Leasing Specialist Module

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Before we get started – what is this Leasing Specialist Module (… and what it is not)

This module is …

- An **introduction to the financial concept of Leasing**
- a tool to enable **standardised and systematic evaluation** of potential energy projects
- able to **consider impact of leasing on EE and REN**
- hands-on and suitable for **capacity-building** initiatives
- **Builds on concepts** (such as NPV and IRR) covered in other learning materials of this series

This module is not …

- an **exhaustive and complete** list of all leasing activities
- a **scientific study** comparing different evaluation methods and proposing "one best" method
- **applicable to all countries** without reflection of local conditions
- a **blueprint** for analysing lease vs buy decisions

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Learning outcomes

- By the end of this module participant should be able to:
  - Explain what leasing is and how firms may use it
  - Distinguish between different kinds of leasing
  - Understand the importance of accounting and tax implications to leasing
  - Evaluate a lease vs. buy decision
  - Identify what are the benefits of leasing and what are the forces that drive them

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- 7 Examples and cases

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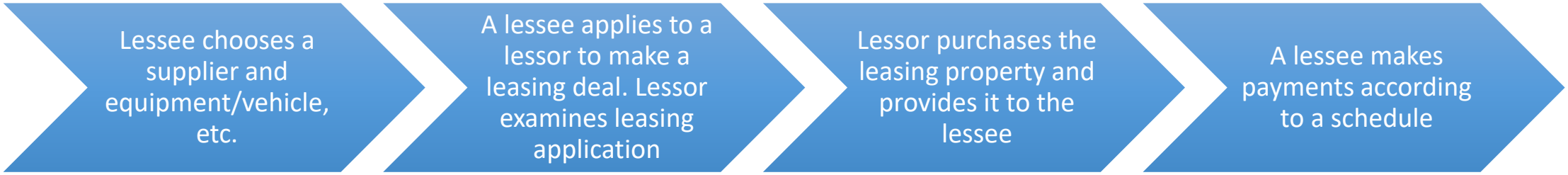
What is Leasing?

A lease is a contractual agreement between a lessee and lessor. The agreement establishes that the lessee has the right to use an asset. In return, the lessee makes periodic payments according to a pre-arranged schedule to the lessor, the owner of the asset.



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Source: Financial Management: Theory and Practice, 14th edition Eugene F. Brigham and Michael C. Ehrhardt

How does leasing work?

- The lessor is either the asset's manufacturer or an independent leasing company. If the lessor is an independent leasing company, it must buy the asset from a manufacturer.
- Then the lessor delivers the asset to the lessee, and the lease goes into effect.
- The lessee obtains use of the property in exchange for one or more lease, or rental, payments.
- During the lease, the lessee uses asset but does not own it.

Because the user can also buy the asset, thus own and use at the same time, leasing and buying involve alternative financing arrangements for the use of an asset.

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Three main kinds of Leasing

Type	Description
Operating Lease	▪ Operating leases generally provide for both financing and maintenance. ▪ Ordinarily, operating leases require the lessor to maintain and service the leased equipment, and the cost of the maintenance is built into the lease payments. ▪ Affected by new IFRS regulation
Financial lease **(≠ Operating Lease)**	▪ Do not provide for maintenance service ▪ Not cancellable ▪ Fully amortized (the lessor receives rental payments equal to the full price of the leased equipment plus a return on invested capital).
Sale and leaseback	▪ Under a sale-and-leaseback arrangement, a firm that owns land, buildings, or equipment sells the property to another firm and simultaneously executes an agreement to lease the property back for a stated period under specific terms.

In general, any asset can be leased, but some restrictions can be in place in different countries.

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Operating Lease

Operating leases generally provide for both financing and maintenance

Important! Under IFRS 16 (coming up later) operating leases are only available for assets leased for less than 1 year or of low value.

Not fully amortized	• The rental payments required under the lease contract are not sufficient for the lessor to recover the full cost of the asset.
Life time of the contract is shorter than the economic life of the asset	• The lessor can expect to recover all costs either by subsequent renewal payments, by re-leasing the asset to another lessee, or by selling the asset.
Cancellation clause	• The asset can be returned if it is rendered obsolete by technological developments or is no longer needed because of a change in the lessee's business. However, cancellation might result in penalties for the lessee.

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Financial Leases

Financial leases, sometimes called capital leases, differ from operating leases in that they:

- Do not provide for maintenance service
- Cannot be cancelled
- Are fully amortized (the lessor receives rental payments equal to the full price of the leased equipment plus a return on invested capital).

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Financial Leases

- Lessee selects the required specific items and negotiates the price with the manufacturer.
- The user firm arranges to have a leasing company (lessor), which buy the equipment from the manufacturer and simultaneously executes a lease contract.
- Generally, the contract includes full amortization of the lessor's investment, plus a rate of return on the unamortized balance. This rate of return is close to the percentage rate the lessee would have paid on a secured loan.
- The lessee is generally given an option to renew the lease at a reduced rate upon expiration of the basic lease. However, the basic lease usually cannot be canceled unless the lessor is paid in full.
- The lessee pays insurance on the leased property and may be obligated to pay the property taxes.

Considering that financial leases are fully amortized this lease provides an alternative method of financing to purchase.

