The use of leases varies widely across sectors, and the effect of capitalizing leases will also reflect the variation. Using the approach described in the last three sections, we capitalized operating lease commitments for all publicly traded US companies in April 2009. Since our sample included several thousand firms, we made the following simplifying assumptions in capitalizing leases:

a. Synthetic ratings: We used the crude adjusted interest coverage ratio, estimated by treating the entire operating lease expense as an interest expense, to estimate the synthetic ratings for each firm. For money losing firms, we used the cost of debt of a B rated firm (about 10%) as the pre-tax cost of debt.

b. Lump sum commitments; Every company in the sample reported a lump sum commitment in year 6, just as Target, A&F and Starbucks did. As with those companies, we used the average lease commitment over the first 5 years to estimate the annual lease payment embedded in the lump sum.

c. Book debt and equity: Lacking more precise information, we took the stated book values of debt and equity for the firms as our starting points in making estimates.

We computed the present value of lease commitments for each firm in the sample and estimated the debt and capital invested for each firm, before and after the lease adjustment. Obviously, the effect was much greater for firms with bigger lease commitments, but there was a clustering of these firms in a few sectors. In table 14, we list the sectors where the cumulated debt values increased the most as a result of the lease adjustment:

Table 14: Sectors with biggest lease commitments (relative to conventional debt

Primary Industry	*Stated Debt*	*Adjusted Debt*	*% Change in Debt*	*Market Debt Ratio*	*Adjusted Debt Ratio*	*Book Debt Ratio*	*Adjusted Book Debt Ratio*
Restaurants	$30,171	$56,822	88.33%	20.13%	32.19%	52.96%	67.95%
Air Freight and Logistics	$13,696	$28,499	108.08%	13.71%	24.85%	34.06%	51.80%
Human Resource and Employment	$1,714	$3,747	118.65%	11.25%	21.71%	15.19%	28.14%

Services							
Footwear	$1,604	$3,785	135.93%	5.00%	11.04%	11.92%	24.19%
Specialty Stores	$11,459	$29,135	154.26%	27.02%	48.50%	43.20%	65.91%
Home Furnishing Retail	$1,119	$3,137	180.40%	7.64%	18.83%	14.43%	32.10%
Drug Retail	$21,519	$63,613	195.62%	20.75%	43.63%	29.74%	55.58%
Apparel Retail	$7,076	$34,134	382.42%	10.43%	35.97%	20.09%	54.81%
Home Entertainment Software	$96	$518	439.82%	0.44%	2.35%	0.61%	3.23%
Education Services	$449	$3,028	574.48%	1.69%	10.38%	8.52%	38.57%

These are also the sectors where capitalizing leases has the biggest impact on both margins and returns on capital. Table 15 summarizes after-tax returns on capital and pre-tax operating margins before and after the lease adjustment in these sectors:

Table 15: Changes in profitability ratios

Primary Industry	ROC	Adjusted ROC	Operating Margin	Adjusted Operating Margin
Restaurants	14.53%	9.57%	13.44%	13.29%
Air Freight and Logistics	17.36%	11.44%	8.79%	8.22%
Human Resource and Employment Services	15.17%	14.14%	4.38%	5.07%
Footwear	19.40%	15.71%	11.23%	10.98%
Specialty Stores	9.76%	7.28%	4.53%	5.88%
Home Furnishing Retail	12.89%	11.79%	7.84%	9.30%
Drug Retail	9.51%	4.23%	5.70%	4.06%
Apparel Retail	17.95%	12.20%	7.07%	9.72%
Home Entertainment Software	-2.09%	-2.54%	-2.62%	-3.29%
Education Services	35.17%	18.28%	17.43%	16.18%

In appendix 1, we list all of the sectors and the adjustments to debt ratios and profitability that result from the capitalization from leases.

Effects on Value

Since we draw on financial statements for raw material in corporate finance and valuation, it should come as no surprise that capitalizing operating leases can have significant effect on the fundamental inputs that go into the value of a firm, and through them, on the estimated value of equity. In this section, we will begin by looking at the effects on cash flows and then move on to the impact on the cost of capital that we

estimate for a firm, and finally to value. In the last part of the section, we look at the effects of capitalizing leases on multiples and relative valuation.

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. The standard computation of the free cash flow to the firm begins with after-tax operating income but then adjusts for net capital expenditures and working capital:

FCFF = After-tax Operating Income – (Capital Expenditures – Depreciation) – Change in non-cash Working Capital

As described in the last section, capitalizing operating leases affects the starting point for the analysis – the operating income. In general, the operating income (and after-tax operating income) for a firm will increase when leases are capitalized. However, the effect of capitalizing operating leases is not limited to operating income. 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 accruing from operating leases is determined by the increase in the present value of the operating lease commitments (PVOL) over time.

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

Thus, a firm with increasing operating lease commitments 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 expenditure.

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: Free Cash Flow Estimation with Capitalized Operating Leases

In illustration 2, we examined the effect of capitalizing leases on operating income. To get to free cash flow to the firm, we expand our assessment to look at how capital expenditures and depreciation change when leases are capitalized. Table 16 summarizes our estimates of free cash flow to the firm for each of the three firms, with and without the lease adjustment.

Table 16: Cash flow Effects of Capitalizing Leases

	Target		A&F		Starbucks	
	Stated	Adjusted	Stated	Adjusted	Stated	Adjusted
After-tax operating income	$2,729	$2,767	$272	$321	$407	$562
+ Depreciation	$1,826	$1,934	$225	$447	$605	$1,097
- Cap Ex	$3,547	$3,788	$367	$1,090	$985	$1,575
- Chg in WC	$736	$736	$176	$176	$137	$137
FCFF	$272	$177	-$46	-$498	-$110	-$54

To compute the change in the net capital expenditures, we estimated the present value of operating lease commitments in the prior year's annual report, and then took the change in the present value of leases between the two periods. Adding the depreciation on the leases asset to this change in lease present value yields the change in overall capital expenditures.

$$\text{Capital Expenditures}_{\text{Operating leases}} = (PVOL_t - PVOL_{t-1}) + \text{Depreciation on leased asset}_t$$

The free cash flows to equity will be unaffected by the lease adjustment, and we illustrate this using Target as an example in table 17:

Table 17: Free Cashflows to Equity – Target

	Stated	Adjusted	Comments
Net Income	2214	2214	No effect from capitalizing leases
+ Depreciation	$1,826	$1,934	Increases by depreciation on leased asset
- Capital Expenditures	$3,547	$3,788	Increases by change in PVOL + Depreciation on leased asset
- Change in non-cash WC	$736	$736	No effect from capitalization
+ Change in debt (Debt issued - Debt repaid)	1662	$1,795	Increases by change in PVOL
FCFE	$1,419	$1,419	No change!!!

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 both operating and financing expenses.

The change in the composition of the free cash flow to the firm can be captured by looking at the reinvestment rate – the proportion of after-tax operating income that is reinvested back into the business. Table 18 measures the reinvestment rate at Target, A&F and Statbucks, prior to and after the operating lease adjustment:

Table 18: Reinvestment Rates

	Target		A&F		Starbucks	
	Stated	Adjusted	Stated	Adjusted	Stated	Adjusted
Reinvestment	$2,457	$2,590	$318	$819	$517	$616
After-tax Operating Income	$2,729	$2,767	$272	$321	$407	$562
Reinvestment Rate	90.03%	93.59%	116.83%	255.12%	126.92%	109.59%

Capitalizing operating leases changes the measures of both the reinvestment rate and return on capital for a firm. Since sustainable growth is a product of these two numbers, it has an impact on our estimates of growth in the cash flows (and through those numbers, on value). Table 19 summarizes the expected growth rates in operating income, based upon both the stated and adjusted returns on capital and reinvestment rates for all three companies:

Table 19: Sustainable Growth Rates in Operating Income

	Target		A&F		Starbucks	
	Stated	Adjusted	Stated	Adjusted	Stated	Adjusted
ROC	9.11%	8.59%	26.87%	10.66%	13.11%	7.98%
Reinvestment Rate	90.03%	93.59%	116.83%	255.12%	126.92%	109.59%
Growth Rate	8.20%	8.04%	31.39%	27.21%	16.64%	8.75%

The Cost of Capital Effect

When computing the cost of capital for a firm, we estimate the costs of debt and equity for the firm and the weight them, based on market value. The treatment of operating leases may or may not affect the costs we estimate for debt and equity,

depending upon how we compute them, but they will have an effect on the weights and the cost of capital.

To see why the costs of equity and debt may not be affected by the conversion of operating leases to debt, we have to consider how they were obtained in the first place. If, as is common practice, we estimate the cost of equity from a regression beta and the cost of debt from a bond rating from S&P or Moody's, the numbers should already reflect the risk created through the existence of operating leases. The regression beta is determined by stock returns, which should be more volatile, if a firm has larger fixed commitments (like leases), no matter what the accounting treatment of the leases may be. The ratings agencies consider the magnitude of fixed charges, when assigning ratings to a company. That does not mean, however, that using regression betas and ratings will yield the right answers. Ratings agencies can make mistakes and the lease commitment of a firm may have become more or less onerous over time, thus skewing regression betas.

If the cost of equity is estimated using sector-average or bottom-up betas and the cost of debt from synthetic ratings, then the way we treat operating leases can affect our estimates. Earlier in the paper, we noted how interest coverage ratios can be affected by the conversion of leases and how synthetic ratings will change as a consequence. When we use sector betas to estimate costs of equity, the reason operating leases can matter is because lease commitments may vary widely across firms, even within a sector. We have two choices:

- To adjust for betas for leases correctly, we can convert lease commitments into debt for every firm in the sector and unlever betas using the cumulated debt ratios. This is data intensive, since it will require us to collect data on lease commitments for all firms. However, it will allow us to adjust the betas we use for differences in lease commitments across companies in a sector.
- The less data intensive and less precise approach is to ignore leases when computing unlevered betas for the sector and to then use only the conventional debt to equity ratio when computing the levered beta for an individual firm, even if it has lease commitments. In effect, we are assuming that the magnitude of lease commitments (as a percent of market value) is similar across firms within the same business.

If the costs of equity and debt do not change, the computed cost of capital will decrease when leases are capitalized, since the debt ratio will always increase. If the costs of equity and debt also change as a result of the recapitalization, the cost of capital will change, but in either direction, since the benefits of a lower debt ratio may be overwhelmed by increases in the estimated costs of debt and equity.

