Lease vs. Borrow Problem after Tax Reform in Slovak Republic

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The paper deals with the problem of effectiveness evaluation of long-term property financing through financial leasing, emphasizing the application of quantitative methods within this area. The aim was to focus on defining the financial flows relevant for the analysis, as well as on the derivation of the basic model of the financial leasing effectiveness.

The aim of the presented paper is to elaborate the methodology for evaluation of effectiveness of financial leasing under the conditions prevalent in the Slovak Republic.

The review of literature devoted to valuation of leasing contracts indicates, that consensus in the field of suitable methodology for valuation of leasing investments does not exist.

The authors above mentioned corresponded to tax modification of financial lease before adoption of tax reform in Slovak Republic, when the lessor amortized the lease subject and transferred the benefits of lease mode of depreciation indirectly on lessee in the form of lease payment, representing for him the fully acceptable tax item. For conditions stated by regularization of financial lease and practical use the formula needs further modification.

Keywords: *financial lease, lease analysis, leasing decision, net advantage to leasing.*

Introduction

Economic theoreticians, mainly in the U.S.A. in the 1970s, treated the problem of making the comprehensive criteria for valuation of economic expedience of financial lease. Two articles in renowned American journals brought the principal contribution. The article of three authors Myers, Dill and Bautista (1976) titled *Valuation of Financial Lease Contracts*, being published in Journal of Finance, showed the peculiar types of cash flows relevant for analysis. The paper by Levy and Sarnat (1979) *On Leasing, Borrowing and Financial Risk* issued in journal Financial Management contained compendious derivation of fundamental model together with detail explanation of relation between lease financing and credit capacity of the firm.

The review of literature devoted to valuation of leasing contracts indicates, that consensus in the field of suitable methodology for valuation of leasing investments does not exist. Cf. works by Weston and Brigham (1985), Johnson (1983), Weingartner (1987), Brealey and Myers (1984), Smith and Wakeman (1985),
McGugan and Caves (1984), Mikesell (1978), Wyman (1973), Franks and Hodges (1978), Schall (1985), Schall (1987), Ang and Peterson (1984) as well as Metawa (1995). Main of works in this field was published more than twenty years ago, so they do not reflect the changes occurring in this sector. The problem of selection of discount measures by methods of valuation of leasing contracts, being derived from NPV, "hurdle rates" by methods outgoing from IRR, ROI was studied by Weingartner (1987) as well as Sorrensen and Johnson (1977). The question of tax optimization aiming to use the tax shields tied with asset ownership was solved in works by Carson (1987), Corder and Sheffrin (1983).

The modification of the model for conditions of Czech Republic was published by Termer (1995) in his work *Effectivity of leasing financing*, for Italian conditions by Regalli and Tagliavini (2004) in article *A new approach for estimating the tax advantage of leasing*, for conditions of Great Britain by Hubbard and Hull (1980) in article *Lease evaluation in the UK: current theory and practice*. The leveraged lease valuation was presented by Athanasopoulos and Bacon (1980). In Slovak Republic the problem of valuation of effectivity of financial lease is presented in publication by Majcher et al. (1998) and Marušin (2002). The principal relation (1) by Myers, Dill and Bautista (1976).

The authors above mentioned corresponded to tax modification of financial lease before adoption of tax reform in Slovak Republic, when the lessor amortized the lease subject and transferred the benefits of lease mode of depreciation indirectly on lessee in the form of lease payment, representing for him the fully acceptable tax item. For conditions stated by regularization of financial lease and practical use the formula needs further modification.

Modification of model for practical use in conditions of Slovak Republic

By adoption of the law No. 595/2003 on income tax as amended by further acts (ZDP), several significant changes were introduced to financial lease. That is the reason, why the fundamental formula has to be modified, so that it corresponds to practice as well as to legal regulations of financial lease after tax reform in Slovak Republic. The fundamental formula showed in the papers stated above, is

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

in which

NAL – Net Advantage to Lease
I – value of the investment in the beginning of the leasing period,
T – marginal income tax rate,
L_t – level of leasing repayment arranged in year t,
D_t – level of depreciation and amortization in year t,
R – interest rate demanded for alternative meaning of financing the investment.