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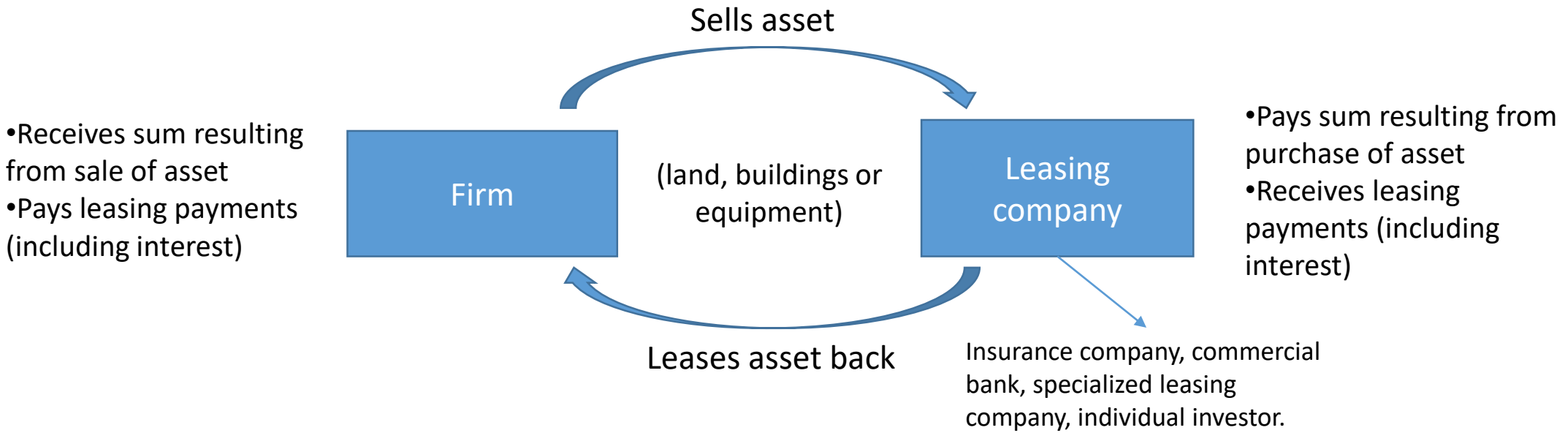
Sale and Leaseback



- Sale-and-leaseback arrangements are similar to financial leases; the major difference is that the leased equipment is usually used, not new, and the lessor buys it from the user-lessee instead of a manufacturer or a distributor. A sale-and-leaseback is thus a special type of financial lease.
- The seller immediately receives the purchase price put up by the buyer. And at the same time, the seller-lessee retains the use of the property. The lease payments are similar to loan repayment, they happen according to a determined schedule.

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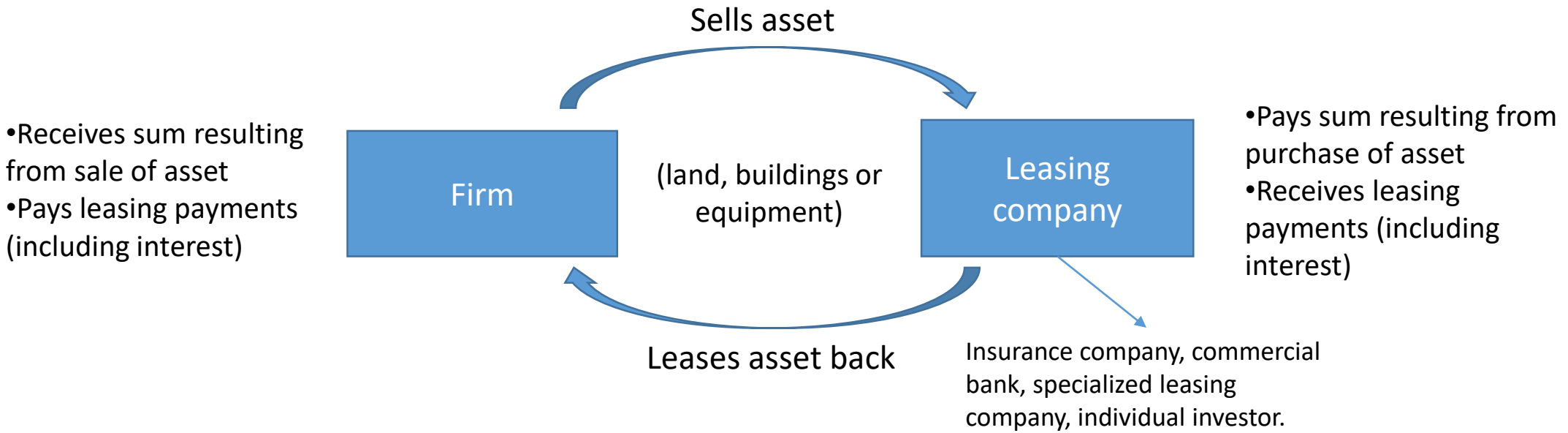

- Under a mortgage loan arrangement, the lender would normally receive a series of equal payments just sufficient to amortize the loan and to provide a specified rate of return on the outstanding loan balance. Under a sale-and-leaseback arrangement, the lease payments are set up exactly the same way—the payments are just sufficient to return the full purchase price to the investor plus a stated return on the lessor's investment.

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Other types of Leasing: Combination Leases

Combination Leases

- Cancellation clauses are normally associated with operating leases.
- Today's financial leases also contain cancellation clauses.
- These clauses generally include prepayment provisions.
- The penalty payments must be sufficient to enable the lessor to recover the unamortized cost of the leased property and cover for unearned possible revenues.

