

MEASURING THE EFFICIENCY OF FINANCIAL LEASING

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Introduction

Issues of creating a summary criterion for assessing the economic efficiency of financial leasing were dealt with by economic theoreticians mainly in the USA in the 1970s. Two articles in particular, published in leading American journals, were of cardinal importance. The article by the three authors Myers, Dill and Bautista (1976) published in the *Journal of Finance* entitled "Valuation of Financial Lease Contracts", identified which types of financial flows are relevant for analysis. The second article, by Levy and Sarnat (1979), "On Leasing, Borrowing and Financial Risk", published in the journal *Financial Management* contained a clear derivation of the basic model together with a detailed explanation of the relationship between financial leasing and a firm's credit capacity.

From the literature devoted to the issue of valuing leasing contracts it is clear that there is no accord in this field as regards determining a methodology to be used for valuing leasing investments. Most of the works in this field were published more than 20 years ago and do not reflect the changes that have taken place in the sector. See, for example, the works of the authors Weston, Brigham (1985), Johnson (1983), Weingartner (1987), Brealey, Myers (1984), Smith, Wakeman (1985), McGugan, Caves (1984), Mikesell (1978), Wyman (1973), Franks, Hodges (1978), Schall (1985), Schall (1987), Ang, Peterson (1984), Metawa (1995), Termer (1995).

Adjusting the model to the conditions of the SR

The basic equation (1) must be adjusted so that it corresponds to practical situations and takes account of the tax treatment of financial leasing following the tax reforms in the SR.

$$NAL = I - \sum_{t=1}^n \frac{(1-T) \cdot L_t + T \cdot D_t}{[1+r \cdot (1-T)]^t}, \quad (1)$$

• where I represents the value of the investment at the start of the leasing, T is the marginal tax rate on incomes, L_t is the level of agreed leasing instalments in the year t , D_t is the level of depreciation applied in

year t and r is the interest rate required for an alternative form of investment financing.

Equation (1) expresses the difference between the value of the acquired asset at the start of the leasing and the following items:

• present value of leasing instalments

$$\sum_{t=1}^n \frac{L_t}{[1+r \cdot (1-T)]^t},$$

• tax savings from leasing instalments which the lessee gained in individual years of the leasing, since the lessee, prior to the tax reform, had previously applied the whole leasing instalment as a tax expense (we shall therefore add it to the value of the investment)

$$\sum_{t=1}^n \frac{T \cdot L_t}{[1+r \cdot (1-T)]^t},$$

• Σ tax savings from depreciation which the lessor gained in individual years of the lease, because the leased object before the tax reform was depreciated by the lessor (we shall therefore discount it from the value of the investment)

$$\sum_{t=1}^n \frac{T \cdot D_t}{[1+r \cdot (1-T)]^t}.$$

Adjustment of the model must take account of the following facts:

1. Firstly it is necessary to take account of the interest charge period, which is in our practice one year. If we deposit a certain amount, then interest is credited on this deposit annually, according to the average annual balance of the deposit. It is therefore necessary to use the same principle also for charging interest. If in equation (1) we assume that interest charges for the repayment period are compound, this model in practice may be used only in the case of annual instalments. Annual periods for instalments are though unusual in financial leasing. In practice monthly, or, less often, quarterly instalments are used. The first task then is to adjust the model so as to fit with the agreed period for leasing instalments.



The expression

$$\sum_{t=1}^n \frac{L_t}{[1 + r \cdot (1 - T)]^t},$$

may then be replaced by the expression

$$L \left(m + \frac{m-1}{2} \cdot i \right) \cdot \frac{1 - (1+i)^{-N}}{i},$$

provided that leasing instalments are of post-term annuity nature. The component m expresses the period of the leasing instalments, in the case of monthly instalments $m = 12$, in the case of quarterly instalments $m = 4$ and i is the effective interest rate ($r^*(1 - T)$).

2. Secondly, it is necessary to take account of legislation governing the manner of how leasing instalments are reflected into expenses. Following the tax reforms in the SR a lessee applies two types of tax expenses and the resultant tax savings:

- depreciation
- rent.

It is logical that the lessee has the right to include the total sum of payments into expenses, since they are indeed business-related expenses. The lessee deducts rent that is reflected by timing differences into expenses and depreciates the remainder, i.e. the principal. In some contracts the unrealised financial expense (rent) is termed "interest", certainly also due to the fact that the financial expense payable is charged in the lessee's accounts to the debit of account 562 – Interest.

Pursuant to Article 26(9) of Act No 595/2003 Coll. on income taxes, annual depreciation is determined with precision to the whole calendar month, beginning with the month in which the conditions for commencing depreciation were fulfilled. This is the month in which the asset began to be accounted for or registered pursuant to Article 6(11) of the Income Tax Act, i.e. that in which the leased tangible asset was provided to the lessee in accordance with the financial leasing contract in a state appropriate to the contractually agreed or usual use.

