CHAPTER 1

What a Lease Looks Like

This chapter is an introduction to leases. One aim is to provide sufficient information about leases for those unfamiliar with them, but more importantly, the purpose is to orient you to a particular way of looking at a lease—as a bundle of cash flows that provides a return to the leasing company, with each cash flow changing in importance over time, and each cash flow being subject to certain risks.

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REASONS TO LEASE RATHER THAN BUY

According to a recent survey, three of the main reasons a company leases equipment rather than buying it are:

1. Leasing equipment protects companies against owning equipment that may become technologically obsolete—that risk is shifted to the lessor.
2. Often the company does not have to show the equipment and the debt financing it on its balance sheet. On their face, the financials of the company leasing the equipment look better than they otherwise would.
3. The company leasing the equipment cannot make use of the depreciation benefits.

CHARACTERISTICS OF A LEASE

A lease is a contract that lets a company (lessee) rent equipment for a specified period of time. The rent is paid periodically throughout

the term of the lease—every month, or every 3, 6, or 12 months. The leasing company (lessor) owns the equipment.

Lessors deduct the depreciation charges for the equipment from their income before calculating their taxes. Lessees receive part of the tax benefit of depreciation in the form of lower rent.

How a Lease Works

The way a lease works can be described in five steps:

1. A company needs new equipment. It specifies the make, model, and features, and negotiates the price with the manufacturer.
2. The company then negotiates an agreement with a lessor—how much rent, for how long, and what the equipment will be worth at the end of the lease.
3. The equipment is delivered. The company and the lessor make sure it is what was ordered. The lessor pays for it.
4. Rent payments are made by the company, now a lessee, to the lessor.
5. At the end of the lease the lessee may have an option to renew the lease or to buy the equipment.

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WHY LEASING IS DIFFERENT

Leasing is unique in three fundamental ways:

1. The lessor owns the equipment and is not simply financing it. In most cases, a lessor buys a piece of equipment only when it has a customer who wants to use it. In the case of airplanes and rail cars, however, there are leasing companies that order planes and rail cars without specific customer orders in the hope they will be able to lease the equipment when it is delivered.
2. Leases are long. Though a computer lease probably lasts no more than three years, the lease on a rail car may last up to 25 years, and the lease on a power plant for 30 years. This means that at the start of the lease it is not easy to take into account everything that can happen to the equipment or to the lessee for the next 3 to 30 years.
3. There is no organized market for buying and selling leases. Leases are not traded like bonds or stocks because there are not

enough common characteristics among them. Lease prices do not show up on Bloomberg or Reuters. There is a reasonably active private market for syndicating leases when they are originated. Sales of seasoned leases (2 to 10 years old), however, are not common, so if a lessor is unhappy with the risk or return on a lease it has in portfolio, it may take a while to fix the problem. This lack of a ready market means that the lessor must be careful when deciding what leases it wants in portfolio and have the tools for tracking what is happening with the lessee, the equipment, and tax rates and regulations.

ATTRACTIONS OF A LEASE TO A LESSOR

Four distinct advantages make a lease attractive to a lessor:

1. Regular cash flow from the rent payments.
2. The prospect of making a profit on selling the equipment when the lease is over.
3. Tax benefits of depreciation on the equipment.
4. Ability to further enhance the value of a lease with a creative financial structuring.

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However, that which is valued is always at risk against a change in the value. The sources of value to the lessor are sources of risk—the lessee can stop paying rent, the equipment may not be worth very much at the end of the lease, the depreciation may not be as valuable as was calculated at the start of the lease, or the structure turns out to be overly aggressive when viewed later by tax and accounting auditors.

SETTING THE RENT ON A LEASE

Five things are taken into consideration when determining the amount of rent:

1. The value of the equipment today and what it will be worth at the end of the lease.
2. The likelihood the lessee may stop paying the rent.

3. The value of being able to take depreciation on the equipment.
4. The cost to the lessor of borrowing the money to buy the equipment.
5. The amount the lessor needs to charge, and keep in reserve, to cover the risk of getting the preceding four estimates wrong.

