

ELFA

EQUIPMENT LEASING AND FINANCE ASSOCIATION

Financing a Growing Economy

Lease Analysis Tools

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Overview

- Math of Finance
 - Theory
 - Glossary of terms
- Common calculations
- Common analytical cases

Time Value of Money

Time line

Residual

Rents

Investment

Investment = cash **outflow**, present value

Rents = cash **inflows**, payments

Residual = cash **inflow**, future value

Periods when payments occur (monthly, quarterly...)

Payment timing – in advance or arrears

Interest rate that is implicit in cash flows - \$1 today > value than \$1 in future

Glossary of Terms

- Present value - The discounted value of a future sum or stream of cash flows, PV. **Cash outflow.**
- Interest rate - The percentage of an amount of money which is paid for its use for a specified period of time.
- Payment- Sum of money paid on a periodic basis, rent. **Cash Inflow.**
- Residual - The anticipated value of the leased asset at the end of the lease. **Cash Inflow.**
- Implicit rate – The interest rate that will discount the rents and residual to the fair value of the leased asset in a lease, pretax yield rate, internal rate of return, IRR.
- Period – Frequency of payments (monthly quarterly, etc.)
- Advance/arrears – Timing of payment in the period, advance = beginning of period, arrears = end of period.

Common Calculations

- Payment amount
- Residual to get off deal balance sheet
- Calculate RVI needed to Create DFL
- Purchase price of deal
- FAS 13 PV test – Lessee & Lessor
- Yield of a deal
- Yield of a stream of cash flows

Payment Amount

- **Calculator:** Enter N (# of payments), INT (interest rate), PV (as a negative number), FV and solve for PMT
- **Example:**
 - Assume 1,000 eq cost, 36 month lease, monthly payments in arrears, no residual and a 10% yield rate
 - $g = \text{end (arrears)}$
 - $3 g = n$ (36 months)
 - $10 g = i$ (10% per yr/.833 per month)
 - 1000 chs = PV (investment/eq cost)
 - PMT = **32.27 that will yield 10% rate**

Payment Amount

- **Excel**: using a “fx function”
- **PMT** - Calculates the payment for a loan based on constant payments and a constant interest rate.
- **PMT(rate,nper,pv,fv,type)**
- Per our example (10/12,36,-1000,0,0)
- Rate is the interest rate per payment period(annual rate / by 12,4,2 or 1 payment per year).
- Nper is the total number of payments for the loan.
- Pv is the present value, or the total amount that a series of future payments is worth now; also known as the principal.
- Fv is the future value, or a cash balance you want to attain after the last payment is made. If fv is omitted, it is assumed to be 0 (zero), that is, the future value of a loan is 0.
- Type is the number 0 (zero) (arrears) or 1 (advance) and indicates when payments are due.

Residual to get off Deal Balance Sheet

- **Calculator:** Enter N (# of payments), INT (interest rate), 89% of PV (as a negative number), PMT and solve for FV
- **Example:**
 - Given same assumptions how much must the rent be lowered to get operating lease treatment for the lessee and what residual must the lessor assume to maintain a 10% yield?
 - **g = end (arrears)**
 - **3 g = n (36 months)**
 - **10 g = i (10% per yr/.833 per month)**
 - **1000 enter .89 x chs = PV (89% of equipment cost)**
 - **28.7178 = PMT (reduction in rent needed)**
 - **To calculate residual needed to maintain yield**
 - **FV = 148.30**

Residual to get off Deal Balance Sheet

- **Excel: FV** - Returns the future value of an investment based on periodic, constant payments and a constant interest rate.
- **FV(rate,nper,pmt,pv,type)**
- For a more complete description of the arguments in FV and for more information on annuity functions, see PV.
- **Rate** is the interest rate per payment period(annual rate / by 12,4,2 or 1 payment per year).
- **Nper** is the total number of payment periods in an annuity.
- **Pmt** is the payment made each period; it cannot change over the life of the annuity. Typically, pmt contains principal and interest but no other fees or taxes. If pmt is omitted, you must include the pv argument.
- **Pv** is the present value, (-.89%) or the lump-sum amount that a series of future payments is worth right now. If pv is omitted, it is assumed to be 0 (zero), and you must include the pmt argument.
- **Type** is the number 0 or 1 and indicates when payments are due. If type is omitted, it is assumed to be 0.