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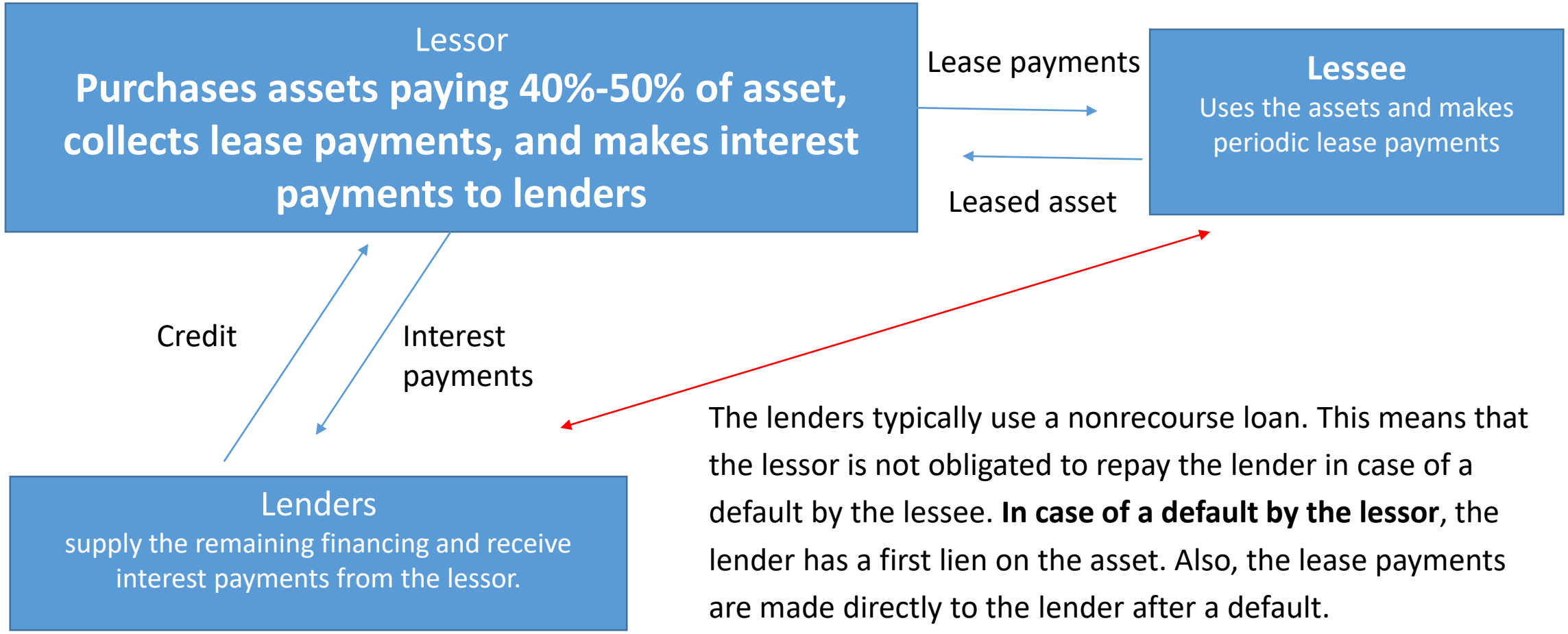
Other types of Leasing: Leveraged Leases



The lenders typically use a nonrecourse loan. This means that the lessor is not obligated to repay the lender in case of a default by the lessee. **In case of a default by the lessor**, the lender has a first lien on the asset. Also, the lease payments are made directly to the lender after a default.

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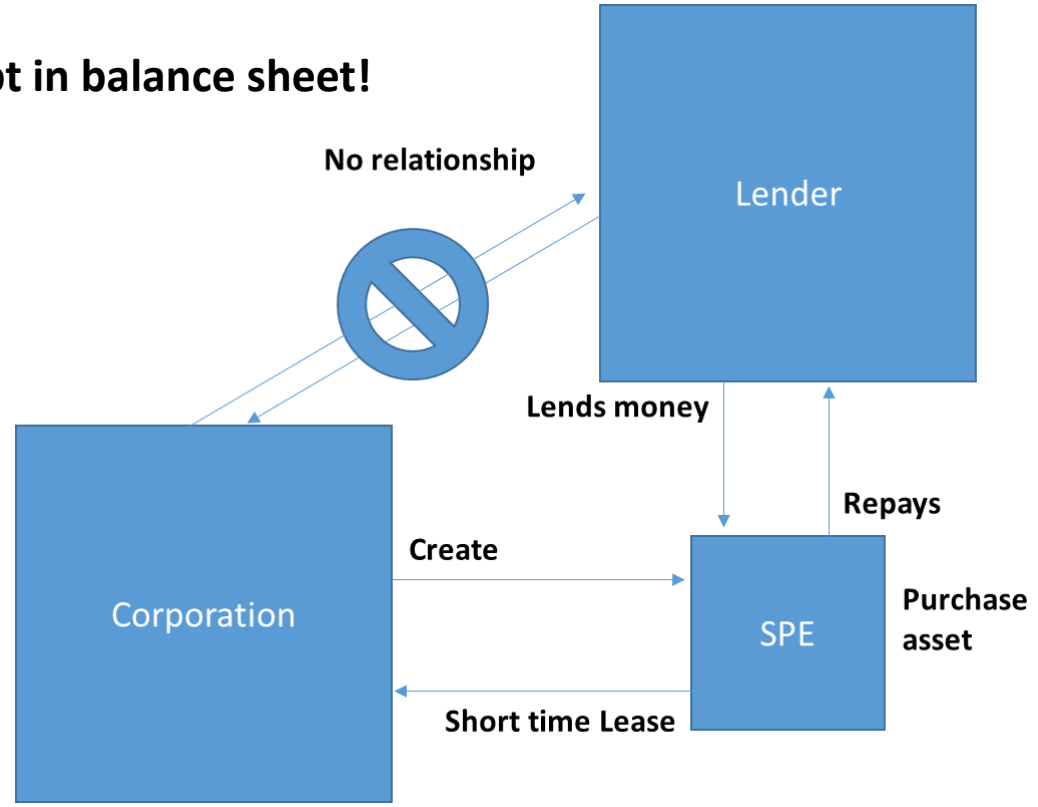
Other types of Leasing: Synthetic

Synthetic Leases

- First used in the early 1990s
- Became very popular in the mid- to late-1990s. When companies such as Enron and Tyco, as well as other companies that did not engage in fraud, discovered that synthetic leases could be used to keep debt off their balance sheets.
- Since 2003, when FASB (Financial Accounting Standards Board) put in place rules that require companies to report on their balance sheets most special purpose entities and synthetic leases, management's opportunity to hide these transactions from shareholders are limited.

