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# MBA ASSIGNMENT

# CORPORATE FINANCE

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# 1. Lease financing analysis

Leasing is a term that describes a contract calling for the lesser, or user to pay for the use of an asset to the lessor (or the owner of this asset). According to Helfert, (2001) there are two basic types of leasing: financial and operating leases. According to (Brigham & Houston, 2009), a financial lease is a non-cancelable contractual commitment on part of the lessee to make series of payments to the lessor for the use of asset when one of the following applies

- Lease transfers title to lessee before lease expires
- Lease has option to purchase at bargain
- Lease period exceeds 75% of asset life
- PV of lease payments exceed 90% of value

If one of these conditions is met then the economic value of an asset is in fact transferred to the lessee. This means that the operating lease takes place if none of the above-mentioned conditions holds. In this case, most of the economic value is retained by the lessor. Leases are treated as debts in accounting context, since they in fact introduce a form of credit for the companies.

The first value needed to compute the financing analysis is the net interest rate on debt. Since there are values of the mortgage rate given (6.5%) and the marginal tax rate (30%), it is possible to calculate the net interest rate on debt as follows:

Net Interest Rate on Debt = (1 - Marginal Tax Rate)*Mortgage Rate = 0.065*(1-0.70) =0.0455, or 4.55%.

As Brealey et al (2003) argue it is important to determine whether the lease is ‘operating’ or ‘financial’. It is possible to see that the asset is leased for 10 years with

the actual life of the asset constituting 10 years (11, within the MACRS concept). From this information it can be inferred that in this case we deal with a financial lease. Moreover, the PV of lease payments (using the net interest rate on debt for PV estimate) is $9 471 961.83, which is more than the total value of the asset. Thus, leasing of a new zippy diagnostic machine is a financial lease and should be treated as debt in the financial calculations performed.

In order to perform lease financing analysis, some preliminary considerations should be discussed. First of all, it is necessary to determine the cash flows taking place during the leasing period. Moreover, since the main task is to compare leasing and buying options, it is therefore necessary to include alternative cash flows (i.e. the cash flows which would appear as a result of buying). For the zippy diagnostic machine, the following information is given: “the cost of the asset is $8 000 000, annual lease payments are $1 200 000”. Lease payments include maintenance costs. Thus, for comparing it with the buying option it is necessary to include tax-adjusted maintenance costs as this comprises the cash inflows which are to be compared against the option of purchasing the asset.

Furthermore, it is necessary to take into account that Cherry Medical Clinic is a tax-paying entity and uses Modified Accelerated Cost Recovery System. Under MACRS, the annual depreciation deductions on all tangible property are determined by special life and depreciation scales (Vance, 2002). Let us consider that the zippy diagnostic machine will be depreciated under regular depreciation and the property class for the zippy will be given 10 years of life (actually 11 years) with respect to MACRS. The MACRS deduction percentage for 10-year period is shown in Table 1.

| Year | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| % | 10 | 18 | 14.40 | 11.52 | 9.22 | 7.37 | 6.55 | 6.55 | 6.55 | 6.55 | 3.29 |

Table 1 MACRS applicable percentage for 10-year asset life (Vance, 2002)

Using the above information, it is possible to determine the annual cash flows from the leasing when compared to the purchasing option. It should be noted that all cash flows will be indicated in nominal rates (without calculating the present value of them), and for final cash flows the adjustment according to net interest rate on debt will be done.