Illustration 5: Cost of Capital Estimation with Capitalized Operating Leases

We computed the cost of debt, equity and capital for Target, A&F and Starbucks, before and after the capitalization of leases. In table 20, we summarize our estimates:

Table 20: Cost of Capital Computations

	Target		A&F		Starbucks	
Unlevered Beta for sector	1.31	1.08	1.58	1.21	1.17	1.05
Debt	$17,090	$19,353	$43	$2,041	$1,261	$5,194
Market Value of Equity	$30,024	$30,024	$2,175	$2,175	$8,815	$8,815
D/E ratio	62.46%	69.99%	7.22%	99.10%	14.34%	58.96%
Tax Rate	38%	38%	38%	38%	38%	38%
Levered Beta	1.82	1.55	1.65	1.95	1.27	1.43
Cost of equity	13.92%	12.30%	12.90%	14.70%	10.62%	11.58%
Rating	A	A	AAA	BB+	BBB	BBB
Default Spread	2.50%	2.50%	1.25%	4.25%	3.50%	3.50%
Pre-tax Cost of debt	5.50%	5.50%	4.25%	7.25%	6.50%	6.50%
Debt to capital	38.45%	41.17%	6.73%	49.77%	12.54%	37.09%
Cost of capital	9.88%	8.64%	12.21%	9.62%	9.79%	8.78%

In making the estimates, we used the following procedures:

a. Cost of equity: The beta used to compute the cost of equity is a bottom up beta. The way in which the sector unlevered beta was computed was different under each approach. When operating leases are not capitalized, we estimate the unlevered beta for all firms in the sector, using the conventional debt ratio, and re-lever this beta for each of the three firms, using their conventional debt ratios.[6] When operating leases are capitalized, the unlevered betas we compute for the sectors are based upon the cumulated debt numbers and are hence lower. However, they are also re-levered back up using the cumulated debt ratios for all

[6] For primary industry, we used department stores for Target, apparel retail for A&F and restaurants for Starbucks.

three firms. Appendix 2 includes a complete listing of unlevered betas, by sector, before and after the capitalization of leases.

b. Cost of debt: For Target and Starbucks, we assumed that the bond ratings assigned by S&P reflected their lease commitments and hence used them to estimate the cost of debt for both approaches. For A&F, as we noted earlier in the paper, the synthetic rating, based upon the interest coverage ratio, is lower when we consider leases to be debt, leading to a higher cost of debt.

c. Debt Ratios: The debt to capital ratio reflects the market value of equity and the estimated debt outstanding. We assumed that the book value of conventional debt matched the market value for all three firms and used only that debt in computing the debt ratio for the non-capitalized leases approach, but added the present value of leases to estimate debt for the capitalized leases approach.

The net effect on the cost of capital of making these adjustments is that the cost of capital decreases for all three firms after the capitalization of leases, but it drops the most for A&F, which has almost no conventional debt but significant lease commitments.

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. Table 21 summarizes the differences:

Table 21: Valuation Effects of Capitalizing Leases

	Leases capitalized
After-tax Operating Income	Add back operating leases and subtract depreciation to stated income; generally increases operating income
Return on capital	Capital invested increases to include lease commitments. Since operating income increases as well, net effect is unpredictable but results in decreases for most firms.
Reinvestment Rate	Reinvestment includes change in the PV of leases from

	period to period, which can be positive or negative. Generally, reinvestment rates increase with capitalization.
Expected growth rate	Depends on the change in return on capital, relative to the change in reinvestment rate. The effect on expected growth rate is therefore unpredictable.
Cost of capital	Debt ratio increases, but costs of equity and debt will also change. Generally decreases with capitalization.
Value of operating assets	Higher operating income and lower cost of capital should generally increase the value of operating assets.
Debt outstanding	Increases to include PV of leases.
Value of equity	Depends upon whether operating asset value increased by more than the debt value. Generally will increase (decrease) if return spread (Return on capital – cost of capital) increases (decreases)

Some of the changes will increase value and some will decrease value. Hence, the net effect of capitalizing leases can be positive or negative for the estimated equity value per share. One simple indicator of the direction of the change is the shift in excess returns, i.e., the difference between the return on capital and cost of capital, as a result of the capitalization. If the excess return, stated as a percentage of the cost of capital, decreases as a result of capitalization, the value of equity per share should decrease. If it increases, the value of equity should go up.

We estimated the return on capital, reinvestment rate, growth rate and cost of capital for all firms in the United States, with and without the lease capitalization. While the effect was small for many sectors, there were significant shifts in some industries. Table 22 lists the industries where the excess returns decreased the most as a result of the capitalization.

Table 22: Sectors with biggest drops in excess returns post-capitalization

Primary Industry	Cost of capital	Adjusted Cost of capital	ROC	Adjusted ROC	ROC - Cost of capital	Adj ROC - Adj Cost of capital
Specialized Consumer Services	6.75%	6.74%	13.13%	10.51%	6.38%	3.77%
Food Retail	5.96%	5.48%	9.35%	5.87%	3.39%	0.39%
Footwear	9.72%	9.26%	19.40%	15.71%	9.67%	6.45%
Apparel Retail	10.84%	8.86%	17.95%	12.20%	7.11%	3.34%
Personal Products	7.15%	6.94%	23.04%	19.00%	15.89%	12.06%
Restaurants	9.30%	8.54%	14.53%	9.57%	5.23%	1.03%
Drug Retail	7.12%	6.19%	9.51%	4.23%	2.39%	-1.96%

Air Freight and Logistics	9.25%	8.52%	17.36%	11.44%	8.11%	2.92%
Marine Ports and Services	8.09%	7.04%	31.56%	20.45%	23.47%	13.41%
Education Services	7.56%	7.16%	35.17%	18.28%	27.62%	11.12%

Not surprisingly, many of the sectors with the biggest increases in debt from the capitalization of lease commitments make this list as well. These are the businesses where we would expect the estimated values to also change the most as a result of capitalizing leases. Appendix 3 has a complete listing of all sectors, with the valuation fundamentals for each.

It is important that we read the change in value of equity that results when we capitalize leases correctly. A firm, after all, can have only one intrinsic value of equity, and when we get two different estimates, depending upon how we account for an item, we have to decide which one of the estimates is more credible. We believe that the lease-capitalized value is, in fact, a better measure of the true value of the equity per share, and that we are estimating the value of equity incorrectly with the accounting numbers that were available, prior to the adjustment.

Converting operating lease expenses into financing expenses should have no technical impact on equity valuation. The free cash flows to equity are after both operating and financing expenses, and are thus unaffected by re-categorizing operating lease expenses, especially since there is no tax effect from the re-categorization. The cost of equity is not affected by the treatment of the present value of operating lease expenses as debt. If the equity valuation is done right, the value of equity that was estimated should be close to the value of equity that we obtained, with the accounting numbers adjusted for capitalized leases. In practice, though, the accounting treatment of leases can also contaminate equity valuation, but altering the inputs we use for betas and costs of equity.

Illustration 6: Intrinsic Value with Capitalized Operating Income

To examine the effects of converting operating leases to debt on value, we valued Target, A&F and Starbucks with and without the operating lease capitalization. In valuing the companies, we made the following assumptions:

- We assumed five years of high growth for each firm. During that period, the expected growth rate is estimated from the return on capital and reinvestment rate. (These numbers were computed earlier in the paper in table 19, with and without leases.)
- The cost of capital for the five-year high growth period will stay at current levels, estimated again with and without leases. (See table 20)
- At the end of the fifth year, we assume that all three firms will be in stable growth and that their returns on capital will converge on their stable growth costs of capital. To estimate the latter, we assume that the levered beta for all three firms will be 1.20, but that they will preserve their current debt ratios.

Table 23 summarizes our valuation inputs and results:

Table 23: DCF Valuation Inputs and Output: Pre and Post Lease Capitalization

	Target		A&F		Starbucks	
ROC - next 5 years	9.11%	8.59%	26.87%	10.66%	13.11%	7.98%
Cost of capital - next 5 years	9.88%	8.64%	12.21%	9.62%	9.79%	8.78%
Excess returns - next 5 years	-0.77%	-0.05%	14.66%	1.04%	3.32%	-0.80%
Reinvestment Rate - next 5 years	90.03%	93.59%	116.83%	255.12%	126.92%	109.59%
Growth Rate - next 5 years	8.20%	8.04%	31.39%	27.21%	16.64%	8.75%
Stable growth rate	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%
Stable ROC	7.59%	7.41%	9.74%	9.08%	9.35%	7.68%
Stable cost of capital	7.59%	7.41%	9.74%	9.08%	9.35%	7.68%
Operating Asset Value	$38,568	$42,085	$4,829	$6,746	$5,708	$8,169
Debt outstanding	$17,090	$19,353	$43	$2,041	$1,261	$5,194
Value of equity	$21,478	$22,732	$4,786	$4,705	$4,447	$2,975
Value of equity per share	$26.33	$26.50	$59.14	$27.12	$6.49	$3.73

The value per share for Target increases slightly but the estimated value per share drops precipitously for A&F and Starbucks, by more than 50% for the former and by about 40% for the latter. The changes in our estimates of excess returns provide insight into why this happens. For A&F, our assessment of how well the firm is making investments is positive both before and after lease capitalization, but the magnitude of the excess returns is significantly lower, dropping from 14.66%, pre-capitalization, to 1.04%, post-capitalization. Our measure of excess returns for Starbucks is positive before we capitalize leases (3.32%) but negative after the capitalization (-0.80%); combined with a high reinvestment rate, this is a recipe for value destruction. Finally, for Target, the excess returns are negative before capitalization (-0.77%) but are close to zero (-0.05%)

afterwards, making it the only firm where the excess return measure improves as a result of the capitalization.

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 or an enterprise value multiple, there can be significant shifts in the multiple once operating lease expenses are re-categorized for two reasons:

(a) Since enterprise and firm value include debt, reclassifying operating leases as debt will lead to much higher values for both.

(b) Any measure of operating income, include EBIT or EBITDA, will be altered when operating leases are categorized as debt. The magnitude of the adjustment will vary, depending upon the measure. Earlier in the chapter, we outlined the adjustment to operation income:

Adjusted Operating Income = Operating Income + Operating lease expense – Depreciation on leased asset

For EBITDA, the adjustment is even simpler:

Adjusted EBITDA = Stated EBITDA + Operating Lease Expense

This measure is often called EBITDAR, i.e., earnings before interest, taxes, depreciation and rent.

If value increases more than the income measure, the computed multiple will increase, making the company more expensive, at least based upon the multiple. As an example, the Enterprise Value/EBITDA multiple with operating lease expenses recategorized would be:

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

Whether the EV/EBITDA multiple will increase or decrease will depend, again, on whether the unadjusted EV/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 EV/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. In appendix 4, we estimate three multiples of enterprise value – EV/Sales, EV/EBITDA and EV/Invested capital – by sector, before and after the capitalization of leases. Again, the sectors with the biggest lease commitments are the ones where we see the most significant change in multiples.

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

- When some firms lease assets and other firms buy them, in the same business, converting operating leases to equivalent debt will make the enterprise value multiples more comparable across firms.
- 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.

In summary, if we are making valuation and investment judgments based upon multiples, it behooves us to consider leases to be debt, when making these comparisons.