DIFFERENT KINDS OF LEASES

There are four basic kinds of leases:

1. *Single investor leases*. This is the most common type of lease. The lessor supplies all of the money to buy the equipment. The length of the lease cannot be more than 80 percent of the useful life of the equipment to be eligible for tax treatment. The rent paid by the lessee is set by taking into account rental payments, depreciation, and the value of the equipment at the end of the original lease term. Because of the value of the depreciation tax benefits and the lease end value of the equipment, the rental payments are generally lower than interest and principal payments on a similar loan. The lessor monitors the ability of the lessee to pay rent and is concerned about the value of the equipment at lease end, as well as the value of the tax benefits.
2. *Leveraged leases*. The principal difference from a single investor lease is that the lessor supplies less than the entire cost of the equipment, an equity portion of somewhere between 20 percent and 40 percent. Lenders (commercial banks and insurance companies) provide the rest as debt. The lessor receives the tax benefits and resale rights from owning the equipment, but is not responsible to the lenders for paying off the debt in the event the lessee stops paying rent. On the other hand, the lessor is second in the pecking order in the event the lessee goes bankrupt. The lenders have first rights to the proceeds from selling the equipment plus additional proceeds from the lessee's estate. Leveraged leases are generally used for longer-lived and larger types of equipment. The benefits of this structure are greater and they cost more to put together.

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3. *Operating leases*. The principal difference between an operating lease and the others is that its length is substantially shorter than the useful life of the equipment. Equipment like airplanes and rail cars can have 25- to 30-year lives. A lessor buys them and rents them out five to seven years at a time. The lessor usually supplies all the money to buy the equipment. Though the lessor monitors the ability of the lessee to make rent payments, the lessor is less concerned, relative to other leases, because it owns equipment that is a commodity and it can easily be leased to someone else. The principal problems operating lessors face are industry downturns, not individual lessee difficulties.
4. *TRAC leases*. *TRAC* stands for "terminal rental adjustment clause." These leases are limited by law to over-the-road vehicles—tractors, trucks, buses, and auto fleets. The principal difference with this type of lease is that the lessor bears no risk on the equipment at the end of the lease. A terminal value is agreed to at the beginning of the lease. If the vehicle sells for more than that value, the lessee gets a rebate on its rent; if it sells for less, the lessee pays the lessor the difference.

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Table 1.1, on page 6, summarizes the principal distinctions among leases. The last column in the chart is about risk. In this book, risk means uncertainty. When looking at the future we generally have some idea about the way things (prices, values) will end up—on average. Measures of risk tell us about the range and clustering of future prices around the average. Is there a small chance of a large positive result, or a large chance of a large negative outcome? Chapter 2 defines risk in more specific statistical terms.

LEASES AS A SET OF CASH FLOWS

The last column of Table 1.1 is the focus of this book—how to get a better handle on measuring the risks of a lease and the return you are getting for taking those risks. One of the first steps in that process is to break a lease into cash flow streams that are

TABLE 1.1 Differences among Types of Leases

Type of Lease	How Long Do They Last?	Who Supplies the Money to Buy the Equipment?	Who Gets the Tax Benefits of Owning the Equipment?	Who Owns the Equipment at the End of the Lease?	What Is at Risk for the Lessor?
Single Investor	80 percent of the useful life of equipment	Lessor	Lessor	Lessor	Rent Equipment value Tax benefits
Leveraged	80 percent of the useful life of equipment	Lessor and lenders	Lessor	Lessor	Rent after debt service Position in bankruptcy Equipment value Tax benefits
Operating	Shorter than the useful life of equipment	Lessor	Lessor	Lessor	Equipment value Tax benefits
TRAC	80 percent of the useful life of equipment	Lessor	Lessor	Lessee	Rent Tax benefits

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generated by the different elements in a lease. Understanding them and their interaction will enable you to manage them better.

Table 1.2 shows the principal cash flows of a single investor lease from the point of view of the lessor.[2] The equipment cost $1,000,000 and is bought on January 1, 2005. It is depreciated over five years. Only federal taxes of 35 percent are calculated. You do not need to look at the details of the calculations, only notice certain characteristics of the cash flows.