Assets will not be capitalized and thus…
No debt in balance sheet!



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Accounting and Taxes

Important: Taxation of lease related activities differs by countries

- For example, in Georgia interest payments of financial leases are VAT exempted on leases which have assets that are VAT exempt, while principal payments are taxed with VAT. In the USA, the lessee can deduct lease payments for income tax purposes if the lease is qualified by the Internal Revenue Service (IRS).

The ability to structure leases that are advantageous to both the lessor and the lessee depends on a large part on these laws. Four major tax factors influence this:

- Investment tax credits
- Depreciation rules
- Tax rates
- Alternative minimum tax

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Accounting and Taxes

From January 1, 2019, IFRS 16 specifies how to account for lease

https://www.ifrs.org/issued-standards/list-of-standards/ifrs-16-leases/

The objective of IFRS 16 is to report information that:

- (a) faithfully represents lease transactions and
- (b) provides a basis for users of financial statements to assess the amount, timing and uncertainty of cash flows arising from leases.

IFRS 16 introduces a single lessee accounting model and requires a lessee to recognize assets and liabilities for all leases with a term of more than 12 months, unless the underlying asset is of low value. A lessee is required to recognize a right-of-use asset representing its right to use the underlying leased asset and a lease liability representing its obligation to make lease payments.

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For further information: https://www.ifrs.org/-/media/project/leases/ifrs/published-documents/ifrs16-effects-analysis.pdf

Accounting and Taxes

Main change to current lease accounting (IAS 17):

- For lessees no further distinction between operating & finance leases (in most cases)
- All leases have to be accounted for similar to finance leases under IAS 17
- →→ Lessees have to take all their lease arrangements on balance

Lease payments as **finance cost and depreciation not as operating cashflow.** This affects KPI's

- Increase of EBITDA
- Slight increase of EBIT
- Increase of operating cash flow / decrease of financing cash flow
- Decrease of equity ratio
- Weakening of Gearing / gearing ratio
- →→Probably necessity to re-negotiate loan covenants

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Lease Accounting (IFRS 16)

Lease accounting is currently in a transition phase, that significantly impacts key performance indicators (e.g. EBITDA, equity ratio, gearing).

Current lease accounting for lessee's (IAS 17):

- Distinction between operating lease and finance lease.
- Accounting treatment:

	Operating Lease (Lessee)	Finance Lease (Lessee)
Balance Sheet	► Prepaid / accrued lease rental payable	► Leased asset ► Liability
Income Statement (P/L)	► Lease / rental expense	► Depreciation ► Finance expense

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Evaluation of the lease

- Leases are evaluated by both the lessee and the lessor.
- The **lessee** must determine whether leasing an asset is less costly than buying it
- The **lessor** must decide whether the lease payments provide a satisfactory return on the capital invested in the leased asset.

Evaluation by the lessee

Whether or not to acquire the asset is not part of the lease analysis

Lease analysis is focused exclusively on whether a certain asset should be obtained by lease or by purchase.

In general, businesses do not have excess cash, so capital to finance new assets could be obtained from internally generated cash flows, by borrowing, or by selling new equity. Alternatively, the asset could be leased.

Appropriate comparison: leasing vs. debt financing

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Evaluation by the lessee

A lease is comparable to a loan because the firm is required to make a specified series of payments, and a failure to meet these payments could result in bankruptcy.

Leasing normally has the **same effect on the capital structure effect as borrowing**. If a company has a target capital structure, then $1 of lease financing displaces $1 of debt financing.

Thus, the most appropriate comparison is **lease financing versus debt financing**. Compare the cost of leasing with the cost of debt financing regardless of how the asset purchase is actually financed.

The asset may be purchased with available cash or with cash raised by issuing stock, but because leasing is a substitute for debt financing and has the same capital structure effect, the appropriate comparison would still be with debt financing.

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Calculating the NAL (Net advantage to leasing)

The analysis for the lease-versus-borrow decision consists of

- Estimating the cash flows associated with borrowing and buying the asset (the flows associated with debt financing) i.e. owning
- Estimating the cash flows associated with leasing the asset
- Comparing the two financing methods to determine which is preferable.