Formula (1) represents distinction between the value of assets purchased in the beginning of the leasing and following items:

$$\sum_{t=1}^{n} \frac{L_t}{\left[1 + r \times (1 - T)\right]^t}$$ – presents value of leasing repayments,

$$\sum_{t=1}^{n} \frac{T \times L_t}{\left[1 + r \times (1 - T)\right]^t}$$ – tax savings from leasing repayments, which was obtained by lessee, as, before tax reform, he could apply the whole leasing repayment as tax expense (that is why it is added to the value of the investment),

$$\sum_{t=1}^{n} \frac{T \times D_t}{\left[1 + r \times (1 - T)\right]^t}$$ – tax savings, which was obtained by lessor as a result of depreciation and amortization (that is why it is deducted from the value of the investment).

Modification of the model has to consider the following facts:

First of all, we have to consider that interest period is a year in practice. If we deposit money in the bank, interest is credited once a year according to average level of the deposit. The same principle must be used also for discounting. As the formula (1) uses compound interest with the interest period one year, we can use it only if the leasing repayment period is also one year. Actually, this is very rare. Leasing uses repayments on the monthly or quarterly basis. The first task is to modify the formula, so that it would consider leasing period arranged.

Term $\sum_{t=1}^{n} \frac{L_t}{\left[1 + r \times (1 - T)\right]^t}$ might be substituted by

the term $L \times \left(m + \frac{m-1}{2} \times i \right) \times \frac{1 - (1 + i)^{-N}}{i}$, if we suppose

that leasing repayments are of the decursive annuity nature. Member of the term m means leasing repayments period, i. e. if repayments are paid monthly, m=12, if quarterly, m=4 and i is effective interest

rate (r*(1-T)).

According to IAS 17 paragraph 12 the lessee should itemize their financial leases in their balance sheets as properties and terms in sums equivalent at leasing beginning to the objective value of leased possession, or, in the case, when it is lower, in recent value of minimum lease installments. During calculation of recent value of minimum leasing installments by discount factor the lease interest rate represents the implicit value in the case if it is determinable. If not, the lessor incremental rate from loans can be used.

The valid accounting practice in Slovak Republic after the tax reform in this point respects the IAS 17, because the receiving of property by lessee is in his balance sheets counted in the day of property accepting ad gravamen of particular account in value equivalent to capital of lessor with correlative inscription in favour of account No. 474 – Liabilities from leasing.

Similarly, new valid accounting practice are derived from the subparagraph 17 of IAS 17, according which the leasing installments should be divided between financial base and lowering of unpaid obligation. The financial base would be allocated during leasing into periods with constant periodic rate of interest for remaining balance of each period.

After the tax reform the lessee applies two types of expenses: depreciations and hire costs. It is important to stress, that during financial leasing of automobiles the right of subtracting the tax of added value does not exist. According to amended §25 paragraph 6 of ZDP, during the acquisition of tangible property by financial leasing, the tax of added value is not a part of purchase price.

According to § 19 paragraph 3 letter a) of ZDP, the tax expenses represent the depreciation charge of tangible and intangible properties. New Law about the income tax allowed in precisely determined cases to claim depreciation charge not only to tax-payer, having the proprietorship or the administration right (if it relates to state, village or higher regional unit), but also to tax-payer, who does not have this right, if he counts this property, incl. he counts this property being rent by the form of financial leasing (§24 paragraph 1 letter. e). ZDP). The lessee by this way has the right the leasing object amortizes; despite he is not its owner. This represents very advantageous, so-called leasing form of depreciation, when the lessees depreciate the property much earlier than using the balanced or accelerated depreciation.

This fact has a logical background. Lessee can include the whole leasing repayment to the tax expenses, as these are expenses connected with running the business. He has to subtract rental, which is differed by time and the rest – principal – is amortized. In some contracts, non-realized financial cost (rental) is marked as interest surely also because of the fact that realized financial cost is accounted as interests. According to § 26 sec. 9 of the income tax law, annual amortization is calculated with accuracy of the month beginning with

the one, in which all conditions for the beginning of amortization were satisfied. That is the month, in which the asset was accounted or registered according to § 6 sec. 11 of the income tax law, i. e. the one in which the lessee was provided with leased asset to use it in arranged or usual way in respect with the financial leasing policy.