Illustration 7: A&F - Multiples with Operating Income recategorized

In table 24, we summarize the enterprise value multiples for Target, A&F and Starbucks with and without the operating lease adjustments:

Table 24: Effect of Capitalizing Leases on Enterprise Value Multiples

	Target		*A&F*		*Starbucks*	
	Stated	Adjusted	Stated	Adjusted	Stated	Adjusted
Market value of equity	$30,024	$30,024	$2,175	$2,175	$8,815	$8,815
Debt	$17,090	$19,353	$43	$2,041	$1,261	$5,194
Cash	$2,450	$2,450	$648	$648	$439	$439
Enterprise Value	$44,664	$46,927	$1,570	$3,568	$9,638	$13,571
Revenues	$64,948	$64,948	$3,540	$3,540	$10,383	$10,383
EBIT	$4,402	$4,463	$439	$518	$657	$906
EBITDA	$6,228	$6,397	$664	$965	$1,262	$2,003
Capital Invested	$29,947	$32,210	$1,013	$3,011	$3,106	$7,040

EV/Revenues	0.69	0.72	0.44	1.01	0.93	1.31
EV/EBITDA	7.17	7.34	2.36	3.70	7.64	6.78
EV/EBIT	10.15	10.51	3.58	6.89	14.67	14.97
EV/Capital	1.49	1.46	1.55	1.18	3.10	1.93

For all three firms, the enterprise value to revenue multiple is lower with stated numbers than with adjusted numbers, not surprising since the present value of leases adds to enterprise value and has no impact on revenues. With EV/EBITDA and EV/EBIT, the effects are mixed, with the multiple increasing from Target and A&F and decreasing for Starbucks. Finally, all three firms have lower EV/Capital ratios, when leases are capitalized.

Leasing versus Borrowing: Making the Choice

If we treat operating leases as debt, is there still a rationale for leasing assets? If the only reason for leasing is that it allows firms to look less levered than they truly are and to hide debt, then treating leases as debt will eliminate the leasing option. However, there are good reasons for leasing an asset, rather than borrowing and buying that same asset, which will persist even if we capitalize leases:

a. Lower costs: In some cases, it may be cheaper for a firm to lease assets, rather than buy them. These lower costs can come from economies of scale enjoyed by the lessor, that are partially passed on to the lessee. They can also come from the lessor obtaining greater tax benefits from asset ownership (depreciation and interest expenses) than the lessee and sharing some of those benefits, by charging a lower lease payment..
b. No asset risk: We argued that the ownership of the asset, a key factor in accounting lease classifications, should play no role in whether we treat leases as debt. However, ownership does matter for risk. The fact that the lessee gets the use of an asset, without ownership of that asset, also implies that he or she is not exposed to the risk that the asset may depreciate in value faster than expected. Thus, a retail firm that leases all its stores is less exposed to real estate risk (in the form of changing values of the store sites) than one that buys its stores. To the extent that the firm believes that its competitive edge is in retailing (and not in real estate), this can to work to its advantage.

c. Service: In some cases, leasing an asset also brings more extensive service support from the lessor than buying that asset. The costs saved as a result can tip the scales in favor of leasing.
d. Flexibility: With some lease agreements, the lessee gets more flexibility in terms of being able to exchange the asset for a newer and more upgraded model. This can be an advantage, especially with assets with the risk of technological obsolescence. Thus, a business may benefit from leasing all of the computers it uses in its facilities, rather than buying them.

Even if the accounting rules change and leases are capitalized, firms will continue to lease assets. Some firms that were using leases as a front for borrowing will cease to use them, but those firms should not have been using leases in the first place.

Conclusion

The value that we assign a firm and its equity can be affected by how we account for operating leases. The accounting distinction between capital leases (which are recorded as debt) and operating leases (shown as operating expenses) is built around where the ownership of the leased asset effectively resides. In this paper, we have argued that the key determinant of whether an expense is an operating or a financial expense is not ownership rights but the nature of the cash flow claims associated with a transaction. Any commitment that is contractually fixed and not a function of operating performance is more akin to a financing expense, and it is clear that operating lease commitments meet these criteria. Once this argument is accepted, we have no choice but to reclassify operating leases as financing expenses. The process is a simple one, with all future lease commitments being discounted back at a pre-tax cost of debt to get the debt value of operating leases. The consequences, though, are far reaching, since we will change not just the measured income and financial leverage of the firm, but also our perceptions of quickly the firm will grow in the future, how efficiently it is generating this growth and what value we assign to the firm.

There are good and bad reasons for leasing an asset, as opposed to buying that same asset. Current accounting practices deal with the two alternatives inconsistently, allowing firms that lease assets to hide both their debt and assets. Treating leases as debt

will not only introduce consistency into the practice but also induce firms that lease assets for cosmetic reasons or for deception to stop doing so. There are after all good reasons for leasing an asset, including lower costs, less asset-based risk and more flexibility, and those are unaffected by lease capitalization.

Appendix: Effects of Capitalizing Leases across sectors
US companies with market capitalization > $100 million
April 2009

The raw data for this analysis was obtained from Capital IQ. The income statement numbers, including operating income and depreciation comes from the most recent twelve months, which for most firms in the sample is the 2008 fiscal year, ending in December 2008. The book values of debt, equity and cash come from the most recent balance sheet of the company, which is also December 2008 for most firms. The lease commitments represent commitments for the next 5 years in this fiscal statement, i.e., the commitments from 2009 forward. The betas used are two-year regression betas, against the S&P 500. The cost of debt for each sector is estimated using a composite interest coverage ratio for that sector, and a lookup table that attributes a default spread based on the coverage ratio.

Appendix 1: Changes to debt ratios and profitability measures – By industry

Primary Industry	Debt Ratio	Adjusted Debt Ratio	ROC	Adjusted ROC	Operating Margin	Adjusted Operating Margin
Advertising	42.52%	51.61%	9.71%	11.24%	11.85%	17.39%
Aerospace and Defense	21.48%	24.04%	21.70%	21.02%	10.65%	11.13%
Agricultural Products	32.86%	35.46%	13.81%	13.01%	4.90%	4.84%
Air Freight and Logistics	13.71%	24.85%	17.36%	11.44%	8.79%	8.22%
Airlines	74.76%	83.50%	-2.47%	0.56%	-1.81%	0.73%
Alternative Carriers	65.65%	67.92%	2.45%	4.80%	3.76%	8.08%
Aluminum	53.12%	55.58%	4.06%	3.16%	3.49%	2.84%
Apparel Retail	10.43%	35.97%	17.95%	12.20%	7.07%	9.72%
Apparel, Accessories and Luxury Goods	20.33%	31.31%	14.89%	12.02%	11.37%	11.89%
Application Software	8.57%	11.60%	11.84%	10.65%	14.07%	14.08%
Asset Management and Custody Banks	42.64%	44.07%	-1.09%	-0.67%	-6.48%	-4.13%
Auto Parts and Equipment	39.67%	43.49%	7.17%	6.95%	3.76%	3.94%
Automobile Manufacturers	93.21%	93.37%	-13.57%	-11.84%	-6.29%	-5.84%
Automotive Retail	33.79%	44.96%	8.66%	5.98%	5.13%	4.82%
Biotechnology	10.91%	12.29%	8.68%	8.39%	18.02%	18.34%
Brewers	21.07%	22.56%	5.23%	5.41%	11.91%	12.60%
Broadcasting	73.14%	75.48%	7.50%	8.82%	19.32%	24.85%
Building Products	43.84%	46.34%	4.50%	5.20%	4.20%	5.10%
Cable and Satellite	49.19%	50.07%	6.33%	6.45%	16.40%	17.09%
Casinos and Gaming	67.21%	67.91%	3.96%	3.86%	12.84%	12.84%
Catalog Retail	73.80%	74.23%	7.94%	7.86%	9.40%	9.43%
Coal and Consumable Fuels	28.20%	29.39%	3.30%	3.79%	3.79%	4.48%
Commercial Printing	68.89%	70.90%	9.89%	9.88%	10.15%	10.87%
Commodity Chemicals	51.10%	55.21%	8.45%	7.75%	5.21%	5.38%
Communications Equipment	6.95%	8.15%	12.04%	11.67%	14.00%	14.06%
Computer and Electronics Retail	12.37%	17.08%	19.48%	18.95%	5.05%	5.69%
Computer Hardware	14.08%	16.05%	28.04%	25.87%	11.65%	11.77%
Computer Storage and Peripherals	12.87%	14.98%	10.58%	10.55%	6.92%	7.35%
Construction and Engineering	13.65%	18.87%	18.50%	17.53%	5.23%	5.72%
Construction and Farm Machinery and Heavy Trucks	55.01%	55.88%	8.38%	8.37%	9.05%	9.29%
Construction Materials	36.55%	38.23%	4.22%	4.38%	10.87%	11.69%
Consumer Electronics	25.82%	31.24%	6.75%	5.15%	3.25%	2.75%
Consumer Finance	88.44%	88.55%	-0.02%	0.29%	-0.40%	5.01%
Data Processing and Outsourced Services	15.50%	17.17%	14.84%	14.21%	19.43%	19.63%
Department Stores	38.29%	51.22%	6.91%	5.47%	4.27%	4.49%
Distillers and Vintners	39.29%	39.51%	8.28%	8.17%	18.60%	18.46%
Distributors	14.80%	20.44%	14.47%	14.51%	5.93%	6.71%