If the **NAL, is positive** leasing is preferable and if it is negative borrowing and buying is better from **valuation standpoint. This is analogous to the NPV capital budgeting method.**

- Present values of these cash flows should be calculated to make them comparable. Net advantage to leasing (NAL) equals to:
  - NAL = PV of leasing – PV of owning

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Lessor vs Lessee

Lessee	0	1	2	3	4	5
Equipment	200,000					
Lease payments	-	- 55,000	- 55,000	- 55,000	- 55,000	- 55,000
Tax saving from lease	-	19,250	19,250	19,250	19,250	19,250
Net cash flow	200,000	- 35,750	- 35,750	- 35,750	- 35,750	- 35,750
PV of cash flows	200,000.00	- 33,568.08	- 31,519.32	- 29,595.61	- 27,789.30	- 26,093.24
NPV	51,434					

Lessor	0	1	2	3	4	5
Equipment	- 200,000					
Lease payments	-	55,000	55,000	55,000	55,000	55,000
Tax on lease payments	-	- 19,250	- 19,250	- 19,250	- 19,250	- 19,250
Residual value	-	-	-	-	-	-
Net cash flow	- 200,000	35,750	35,750	35,750	35,750	35,750
PV of cash flows	- 200,000.00	33,568.08	31,519.32	29,595.61	27,789.30	26,093.24
NPV	- 51,434					

If the inputs to the lessee and the lessor are identical, then a positive NAL to the lessee implies an equal but negative NPV to the lessor. **However, conditions are often such that leasing can provide net benefits to both parties. This situation arises because of differentials in taxes, in borrowing rates, in estimated residual values, or in the ability to bear the residual value risk**

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Evaluation by the lessee: Calculating the NAL (II)

- The Tunnel Excavating Company (TEC) needs a new tractor that costs $200,000 and will be used for 5 years. TEC can get a loan from the bank with a 10% interest rate and repayment of the principal after 5 years.
- For simplicity, assume:
  1. The tractor can be depreciated using straight line depreciation for the 5 years,
  2. Assume TEC can deduct lease payments, depreciation expenses, and interest payments for income tax purposes,
  3. Maintenance costs are included in the purchase of the tractor by the manufacturer

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Evaluation by the lessee: Calculating the NAL (II)

- However, Tractor Leasing Corp. offers leases for the tractor. TEC's financial manager must choose whether she would like to lease or buy the new tractor. Assume the lease payments are tax deductible.

Life of the asset	5yr
Tax rate for TEC	35%
Interest rate on loan	10%
After-tax cost of debt	6.5%

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Evaluation by the lessee: Calculating the NAL (III)

Lets first calculate the NPV for Owning the tractor. This means taking the loan and purchasing the asset.

1. The equipment cost and loan and amount
2. Interest payments and interest savings (Interest payments*Tax Rate)

Cost of Owning	0	1	2	3	4	5
Equipment Cost	- 200,000					
Loan Amount	200,000					
Interest payments	-	- 20,000	- 20,000	- 20,000	- 20,000	- 20,000
Tax savings from interest	-	7,000	7,000	7,000	7,000	7,000

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Evaluation by the lessee: Calculating the NAL (IV)

3. Add the Principal repayment (in the last period)
4. Add the Tax savings from depreciation (Depreciation * Tax rate)
5. Sum up the net cash flows and discount them. **Because the cash flows are after-taxes, use the after-tax cost of debt = interest rate * (1 – tax rate)**

Cost of Owning	0	1	2	3	4	5
Equipment Cost	- 200,000					
Loan Amount	200,000					
Interest payments	-	- 20,000	- 20,000	- 20,000	- 20,000	- 20,000
Tax savings from interest	-	7,000	7,000	7,000	7,000	7,000
Principal repayment	-	-	-	-	-	- 200,000
Tax savings from depreciation	-	14,000	14,000	14,000	14,000	14,000
Residual value	-	-	-	-	-	-
Lease payments	-	-	-	-	-	-
Tax saving from lease	-	-	-	-	-	-
Net cash flow	-	1,000	1,000	1,000	1,000	- 199,000
PV of cash flows	-	938.97	881.66	827.85	777.32	- 145,246.29

NPV
-141,820.49

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Evaluation by the lessee: Calculating the NAL (V)

- Now let's move on to the leasing alternative.
  1. The equipment cost and loan and amount
  2. Add lease payments
  3. Add tax savings from leasing (lease payments * tax rate)
  4. Sum up the net cash flows and discount them. **Because the cash flows are after-taxes, use the after-tax cost of debt = interest rate * (1 – tax rate)**

Cost of Leasing	0	1	2	3	4	5
Equipment Cost	-					
Loan Amount	-					
Interest payments	-	-	-	-	-	-
Tax savings from interest	-	-	-	-	-	-
Principal repayment	-	-	-	-	-	-
Tax savings from depreciation	-	-	-	-	-	-
Residual value	-	-	-	-	-	-
Lease payments	-	- 55,000	- 55,000	- 55,000	- 55,000	- 55,000
Tax saving from lease	-	19,250	19,250	19,250	19,250	19,250
Net cash flow	-	- 35,750	- 35,750	- 35,750	- 35,750	- 35,750
PV of cash flows	-	- 33,568.08	- 31,519.32	- 29,595.61	- 27,789.30	- 26,093.24

NPV
-148,565.54

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Evaluation by the lessee: Calculating the NAL (VI)

NAL = PV of leasing – PV of owning

= -148,566 – (-141,820.49)

= -6,745.05

This means that the Net Advantage to Leasing in this case is **negative.** The firm is better off taking a loan and purchasing the equipment

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Evaluation by the lessee: Calculating the NAL (VII)

What would happen to the NAL if the interest payments on the loan are not deductible for tax purposes?

Cost of Owning	0	1	2	3	4	5
Equipment Cost	- 200,000					
Loan Amount	200,000					
Interest payments	-	- 20,000	- 20,000	- 20,000	- 20,000	- 20,000
Tax savings from interest	-					
Principal repayment	-	-	-	-	-	- 200,000
Tax savings from depreciation	-	14,000	14,000	14,000	14,000	14,000
Residual value	-	-	-	-	-	-
Lease payments	-	-	-	-	-	-
Tax saving from lease	-	-	-	-	-	-
Net cash flow	-	- 6,000	- 6,000	- 6,000	- 6,000	- 206,000
PV of cash flows	-	- 5,633.80	- 5,289.96	- 4,967.09	- 4,663.94	- 150,355.45

NAL = PV of leasing – PV of owning

= -148,566 – (-170,910)

= +22,345

This means that the Net Advantage to Leasing in this case is **positive.** The firm is better off leasing.