- In the "Taxable Income" column, the lessor's taxable income is negative in the first three years of the lease because depreciation is greater than rent in these years. The lessor or its parent company is able to deduct this amount from other income before calculating income taxes.
- In the "Taxes" column the effect of the depreciation is evident—the lessor saves $75,000 in taxes in the first three years, and it's not until year six of the lease that it pays any taxes on a net basis.
- If you look at the total of "Pre-Tax Cash Flow" (unaffected by depreciation) and the total of "Taxes," you'll see that the lessor pays a 35 percent tax rate. Depreciation doesn't eliminate the tax bill, it pushes it off into the future. And that is valuable.
- Note the difference between the "After-Tax Cash Flow" series and the "Accounting Income" series. They total to the same number but are very different in timing. This is due to the accounting conventions governing leases. Income for accounting purposes is computed by calculating the amount the lessor has invested in the lease in any year, and multiplying that amount by the rate on the transaction. This is, as is evident, very different than the pattern of the way cash is received by the lessor. In this book we'll focus primarily on the economic risks of the transactions.
- The "Termination Value" column shows what the lessor has at risk any year during the lease. It includes the rents to be paid, equipment value, and the value of taxes that have been deferred. In a single investor lease the termination value decreases as time goes on.

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TABLE 1.2 Cash Flows of a 10-Year Single Investor Lease

Year Ending Dec. 31	Purchase and Residual	Rent	Pre-Tax Cash Flow	Depreciation	Taxable Income	Taxes	After-Tax Cash Flow	Accounting Income	Termination Value
1/1/2005	(1,000,000)		(1,000,000)				(1,000,000)		
2005	0	166,010	166,010	(200,000)	(33,990)	(11,896)	177,906	75,484	1,000,000
2006	0	166,010	166,010	(320,000)	(153,990)	(53,896)	219,906	74,134	961,028
2007	0	166,010	166,010	(192,000)	(25,990)	(9,096)	175,106	63,328	907,575
2008	0	166,010	166,010	(115,200)	50,810	17,784	148,226	54,826	837,846
2009	0	166,010	166,010	(115,200)	50,810	17,784	148,226	47,073	755,225
2010	0	135,827	135,827	(57,600)	78,227	27,379	108,448	38,954	660,597
2011	0	135,827	135,827		135,827	47,539	88,288	33,552	583,679
2012	0	135,827	135,827		135,827	47,539	88,288	29,010	498,909
2013	0	135,827	135,827		135,827	47,539	88,288	24,089	407,103
2014	0	135,827	135,827		135,827	47,539	88,288	18,760	307,678
12/31/14	200,000		200,000		200,000	70,000	130,000	1,760	200,000
Totals	(800,000)	1,709,183	709,185	(1,000,000)	709,185	248,214	460,970	460,970	

Legend: Rent—payments made by the lessee. Pre-tax cash flow—purchase of the equipment plus rent plus the residual. Depreciation—schedule specific to the equipment type. Taxable income—rent minus depreciation. Taxes—35% of taxable income. After-tax cash flow—pre-tax cash flow minus taxes. Accounting income—defined by accounting regulations. Termination value—amount in any year needed to make the lessor whole in the event the lessee defaults.

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CONTRIBUTIONS OF RENT, EQUIPMENT, AND TAXES

One way of looking at the changing contributions over time is to calculate the present value of the remaining cash flows each year. This number will give you a picture of what is important today and the change in importance over time. It's as if you were walking along in time and were able to take a look at what you cared about most each year. Figure 1.1 shows the changes in rent, equipment, and tax contributions.

- As time goes on, the contribution of equipment increases because the day the equipment is coming back to the lessor becomes closer.
- The cash received by the lessor (rent) is the most important consideration in the lease up until the last couple of years, though it declines as the rent payments are made.
- Taxes that had been deferred are paid toward the end of the lease.