Diversified Banks	70.99%	71.45%	0.00%	0.10%	0.00%	2.01%
Diversified Chemicals	41.19%	42.99%	9.71%	10.12%	6.37%	6.94%
Diversified Metals and Mining	29.15%	29.90%	10.77%	10.62%	21.52%	21.58%
Diversified Real Estate Activities	36.80%	36.95%	3.57%	3.58%	29.50%	29.71%
Diversified REITs	74.09%	74.09%	3.30%	3.30%	45.42%	45.42%
Diversified Support Services	24.69%	32.17%	8.86%	7.51%	13.94%	14.10%
Drug Retail	20.75%	43.63%	9.51%	4.23%	5.70%	4.06%
Education Services	1.69%	10.38%	35.17%	18.28%	17.43%	16.18%
Electric Utilities	49.44%	51.87%	7.52%	7.23%	18.71%	19.13%
Electrical Components and Equipment	21.13%	22.42%	17.00%	56.12%	13.44%	45.91%
Electronic Components	11.12%	13.16%	17.43%	17.30%	10.68%	11.26%
Electronic Equipment and Instruments	19.49%	21.20%	11.64%	11.31%	11.35%	11.52%
Electronic Manufacturing Services	28.42%	30.64%	9.60%	9.24%	3.85%	3.88%
Environmental and Facilities Services	37.45%	38.91%	6.43%	6.54%	13.52%	14.22%
Fertilizers and Agricultural Chemicals	8.40%	9.55%	29.41%	28.26%	29.50%	29.65%
Food Distributors	17.56%	20.13%	18.61%	17.08%	4.23%	4.19%
Food Retail	41.83%	53.65%	9.35%	5.87%	3.32%	2.78%
Footwear	5.00%	11.04%	19.40%	15.71%	11.23%	10.98%
Forest Products	45.74%	46.65%	-4.21%	-3.55%	-5.63%	-4.84%
Gas Utilities	44.49%	45.49%	9.48%	9.20%	10.44%	10.38%
General Merchandise Stores	31.15%	37.37%	9.80%	8.21%	6.69%	6.53%
Gold	8.53%	8.62%	4.24%	4.25%	18.28%	18.37%
Health Care Technology	14.38%	16.78%	14.89%	14.30%	14.62%	15.32%
Healthcare Distributors	19.89%	22.16%	13.83%	13.01%	2.02%	1.99%
Healthcare Equipment	14.17%	15.13%	13.07%	12.95%	20.93%	21.26%
Healthcare Facilities	68.16%	72.34%	6.72%	6.74%	8.10%	9.49%
Healthcare Services	23.61%	26.18%	12.89%	12.92%	7.70%	8.29%
Healthcare Supplies	19.18%	20.80%	6.74%	6.70%	13.19%	13.53%
Heavy Electrical Equipment	10.90%	12.13%	0.98%	0.97%	1.31%	1.34%
Home Entertainment Software	0.44%	2.35%	-2.09%	-2.54%	-2.62%	-3.29%
Home Furnishing Retail	7.64%	18.83%	12.89%	11.79%	7.84%	9.30%
Home Furnishings	39.57%	44.09%	6.09%	6.55%	5.57%	6.48%
Home Improvement Retail	18.64%	27.05%	10.53%	8.92%	7.03%	7.18%
Homebuilding	56.03%	56.76%	-3.57%	-3.36%	-4.04%	-3.91%
Hotels, Resorts and Cruise Lines	45.14%	47.78%	7.23%	7.15%	17.89%	18.66%
Household Appliances	40.74%	43.37%	11.92%	12.82%	6.37%	7.24%
Household Products	22.02%	22.88%	13.60%	13.33%	18.72%	18.80%
Housewares and Specialties	52.00%	53.67%	8.20%	8.40%	10.36%	11.05%
Human Resource and Employment Services	11.25%	21.71%	15.17%	14.14%	4.38%	5.07%
Hypermarkets and Super Centers	16.80%	20.46%	15.53%	14.30%	5.18%	5.30%

Independent Power Producers and Energy Traders	67.17%	69.27%	7.43%	7.12%	12.30%	12.59%
Industrial Conglomerates	76.23%	76.42%	2.83%	2.97%	14.52%	15.40%
Industrial Gases	22.99%	24.03%	13.41%	13.02%	15.82%	15.84%
Industrial Machinery	24.01%	25.71%	12.99%	12.97%	11.77%	12.16%
Industrial REITs	66.38%	66.40%	4.16%	4.15%	29.79%	29.73%
Insurance Brokers	20.64%	29.37%	9.35%	8.78%	11.97%	13.80%
Integrated Oil and Gas	9.46%	11.67%	29.36%	28.85%	14.36%	14.84%
Integrated Telecommunication Services	37.99%	40.77%	9.65%	9.46%	20.06%	21.03%
Internet Retail	8.50%	10.42%	18.35%	16.76%	6.77%	7.16%
Internet Software and Services	3.97%	6.41%	12.12%	11.16%	19.90%	20.07%
Investment Banking and Brokerage	83.15%	83.35%	0.01%	0.20%	0.32%	4.48%
IT Consulting and Other Services	15.71%	22.42%	16.74%	14.61%	8.32%	8.86%
Leisure Facilities	53.08%	56.57%	8.44%	7.59%	23.42%	22.88%
Leisure Products	21.59%	26.14%	14.29%	14.05%	7.52%	8.29%
Life and Health Insurance	44.63%	45.72%	9.15%	9.08%	7.77%	7.94%
Life Sciences Tools and Services	13.36%	15.87%	7.95%	7.93%	11.42%	12.02%
Managed Healthcare	29.77%	31.95%	11.55%	11.45%	6.23%	6.45%
Marine	55.43%	56.89%	7.32%	8.16%	17.89%	20.62%
Marine Ports and Services	0.00%	18.34%	31.56%	20.45%	54.46%	47.78%
Metal and Glass Containers	40.25%	41.74%	15.49%	15.54%	10.27%	10.79%
Mortgage REITs	88.43%	88.49%	0.00%	-0.05%	0.00%	-7.24%
Motorcycle Manufacturers	48.19%	48.45%	12.36%	12.33%	18.97%	19.07%
Movies and Entertainment	44.99%	48.78%	8.09%	7.43%	16.07%	15.95%
Multi-line Insurance	86.57%	86.78%	-19.85%	-19.42%	-51.42%	-50.97%
Multi-Sector Holdings	28.32%	29.21%	-1.97%	-1.81%	-15.45%	-14.43%
Multi-Utilities	51.56%	52.36%	6.40%	6.40%	13.99%	14.24%
Office Electronics	60.37%	62.01%	11.09%	11.67%	9.18%	10.08%
Office REITs	51.99%	52.43%	4.20%	4.06%	27.81%	27.13%
Office Services and Supplies	42.04%	44.28%	11.93%	12.41%	8.68%	9.65%
Oil and Gas Drilling	18.49%	18.82%	17.28%	17.54%	34.29%	34.95%
Oil and Gas Equipment and Services	18.84%	20.75%	17.34%	18.13%	18.59%	20.21%
Oil and Gas Exploration and Production	30.40%	31.80%	7.18%	6.96%	20.03%	19.92%
Oil and Gas Refining and Marketing	38.84%	42.77%	10.24%	10.48%	2.89%	3.16%
Oil and Gas Storage and Transportation	53.93%	54.84%	8.95%	8.91%	9.78%	9.97%
Other Diversified Financial Services	90.63%	90.76%	0.00%	0.41%	0.13%	17.91%
Packaged Foods and Meats	33.09%	34.34%	7.86%	7.78%	7.93%	8.10%
Paper Packaging	55.41%	56.66%	6.73%	6.95%	6.72%	7.17%
Paper Products	71.40%	72.44%	6.04%	6.35%	5.38%	5.86%
Personal Products	26.33%	30.20%	23.04%	19.00%	13.08%	12.78%

Pharmaceuticals	14.33%	14.91%	18.21%	18.23%	25.06%	25.54%
Photographic Products	52.99%	57.68%	94.12%	46.85%	1.19%	1.95%
Precious Metals and Minerals	17.06%	17.80%	0.20%	0.15%	0.89%	0.64%
Property and Casualty Insurance	26.71%	28.21%	-1.81%	-1.28%	-2.36%	-1.71%
Publishing	30.87%	34.56%	7.30%	7.14%	16.79%	17.51%
Railroads	32.00%	37.29%	11.44%	10.83%	25.04%	26.53%
Real Estate Development	40.91%	41.88%	-0.93%	-0.82%	-6.03%	-5.44%
Real Estate Operating Companies	87.51%	88.08%	3.05%	2.76%	16.64%	15.70%
Real Estate Services	55.62%	61.62%	7.81%	8.10%	6.65%	8.31%
Regional Banks	75.20%	75.58%	0.00%	0.55%	0.00%	13.62%
Reinsurance	28.89%	29.82%	8.98%	8.96%	10.18%	10.30%
Research and Consulting Services	17.48%	23.02%	14.20%	12.27%	15.31%	15.62%
Residential REITs	54.24%	58.54%	4.78%	3.34%	33.59%	26.64%
Restaurants	20.13%	32.19%	14.53%	9.57%	13.44%	13.29%
Retail REITs	57.25%	57.36%	8.40%	8.43%	43.58%	43.93%
Security and Alarm Services	34.74%	38.25%	10.37%	10.59%	11.60%	12.88%
Semiconductor Equipment	8.91%	10.24%	8.58%	8.36%	11.39%	11.46%
Semiconductors	8.73%	9.55%	9.33%	9.34%	13.25%	13.58%
Soft Drinks	15.72%	16.50%	20.00%	19.77%	16.47%	16.83%
Specialized Consumer Services	40.04%	44.50%	13.13%	10.51%	17.50%	16.14%
Specialized Finance	63.59%	64.18%	3.48%	3.57%	33.95%	35.47%
Specialized REITs	26.63%	28.35%	7.11%	6.76%	31.42%	30.84%
Specialty Chemicals	33.21%	34.65%	10.22%	10.41%	9.30%	9.84%
Specialty Stores	27.02%	48.50%	9.76%	7.28%	4.53%	5.88%
Steel	32.62%	34.16%	17.23%	16.88%	10.99%	11.08%
Systems Software	5.59%	6.94%	30.53%	27.96%	33.37%	32.76%
Technology Distributors	31.70%	35.79%	10.87%	10.95%	2.33%	2.51%
Thrifts and Mortgage Finance	97.60%	97.60%	-0.06%	-0.03%	-28.59%	-14.47%
Tires and Rubber	70.09%	73.38%	9.66%	10.41%	2.99%	3.88%
Tobacco	16.36%	16.79%	42.88%	42.18%	34.17%	34.50%
Trading Companies and Distributors	42.87%	46.26%	11.29%	10.89%	11.23%	11.81%
Trucking	53.06%	55.18%	6.49%	7.06%	6.09%	7.05%
Water Utilities	50.05%	50.99%	4.63%	4.57%	24.35%	24.57%
Wireless Telecommunication Services	44.99%	53.45%	3.79%	3.49%	6.87%	7.92%
Grand Total	**49.62%**	**51.24%**	**4.76%**	**4.90%**	**9.58%**	**10.32%**