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Evaluation by the Lessor

Who is the lessor?

- The lessor is generally a specialized leasing company, a bank or bank affiliate, an individual or group of individuals, or a manufacturer that uses leasing as a sales tool.

How do they evaluate a leasing decision?

- Leasing can be considered an alternative to debt financing. Similarly, any potential lessor needs to know the **rate of return on the capital invested in the lease**.
- Useful information to the prospective lessee: Lease terms on large are generally negotiated, so the lessee should know what return the lessor is earning.

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Source: Financial Management: Theory and Practice, 14th edition Eugene F. Brigham and Michael C. Ehrhardt

Evaluation by the Lessor (II)

1. • Determining the net cash outlay, which is usually the invoice price of the leased equipment less any lease payments made in advance;
2. • Determining the periodic cash inflows, which consist of the lease payments minus both income taxes and any maintenance expense the lessor must bear;
3. • Estimating the after-tax residual value of the property when the lease expires; and
4. • **Determining whether the rate of return on the lease exceeds the lessor's opportunity cost of capital or, equivalently, whether the NPV (Net Present Value) of the lease exceeds zero.**

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Same example but from lessors perspective

- The Tunnel Excavating Company (TEC) needs a new tractor that costs $200,000 and will be used for 5 years. TEC can get a loan from the bank with a 10% interest rate and repayment of the principal after 5 years.
- For simplicity, assume:
  1. The tractor can be depreciated using straight line depreciation for the 5 years
  2. Assume that TEC can deduct lease payments, depreciation expenses, and interest payments for income tax purposes
  3. Maintenance costs are included in the purchase of the tractor by the manufacturer

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Same example but from lessors perspective

- However, Tractor Leasing Corp. offers leases for the tractor. Assume that the lease payments are tax deductible for the lessee.
- …There are some differences! Assume that the Tractor Leasing Corp. has:
  - Access to financing at a lower rate (8% pre-tax)
  - Is on a higher tax bracket (40%)
  - Has a deal with a local junkyard that agrees to purchase the tractor after 5 years for $3,000
  - Has an IRR hurdle rate equal to their after-tax cost of debt

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Same example but from lessors perspective (II)

Cost of Owning	0	1	2	3	4	5
Equipment Cost	- 200,000					
Tax savings from depreciation	-	15,760	15,760	15,760	15,760	15,760
Residual value	-	-	-	-	-	3,000
Lease payments	-	55,000	55,000	55,000	55,000	55,000
Tax on lease payment	-	- 22,000	- 22,000	- 22,000	- 22,000	- 22,000
Net cash flow	- 200,000	48,760	48,760	48,760	48,760	51,760
PV of cash flows	- 200,000.00	46,526.72	44,395.72	42,362.33	40,422.07	40,943.77

1. The leasing company provides the capital
2. It is able to depreciate the asset and benefit from tax savings
3. Residual value resulting from deal with junkyard
4. Receives the lease payments
5. Pays taxes on lease payments
6. PV → **Because the cash flows are after-taxes, use the after-tax cost of debt = interest rate* (1 – tax rate)**
    1. **8% * (1- 40%) = 4.8 %**
7. Project has a positive NPV and clears the hurdle rate of 4.8%

NPV	IRR
14,650.62	7%

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- 6 Leasing and EE
- 7 Examples and cases

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Some benefits of leasing

- Taxes may be reduced
- Lease contract might reduce uncertainties that might decrease the value of the company
- Transaction costs may be lower for a lease than for a purchase
- Leasing may require fewer restrictions and encumber fewer assets than secured borrowing.

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Tax advantages

- A potential tax shield that cannot be used as efficiently by one firm can be transferred to another by leasing
- High tax bracket firms will want to act as the lessor
- Low–tax bracket firms will be lessee
- Lessees would not be able to use the tax advantages of ownership, such as depreciation and debt financing, as efficiently as the lessors.

Sum of the above is one of the reasons why leasing companies can offer favorable rates while still making a profit. A more efficient use of the tax advantages of ownership results in a benefit that can be passed on to the lessee, thus resulting in a favorable deal for both the lessee and the lessor.

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Reduction of Uncertainty and transaction costs

Transferring uncertainty from the lessee to the lessor

- Substantial uncertainty (residual value of the asset)
- Transferring the uncertainty about the residual value of an asset to the lessor makes sense when the lessor is better able to bear the risk. (e.g. the lessor is the manufacturer, then the lessor may be better able to assess and manage the risk associated with the residual value)

Transaction costs

- The costs of changing ownership of an asset many times over its useful life will frequently be greater than the costs of writing a lease agreement.
- Lower transactions costs may be the major reason for short-term leases (operating leases) → not the major reason for long-term leases.

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Restrictions and Security requirements

Fewer restrictions compared to borrowing (but beware!!)

- The borrower will generally agree to a set of restrictive covenants, spelled out in the indenture, or loan agreement. **Such restrictions are not generally found in lease agreements**. This is very important especially for SMEs during the growth stage, when they need financing their CAPEX programs and collateral requirements **limit their growth potential**

Encumbered Assets

- With a secured loan, the borrower may have to pledge other assets as security. With a lease, only the leased asset is so encumbered→ Leasing companies typically **use leased equipment/machinery as a collateral.**

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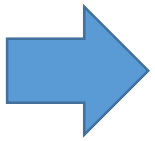
How can leasing be used to increase Energy Efficiency ?