If we use this method of amortization, in the first and the last years of amortization we can apply only the part of depreciation, which is related to the number of months, in which the asset was used to get the revenues. So, both tax savings from the rent in year t ($T \times LR_t$) and tax savings from amortization in year t ($T \times D_t$) are given to the lessee, i. e. they will be added to the value of the investment I.

The formula will be modified also due to the regime of part payment of an income tax. We can observe the shift between leasing repayment and realization of tax savings, as amortization and rent (tax appreciated costs) will be considered at the moment of tax payment, i. e. at the end of the year. If not considering the three-month period for the report of income-tax return, tax savings will be observed on the December 31 of given year t. As the leased asset can be provided during the year, it is necessary to discount tax savings from the rent and amortization to the date of providing the leased asset.

Let us suppose that leasing repayments are the same as the anticipated annuity (except the first repayment, which is higher and can be easily subtracted from the value of investment, as it is paid in the beginning of the leasing). Then, we can modify the formula (1) as follows:

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

where

NAL – Net Advantage to Lease,
I* – cost of acquisition of the leased asset minus the first higher leasing repayment,
L – regular leasing repayment during the period m,
N – leasing period in years,
i – effective interest rate,
D_t – level of depreciation and amortization in year t,
LR_t – rent applied as a tax expense in year t,
T – marginal income tax rate,
p – shift between the dates of providing leased asset and the end of the year.

If N is not integer, i. e. financial leasing does not last integer number of years, indicator NAL will be calculated as follows:

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

where

L_t – leasing repayment in period j of the year n.

Another advantage of the leasing is the fact, that lessee can pay VAT in several payments during the leasing period, not in the whole in the beginning of the leasing (except automobiles). This advantage can be measured as the difference between VAT that should have been paid in the beginning of the leasing and the present value of VAT paid in payments during the leasing period. That means

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

where

VAT – VAT from the cost of acquisition minus VAT paid from the first higher repayment,
L_{DPH} – VAT in the regular leasing repayment.

Formula (2) can be modified to

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

where PV(VAT) – can be calculated by (3).

If we suppose that leasing repayments make decursive annuity, the final formula will be modified as follows:

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

where PV(VAT) is calculated by (6).

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

The formula is useful and interesting in several respects. First, it is simple and easy to use. The decision makers need only discount lease payments and tax

shields at an adjusted discount rate i. Second, the formula solves simultaneously for the value of the lease contract and the value of the "equivalent loan"- that is, the value of debt displaced by the lease. Third, the formula implies a time pattern of displaced debt that differs significantly form the pattern implied by other formulas. Fourth, the way of its mathematical formulation reflects the main changes in the field of financial leasing after adapting the tax reforms in Slovak Republic as well as peculiarities of lease financing. Methodology takes into account such peculiarities like different acquisition value, repayment interval, half-periodical, anticipated installment character, tax savings derived from the income tax and tax of added value regimes, influence of the change of depreciation mode, term of depreciation, tax rate from the income of juristic person on amount of tax saving according Slovak tax laws.

Conclusions

The aim of presented paper was to elaborate the methodology for valuation of effectiveness of financial leasing in the conditions of Slovak Republic. When applied, this methodology can be used for comparison of price offers of several leasing companies or for comparison of financial leasing with alternative financing tools for long-time property. From the viewpoint of the increasing competition in the market of leasing companies, related to free investment transfer in European Union, overreaching the frame of national leasing market, it is one of assumptions for qualified decision about effective financing of long-time assets. We are aware of the fact, that some economic calculations, being derived from recently valid laws, mainly the tax laws, partially lost their validity already with the nearest amendment of particular law. The phrase *partially* we have used intentionally, because the calculation method remains actual despite the varying parameters used. The methodical technique of the leasing modification after the tax reform in Slovak Republic is in considerable part derived from adaptation given by International accounting standards.

References

1. Ang, J.The leasing puzzle / J.Ang, P.P. Peterson // Journal of Finance, September 1984, p.1061–1065.

2. Athanasopoulos, P.J., Bacon, P.W. The evaluation of leveraged leases / P.J. Athanasopoulos, P.W. Bacon// Financial Management, Spring 1980, p.76–80.

3. Brealey, R.A. Principles of Corporate Finance / R.A. Brealey, S. Myers. (2 nd ed.) McGraw–Hill, New York, NY,1984. P.541–565.