Appendix 2: Sector Betas – Before and After Lease Capitalization

Primary Industry	*Stated Debt*	*Adjusted Debt*	*Regression beta*	*Unlevered beta*	*Unlevered beta (adjusted)*
Advertising	$12,353.70	$17,808.20	1.30	1.03	0.89
Aerospace and Defense	$64,837.73	$74,999.69	1.06	1.00	0.98
Agricultural Products	$13,710.10	$15,389.17	1.06	0.89	0.87
Air Freight and Logistics	$13,695.90	$28,499.05	1.22	1.17	1.07
Airlines	$64,901.60	$110,883.03	1.52	0.65	0.42
Alternative Carriers	$9,387.30	$10,400.59	1.29	0.67	0.63
Aluminum	$10,709.80	$11,829.10	2.33	1.48	1.42
Apparel Retail	$7,075.61	$34,134.30	1.47	1.58	1.21
Apparel, Accessories and Luxury Goods	$8,194.06	$14,638.24	1.51	1.43	1.28
Application Software	$7,223.94	$10,112.62	1.03	1.09	1.07
Asset Management and Custody Banks	$74,716.52	$79,181.31	1.41	1.12	1.10
Auto Parts and Equipment	$15,770.78	$18,461.95	1.46	1.24	1.17
Automobile Manufacturers	$200,745.10	$205,736.32	2.03	0.24	0.24
Automotive Retail	$13,428.70	$21,497.70	1.52	1.18	1.03
Biotechnology	$24,563.35	$28,124.31	0.97	0.96	0.95
Brewers	$1,831.80	$1,999.36	0.53	0.47	0.46
Broadcasting	$34,012.80	$38,452.45	0.90	0.35	0.32
Building Products	$9,877.06	$10,926.89	1.28	1.01	0.97
Cable and Satellite	$117,731.10	$121,937.86	1.27	0.85	0.84
Casinos and Gaming	$42,051.90	$43,423.16	1.89	0.94	0.92
Catalog Retail	$7,539.50	$7,707.55	1.41	0.58	0.57
Coal and Consumable Fuels	$15,257.00	$16,166.46	1.69	1.47	1.45
Commercial Printing	$10,094.80	$11,105.81	1.38	0.62	0.58
Commodity Chemicals	$8,539.80	$10,073.32	1.23	0.83	0.77
Communications Equipment	$22,134.05	$26,265.02	1.15	1.20	1.18
Computer and Electronics Retail	$3,543.88	$5,171.86	1.29	1.29	1.24
Computer Hardware	$58,835.00	$68,646.87	0.98	0.99	0.97
Computer Storage and Peripherals	$7,578.91	$9,039.79	1.06	1.22	1.20
Construction and Engineering	$7,147.20	$10,514.49	1.44	1.61	1.52
Construction and Farm Machinery and Heavy Trucks	$88,423.23	$91,585.04	1.53	0.94	0.92
Construction Materials	$6,414.70	$6,890.48	1.62	1.21	1.19
Consumer Electronics	$444.90	$580.81	1.38	1.34	1.26
Consumer Finance	$321,191.40	$324,456.82	1.68	0.32	0.32
Data Processing and Outsourced Services	$28,834.55	$32,587.01	1.09	1.06	1.04
Department Stores	$24,051.90	$40,709.62	1.65	1.31	1.08
Distillers and Vintners	$6,426.30	$6,483.43	0.98	0.73	0.73
Distributors	$1,389.20	$2,054.34	0.68	0.63	0.60

Diversified Banks	$626,735.00	$641,075.82	1.23	0.55	0.54
Diversified Chemicals	$36,319.40	$39,103.71	1.22	0.96	0.94
Diversified Metals and Mining	$24,483.67	$25,381.90	1.62	1.40	1.39
Diversified Real Estate Activities	$2,455.49	$2,471.60	0.88	0.67	0.67
Diversified REITs	$2,880.50	$2,880.50		0.00	0.00
Diversified Support Services	$5,747.37	$8,314.14	1.01	0.88	0.81
Drug Retail	$21,518.50	$63,612.96	0.87	0.77	0.60
Education Services	$448.94	$3,028.02	0.77	0.83	0.78
Electric Utilities	$179,894.40	$198,301.74	0.68	0.44	0.43
Electrical Components and Equipment	$20,195.64	$21,778.00	1.49	1.38	1.36
Electronic Components	$2,573.99	$3,115.60	1.13	1.19	1.17
Electronic Equipment and Instruments	$4,999.96	$5,556.78	1.14	1.13	1.11
Electronic Manufacturing Services	$4,686.80	$5,212.69	1.37	1.51	1.47
Environmental and Facilities Services	$22,324.83	$23,746.30	0.87	0.66	0.65
Fertilizers and Agricultural Chemicals	$10,087.00	$11,611.78	1.24	1.25	1.24
Food Distributors	$3,319.10	$3,925.92	0.61	0.56	0.54
Food Retail	$39,750.93	$63,989.16	0.78	0.57	0.47
Footwear	$1,604.43	$3,785.40	1.19	1.26	1.21
Forest Products	$9,127.67	$9,469.33	0.99	0.78	0.77
Gas Utilities	$32,080.90	$33,400.18	0.81	0.56	0.55
General Merchandise Stores	$20,485.91	$27,016.68	0.93	0.75	0.70
Gold	$10,848.82	$10,964.42	0.75	0.74	0.74
Health Care Technology	$2,031.90	$2,439.66	0.89	0.88	0.87
Healthcare Distributors	$8,920.19	$10,226.03	0.75	0.71	0.69
Healthcare Equipment	$33,954.92	$36,663.44	0.83	0.80	0.80
Healthcare Facilities	$29,975.70	$36,637.60	1.15	0.53	0.46
Healthcare Services	$22,177.88	$25,449.19	0.82	0.72	0.70
Healthcare Supplies	$3,358.90	$3,717.79	0.97	0.90	0.88
Heavy Electrical Equipment	$145.44	$164.12	1.58	1.57	1.56
Home Entertainment Software	$96.00	$518.22	1.18	1.51	1.48
Home Furnishing Retail	$1,118.89	$3,137.40	0.88	0.90	0.82
Home Furnishings	$4,130.60	$4,974.39	1.35	1.02	0.96
Home Improvement Retail	$18,737.50	$30,321.13	0.98	0.87	0.81
Homebuilding	$23,913.30	$24,638.73	2.06	1.70	1.66
Hotels, Resorts and Cruise Lines	$29,649.41	$32,972.77	1.70	1.17	1.13
Household Appliances	$6,521.70	$7,266.34	1.16	0.87	0.84
Household Products	$59,168.30	$62,173.73	0.79	0.69	0.69
Housewares and Specialties	$12,462.80	$13,326.61	1.60	1.02	0.99
Human Resource and Employment Services	$1,713.55	$3,746.65	1.29	1.47	1.32

Hypermarkets and Super Centers	$44,628.12	$56,855.39	0.80	0.75	0.72
Independent Power Producers and Energy Traders	$61,395.20	$67,652.14	0.91	0.45	0.42
Industrial Conglomerates	$546,455.20	$552,392.56	1.28	0.47	0.47
Industrial Gases	$11,067.60	$11,729.05	1.17	1.00	0.99
Industrial Machinery	$31,621.56	$34,620.69	1.32	1.18	1.16
Industrial REITs	$666.80	$667.42		0.00	0.00
Insurance Brokers	$6,945.70	$11,104.84	0.88	0.83	0.76
Integrated Oil and Gas	$77,122.30	$97,515.42	1.20	1.21	1.19
Integrated Telecommunication Services	$183,572.30	$206,273.78	0.95	0.72	0.70
Internet Retail	$4,312.43	$5,405.01	0.97	1.02	1.00
Internet Software and Services	$7,823.29	$12,963.97	1.07	1.18	1.16
Investment Banking and Brokerage	$654,447.89	$663,604.37	1.52	0.45	0.44
IT Consulting and Other Services	$3,735.28	$5,793.73	1.06	1.08	1.01
Leisure Facilities	$4,190.40	$4,826.14	1.52	0.96	0.90
Leisure Products	$3,438.37	$4,420.06	1.21	1.19	1.13
Life and Health Insurance	$110,439.40	$115,401.68	1.68	1.69	1.65
Life Sciences Tools and Services	$7,684.62	$9,401.25	0.95	0.96	0.94
Managed Healthcare	$34,430.13	$38,140.54	1.06	1.02	0.99
Marine	$5,615.20	$5,958.21	1.50	0.89	0.87
Marine Ports and Services	$0.00	$127.40	0.85	0.95	0.82
Metal and Glass Containers	$13,775.40	$14,649.21	0.97	0.73	0.72
Mortgage REITs	$40,482.10	$40,704.90	1.44	0.27	0.26
Motorcycle Manufacturers	$3,914.90	$3,955.81	1.97	1.36	1.36
Movies and Entertainment	$87,968.47	$102,415.94	1.18	0.88	0.83
Multi-line Insurance	$228,856.40	$232,974.67	1.46	0.33	0.33
Multi-Sector Holdings	$2,123.90	$2,218.37	1.37	1.16	1.15
Multi-Utilities	$160,216.20	$165,408.58	0.71	0.44	0.43
Office Electronics	$9,032.00	$9,680.19	1.35	0.77	0.74
Office REITs	$7,583.90	$7,719.39	1.15	0.71	0.70
Office Services and Supplies	$9,756.90	$10,687.64	1.26	0.93	0.90
Oil and Gas Drilling	$7,044.47	$7,196.85	1.41	1.35	1.34
Oil and Gas Equipment and Services	$32,209.56	$36,340.96	1.49	1.39	1.37
Oil and Gas Exploration and Production	$151,592.11	$161,860.83	1.38	1.13	1.11
Oil and Gas Refining and Marketing	$17,420.10	$20,497.76	1.35	1.03	0.98
Oil and Gas Storage and Transportation	$163,425.40	$169,524.12	1.06	0.64	0.63
Other Diversified Financial Services	$1,948,325.10	$1,977,885.96	2.15	0.34	0.34
Packaged Foods and Meats	$75,648.19	$79,997.62	0.71	0.56	0.55

Paper Packaging	$13,128.50	$13,814.50	1.07	0.63	0.62
Paper Products	$18,057.40	$19,008.58	1.39	0.60	0.58
Personal Products	$9,952.26	$12,047.80	0.94	0.83	0.80
Pharmaceuticals	$97,212.39	$101,843.49	1.49	1.48	1.47
Photographic Products	$1,303.00	$1,575.74	1.29	6.03	3.30
Precious Metals and Minerals	$1,853.90	$1,952.53	1.32	1.26	1.25
Property and Casualty Insurance	$43,489.50	$46,896.76	1.05	0.92	0.91
Publishing	$30,376.00	$35,925.40	1.03	0.84	0.81
Railroads	$46,497.30	$58,750.81	1.02	0.82	0.77
Real Estate Development	$480.62	$500.19	0.70	0.60	0.59
Real Estate Operating Companies	$9,577.10	$10,099.78	0.90	0.18	0.17
Real Estate Services	$3,794.30	$4,860.18	1.06	0.63	0.56
Regional Banks	$421,510.45	$430,284.91	1.17	0.47	0.47
Reinsurance	$3,138.80	$3,283.39	1.07	1.05	1.04
Research and Consulting Services	$4,479.32	$6,322.14	0.89	0.83	0.79
Residential REITs	$7,518.20	$8,954.91	1.18	0.70	0.65
Restaurants	$30,170.88	$56,821.75	1.31	1.17	1.05
Retail REITs	$2,125.00	$2,134.60	1.19	0.78	0.78
Security and Alarm Services	$2,461.60	$2,864.31	1.09	0.88	0.84
Semiconductor Equipment	$3,808.82	$4,445.46	1.30	1.47	1.45
Semiconductors	$19,306.07	$21,326.50	1.17	1.22	1.21
Soft Drinks	$39,132.49	$41,461.47	0.87	0.81	0.81
Specialized Consumer Services	$9,800.60	$11,764.38	1.04	0.81	0.76
Specialized Finance	$86,148.30	$88,401.10	1.46	0.75	0.74
Specialized REITs	$6,979.59	$7,608.72	1.34	1.15	1.13
Specialty Chemicals	$19,163.94	$20,434.00	1.39	1.13	1.11
Specialty Stores	$11,458.52	$29,134.92	1.37	1.20	0.92
Steel	$18,341.09	$19,650.85	1.56	1.34	1.32
Systems Software	$19,832.93	$24,969.59	1.00	1.04	1.03
Technology Distributors	$5,577.71	$6,698.44	1.23	1.15	1.09
Thrifts and Mortgage Finance	$1,799,974.00	$1,800,884.03	1.02	0.04	0.04
Tires and Rubber	$5,637.30	$6,630.47	1.78	1.01	0.88
Tobacco	$26,030.30	$26,846.58	0.73	0.71	0.71
Trading Companies and Distributors	$18,996.52	$21,785.84	1.23	0.88	0.84
Trucking	$20,027.08	$21,811.31	1.23	0.78	0.75
Water Utilities	$8,074.60	$8,385.57	0.75	0.47	0.46
Wireless Telecommunication Services	$57,128.30	$80,202.96	1.44	1.03	0.90