- **Energy efficient technology can decrease energy costs, while simultaneously increase production capacity. Resulting in significant savings.**
- However, new, EE assets can represent a significant capital investment
- A firm (particularly SMEs)
  - May not have access to capital
  - Want avoid transaction cost related to large purchase



Leasing can provide a viable financial solution to purchase/replace equipment

- Moreover, EE projects might receive national or international support in the shape of tax exemptions or access to special financing rates
- Companies such as Georgian Leasing Company in Georgia and the ACBA in Armenia are already offering and specialized leasing services revolving around energy efficient equipment
- In some countries, firms can even use carbon credits

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Dairylicious Case

1. Does it make sense to install the equipment? Calculate the NPV of the project assuming Dairylicious can buy the equipment right away with cash?
2. What is the appropriate discount rate to use for a Buy vs. Lease decision?
3. Should you buy or should you lease? What is the Net Advantage to Leasing?

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Dairylicious Case

4. Dairylicious can negotiate the lease terms,
   - What lease payment would make Dairylicious indifferent between Leasing or Buying? What would be a favorable lease payment?
   - Dairylicious is able to negotiate the lease down to 60,000. What is the NAL now?
5. Discuss how energy efficiency was used in the case

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Dairylicious Case: Q1

Does it make sense to install the equipment? Calculate the NPV of the project assuming Dairylicious can buy the equipment right away with cash?

1. Determine what information is needed:
    1. Discount rate: "They would expect a project of similar risk to have yield a 18% return"
    2. Period: Equipment will last for 15 years
    3. Relevant cash flows:
        - Energy savings: "savings of 700 MWh per year priced at 58 $/MWh"
        - Maintenance savings: "maintenance costs of around 30,000 USD"
        - Tax on savings: "Dairylicious is in the 10% tax bracket"
        - Residual value: "$3,000 higher than the book value"
        - Tax on book value: "book value of 20% of original investment"
        - Depreciation tax shield "tax laws will allow the asset to be depreciated using straight line depreciation for 15 years down to a book value of 20% of original investment)"

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Dairylicious Case: Q1

Installing the Refrigiration equipment	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Total Energy Savings		40,600	40,600	40,600	40,600	40,600	40,600	40,600	40,600	40,600	40,600	40,600	40,600	40,600	40,600	40,600
Saved Operations & Maintenance Costs		30,000	30,000	30,000	30,000	30,000	30,000	30,000	30,000	30,000	30,000	30,000	30,000	30,000	30,000	30,000
Operating Profit (EBIT)		**70,600**	**70,600**	**70,600**	**70,600**	**70,600**	**70,600**	**70,600**	**70,600**	**70,600**	**70,600**	**70,600**	**70,600**	**70,600**	**70,600**	**70,600**
Tax on Gross Profit	-	- 7,060	- 7,060	- 7,060	- 7,060	- 7,060	- 7,060	- 7,060	- 7,060	- 7,060	- 7,060	- 7,060	- 7,060	- 7,060	- 7,060	- 7,060
Residual value		-	-	-	-	-	-	-	-	-	-	-	-	-	-	85,000
Tax on residual value																- 8,200
Depreciation tax shield		21,867	21,867	21,867	21,867	21,867	21,867	21,867	21,867	21,867	21,867	21,867	21,867	21,867	21,867	21,867
Net Profit		**85,407**	**85,407**	**85,407**	**85,407**	**85,407**	**85,407**	**85,407**	**85,407**	**85,407**	**85,407**	**85,407**	**85,407**	**85,407**	**85,407**	**162,207**
Net cash flow	- 410,000	85,407	85,407	85,407	85,407	85,407	85,407	85,407	85,407	85,407	85,407	85,407	85,407	85,407	85,407	162,207
PV of cash flows	441,268.70	72,378.53	61,337.74	51,981.13	44,051.81	37,332.04	31,637.32	26,811.29	22,721.43	19,255.45	16,318.18	13,828.97	11,719.46	9,931.75	8,416.74	13,546.86

NPV = 31,269
IRR = 20%

Positive NPV and IRR would suggest it is a value creating project

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Dairylicious Case: Q2

What is the appropriate discount rate to use for a Buy vs. Lease decision?

The appropriate discount rate is the **after-tax cost of debt**

“pre-tax cost for debt is estimated by using a government bond yield rate plus a risk premium is equal to 20%.”

20*(1-10%) = 18%

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Dairylicious Case: Q3

Should you buy or should you lease? What is the Net Advantage to Leasing?

We must determine the appropriate discount rate, period and cash flows:

- As per Q2, the appropriate discount rate is 18%
- Period is 15 years

- Cash flows: Since the energy savings, maintenance savings (and their respective taxes) will be the same if we buy or lease, we can exclude these from the calculation.
  1. For Owning:
     1. Residual value: "$3,000 higher than the book value"
     2. Tax on book value: "book value of 20% of original investment"
     3. Depreciation tax shield "tax laws will allow the asset to be depreciated using straight line depreciation for 15 years down to a book value of 20% of original investment)"
     4. After-tax loan payments: 20% *(1-10%) * 410,000
  3. For Leasing:
     1. Lease payments
     2. Tax savings on lease
- Compute the NAL