4. Carson, R.L. Leasing. asset lives and uncertainty: a practitioner's comments // Financial Management, Summer 1987, p. 13–16.

5. Corder, J.J. Estimating the tax advantage of corporate debt / J.J. Corder, S.M. Sheffrin // Journal of Finance, March 1983, p. 95–105.

6. Franks, J.R. Valuation of financial lease contracts: a note / J.R.Franks, S.D. Hodges // Journal of Finance, Vol. 33, May 1978, p. 657–669.

7. Hubbard,G. Lease evaluation in the UK: current theory and practice / G. Hubbard, J.C. Hull // Journal of Business, Finance and Accounting, Vol. 7, No 4, Winter 1980, p. 619–630.

8. Johnson, J.M. Yield analysis for lessor: a primer // The journal of Equipment Lease Finance, Fall/Winter 1983, p. 15–23.

9. Levy, R.A. On Leasing, Borrowing and Financial Risk / R.A. Levy, M. Sarnat// Financial Management, Winter 1979, p. 47–54.

10. Majcher, M. a kol. LEASING nástroj rozvoja podnikateľskej činnosti, Euronion spol. s.r.o., Bratislava, 1998. P. 119–128.

11. Marušin, J. Daňové aspekty lízingu. Bratislava: Vydavateľstvo Ekonóm, 2002. P. 54–61.

12. Metawa, S.A. The evaluation of lease investment opportunities: a decision–support methodology // Facilities, Vol. 13, No 8, July 1995, p. 6–17.

13. McGugan, V.J. Integration and competition in the equipment-leasing industry / V.J. McGugan, R. Caves // Journal of Business, July 1984, p.382–396.

14. Mikesell, D.W. Leasing, financing or buying out-right // Credit and Financial Management, November 1978, p.16.

15. Myers, C.M. Valuation if Financial Lease Contracts / C.M. Myers, D. Dill, A. Bautista // Journal of Finance, June 1976, p.799–819.

16. Radová, J. Finančná matematika pre každého / J.Radová, P. Dvořák // Grada, Praha 1995. P.60–63.

17. Regalli, M. A new approach for estimating the tax advantage of leasing / M. Regalli, G. Tagliavini // Management Research News, 2004, Vol.27, No 3, Barmarick Publications p.1–31.

18. Schall, L.D. The evaluation of lease-financing opportunities // Midland Corporate Finance Journal, Spring 1985, p.48–65.

19. Schall, L.D. Analytic issues in lease vs. purchase decisions // Financial Management, Summer 1987, p. 17–20.

20. Smith, C.W. Determinants of corporate leasing policy / C.W. Smith, M. Wakeman // Journal of Finance, July 1985, p. 895–908.

21. Sorrensen, I.W. Equipment financial leasing practices and costs: an empirical study / I.W. Sorrensen, R.E. Johnson // Financial management, Spring 1977, p.33–40.

22. Termer, T. Efektivnost leasingového financování. Praha: Nad Zlato, 1995, p.39–53.

23. Weingartner, H.M. Leasing asset lives and uncertainty: guides to decision making // Financial Management, Summer 1987, p. 5–12.

24. Weingartner, H.M. The lease analysis problem: a response to Carson and Schall // Financial Management, Summer 1987, p.21–23.

25. Weston, J.F. Essentials of Managerial Finance / J.F. Weston, E.F. Brigham. (7 th ed.) Chicago IL: Dryden Press, 1985, str.641–655.

26. Wyman, H.E. Financial lease evaluation under conditions of uncertainty // Accounting Review, July 1973, p. 489–493.

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Nuomos ir skolinimosi problema po mokesčių reformos Slovakijos Respublikoje

Santrauka

Straipsnyje nagrinėjama ilgalaikio turto finansavimo efektyvumo problema finansinio lizingo būdu ir pabrėžiami kokybiniai metodai bei jų taikymas šioje srityje. **Straipsnio tikslas** – sutelkti daugiau dėmesio prie apibrėžimo tų finansinių srautų, kurie būtini šiai analizei, taip pat sukurti pagrindinį finansinio lizingo efektyvumo modelį, kuris būtų naudingas sprendžiant finansinio lizingo problemas.

