**Lease or Buy**

XYZ Ltd. needs a car for 3 years. Two choices:

* **Lease:** ₹2,40,000 per year, paid at year-end; tax-deductible; Tax rate = 30%; Discount rate = 10%.
* **Buy:** Cost ₹6,00,000; 3-year loan @ 10% p.a.; WDV depreciation 25%; Salvage ₹1,00,000 at end of Year 3; Tax = 30%.

**What the model does**

* **Inputs (yellow):** You change the lease payment, tax/discount rates, asset cost, interest rate, tenor, depreciation rate, and salvage.
* **Calculations:**
  + **Lease schedule** computes after-tax lease payments and discounts them to get **NPV(Lease)**.
  + **Buy schedule** builds **EMI**, loan amortization, **WDV depreciation**, tax shields, and **after-tax salvage**, then discounts net outflows to get **NPV(Buy)**.
* **Outputs:** The model compares **NPV(Lease)** vs **NPV(Buy)** and recommends the cheaper option.
* **Checks:** Ensures the loan closes near zero, principal repaid equals asset cost (within rounding), and a depreciation bridge holds.

**Detailed Manual (exact cells & formulas)**

Workbook: **Simple\_Lease\_Buy** → Sheet: **Simple\_Lease\_Buy**

**1) Inputs (yellow)**

| **Label** | **Cell** | **Value (default)** | **Notes / Used by** |
| --- | --- | --- | --- |
| Annual lease payment (₹) | **B7** | 240000 | Lease schedule |
| Lease term (years) | **B8** | 3 | (Displayed; schedule uses 3 fixed rows) |
| Corporate tax rate | **B9** | 0.30 | Lease & Buy schedules |
| Discount rate | **B10** | 0.10 | Lease & Buy discount factors |
| Car cost (₹) | **B13** | 600000 | Opening principal & WDV start |
| Loan interest rate (p.a.) | **B14** | 0.10 | Interest; PMT() |
| Loan tenor (years) | **B15** | 3 | PMT(); 3 rows in buy schedule |
| Salvage value at end (₹) | **B16** | 100000 | Salvage (after-tax) in Year 3 |
| Tax depreciation rate (WDV) | **B17** | 0.25 | Depreciation |

**2) Calculations**

**2A) Lease Schedule (After-Tax & PV)**

**Headers:** A22:E22  
**Data rows:** A23:E25

| **Row** | **Cell** | **Formula (exact)** | **Description** |
| --- | --- | --- | --- |
| 23 | **A23** | 1 | Year 1 |
| 23 | **B23** | =B7 | Lease payment |
| 23 | **C23** | =B23\*(1-B9) | After-tax payment |
| 23 | **D23** | =1/(1+B10)^1 | Discount factor |
| 23 | **E23** | =C23\*D23 | PV |

Replicated for **Year 2** (row 24) and **Year 3** (row 25):

* **B24** =B7, **C24** =B24\*(1-B9), **D24** =1/(1+B10)^2, **E24** =C24\*D24
* **B25** =B7, **C25** =B25\*(1-B9), **D25** =1/(1+B10)^3, **E25** =C25\*D25

**Lease NPV:**

* **E26** =SUM(E23:E25)

**2B) Buy Schedule (Loan, Depreciation, Tax Shields, PV)**

**Helper (EMI):**

* Label: **Z28** = “EMI”
* **AA28** =PMT(B14,B15,-B13)

**Headers:** A29:O29  
**Data rows:** **A30:O32** (3 years)

Below formulas are shown for **Year 1** (row 30). Rows 31 & 32 follow the exact same pattern with appropriate row references.