Appendix 3: Excess Returns and Reinvestment Rates by sector

Primary Industry	Cost of capital	Adjusted Cost of capital	ROC	Adjusted ROC	ROC - Cost of capital	Adj ROC - Adj Cost of capital	Reinvestment Rate	Adjusted Reinvestment Rate
Advertising	7.75%	7.10%	9.71%	11.24%	1.96%	4.14%	-17.90%	15.28%
Aerospace and Defense	7.88%	7.85%	21.70%	21.02%	13.82%	13.17%	2.59%	3.50%
Agricultural Products	7.26%	7.10%	13.81%	13.01%	6.55%	5.92%	36.94%	30.06%
Air Freight and Logistics	9.25%	8.52%	17.36%	11.44%	8.11%	2.92%	34.23%	-7.14%
Airlines	6.65%	5.51%	-2.47%	0.56%	-9.12%	-4.95%	-131.51%	-111.05%
Alternative Carriers	6.44%	6.29%	2.45%	4.80%	-3.99%	-1.49%	-199.41%	-53.96%
Aluminum	9.88%	9.55%	4.06%	3.16%	-5.82%	-6.40%	216.45%	219.41%
Apparel Retail	10.84%	8.86%	17.95%	12.20%	7.11%	3.34%	13.34%	-8.32%
Apparel, Accessories and Luxury Goods	10.23%	9.42%	14.89%	12.02%	4.67%	2.60%	14.05%	-6.18%
Application Software	8.57%	8.44%	11.84%	10.65%	3.27%	2.21%	-25.80%	-40.68%
Asset Management and Custody Banks	8.63%	8.53%	-1.09%	-0.67%	-9.71%	-9.20%	-85.11%	-160.80%
Auto Parts and Equipment	8.54%	8.22%	7.17%	6.95%	-1.37%	-1.27%	1.56%	-7.19%
Automobile Manufacturers	5.50%	5.49%	-13.57%	-11.84%	-19.08%	-17.33%	66.04%	65.25%
Automotive Retail	9.22%	8.27%	8.66%	5.98%	-0.57%	-2.30%	46.52%	-12.10%
Biotechnology	8.18%	8.10%	8.68%	8.39%	0.50%	0.28%	-1.44%	-7.27%
Brewers	5.50%	5.58%	5.23%	5.41%	-0.27%	-0.17%	1.01%	2.81%
Broadcasting	4.89%	4.78%	7.50%	8.82%	2.60%	4.04%	-15.58%	7.77%
Building Products	7.58%	7.40%	4.50%	5.20%	-3.07%	-2.20%	5.19%	18.56%
Cable and Satellite	7.18%	7.12%	6.33%	6.45%	-0.85%	-0.67%	-7.98%	-5.94%
Casinos and Gaming	7.12%	7.04%	3.96%	3.86%	-3.16%	-3.18%	256.62%	249.38%
Catalog Retail	5.65%	5.62%	7.94%	7.86%	2.29%	2.24%	-34.92%	-37.00%
Coal and Consumable Fuels	10.46%	10.35%	3.30%	3.79%	-7.16%	-6.56%	-85.25%	-65.16%
Commercial Printing	6.00%	5.84%	9.89%	9.88%	3.90%	4.04%	-24.55%	-22.17%
Commodity Chemicals	6.93%	6.65%	8.45%	7.75%	1.52%	1.10%	42.25%	25.49%
Communications Equipment	9.38%	9.29%	12.04%	11.67%	2.65%	2.37%	10.06%	5.93%
Computer and Electronics Retail	9.73%	9.54%	19.48%	18.95%	9.76%	9.41%	-28.57%	-19.12%
Computer Hardware	7.95%	7.82%	28.04%	25.87%	20.10%	18.05%	-6.09%	-10.03%
Computer Storage and Peripherals	8.46%	8.41%	10.58%	10.55%	2.12%	2.14%	-5.58%	-6.49%
Construction and Engineering	10.35%	10.10%	18.50%	17.53%	8.14%	7.43%	10.98%	10.72%
Construction and Farm Machinery	6.80%	7.05%	8.38%	8.37%	1.58%	1.32%	65.81%	63.71%

and Heavy Trucks								
Construction Materials	9.38%	9.22%	4.22%	4.38%	-5.15%	-4.84%	60.55%	55.47%
Consumer Electronics	9.14%	8.69%	6.75%	5.15%	-2.39%	-3.54%	-44.13%	-111.61%
Consumer Finance	5.76%	5.22%	-0.02%	0.29%	-5.78%	-4.93%	-1804.79%	283.93%
Data Processing and Outsourced Services	8.53%	8.42%	14.84%	14.21%	6.31%	5.79%	-15.57%	-19.98%
Department Stores	9.34%	8.14%	6.91%	5.47%	-2.43%	-2.67%	-1.67%	-44.54%
Distillers and Vintners	6.82%	6.81%	8.28%	8.17%	1.45%	1.36%	-3.17%	-5.70%
Distributors	6.41%	6.39%	14.47%	14.51%	8.07%	8.12%	7.34%	12.03%
Diversified Banks	4.72%	5.54%	0.00%	0.10%	-4.72%	-5.44%	NA	233.37%
Diversified Chemicals	7.56%	7.44%	9.71%	10.12%	2.16%	2.68%	20.24%	24.45%
Diversified Metals and Mining	9.88%	9.81%	10.77%	10.62%	0.88%	0.81%	74.67%	72.96%
Diversified Real Estate Activities	6.57%	6.56%	3.57%	3.58%	-3.00%	-2.98%	26.65%	26.11%
Diversified REITs	3.44%	3.44%	3.30%	3.30%	-0.14%	-0.14%	-14.20%	-14.20%
Diversified Support Services	7.56%	7.30%	8.86%	7.51%	1.30%	0.21%	37.86%	13.22%
Drug Retail	7.12%	6.19%	9.51%	4.23%	2.39%	-1.96%	36.33%	-111.38%
Education Services	7.56%	7.16%	35.17%	18.28%	27.62%	11.12%	4.08%	-42.94%
Electric Utilities	5.36%	5.28%	7.52%	7.23%	2.15%	1.95%	118.70%	109.28%
Electrical Components and Equipment	9.93%	10.07%	17.00%	56.12%	7.07%	46.05%	13.08%	102.63%
Electronic Components	8.95%	8.87%	17.43%	17.30%	8.48%	8.43%	-3.36%	-1.53%
Electronic Equipment and Instruments	8.49%	8.38%	11.64%	11.31%	3.14%	2.93%	-14.48%	-18.63%
Electronic Manufacturing Services	8.88%	8.88%	9.60%	9.24%	0.72%	0.36%	1.53%	-5.29%
Environmental and Facilities Services	6.49%	6.43%	6.43%	6.54%	-0.06%	0.11%	-5.19%	-4.23%
Fertilizers and Agricultural Chemicals	9.77%	9.67%	29.41%	28.26%	19.65%	18.59%	22.08%	20.28%
Food Distributors	5.91%	5.92%	18.61%	17.08%	12.69%	11.16%	11.68%	3.90%
Food Retail	5.96%	5.48%	9.35%	5.87%	3.39%	0.39%	35.84%	-37.28%
Footwear	9.72%	9.26%	19.40%	15.71%	9.67%	6.45%	12.43%	-5.91%
Forest Products	7.06%	7.02%	-4.21%	-3.55%	-11.27%	-10.57%	-8.39%	-23.27%
Gas Utilities	5.96%	5.92%	9.48%	9.20%	3.51%	3.29%	111.52%	107.52%
General Merchandise Stores	6.83%	6.71%	9.80%	8.21%	2.97%	1.50%	48.50%	22.93%
Gold	7.07%	7.06%	4.24%	4.25%	-2.83%	-2.81%	171.16%	170.48%
Health Care Technology	7.51%	7.47%	14.89%	14.30%	7.38%	6.83%	-7.59%	-9.26%
Healthcare Distributors	6.50%	6.39%	13.83%	13.01%	7.33%	6.62%	-4.37%	-12.67%