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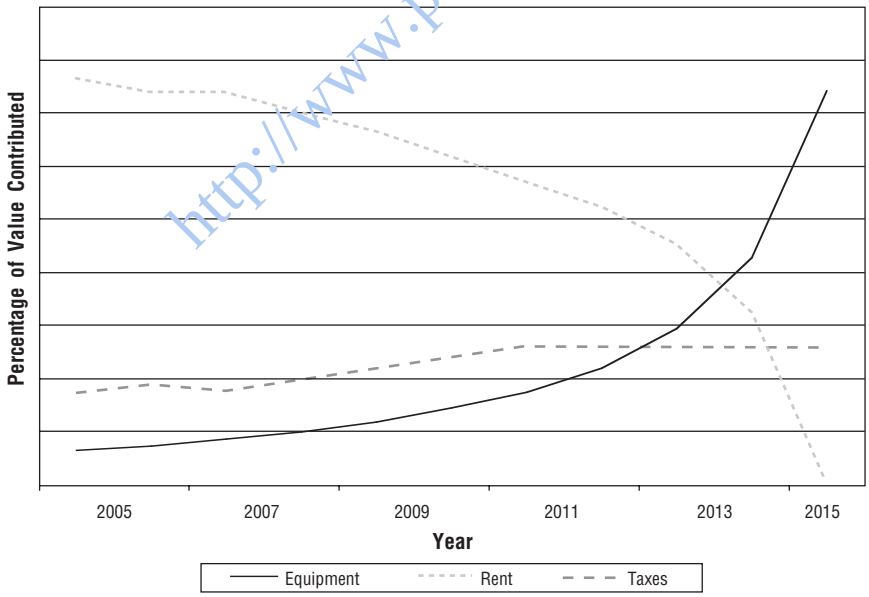

FIGURE 1.1 Importance of Cash Flows over Time for a Single Investor Lease

TABLE 1.3 Cash Flows of a 20-Year Leveraged Lease

Year Ending Dec. 31	Purchase, Loan, and Residual	Rent	Principal	Interest	Pre-Tax Cash Flow	Depreciation	Taxable Income	Taxes	After-Tax Cash Flow	Accounting Income	Termination Value
1/1/2005	(1,000,000)										
2005	774,686				(225,314)				(225,314)		
2005		79,036	(17,061)	(61,975)		(142,857)	(125,796)	(44,029)	44,029	15,815	225,314
2006		79,036	(18,426)	(60,610)		(244,898)	(226,472)	(79,265)	79,265	14,072	251,666
2007		79,036	(19,900)	(59,136)		(174,927)	(155,027)	(54,259)	54,259	9,383	272,647
2008		79,036	(21,492)	(57,544)		(124,948)	(103,456)	(36,210)	36,209	6,179	286,622
2009		79,036	(23,212)	(55,825)		(89,249)	(66,037)	(23,113)	23,113	4,064	295,820
2010		79,036	(25,069)	(53,968)		(89,249)	(64,180)	(22,463)	22,463	2,502	301,877
2011		79,036	(27,074)	(51,962)		(89,249)	(62,174)	(21,761)	21,761	865	305,521
2012		79,036	(29,240)	(49,796)		(44,624)	(15,384)	(5,385)	5,385	0	306,668
2013		79,036	(28,798)	(47,457)	2,782	0	31,579	11,053	(8,271)	0	306,668
2014		79,036	(21,601)	(45,153)	12,283	0	33,883	11,859	423	361	303,915
2015		96,600	(33,899)	(43,425)	19,276	0	53,175	18,611	665	618	292,284
2016		96,600	(35,628)	(40,713)	20,259	0	55,887	19,560	698	692	274,031
2017		96,600	(37,445)	(37,863)	21,292	0	58,737	20,558	734	727	254,846
2018		96,600	(41,768)	(34,867)	19,965	0	61,733	21,606	(1,642)	764	234,684
2019		96,600	(65,074)	(31,526)		0	65,074	22,776	(22,776)	988	215,906
2020		96,600	(70,280)	(26,320)		0	70,280	24,598	(24,598)	2,870	217,465
2021		96,600	(75,902)	(20,698)		0	75,902	26,566	(26,566)	5,207	222,162
2022		96,600	(81,974)	(14,625)		0	81,974	28,691	(28,691)	7,905	230,499
2023		96,600	(88,532)	(8,067)		0	88,532	30,986	(30,986)	11,009	243,036
2024		96,600	(12,311)	(985)	83,305	0	95,615	33,465	49,839	14,566	260,403
12/31/2024	200,000				200,000	0	200,000	70,000	130,000	1,413	200,000
Totals	(800,000)	1,756,360	(774,686)	(802,514)	153,846	(1,000,000)	153,846	53,846	100,000	100,000	