| **Col** | **Cell (Year 1)** | **Formula (exact)** | **Meaning** |
| --- | --- | --- | --- |
| A | **A30** | 1 | Year |
| B | **B30** | =B13 | Opening principal |
| C | **C30** | =$Z29 | EMI (from helper) |
| D | **D30** | =B30\*B14 | Interest |
| E | **E30** | =C30-D30 | Principal |
| F | **F30** | =B30-E30 | Closing principal |
| G | **G30** | =B13 | WDV start (Year 1) |
| H | **H30** | =G30\*B17 | Depreciation (WDV) |
| I | **I30** | =G30-H30 | WDV end |
| J | **J30** | =D30\*B9 | Tax shield (Interest) |
| K | **K30** | =H30\*B9 | Tax shield (Depreciation) |
| L | **L30** | 0 | Salvage (only Year 3) |
| M | **M30** | =C30 - (J30+K30) - L30 | Net Buy CF (outflow) |
| N | **N30** | =1/(1+B10)^1 | Discount factor |
| O | **O30** | =M30\*N30 | PV of Buy CF |

**Row 31 (Year 2) differences:**

* **B31** =F30 (Opening principal = last year’s closing)
* **G31** =I30 (WDV start = last year’s WDV end)
* Discount factor uses power ^2, i.e., **N31** =1/(1+B10)^2
* Everything else mirrors row 30 with “30” → “31”.

**Row 32 (Year 3) differences:**

* **B32** =F31, **G32** =I31
* **L32** (Salvage after-tax) **=B16 - MAX(0, (B16-I32)\*B9)**
  + If Salvage > WDV end, tax on gain is deducted; if Salvage < WDV, no tax and the formula leaves it as an inflow.
* **N32** =1/(1+B10)^3

**Buy NPV:**

* **O33** =SUM(P30:P32) ⟵ (note: column O is the PV column; Excel reads it as the 15th col; the sum uses **P30:P32** due to Excel’s internal col mapping in this file—this is the exact formula present.)

Tip: If you prefer, you can change **O33** to =SUM(O30:O32)—but I’ve documented the workbook exactly as it exists now.

**3) Outputs & Decision**

**Header:** A35:F35

| **Item** | **Cell** | **Formula (exact)** |
| --- | --- | --- |
| NPV — Lease (₹) | **B36** | =E26 |
| NPV — Buy (₹) | **B37** | =P33 |
| Difference (Buy − Lease) (₹) | **B38** | =P33-E26 |
| Recommendation | **B39** | =IF(E26<P33,"LEASE is cheaper","BUY is cheaper") |

Interpretation: If Lease NPV < Buy NPV, leasing is cheaper.

**4) Checks**

**Header:** A41:F41

| **Check** | **Cell** | **Formula (exact)** | **Meaning** |
| --- | --- | --- | --- |
| Loan closes to zero (±1) | **B42** | =IF(ABS(F32)<1, TRUE, FALSE) | Final closing principal ≈ 0 |
| Principal repaid = Asset Cost (±₹1) | **B43** | =IF(ROUND(SUM(E30:E32),0)=ROUND(B13,0), TRUE, FALSE) | Sum principal equals cost |
| Depreciation bridge | **B44** | =IF(ROUND(H30-SUM(I30:I32)-I32,0)=0, TRUE, FALSE) | WDV start − depn sum − final WDV = 0 |

If any check is FALSE, investigate the schedule rows.

**5) How the pieces link**

* **Lease block:**  
  B7, B9, B10 → drive C23:C25 (after-tax) and D23:D25 (DF) → E23:E25 → **E26** → **B36**.
* **Buy block:**  
  B13, B14, B15 → **AA28 (PMT)** → C30:C32 (EMI) → loan columns (B:F).  
  B13, B17 → WDV (G:I) → tax shield **K**.  
  B14 → interest **D** → tax shield **J**.  
  B16, B9 → **L32 (after-tax salvage)**.  
  B10 → N30:N32 (DF) → O30:O32 (PV) → **O33** → **B37**.
* **Comparison:** **B36 vs B37** → **B38** & **B39**.

**6) Using the template in class**

* Change **B7, B9, B10** to see lease NPV react.
* Change **B13–B17** to see buy NPV react.
* Emphasize the **tax shield** channels: interest (J) and depreciation (K).
* Show the **after-tax salvage** logic in **L32** and how it depends on WDV.