RVI Calculation to Create DFL for Lessor

- **Example:**

- Assuming a 36 month lease with monthly rent of 28.72 in arrears and a 10% implicit rate, and a residual assumed of 148.21 - how much residual insurance must the lessor buy to make the PV of the MLP = 90%
- **g = end (arrears)**
- **3 g = n (36 months)**
- **10 g = i (10% per yr/.833 per month)**
- **1000 enter .90 x chs = PV (90% of equipment cost)**
- **PMT = 28.7178**
- **To calculate residual insurance needed to get DFL treatment**
 - **FV = 13.4818**

Purchase Price of Deal

- **Calculator:** Enter N (# of payments), INT (interest rate), PMT, FV and solve for PV
- **Example:**
 - Assume a 36 month lease with monthly rents of 32.27 in arrears, no residual and a 10% target yield
 - **g = end (arrears)**
 - **3 g = n (36 months)**
 - **10 g = i (10% per yr/.833 per month)**
 - **32.27 = PMT**
 - **PV = 1000.09**

Purchase Price of Deal

- **Excel: PV** - Returns the present value of an investment. The present value is the total amount that a series of future payments is worth now. For example, when you borrow money, the loan amount is the present value to the lender.
- $PV(\text{rate}, \text{nper}, \text{pmt}, \text{fv}, \text{type})$
- **Rate** is the interest rate per payment period(annual rate / by 12,4,2 or 1 payment per year).
- **Nper** is the total number of payment periods in an annuity. For example, if you get a four-year car loan and make monthly payments, your loan has 4×12 (or 48) periods. You would enter 48 into the formula for nper.
- **Pmt** is the payment made each period and cannot change over the life of the annuity. Typically, pmt includes principal and interest but no other fees or taxes. If pmt is omitted, you must include the fv argument.
- **Fv** is the future value, or a cash balance you want to attain after the last payment is made. If fv is omitted, it is assumed to be 0 (the future value of a loan, for example, is 0).
- **Type** is the number 0 or or 1 and indicates when payments are due. If type is omitted, it is assumed to be 0.

Purchase Price of Deals (uneven CF)

- **Excel: NPV** - Calculates the net present value of an investment by using a discount rate and a series of future payments (negative values) and income (positive values).
- $\text{NPV}(\text{rate}, \text{value1}, \text{value2}, \dots)$
- Rate is the rate of discount over the length of one period.
- Value1, value2, ... are 1 to 29 arguments representing the payments and income.
- Value1, value2, ... must be equally spaced in time and occur at the end of each period.
- NPV uses the order of value1, value2, ... to interpret the order of cash flows. Be sure to enter your payment and income values in the correct sequence.
- Arguments that are numbers, empty cells, logical values, or text representations of numbers are counted; arguments that are error values or text that cannot be translated into numbers are ignored.
- If an argument is an array or reference, only numbers in that array or reference are counted. Empty cells, logical values, text, or error values in the array or reference are ignored.

PV of cash flows

Input amounts in yellow fields									
INPUTS									
NPV rate		9.00%							
Results		Assumes cash flows are monthly							
NPV in arrears		1,962,128							
NPV in advance		1,976,844							
NPV in arrears			NPV in advance						
period	cash flows		period	cash flows					
1	171,591.00		1	171,591.00					
2	171,591.00		2	171,591.00					
3	171,591.00		3	171,591.00					
4	171,591.00		4	171,591.00					
5	171,591.00		5	171,591.00					
6	171,591.00		6	171,591.00					
7	171,591.00		7	171,591.00					
8	171,591.00		8	171,591.00					
9	171,591.00		9	171,591.00					
10	171,591.00		10	171,591.00					
11	171,591.00		11	171,591.00					

Lessee 90% Test

- **Calculator:** Enter N (# of payments), INT (interest rate), PMT, and solve for PV
- **Example:**
 - Assume equipment cost (fair value) of \$1000, 36 monthly payments of 28.71 and 10% incremental borrowing rate
 - g = end (arrears)
 - 3 g = n (36 months)
 - 10 g = i (10% per yr/.833 per month)
 - PMT = 28.71
 - PV = 889.76 or 88.98% of the eq value = operating lease

Lessor 90% Test

- **Calculator:** Enter N (# of payments), PV, PMT, FV and solve for PV
- **Example:**
 - Assume equipment cost of \$1000, 36 monthly payments of 28.71, residual of 148.30
 - g = end (arrears)
 - 3 g = n (36 months)
 - 1000 chs = PV
 - PMT = 28.71
 - FV = 148.30
 - i = .832 = implicit rate in the deal
 - To do the 90% test discount the rents only
 - 0 = FV
 - PV = 889.95 or 89% of the eq value = operating lease