Legend: Rent—payments made by the lessee. Principal—payments made from rent to the lender to pay down the principal of the loan. Interest—paid to the lender on the loan. Pre-tax cash flow—purchase of the equipment plus rent minus principle minus interest plus the residual. Depreciation—schedule specific to the equipment type. Taxable income—rent plus residual minus depreciation and minus interest. Taxes—35% of taxable income. After-tax cash flow—pre-tax cash flow minus taxes. Accounting income—defined by accounting regulations. Termination value—amount in any year needed to make the lessor whole in the event the lessee defaults.

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The composition of risks that affect the lessor's return is shifting as the importance of the value streams shifts. This is one of the dynamics of the lease. The other dynamic is that the nature of the risks themselves shifts as time goes on.

DIFFERENCES BETWEEN A LEVERAGED LEASE AND A SINGLE INVESTOR LEASE

The introduction of a lender into the lease structure changes the dynamics and interactions of the cash flows from the perspective of the lessor. The changes are most easily tracked by looking at the cash flows of a leveraged lease. Table 1.3 illustrates a 20-year leveraged lease. The assumptions are that the equipment costs $1 million today and it will be worth $200,000 at the end of 20 years. The lease starts on January 1, 2005. The equipment is depreciated over seven years. The lessor puts in $225,314 in equity; the remainder is borrowed from a bank. As in the previous example, you do not need to look at the details of the calculations, only notice certain characteristics of the cash flows.

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- In the "Taxable Income" column, the lessor's taxable income is negative in the first eight years of the lease. (It was three years for the single investor lease.) This is because depreciation and interest are greater than rent in these years. The lessor or its parent can deduct this amount from other income before calculating income taxes.
- In the "Taxes" column the effect of the depreciation is evident—the lessor saves $286,000 in taxes in the first eight years, and it's not until the last year of the lease that it pays any taxes on a net basis.
- If you look at the total of "Pre-Tax Cash Flow" (unaffected by depreciation) and the total of "Taxes," you'll see that the lessor pays a 35 percent tax rate. Again, depreciation doesn't eliminate the tax bill, it pushes it off into the future. With a leveraged lease the delay is even more dramatic than with a single investor lease, even adjusting for the difference in tenors of the examples.

- Looking at "After-Tax Cash Flow" and "Accounting Income" you can see, as with the single investor lease, a significant difference between economics and accounting due to the accounting convention for leases, though the difference is not as great as with the single investor lease. Focusing on the accounting results often distorts the view of what the underlying economics are, sometimes hiding the economics from view, which in turn prompts people to take actions to improve accounting results, but not for risk or economics. Figure 1.2 compares the cash flow and accounting results.
- The significant difference between leveraged leases and single investor leases is in the lessor's exposure to risk, and its ability to do something about it. Note in the "Termination Value" column that the amount at risk increases for eight years before starting to decline. And because of the contractual arrangements with the lessee and lender, the lessor is last in line in the event the lessee cannot pay.