Healthcare Equipment	7.21%	7.25%	13.07%	12.95%	5.86%	5.70%	-2.36%	-3.13%
Healthcare Facilities	5.61%	5.35%	6.72%	6.74%	1.11%	1.39%	47.65%	33.55%
Healthcare Services	6.74%	6.77%	12.89%	12.92%	6.14%	6.15%	-0.96%	1.81%
Healthcare Supplies	7.69%	7.72%	6.74%	6.70%	-0.95%	-1.02%	-6.76%	-10.02%
Heavy Electrical Equipment	11.56%	11.46%	0.98%	0.97%	-10.58%	-10.49%	902.93%	836.21%
Home Entertainment Software	10.07%	9.97%	-2.09%	-2.54%	-12.16%	-12.50%	388.54%	356.44%
Home Furnishing Retail	7.83%	7.40%	12.89%	11.79%	5.06%	4.38%	10.51%	5.38%
Home Furnishings	8.15%	7.81%	6.09%	6.55%	-2.06%	-1.26%	-18.15%	-13.57%
Home Improvement Retail	7.80%	7.47%	10.53%	8.92%	2.73%	1.46%	27.29%	7.92%
Homebuilding	9.45%	9.38%	-3.57%	-3.36%	-13.02%	-12.74%	27.43%	35.75%
Hotels, Resorts and Cruise Lines	8.87%	8.62%	7.23%	7.15%	-1.65%	-1.47%	102.15%	94.86%
Household Appliances	7.38%	7.21%	11.92%	12.82%	4.54%	5.61%	-10.29%	-0.02%
Household Products	6.57%	6.66%	13.60%	13.33%	7.04%	6.68%	3.65%	1.78%
Housewares and Specialties	7.93%	7.78%	8.20%	8.40%	0.27%	0.62%	-9.53%	-6.21%
Human Resource and Employment Services	9.82%	9.21%	15.17%	14.14%	5.35%	4.94%	-3.58%	-1.84%
Hypermarkets and Super Centers	6.92%	6.84%	15.53%	14.30%	8.61%	7.46%	32.64%	27.51%
Independent Power Producers and Energy Traders	5.19%	5.09%	7.43%	7.12%	2.25%	2.03%	76.17%	66.32%
Industrial Conglomerates	4.82%	4.81%	2.83%	2.97%	-1.99%	-1.84%	21.14%	22.99%
Industrial Gases	8.42%	8.35%	13.41%	13.02%	4.99%	4.67%	40.80%	37.19%
Industrial Machinery	9.04%	8.90%	12.99%	12.97%	3.95%	4.07%	-2.27%	-1.72%
Industrial REITs	3.40%	3.40%	4.16%	4.15%	0.76%	0.75%	-88.78%	-89.39%
Insurance Brokers	7.18%	6.90%	9.35%	8.78%	2.17%	1.89%	-14.41%	-18.58%
Integrated Oil and Gas	9.49%	9.32%	29.36%	28.85%	19.87%	19.53%	46.20%	46.88%
Integrated Telecommunication Services	6.54%	6.63%	9.65%	9.46%	3.10%	2.83%	5.11%	3.78%
Internet Retail	8.34%	8.29%	18.35%	16.76%	10.01%	8.47%	4.07%	0.88%
Internet Software and Services	9.15%	8.98%	12.12%	11.16%	2.97%	2.18%	15.47%	6.12%
Investment Banking and Brokerage	5.04%	5.02%	0.01%	0.20%	-5.02%	-4.82%	4104.07%	365.96%
IT Consulting and Other Services	8.38%	8.08%	16.74%	14.61%	8.36%	6.52%	-12.20%	-21.27%
Leisure Facilities	7.61%	7.31%	8.44%	7.59%	0.84%	0.28%	69.66%	56.31%
Leisure Products	8.69%	8.52%	14.29%	14.05%	5.60%	5.53%	-8.93%	-5.83%

Life and Health Insurance	8.84%	8.73%	9.15%	9.08%	0.32%	0.35%	-13.68%	-14.99%
Life Sciences Tools and Services	7.95%	7.90%	7.95%	7.93%	-0.01%	0.03%	-9.67%	-12.44%
Managed Healthcare	7.46%	7.32%	11.55%	11.45%	4.09%	4.12%	-1.40%	-1.44%
Marine	7.02%	7.23%	7.32%	8.16%	0.30%	0.93%	244.32%	225.81%
Marine Ports and Services	8.09%	7.04%	31.56%	20.45%	23.47%	13.41%	-10.17%	-40.00%
Metal and Glass Containers	6.73%	6.65%	15.49%	15.54%	8.76%	8.89%	1.06%	3.36%
Mortgage REITs	3.47%	4.53%	0.00%	-0.05%	-3.47%	-4.58%	NA	-235.10%
Motorcycle Manufacturers	8.84%	8.80%	12.36%	12.33%	3.52%	3.53%	-1.50%	-1.55%
Movies and Entertainment	7.17%	6.93%	8.09%	7.43%	0.92%	0.50%	-3.81%	-18.48%
Multi-line Insurance	5.74%	5.72%	-19.85%	-19.42%	-25.59%	-25.14%	-4.43%	-4.63%
Multi-Sector Holdings	9.40%	9.34%	-1.97%	-1.81%	-11.37%	-11.15%	-2.67%	-1.56%
Multi-Utilities	5.36%	5.33%	6.40%	6.40%	1.04%	1.06%	113.71%	110.63%
Office Electronics	6.20%	6.44%	11.09%	11.67%	4.90%	5.23%	-9.65%	-5.91%
Office REITs	6.61%	6.59%	4.20%	4.06%	-2.41%	-2.53%	-67.02%	-74.09%
Office Services and Supplies	7.38%	7.47%	11.93%	12.41%	4.55%	4.94%	-19.40%	-9.16%
Oil and Gas Drilling	9.78%	9.75%	17.28%	17.54%	7.50%	7.78%	90.33%	90.79%
Oil and Gas Equipment and Services	10.15%	10.09%	17.34%	18.13%	7.19%	8.04%	38.89%	44.16%
Oil and Gas Exploration and Production	8.78%	8.66%	7.18%	6.96%	-1.60%	-1.70%	132.47%	126.88%
Oil and Gas Refining and Marketing	7.94%	7.88%	10.24%	10.48%	2.29%	2.60%	85.80%	83.81%
Oil and Gas Storage and Transportation	6.26%	6.20%	8.95%	8.91%	2.70%	2.71%	116.51%	112.53%
Other Diversified Financial Services	3.67%	4.74%	0.00%	0.41%	-3.66%	-4.33%	NA	113.63%
Packaged Foods and Meats	6.05%	6.00%	7.86%	7.78%	1.81%	1.78%	6.10%	3.09%
Paper Packaging	6.20%	6.13%	6.73%	6.95%	0.53%	0.82%	-20.92%	-18.13%
Paper Products	5.81%	5.73%	6.04%	6.35%	0.23%	0.63%	-53.27%	-45.67%
Personal Products	7.15%	6.94%	23.04%	19.00%	15.89%	12.06%	15.08%	-0.44%
Pharmaceuticals	10.57%	10.52%	18.21%	18.23%	7.64%	7.71%	-10.45%	-8.86%
Photographic Products	6.96%	6.62%	94.12%	46.85%	87.16%	40.23%	-219.64%	-119.81%
Precious Metals and Minerals	9.75%	9.70%	0.20%	0.15%	-9.55%	-9.55%	NMF	NMF
Property and Casualty Insurance	8.09%	8.02%	-1.81%	-1.28%	-9.90%	-9.30%	157.66%	193.42%
Publishing	7.27%	7.25%	7.30%	7.14%	0.03%	-0.11%	1.78%	-4.24%
Railroads	7.16%	7.06%	11.44%	10.83%	4.28%	3.76%	55.14%	47.94%
Real Estate	6.23%	6.21%	-0.93%	-0.82%	-7.16%	-7.03%	-102.16%	-102.97%

Development								
Real Estate Operating Companies	4.72%	4.70%	3.05%	2.76%	-1.67%	-1.94%	-24.33%	-47.09%
Real Estate Services	6.16%	5.81%	7.81%	8.10%	1.65%	2.29%	-15.40%	-12.33%
Regional Banks	4.30%	5.17%	0.00%	0.55%	-4.30%	-4.63%	NA	277.51%
Reinsurance	7.58%	7.52%	8.98%	8.96%	1.40%	1.44%	50.48%	49.55%
Research and Consulting Services	7.39%	7.23%	14.20%	12.27%	6.81%	5.03%	-10.47%	-24.41%
Residential REITs	6.58%	6.30%	4.78%	3.34%	-1.79%	-2.95%	-42.39%	-114.12%
Restaurants	9.30%	8.54%	14.53%	9.57%	5.23%	1.03%	32.91%	-12.36%
Retail REITs	6.39%	6.38%	8.40%	8.43%	2.01%	2.05%	-32.91%	-32.36%
Security and Alarm Services	7.47%	7.26%	10.37%	10.59%	2.90%	3.33%	155.49%	144.04%
Semiconductor Equipment	10.08%	10.02%	8.58%	8.36%	-1.49%	-1.66%	2.73%	-2.01%
Semiconductors	9.37%	9.36%	9.33%	9.34%	-0.04%	-0.02%	-16.26%	-15.94%
Soft Drinks	7.38%	7.34%	20.00%	19.77%	12.62%	12.43%	13.20%	13.54%
Specialized Consumer Services	6.75%	6.74%	13.13%	10.51%	6.38%	3.77%	4.45%	-30.02%
Specialized Finance	5.81%	6.14%	3.48%	3.57%	-2.33%	-2.57%	106.90%	102.82%
Specialized REITs	9.05%	8.92%	7.11%	6.76%	-1.94%	-2.16%	-13.99%	-20.59%
Specialty Chemicals	8.76%	8.65%	10.22%	10.41%	1.46%	1.77%	-1.13%	2.93%
Specialty Stores	9.02%	7.54%	9.76%	7.28%	0.75%	-0.25%	8.25%	-36.73%
Steel	9.11%	8.96%	17.23%	16.88%	8.12%	7.92%	24.05%	22.56%
Systems Software	8.63%	8.54%	30.53%	27.96%	21.90%	19.42%	-4.45%	-11.47%
Technology Distributors	8.03%	7.94%	10.87%	10.95%	2.84%	3.00%	6.22%	7.22%
Thrifts and Mortgage Finance	4.90%	4.90%	-0.06%	-0.03%	-4.96%	-4.93%	-24.09%	-165.09%
Tires and Rubber	6.61%	6.28%	9.66%	10.41%	3.05%	4.12%	80.65%	71.67%
Tobacco	6.55%	6.53%	42.88%	42.18%	36.33%	35.65%	2.05%	2.58%
Trading Companies and Distributors	7.47%	7.24%	11.29%	10.89%	3.82%	3.65%	60.86%	54.07%
Trucking	6.79%	6.64%	6.49%	7.06%	-0.29%	0.42%	598.07%	525.55%
Water Utilities	5.54%	5.50%	4.63%	4.57%	-0.91%	-0.93%	170.93%	165.60%
Wireless Telecommunication Services	8.04%	7.35%	3.79%	3.49%	-4.25%	-3.87%	-84.72%	-125.85%

Appendix 4: Enterprise Value Multiples – By Sector

Primary Industry	EV/ Sales	Adjusted EV/Sales	EV/EBITDA	Adjusted EV/EBITDA	EV/Capital	Adjusted EV/Capital
Advertising	0.92	1.11	5.48	4.47	1.25	1.20
Aerospace and Defense	0.72	0.75	5.60	5.43	2.13	2.05
Agricultural Products	0.27	0.28	4.59	4.69	1.09	1.09
Air Freight and Logistics	0.87	1.00	6.99	7.40	2.69	2.19
Airlines	0.57	0.93	18.75	9.21	1.25	1.14
Alternative Carriers	1.57	1.69	6.93	5.89	1.25	1.23
Aluminum	0.69	0.73	8.36	8.83	0.80	0.81
Apparel Retail	0.56	0.81	5.24	4.76	2.23	1.61
Apparel, Accessories and Luxury Goods	0.81	0.95	5.65	5.66	1.69	1.53
Application Software	2.30	2.39	11.03	10.72	2.92	2.72
Asset Management and Custody Banks	4.37	4.50	NA	NA	1.20	1.19
Auto Parts and Equipment	0.31	0.34	4.37	4.37	0.99	0.99
Automobile Manufacturers	0.70	0.72	53.47	35.83	2.51	2.42
Automotive Retail	0.65	0.78	10.11	10.22	1.76	1.56
Biotechnology	5.21	5.30	20.49	19.69	3.20	3.09
Brewers	1.64	1.67	9.39	8.94	1.10	1.09
Broadcasting	1.69	1.85	6.61	5.57	0.96	0.96
Building Products	0.53	0.56	6.95	6.22	0.95	0.95
Cable and Satellite	1.92	1.96	5.88	5.77	1.24	1.23
Casinos and Gaming	2.04	2.09	8.67	8.67	1.05	1.04
Catalog Retail	0.82	0.84	5.56	5.56	0.69	0.70
Coal and Consumable Fuels	1.50	1.53	6.62	6.42	1.68	1.66
Commercial Printing	0.63	0.67	4.10	4.03	1.01	1.01
Commodity Chemicals	0.56	0.61	5.99	5.99	1.24	1.21
Communications Equipment	2.03	2.06	11.03	10.88	2.56	2.50
Computer and Electronics Retail	0.42	0.44	6.26	5.73	2.59	2.38
Computer Hardware	1.11	1.13	7.34	7.25	3.64	3.41
Computer Storage and Peripherals	1.07	1.10	8.85	8.47	2.08	2.01
Construction and Engineering	0.38	0.41	5.85	5.50	1.94	1.82
Construction and Farm Machinery and Heavy Trucks	0.87	0.89	7.46	7.30	1.34	1.33
Construction Materials	2.10	2.16	10.46	9.90	1.36	1.35
Consumer Electronics	0.37	0.40	5.01	5.43	1.16	1.14

