Leasing

Quantitative Finance - ISEG

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Leasing

- **Leasing** - A contractual arrangement to grant the use of specific fixed assets for a specific time in exchange for payment, usually in form of rent. An operating lease is generally a short-term cancelable arrangement, whereas a financial, or capital, lease is a long-term non cancelable agreement.

- **Lessee** – One that receives the use of assets under a lease;

- **Lessor** – One that conveys the use of assets under lease.

Leasing

- Whether it is an individual looking for a car or apartment, or a business looking at office space or a photocopier, <u>leasing is a widely used alternative to buying property and equipment</u>.
- Suppose ABC Lda is looking for a new car. Leasing is essentially the same as renting the car for a set period of time. If ABC leases, ABC will have the right to drive the car, will have the responsibility for maintaining it and insuring it, but she will not actually be the owner of the car.
- At the end of the lease, ABC’s payments cease and the car must be returned to the leasing company.

Leasing

Lessor

1. Owns the asset
2. Does not use the asset
3. Receives a rent

Lessee

1. Uses the asset
2. Does not own the asset;
3. Pays a rent.

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Example 1

Suppose that ABC decides to finance the entire cost of the car with a 5-year loan at an 8,4% annual interest rate compounded monthly. Calculate ABC monthly payment, knowing that the entire cost of the car is 19,875€.

Solution

- PV = PMT $a_{\overline{n}|i} \Leftrightarrow$ 19,875€ = PMT $a_{\overline{60}|0.7\%}$
- PMT = 406.81 €

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- For comparison, let’s consider what would happen if ABC decided to lease the car. When ABC borrows the money to buy the car, ABC will actually be borrowing 19.875€.
- When ABC signs the lease, ABC doesn’t directly borrow any money. However, ABC does borrow something – the car itself.
- With the actual loan, ABC monthly payments repay all of the principal borrowed together with all of the interest.
- The “loan” ABC takes out with the lease is only partly repaid with ABC monthly lease payments. A large part will be repaid at the end of the lease by returning the car to the leasing company.

Leasing

- Suppose that the leasing company has determined that, after 2 years of normal use and proper maintenance, the value of this car should be 14,055€. This is referred to as its residual value.
- Of the 19,875€ that ABC borrowed in the form of the car, ABC will repay 14,055€ by returning the car.
- ABC lease payments need to cover the difference together with the interest on this debt of 19,875€.

Amount	Interest	Principal
14,055€ (residual value)	Paid by monthly installments	Paid by return of car
5,820€ (loss in value)	Paid by monthly installments	

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The (theoretical) monthly payment on a lease can be found by adding the following two parts:

1. Payment on Loss: Subtract the residual value from the original price, and calculate the annuity payment with this difference as the present value.

PLUS

2. Interest on Residual: Use the residual value as principal and calculate the monthly interest, using $I = PRT$

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Example 2

Using the information provided so far about ABC´s car lease, determine the appropriate monthly lease payment. Assume an annual 8.4% interest rate compounded monthly.

<u>Solution</u>

- Payment on Loss:
- PV = PMT $a_{\overline{n}|i}$
- 5.820 = PMT $a_{\overline{24}|0.7\%}$
- PMT = \$264.29
- Interest on Residual:
- I = RV x i
- I = 14055 x 0.007
- I = 98,39
- Lease Payment = 264.29 + 98.39 = 362.9968