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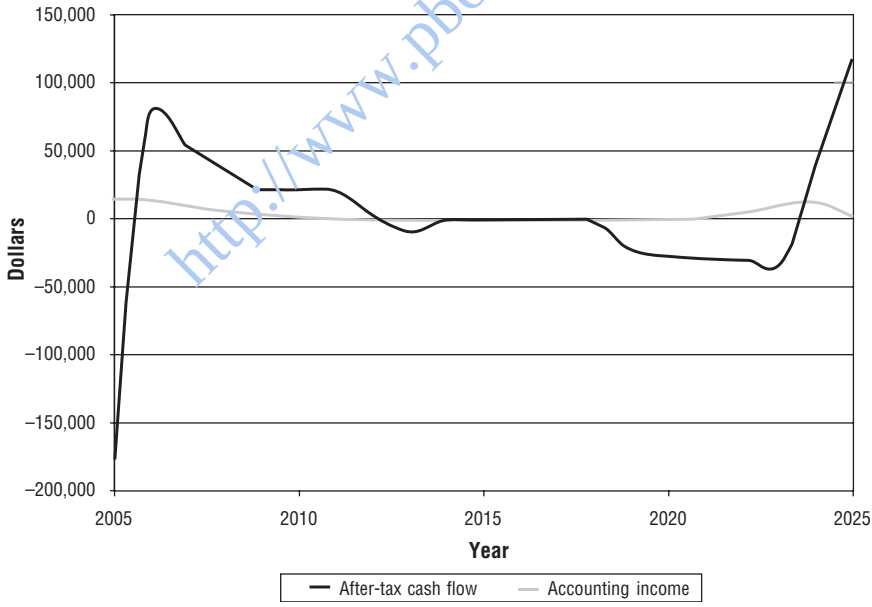

FIGURE 1.2 After-Tax Cash Flow and Accounting Income

FACTORS THAT CONTRIBUTE TO LEASE VALUE

A couple of calculations will make it easier to see what is happening to the values of rent, equipment, and taxes from the start throughout the lease. Figure 1.3 shows the present value of the cash flow streams as a percent of total cash flows over time for each year of the lease. As in the single investor example, you are walking through time to see what the values look like every year.

- As time goes on the contribution of Equipment increases, as the day the equipment comes back to the leasing company draws nearer.
- The lessor does not receive any cash until the eighth year of the lease and then some at the end. This is reflected in the chart. The importance of the cash (rent less debt service) increases up to the time it comes in, falls off, and then increases slightly. Compared to Figure 1.1, the single investor lease, cash is much less important.

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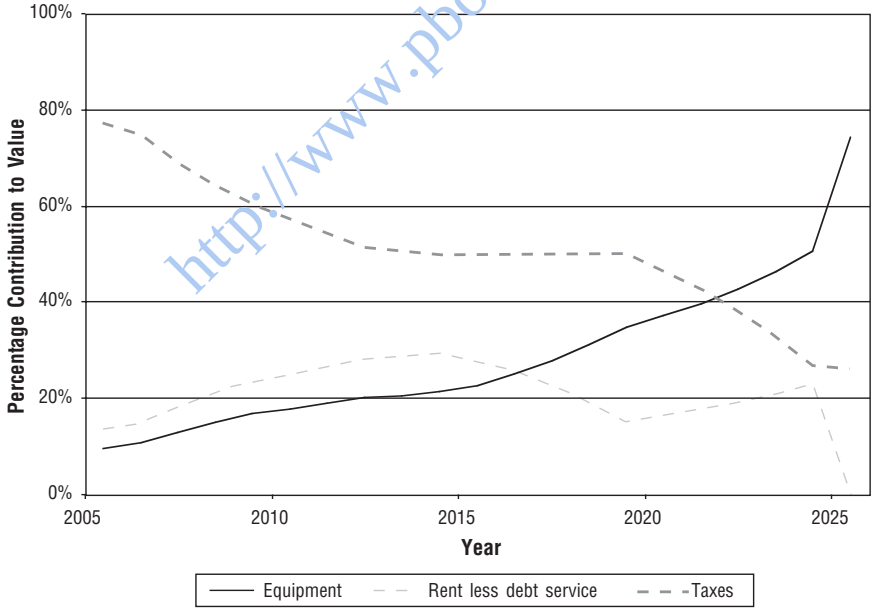

FIGURE 1.3 Importance of Cash Flows over Time for a Leveraged Lease

- Tax benefits are the driver for a leveraged lease. Compare Figure 1.3 to Figure 1.1. The reason for the dominance of the tax flow is that even though the lessor puts up only 25 percent of the money to buy the equipment, it takes 100 percent of the equipment depreciation and deducts the interest on the debt. As with the single investor lease, the composition of risks that affect the lessor's return is shifting as the importance of the value streams is shifting.