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Dairylicious Case: Q3

Cost of Owning	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Total Energy Savings		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Saved Operations & Maintenance Costs		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Operating Profit (EBIT)		**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Tax on Gross Profit	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Residual value		-	-	-	-	-	-	-	-	-	-	-	-	-	-	85,000
Tax on residual value																- 8,200
Depreciation tax shield		21,867	21,867	21,867	21,867	21,867	21,867	21,867	21,867	21,867	21,867	21,867	21,867	21,867	21,867	21,867
After-tax loan payments		- 73,800	- 73,800	- 73,800	- 73,800	- 73,800	- 73,800	- 73,800	- 73,800	- 73,800	- 73,800	- 73,800	- 73,800	- 73,800	- 73,800	- 483,800
Net Profit		**- 51,933**	**- 51,933**	**- 51,933**	**- 51,933**	**- 51,933**	**- 51,933**	**- 51,933**	**- 51,933**	**- 51,933**	**- 51,933**	**- 51,933**	**- 51,933**	**- 51,933**	**- 51,933**	**- 385,133**
Net cash flow	-	- 51,933	- 51,933	- 51,933	- 51,933	- 51,933	- 51,933	- 51,933	- 51,933	- 51,933	- 51,933	- 51,933	- 51,933	- 51,933	- 51,933	- 385,133
PV of cash flows	- 292,250.14	- 44,011.30	-37,297.71	- 31,608.23	- 26,786.64	- 22,700.54	- 19,237.74	- 16,303.17	- 13,816.25	- 11,708.69	- 9,922.61	- 8,409.00	- 7,126.27	- 6,039.21	- 5,117.97	- 32,164.81

Cost of Leasing	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Total Energy Savings		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Saved Operations & Maintenance Costs		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Operating Profit (EBIT)		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tax on Gross Profit	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Lease payment		- 77,900	- 77,900	- 77,900	- 77,900	- 77,900	- 77,900	- 77,900	- 77,900	- 77,900	- 77,900	- 77,900	- 77,900	- 77,900	- 77,900	- 77,900
Tax saving from lease		7,790	7,790	7,790	7,790	7,790	7,790	7,790	7,790	7,790	7,790	7,790	7,790	7,790	7,790	7,790
Net cash flow		- 70,110	- 70,110	- 70,110	- 70,110	- 70,110	- 70,110	- 70,110	- 70,110	- 70,110	- 70,110	- 70,110	- 70,110	- 70,110	- 70,110	- 70,110
PV of cash flows	- 356,970.50	- 59,415.25	-50,351.91	- 42,671.11	- 36,161.96	- 30,645.73	- 25,970.96	- 22,009.28	- 18,651.94	- 15,806.73	- 13,395.53	- 11,352.14	- 9,620.46	- 8,152.93	- 6,909.27	- 5,855.31

NAL = PV of Leasing – PV of owning
NAL = -64,720.36

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Dairylicious Case: Q4

What lease payment would make Dairylicious indifferent between Leasing or Buying? What would be a favorable lease payment?

We know that under the first terms offered (lease payments of $77,900), Dairylicious would be better off buying. So favorable lease payments must but below $77,900

Dairylicious will be indifferent between buying and leasing when the NAL is 0, to determine the cash flows

NAL = PV of Leasing – PV of Owning

0 = PV of leasing – PV of Owning

0 = PV of leasing – (-292,250.14)

-292,250.1 = PV of leasing

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Dairylicious Case: Q4

Now that can use that PV, the to calculate the leasing payments using the PMT Excel formula.

=PMT(After-tax borrowing rate, number of periods, PV)

=PMT(18%, 15, -292,250.14)

Payments of $57,399.74 (after tax lease payment) =$ 63,776.38 pre-tax lease payments

Therefore, lease payments of under $ 63,776.38 would be considered favorable

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Dairylicious Case: Q4

Cost of Leasing	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Total Energy Savings		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Saved Operations & Maintenance Costs		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Operating Profit (EBIT)		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tax on Gross Profit	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Lease payment		- 60,000	- 60,000	- 60,000	- 60,000	- 60,000	- 60,000	- 60,000	- 60,000	- 60,000	- 60,000	- 60,000	- 60,000	- 60,000	- 60,000	- 60,000
Tax saving from lease		6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000
Net cash flow		- 54,000	- 54,000	- 54,000	- 54,000	- 54,000	- 54,000	- 54,000	- 54,000	- 54,000	- 54,000	- 54,000	- 54,000	- 54,000	- 54,000	- 54,000
PV of cash flows	- 274,945.19	- 45,762.71	-38,781.96	- 32,866.07	- 27,852.60	- 23,603.90	- 20,003.30	- 16,951.95	- 14,366.06	- 12,174.63	- 10,317.48	- 8,743.63	- 7,409.85	- 6,279.54	- 5,321.64	- 4,509.87

NAL = - 274,945.19 –(-292,250.14)

= 17,304.95

NAL is now positive, a lease at this rate is favorable

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Conclusion (I)

- Leasing is an important financial vehicle
- There are different types of leasing including operating leases, financial leases, sale and lease back, etc. However, recent accounting standards (IFRS 16), have affected much of the distinction between operating leases and financial leases
- Accounting and tax guidelines affect lease arrangements and their profitability by providing interest and depreciation tax shields

Conclusion (II)

- Lease analysis:
  - Lessee: To analyze whether to lease an asset or to buy it, we compare the PV of the costs associated with owning to the PV of the costs associated with leasing, using the after-tax cost of debt as discount rate.
  - Lessor: compare to an investment. If the lease's NPV is greater than 0 then it should be written
- Leasing can be motivated by tax rate differentials, ability to bear residual value risk and situations under which the lessor can maintain the equipment more efficiently
- Leasing of energy efficient assets can help realize savings while increasing output