Consumer Finance	9.99	10.08	NA	152.32	0.96	0.96
Data Processing and Outsourced Services	2.03	2.07	8.15	8.02	2.51	2.44
Department Stores	0.43	0.56	5.80	6.14	1.14	1.10
Distillers and Vintners	1.98	1.99	9.23	9.27	1.47	1.47
Distributors	0.50	0.53	7.36	6.61	1.79	1.70
Diversified Banks	16.16	16.45	NA	276.80	1.02	1.02
Diversified Chemicals	0.56	0.58	5.48	5.24	1.29	1.28
Diversified Metals and Mining	1.78	1.80	5.53	5.54	1.44	1.43
Diversified Real Estate Activities	8.42	8.44	25.51	25.20	1.38	1.38
Diversified REITs	7.80	7.80	15.83	15.83	0.95	0.95
Diversified Support Services	1.60	1.78	8.55	8.46	1.69	1.58
Drug Retail	0.56	0.79	7.59	9.52	1.45	1.28
Education Services	2.23	2.47	10.69	10.73	7.51	4.64
Electric Utilities	2.03	2.14	7.41	7.34	1.21	1.20
Electrical Components and Equipment	1.09	1.11	6.71	2.27	1.95	1.92
Electronic Components	1.04	1.07	7.67	7.32	2.32	2.24
Electronic Equipment and Instruments	1.29	1.32	8.29	8.13	1.80	1.77
Electronic Manufacturing Services	0.30	0.31	4.61	4.64	1.10	1.09
Environmental and Facilities Services	1.80	1.84	8.63	8.31	1.43	1.41
Fertilizers and Agricultural Chemicals	2.05	2.07	6.26	6.23	3.40	3.30
Food Distributors	0.35	0.36	6.70	6.75	2.40	2.29
Food Retail	0.29	0.37	5.48	6.46	1.24	1.18
Footwear	1.11	1.20	8.59	8.62	2.77	2.47
Forest Products	1.02	1.04	29.09	22.68	0.98	0.98
Gas Utilities	1.00	1.02	6.85	6.87	1.29	1.28
General Merchandise Stores	0.71	0.78	7.53	7.64	1.62	1.53
Gold	5.15	5.16	14.34	14.29	1.72	1.72
Health Care Technology	1.90	1.95	10.03	9.54	2.93	2.77
Healthcare Distributors	0.14	0.15	5.94	6.01	1.52	1.49
Healthcare Equipment	2.34	2.36	8.67	8.52	2.15	2.12
Healthcare Facilities	0.86	0.99	6.69	6.18	1.08	1.06
Healthcare Services	0.76	0.79	8.25	7.69	2.02	1.95
Healthcare Supplies	1.97	2.02	9.74	9.48	1.43	1.42
Heavy Electrical	1.86	1.89	26.15	24.93	2.20	2.16

Equipment						
Home Entertainment Software	1.69	1.73	20.85	21.32	1.55	1.53
Home Furnishing Retail	0.80	0.92	7.50	6.67	2.01	1.78
Home Furnishings	0.60	0.65	6.75	6.13	0.97	0.97
Home Improvement Retail	0.76	0.84	7.60	7.60	1.76	1.63
Homebuilding	0.74	0.76	NA	NA	1.02	1.02
Hotels, Resorts and Cruise Lines	1.83	1.92	7.18	7.02	1.06	1.05
Household Appliances	0.46	0.48	4.85	4.50	1.13	1.12
Household Products	1.96	1.98	8.81	8.76	2.13	2.10
Housewares and Specialties	0.87	0.90	6.56	6.24	1.10	1.10
Human Resource and Employment Services	0.25	0.30	4.62	4.33	1.46	1.38
Hypermarkets and Super Centers	0.52	0.55	7.77	7.69	2.32	2.19
Independent Power Producers and Energy Traders	1.10	1.18	6.22	6.22	0.92	0.93
Industrial Conglomerates	3.82	3.85	16.12	15.34	1.07	1.07
Industrial Gases	1.88	1.91	8.06	8.03	2.27	2.23
Industrial Machinery	0.90	0.92	5.98	5.84	1.44	1.43
Industrial REITs	5.84	5.85	10.31	10.32	0.82	0.82
Insurance Brokers	1.30	1.47	8.38	7.49	1.69	1.56
Integrated Oil and Gas	0.64	0.66	3.51	3.47	1.93	1.88
Integrated Telecommunication Services	1.75	1.83	4.74	4.71	1.40	1.38
Internet Retail	1.47	1.50	16.26	15.14	6.63	5.86
Internet Software and Services	3.18	3.28	11.35	11.11	3.23	3.04
Investment Banking and Brokerage	13.18	13.36	NA	192.92	0.99	0.99
IT Consulting and Other Services	0.79	0.87	6.89	6.59	2.25	2.03
Leisure Facilities	1.73	1.88	5.21	5.48	1.02	1.02
Leisure Products	0.62	0.67	5.80	5.48	1.73	1.65
Life and Health Insurance	0.60	0.61	6.91	6.78	0.98	0.98
Life Sciences Tools and Services	1.74	1.80	9.93	9.46	1.67	1.63
Managed Healthcare	0.37	0.38	5.07	4.97	1.14	1.13
Marine	1.58	1.63	6.25	5.68	0.96	0.96
Marine Ports and Services	2.39	2.99	3.79	4.74	1.41	1.30
Metal and Glass Containers	0.81	0.83	5.58	5.41	1.75	1.72

Mortgage REITs	138.88	139.57	NA	NA	0.98	0.98
Motorcycle Manufacturers	1.35	1.35	5.78	5.76	1.39	1.38
Movies and Entertainment	1.20	1.29	5.42	5.57	1.00	1.00
Multi-line Insurance	1.50	1.53	NA	NA	0.77	0.77
Multi-Sector Holdings	6.79	6.88	NA	NA	1.44	1.43
Multi-Utilities	1.57	1.59	7.19	7.12	1.09	1.08
Office Electronics	0.77	0.81	6.72	6.22	0.93	0.93
Office REITs	7.67	7.74	16.51	16.63	1.16	1.16
Office Services and Supplies	0.71	0.74	5.78	5.38	1.62	1.58
Oil and Gas Drilling	1.52	1.52	3.32	3.27	1.04	1.04
Oil and Gas Equipment and Services	1.13	1.16	4.61	4.36	1.54	1.52
Oil and Gas Exploration and Production	2.42	2.47	3.84	3.88	1.23	1.23
Oil and Gas Refining and Marketing	0.16	0.17	4.17	4.01	0.95	0.95
Oil and Gas Storage and Transportation	1.16	1.19	7.76	7.64	1.19	1.18
Other Diversified Financial Services	35.43	35.96	NA	NA	0.87	0.88
Packaged Foods and Meats	0.97	0.99	9.22	8.99	1.60	1.58
Paper Packaging	0.79	0.81	6.77	6.52	1.13	1.12
Paper Products	0.56	0.58	4.95	4.80	0.88	0.89
Personal Products	1.12	1.18	7.28	7.39	3.10	2.77
Pharmaceuticals	2.26	2.27	7.23	7.11	2.48	2.46
Photographic Products	0.03	0.06	0.51	0.80	2.64	1.50
Precious Metals and Minerals	3.65	3.69	20.70	20.62	1.12	1.12
Property and Casualty Insurance	0.98	1.01	100.38	50.41	1.10	1.09
Publishing	1.70	1.80	7.51	7.27	1.15	1.14
Railroads	2.01	2.18	6.05	5.92	1.38	1.34
Real Estate Development	3.58	3.65	NA	NA	0.75	0.76
Real Estate Operating Companies	4.86	5.11	19.46	19.28	0.89	0.90
Real Estate Services	0.67	0.78	7.33	6.27	1.25	1.20
Regional Banks	14.65	14.91	NA	NA	0.85	0.85
Reinsurance	0.68	0.70	10.14	9.91	0.91	0.91
Research and Consulting Services	1.55	1.67	8.21	8.00	2.40	2.18
Residential REITs	8.31	9.18	17.63	19.05	1.28	1.24
Restaurants	1.63	1.92	8.88	8.78	2.75	2.17
Retail REITs	6.80	6.82	11.87	11.79	1.37	1.37

Security and Alarm Services	1.05	1.11	6.62	6.16	1.43	1.39
Semiconductor Equipment	1.45	1.48	8.39	8.31	1.82	1.80
Semiconductors	1.94	1.96	7.85	7.72	2.28	2.25
Soft Drinks	1.92	1.94	9.40	9.20	3.47	3.39
Specialized Consumer Services	1.39	1.52	6.13	6.48	1.74	1.65
Specialized Finance	6.32	6.43	16.66	15.74	1.05	1.05
Specialized REITs	5.58	5.72	13.94	14.01	1.26	1.25
Specialty Chemicals	0.89	0.91	6.78	6.52	1.64	1.61
Specialty Stores	0.46	0.67	6.57	5.93	1.67	1.38
Steel	0.42	0.43	3.19	3.21	1.10	1.10
Systems Software	3.02	3.07	7.77	7.87	4.60	4.36
Technology Distributors	0.12	0.13	4.50	4.31	0.90	0.91
Thrifts and Mortgage Finance	NA	NA	NA	NA	1.03	1.03
Tires and Rubber	0.26	0.31	4.01	3.80	1.23	1.19
Tobacco	2.47	2.48	6.78	6.72	4.69	4.60
Trading Companies and Distributors	0.91	0.97	6.82	6.55	1.39	1.35
Trucking	0.72	0.76	6.17	5.73	1.28	1.27