The estimated cash inflows in the case of leasing the product are as follows:

1) Cost of asset (appears in the beginning of year 0): $80 000
2) Lease tax deductions will take place in the year following the lease payments (Years 1-11); all these deductions will be equal to tax part of lease payments ($1 200 000 * 0.3 = $360 000).
3) Net maintenance costs saved will also take place in Years 1-11, and will constitute the after-tax part of net maintenance costs ($200 000 * (1-0.3) = $200 000 * 0.7 = $140 000)

The estimated cash outflows in this case are the following:

1) Lease payments: $1 200 000 each year (Years 0-10, since the lease payment is done at the end of the year)
2) Depreciation tax reductions; they are considered as outflows because the clinic would get them in case of purchasing the asset; they are determined each year as appropriate percentage times marginal tax rate times the cost of the asset minus its salvage value
3) Over the next 10 years not all value of the asset will have depreciated. This means that there will be a loss of net salvage in case of leasing the asset. This is estimated on two facts: a) the non-depreciated part of the asset value

(the last MACRS percentage is 0.0329) and b) the market value of the salvage asset (expected to be higher than salvage value of $500 000). The net salvage loss should be calculated using the following figures:

a. Salvage market value to the end of year 10: $500 000 * (1+0.03)^10=$ 671 958.19
b. Book value at the time of sale: $500 000 + 0.0329*($8 000 000 - $500 000)=$746 750
c. Selling salvage value to the end of year 9: $500 000 * (1+0.03)^9=$ 652 386.59
d. Tax gains from the loss on the sale: MTR*(Book value at the time of sale - Selling salvage value to the end of year 9) = 0.3*($746 750 - $ 652 386.59) = $28 309.02
e. Thus, net salvage loss = Salvage market value – tax gains from the loss on the sale = $ 671 958.19 - $28 309.02 = $643 649.17

Net Cash Flows for finance analysis are calculated as cost of asset – lease payments + lease tax deductions – depreciation tax deduction + net maintenance cost saved – net salvage lost.

**Table 2** contains the financing analysis of leasing versus buying zippy.

| Year End | Asset Cost | Lease Payments | Lease Tax deductions | Depreciation tax deductions | Net Maintenance Cost Saved | Net Salvage Lost | Net Cash Flows |
|---|---|---|---|---|---|---|---|
| 0 | 8000000 | 1200000 | | | | | 6800000 |
| 1 | | 1200000 | 360000 | 225000 | 140000 | | -925000 |
| 2 | | 1200000 | 360000 | 405000 | 140000 | | -1105000 |
| 3 | | 1200000 | 360000 | 324000 | 140000 | | -1024000 |
| 4 | | 1200000 | 360000 | 259200 | 140000 | | -959200 |
| 5 | | 1200000 | 360000 | 207450 | 140000 | | -907450 |
| 6 | | 1200000 | 360000 | 165825 | 140000 | | -865825 |
| 7 | | 1200000 | 360000 | 147375 | 140000 | | -847375 |
| 8 | | 1200000 | 360000 | 147375 | 140000 | | -847375 |
| 9 | | 1200000 | 360000 | 147375 | 140000 | | -847375 |
| 10 | | | 360000 | 147375 | 140000 | 643649 | -291024.17 |

Table 2. Cash flows of leasing compared to buying

## 2. Discount rate for lease analysis versus discount rate for investment analysis

It is necessary to determine the discount rate for financing and for producing an investment analysis. Since we are dealing with debt financing, it is possible to use the net interest rate on debt as the discount rate for lease analysis. By calculating the present value of net cash flows for financing analysis, we obtain -$152 348, 35 as net present value of leasing the asset versus purchasing. *Since this value is negative, it is possible to determine that leasing is not recommended, since it results in more expensive debt financing than purchasing***.** For investment analysis, both debt and equity have to be taken into account. It is possible to determine the resulting discount rate using either the CAPM model or WACC model (Brealey, et al, 2003). Since the real return rate on equity is already known as well as the debt and

equity of the clinic, therefore it is recommended to use the WACC formula: $WACC: r = r_d \cdot \frac{D}{D+E} + r_e \frac{E}{D+E}$ (Brealey & Myers & Allen, 2003).

Since inflation exists then the 'nominal rates' should be used instead of the 'real rates'. The required real return on equity is equal to 5% or 0.05, and inflation rate is 3% (0.03). Thus, nominal return rate might be calculated as real return rate * (1 + inflation rate); hence, nominal return rate = 0.05*1.03 = 0.0515 (or 5.15 %). Thus, the nominal return rate on equity is 0.0515 and nominal return rate on debt is 0.0455 (calculated in investing section). Thus, discount rate for investing analysis might be calculated as follows: $r = 0.0515 * \frac{50000000}{50000000+50000000} + 0.0455 * \frac{50000000}{50000000+50000000} \approx 0.0485$.