The position of the lessor relative to the lender affects both the amount of rent the lessor receives and the ability of the lessor to recover the equipment in the event of lessee default. In Figure 1.4, look at the relative positions of the lessor and lender during most of the lease. The lender has a larger and superior position. It has first claim on proceeds if the deal unwinds. Only as the loan is repaid toward the end of the lease does the lessor's share begin to exceed 40 percent.

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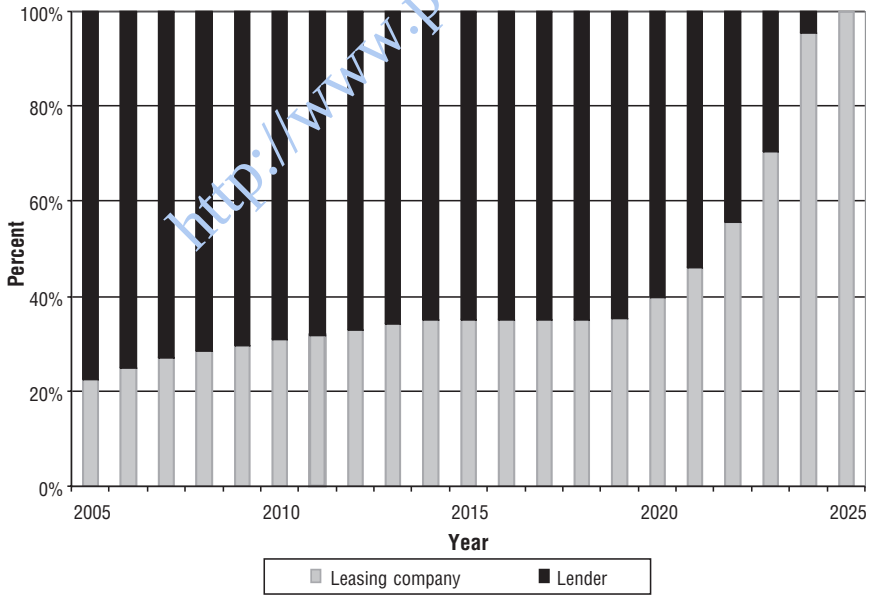

FIGURE 1.4 Positions of Lessor and Lender in a Leveraged Lease

TABLE 1.4 Your Lease Portfolio

Equipment	Lessee	Credit Rating	Type of Lease	Start Date	End Date	After-Tax Yield	Residual	Leverage
Boeing 737-800 aircraft	Ryanair	Not rated	Operating	2006	2011	6.00%	50%	NA
Case G series forklifts	Shamrock Foods	Not rated	Single investor	2007	2011	5.50%	15%	NA
Trinity Industries gondola rail cars	CSX	BBB	Leveraged	2001	2020	5.70%	25%	75%
GE DASH9 locomotives	SNCF	AAA	Leveraged	1989	2014	7.50%	25%	75%
Van Dorn Demag Multi molding machines	Ningbo Fortune Plastic	Not rated	Single investor	2001	2008	5.75%	15%	NA
Lufkin high cube van trailers	JB Hunt	BBB+	Single investor	2003	2010	4.00%	20%	NA
Mack Granite series trucks	R & J Contractors	Not rated	Single investor	2003	2010	6.00%	15%	NA
Timsons T48 book presses	RR Donnelley	A-	Single investor	2005	2015	5.00%	15%	NA
Coal-fired electricity plant, 994 MW	Calpine	B	Leveraged	1995	2025	8.00%	25%	80%
Sun Fire E12K and E25K servers	Amazon	B+	Single investor	2006	2010	8.00%	5%	NA
Oracle application servers	Fifth Third Bancorp	AA	Single investor	2005	2009	7.50%	5%	NA

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YOUR LEASE PORTFOLIO

The purpose of this book is to help you learn how to apply various financial tools toward managing leases; therefore, you will need something at hand to apply the tools to. Table 1.4, on page 15, shows the details of your sample portfolio. As we look at ways to measure the risks of a lease, calculate their returns, estimate the effects of diversification, and think about managing a portfolio, we will apply them to this portfolio.[3]

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