In the case of using this form of depreciation, annual depreciation charges may be applied in the year of its commencement and termination only in the amount pertaining to the taxation period depending on the number of calendar months during which the asset was used for generating income. So both items expressing the tax savings from the rent, i.e. the unrealised financial expense in year t ($T \cdot LR_t$) and the tax saving from depreciation in year t ($T \cdot D_t$) accrue to the lessee. In the resultant equation they appear as a tax non-deductible item to the value of the investment I .

3. The regime of paying advance deposits for income tax influences the model through the fact that a time shift occurs between the instalment and realisation of a tax saving, because rent and depreciation as tax-deductible costs are reflected only upon payment of the tax, i.e. only following the end of the taxation period in which the instalments were made. Unless we take into consideration the three-month term for submitting a tax return, the date at which the tax saving applies is 31 December of the given year t . Since delivery of the leased object may occur over the course of the year, it is necessary to discount the tax saving from the rent and depreciation as at the delivery date of the leased object.

If we assume that leasing instalments have the nature of a pre-term annuity (see Radová et al, 1995) with the exception of the first increased instalment at the start of the financial lease, which may be deducted from the acquisition price of the object, then we can adjust the model (1) to:

$$NAL = I^* - L \left(m + \frac{m+1}{2} \cdot i \right) \cdot \frac{1 - (1+i)^{-N}}{i} + \sum_{t=0}^N \frac{T \cdot (D_t + LR_t)}{(1+i)^t \cdot \left(1 + i \cdot \frac{p}{365} \right)}, \quad (2)$$

where I^* is the acquisition price of the financial lease object minus the first full increased instalment, L is the regular constant instalment for the period m , N is the duration of the financial lease in years, i is the effective interest rate, ($r^*(1 - T)$), D_t is the level of depreciation charges in year t , LR_t is the rent applied as a tax expense in year t , T is the marginal corporate income tax rate, and p is the number of days between handing over the leased object and 31 December of the given year.

In the case that N is not a whole number, i.e. the financial lease does not last a whole number of years, the indicator NAL will have the following form:

$$NAL = I - \sum_{t=0}^{n-1} \sum_{j=0}^{m-1} \frac{L_{tj}}{(1+i)^t \cdot (1+i \cdot j/m)} + \sum_{t=0}^N \frac{T \cdot (D_t + LR_t)}{(1+i)^t \cdot \left(1 + i \cdot \frac{p}{365} \right)}, \quad (2a)$$

where L_{tj} is the leasing instalment in j period of the n th year.

A further advantage of financial leasing is that it enables the lessee to pay VAT in instalments over the duration of the financial lease (with the exception of



cars), and not immediately in full upon purchasing the object of the financial lease. This advantage, expressed numerically, represents the difference between the amount of VAT that the lessee would have to pay immediately upon purchase and the present value of VAT paid in instalments. Expressed in the equation:

$$PV(VAT) = VAT - L_{VAT} \cdot \left(m + \frac{m+1}{2} \cdot i\right) \cdot \frac{1 - (1+i)^{-N}}{i}, \quad (3)$$

where VAT represents the VAT on the acquisition price less the VAT paid from the first increased instalment and L_{VAT} is the amount of VAT in the leasing instalment annuity.

Equation (2) is thus modified into the form:

$$NAL = I^* - L \left(m + \frac{m+1}{2} \cdot i\right) \cdot \frac{1 - (1+i)^{-N}}{i} + \sum_{t=0}^N \frac{T \cdot (D_t + LR_t)}{(1+i)^t} \cdot \frac{1}{\left(1+i \cdot \frac{p}{365}\right)} + PV(VAT), \quad (4)$$

where $PV(VAT)$ is calculated according to equation (3).

In the case that leasing instalments are of a post-term annuity nature, the resultant equation is modified into the form:

$$NAL = I^* - L \left(m + \frac{m-1}{2} \cdot i\right) \cdot \frac{1 - (1+i)^{-N}}{i} + \sum_{t=0}^N \frac{T \cdot (D_t + LR_t)}{(1+i)^t} \cdot \frac{1}{\left(1+i \cdot \frac{p}{365}\right)} + PV(VAT), \quad (5)$$

where $PV(VAT)$ is calculated according to the equation:

$$PV(VAT) = VAT - L_{VAT} \cdot \left(m + \frac{m-1}{2} \cdot i\right) \cdot \frac{1 - (1+i)^{-N}}{i}, \quad (6)$$

Conclusion

The aim of this article has been to create a methodology for assessing the efficiency of financial leasing in the conditions of the Slovak Republic.

From the aspect of applying this model to serve for comparing the price offers of different leasing companies, or for comparing financial leasing with alternative instruments for financing long-term assets. Given the growing competition among leasing companies, resulting in part from the free movement of capital within the European Union, and that this com-

petition is no longer limited to the national leasing market, this model represents one of the conditions for qualified decision making on the efficiency of financing long-term assets. The method of its financial expression reflects the main changes in the field of financial leasing which took place with the adoption of tax reform in the SR and the specific features of financial leasing.

The methodology takes account of such specific features as varying levels of advance payment, the interval between instalments, tax savings resulting from the income tax and value-added tax regimes.

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