This value will be used in the next section for evaluating the NPV of investing into zippy and determining APV of the project.

# 3. Separation of investment and financing analyses

For producing the investment analysis, the calculations of sales, variable costs and net profit (after tax) have to be added. Expected volume per year is 3000, variable costs are $590, and price of service is $999. Thus, sales might be calculated as 3000*$999*(1+inflation rate) ^ (year -1). This formula takes into account the power of (year - 1) since the prices are assumed to hold for the beginning of the year. Analogously, variable costs can be calculated as 3000*$590*(1+inflation rate) ^ (year -1). Net profit after tax is calculated as (1-MTR)*(Sales-Variable Costs) = 0.7*(Sales – Variable Costs).

The depreciation of tax reductions and for the financial analysis are the same as for producing the investment analysis. Maintenance costs and tax reductions, which are based on maintenance costs, are also the same as in previous part of the analysis, as well as lost net salvage value (For clearer illustration it is split into two parts on Table 3).

For producing an investment analysis, the Net Cash Flows are calculated as net profit + depreciation tax deduction – maintenance costs + maintenance cost tax value + *salvage value – tax from gain on sale – cost of asset.* Three final arguments are not annual, but take place for the final year (salvage value and tax from gain) and in Year 0 (cost of the asset).

Table 3 presents the net cash flows for investment analysis (purchase considered).

| Year End | Asset Cost | Sales | Variable Costs | Net Profit After Tax | Depreciation Tax Shield | Maintenance Costs | Maintenance Costs Tax Shield | Salvage Value | Tax from Gain on Sale | Net Cash Flows |
|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 8 000 000 | | | | | | | | | -8000000,00 |
| 1 | | 2997000 | 1770000 | 858900,00 | 225000 | 200000 | 60000 | | | 943900,00 |
| 2 | | 3086910 | 1823100 | 884667,00 | 405000 | 200000 | 60000 | | | 1149667,00 |
| 3 | | 3179517,3 | 1877793 | 911207,01 | 324000 | 200000 | 60000 | | | 1095207,01 |
| 4 | | 3274902,8 | 1934126,79 | 938543,22 | 259200 | 200000 | 60000 | | | 1057743,22 |
| 5 | | 3373149,9 | 1992150,594 | 966699,52 | 207450 | 200000 | 60000 | | | 1034149,52 |
| 6 | | 3474344,4 | 2051915,112 | 995700,50 | 165825 | 200000 | 60000 | | | 1021525,50 |
| 7 | | 3578574,7 | 2113472,565 | 1025571,52 | 147375 | 200000 | 60000 | | | 1032946,52 |
| 8 | | 3685932 | 2176876,742 | 1056338,66 | 147375 | 200000 | 60000 | | | 1063713,66 |
| 9 | | 3796509,9 | 2242183,044 | 1088028,82 | 147375 | 200000 | 60000 | | | 1095403,82 |
| 10 | | 3910405,2 | 2309448,535 | 1120669,69 | 147375 | 200000 | 60000 | 652 386,59 | 28 309,02 | 1752122,26 |

Using the WACC-based discount rate, it is possible to determine that NPV + the initial asset cost with respect to the nominal WACC rate which would be equal to

$632 405,39. Since this value is positive the project should be accepted (purchase option was considered in the calculation).

## 4. Adjusted present value

In order to estimate the investing opportunity of purchasing the asset (zippy) versus leasing, it is necessary to calculate the adjusted present value for the current project with respect to the leasing versus the purchasing choice. In our case, APV = NPV of project + NPV of lease = $480 057.04. Since this value is positive, it means that the project should be accepted and that the option of buying the asset should be chosen over leasing.

# References

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