Yield of a Deal

- **Calculator:** Enter N (# of payments), PV (as a negative number), PMT, FV and solve for INT
- **Example:**
 - Assume a 3 year deal with monthly payments of 28.71 in arrears and a 148.30 residual
 - $3 \text{ g} = \text{n}$
 - $1000 \text{ chs} = \text{PV}$
 - $28.71 = \text{PMT}$
 - $148.30 = \text{FV}$
 - $i = .832092 \times 12 = 9.985\%$

Yield of a Deal

- **Excel: RATE** - Returns the interest rate per period of an annuity. RATE is calculated by iteration and can have zero or more solutions. If the successive results of RATE do not converge to within 0.0000001 after 20 iterations, RATE returns the #NUM! error value.
- RATE(nper,pmt,pv,fv,type,guess)
- For a complete description of the arguments nper, pmt, pv, fv, and type, see PV.
- Nper is the total number of payment periods in an annuity.
- Pmt is the payment made each period and cannot change over the life of the annuity. Typically, pmt includes principal and interest but no other fees or taxes. If pmt is omitted, you must include the fv argument.
- Pv is the present value—the total amount that a series of future payments is worth now.
- Fv is the future value, or a cash balance you want to attain after the last payment is made. If fv is omitted, it is assumed to be 0 (the future value of a loan, for example, is 0).
- Type is the number 0 or 1 and indicates when payments are due.

Impact of a fee on the Yield of a Deal

- **Calculator:** Enter N (# of payments), PV less the fee (as a negative number), PMT, FV and solve for INT
- **Example:**
 - Assume a 3 year deal with monthly payments of 28.71 in arrears and a 148.30 residual and a 1% fee received at inception
 - **3 g = n**
 - **1000 chs = PV**
 - **28.71 = PMT**
 - **148.30 = FV**
 - **$i = .832092 \times 12 = 9.985\%$ = the yield w/o the fee**
 - **To calculate the yield with the fee, reduce the PV by the amount of the fee and solve for the new yield**
 - **RCL PV enter 10 +PV**
 - **$1 = .883814 \times 12 = 10.606$ or a 62 bps increase in yield**

Yield of a Stream of Cash Flows

- **Calculator:** Use uneven cash flow keys – **too complicated to cover**
- **Excel: IRR** - Returns the internal rate of return for a series of cash flows represented by the numbers in values. These cash flows do not have to be even, as they would be for an annuity. However, the cash flows must occur at regular intervals, such as monthly or annually. The internal rate of return is the interest rate received for an investment consisting of payments (negative values) and income (positive values) that occur at regular periods.
- **IRR(values,guess)**
- Values is an array or a reference to cells that contain numbers for which you want to calculate the internal rate of return.
- Values must contain at least one positive value and one negative value to calculate the internal rate of return.
- IRR uses the order of values to interpret the order of cash flows. Be sure to enter your payment and income values in the sequence you want.
- Guess is a number that you guess is close to the result of IRR.

IRR With A Fee

INPUTS									
IRR guess	6.00%			Results		Assumes monthly cash	Fee Impact		
fee amount	10,000.00			w/o fee	IRR in arrears	6.00%			
				w/o fee	IRR in advance	6.21%			
				with fee	IRR in arrears	6.42%	0.42%		
				with fee	IRR in advance	6.65%	0.43%		
without fee									
IRR in arrears		IRR in advance				with fee			
						IRR in arrears			
period		period		period					
initial cash	-1,000,000.00	initial cash	-1,000,000.00	initial cash	-990,000.00			initial cash	
1	19,332.80	1	19,332.80	1	19,332.80				
2	19,332.80	2	19,332.80	2	19,332.80				
3	19,332.80	3	19,332.80	3	19,332.80				
4	19,332.80	4	19,332.80	4	19,332.80				
5	19,332.80	5	19,332.80	5	19,332.80				
6	19,332.80	6	19,332.80	6	19,332.80				
7	19,332.80	7	19,332.80	7	19,332.80				
8	19,332.80	8	19,332.80	8	19,332.80				
9	19,332.80	9	19,332.80	9	19,332.80				
10	19,332.80	10	19,332.80	10	19,332.80				
11	19,332.80	11	19,332.80	11	19,332.80				

Common Analytical Cases

- Deal runout – P&I schedule, Mortgage amortization
- Rate impact of a fee
- Purchase price of deal – present value of cash flows
- Yield of a deal – IRR of cash flows
- Portfolio financial model
- Deferred tax calculations

Q & A



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