Kalbant apie pagrindinį šio straipsnio uždavinį, reikėtų pabrėžti, kad finansinio lizingo efektyvumo įvertinimo metodologija buvo

kuriama Slovakijos Respublikos sąlygomis. Aišku, kad šios metodologijos taikymas galimas ir lyginant kitų lizingo kompanijų veiklą, pavyzdžiui, lyginant finansinio lizingo galimybes su alternatyviais finansavimo būdais ilgalaikio turto (nuosavybės) atveju. Nuolat auga lizingo kompanijų konkurencija rinkoje. Tai yra glaudžiai susiję su investavimų srautais Europos Sąjungoje. Visa tai peržengia nacionalinės lizingo rinkos ribas, todėl efektyvus ilgalaikio turto finansavimas įgauna ypatingą svarbą. Matematinė šios problemos ir sąsajų išraiška atspindi pagrindinius pasikeitimus finansinio lizingo srityje, pritaikius mokesčių reformą Slovakijos Respublikoje, taip pat atkreipus ypatingą dėmesį į lizingo finansavimo ypatumus. Parengta metodologija apima daug sudedamųjų dalių, pavyzdžiui, tokias charakteristikas kaip vertės skirtumai, mokėjimo intervalai, įrengimo pobūdis, mokesčių taupymas iš įvairių mokesčių mokėjimų režimų, įvairių pasikeitimų prekyboje, mokesčių juridiniams asmenims ir panašiai.

Lizingo mokėjimai vykdomi pagal mėnesio arba ketvirčio sistemą. Šio tyrimo tikslas buvo taip pritaikyti formulę, kad joje būtų atsižvelgta į visus lizingo periodų momentus. Be to, reikėjo ypač paisyti taisyklių, kurios reguliuoja ir atspindi lizingo mokėjimo kaštus. Lizingas reikalauja dviejų rūšių mokėjimų, susijusių su kaštais. Mokesčių išlaidos po mokesčių reformos yra šios:

1) susidėvėjimas ir amortizacija,
2) renta.

Šis faktas turi ir savo loginį pagrindą. Skolintojas gali apskaičiuoti visas išlaidas, susijusias su verslo operacijomis. Jis gali numatyti ir atimti iš bendros sumos visas su amortizacija susijusias išlaidas. Kai kuriuose kontraktuose nerealizuoti finansiniai kaštai nurodomi kaip palūkanos.

Formulė pritaikyta visiems atvejams. Galima įžvelgti pasikeitimą kaip mokėjimo už lizingą ir mokesčių sutaupymo realizavimo, kadangi amortizacijos ir rentos išlaidos bus įvertintos mokesčių mokėjimo metu, t.y. metų pabaigoje. Neatsižvelgus į trijų mėnesių mokesčių ataskaitą, mokesčių sutaupymai bus apskaičiuoti tų metų gruodžio 31 dieną. Kadangi nuomojamas turtas gali būti suteiktas per metus, reikia atidėti mokesčių sutaupymus iš rentos ir amortizacijos iki tos datos, kai bus suteiktas nuomojamas turtas.

Kitas su lizingu susijęs faktas – skolintojas gali sumokėti PVM per kelis kartus lizingo numatyto periodo metu, o ne iš karto lizingo pradžioje (išskyrus automobilius). Šį pranašumą galima nustatyti, kaip skirtumą tarp PVM, kurį reikėtų sumokėti lizingo pradžioje, ir dabartinės PVM vertės, mokėtos atskirais lizingo mokėjimo periodais.

Reikėtų priminti, kad sprendimo priėmimas tarp finansinės paskolos ir pirkimo yra tas nutarimas, kuris susijęs su investavimo finansavimo pobūdžiu, o ne sprendimas tik apie investavimo efektyvumą.

Pateikta formulė naudinga ir įdomi keliais požiūriais. Pirma, ji yra paprasta, ja lengva naudotis. Antra, formulė padeda išspręsti pagrindinius skirtumus finansinio lizingo srityje. Trečia, formulėje panaudotas atsiskaitymų laiko faktorius daro ją pranašesnę už kitas formules. Ketvirta, formulės matematinė išraiška atspindi pagrindinius pasikeitimus finansinio lizingo srityje, priėmus mokesčių reformą Slovakijos Respublikoje bei atkreipus dėmesį į pagrindinius lizingo savitumus. Be to, ir formulė, ir bendra metodologija remiasi svarbiausiais tyrimais ir moksliniu patyrimu finansinio lizingo srityje.