

Lease or Buy? How Recent Tax Changes Have Affected the Decision

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PRÉCIS

Les récentes règles fiscales, en vigueur le 26 avril 1989, font qu'il est devenu difficile de décider s'il vaut mieux acheter ou louer un bien. Pour les propriétaires d'un bien locatif désigné, l'avantage fiscal de la déduction de l'allocation du coût en capital est reporté sous le nouveau régime. En conséquence, les locataires devront exiger des paiements plus élevés afin d'assurer le rendement requis. En vertu de l'article 16.1 de la Loi de l'impôt sur le revenu, il est maintenant possible pour les locataires de choisir de déduire l'allocation du coût en capital et l'intérêt au lieu des paiements de location. Les locataires devraient donc tenir compte de cette possibilité lorsque vient le moment de décider s'ils doivent acheter ou louer un bien. Cet article examine les changements apportés aux règlements fiscaux et analyse les conséquences de ce nouveau régime à l'aide de formules pour la valeur actualisée nette d'une location pour les locateurs et les locataires.

ABSTRACT

The decision whether to lease or buy an asset has been complicated by recent tax revisions, effective April 26, 1989. For lessors of specified leasing property, the benefit of the capital cost allowance (CCA) deduction is postponed under the new regime. As a result, lessors will have to charge higher lease payments to provide the required return. For lessees, an election is now available under section 16.1 of the Income Tax Act to deduct CCA and interest instead of lease payments. Lessees should therefore consider the availability of the election in deciding whether to lease or buy an asset. This article discusses the changes to the tax rules and examines the implications of the new regime through the use of formulas for the net present value of leasing for both lessors and lessees.

Is it better to lease or buy an asset? Although this question has always troubled management, recent tax revisions, effective April 26, 1989, have further complicated the decision-making process for both the lessor and the lessee. This article discusses these tax changes and presents formulas for use in making the important decision whether to lease or buy an asset.

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Simulation analysis shows that the lessor will now, as compared with the previous tax regime, charge a higher lease payment, and as a result, the net present value (NPV) of the lessee will be negative if the lessee chooses not to elect. If, however, the lessee elects, the NPV in many cases will be positive and the leasing alternative should be selected. Moreover, simulation analysis shows that when the lessee chooses to elect, the NPV of the lessee is inversely related to the differential between the lessor's tax rate and that of the lessee. Before the changes, a favourable arrangement occurred when the tax rate of the lessee was lower than that of the lessor; now, when the lessee chooses to elect, the opposite is true. Finally, in cases in which the NPV of the lease is greater than zero, its magnitude is positively related to the level of interest rates and the length of the life of the asset, and negatively related to the capital cost allowance (CCA) rate. Hence, the tax changes have provided new opportunities for profitable lease arrangements.

CHANGES FOR THE LESSOR

To restrict the "trading" of CCA for lower lease payments by lessees who are in a tax-exempt or a loss position, Income Tax Act¹ regulations were introduced, effective April 26, 1989, to limit the CCA deduction for lessors of "specified leasing property"² (SLP). This regulation does not apply to exempt property,³ short-term leases (of one year or less), or leasing arrangements with a fair market value below \$25,000. Put simply, SLP includes high-cost heavy equipment and airplanes.

Under these rules, the lease of SLP is treated as a fully financed sale by loan to the lessee. The loan principal is deemed to be equal to the fair market value of the property leased, and the actual lease payments are deemed to be blended payments of principal and interest. The deemed interest, which is compounded semi-annually, not in advance, is computed on the basis of a prescribed rate (regulation 4302) that is set at 1 percent above the rate for long-term government of Canada bonds, which is published monthly in the *Bank of Canada Review* table F1.⁴ After the *prescribed* interest is deducted from the actual lease payment, the remainder is con-

¹ RSC 1952, c. 148, as amended by SC 1970-71-72, c. 63, and as subsequently amended (herein referred to as "the Act"). Unless otherwise stated, statutory references in this article are to the Act.

² "Specified leasing property" under regulation 1100(1.11) is defined as depreciable property (other than exempt property) that is used principally to earn rent or leasing revenue and that is the subject of an arm's-length lease, for a term of more than one year, where the fair market value of all of the property that is subject to the lease is, in aggregate, greater than \$25,000. For greater certainty, intangible property such as films, patents, and computer software has been excluded.

³ Exempt property (regulation 1100(1.13)) includes automobiles, trucks and trailers, certain buildings, home furnishings and appliances, railway cars, vessel mooring space, and most types of general purpose office furniture, office equipment (including mobile office equipment), and computers.

⁴ The prescribed rate is determined at the earlier of the beginning of the lease and the time of the agreement. If the lease provides for a variable interest rate, the lessor may elect to use the prescribed rate in effect at the beginning of the calculation period (regulation 1100(1.1)).

sidered amortization of principal and is used in the computation of the lessor's CCA.

In brief, the maximum CCA deduction for SLP is calculated as the lesser of (1) the cumulative maximum CCA deduction (calculated ignoring the new restrictions) less the cumulative CCA actually claimed previously, and (2) the cumulative repayment of principal (the deemed amount described previously) less the cumulative CCA actually claimed previously. The effect is to postpone the deduction of CCA from earlier years to later years. As a result of this lower tax deduction for the leased asset, the lessor will, accordingly, increase the lease payment to provide the required return.

Each SLP must be placed in a separate class for CCA purposes so that recaptures and terminal losses may be calculated on disposal (regulation 1100(1.1)). It should be noted that this new restricted CCA for the lessor (which is still an optional deduction) has no effect on the tax position of the lessee.

CHANGES FOR THE LESSEE

The changes for lessors were accompanied by new rules for lessees, also effective April 26, 1989. The changes for lessees are aimed at balancing the tax benefits of leasing and those of buying for certain types of property. Under section 16.1 of the Act, lessees now have the option to "elect" to deduct CCA and interest instead of deducting the lease payment. To elect, the lessee and the lessor must jointly complete a form to be filed with each party's tax return for the initial year of the lease. The stipulation for involvement by both parties to the transaction ensures that the fair market value of the leased property has been agreed on.

This option is permitted for lease agreements that are entered into after April 26, 1989. To be eligible for the provisions, the property must be a tangible depreciable property (other than prescribed property)⁵ with a fair market value above \$25,000 that is leased for more than one year from an arm's-length person who is resident in Canada or carrying on business in Canada through a permanent establishment. Similar to the "specified leasing property" described earlier, the items included are high-cost heavy equipment and airplanes. If the election is chosen, the lease is treated as if the property were acquired by a loan equal to its fair market value.

The lease payments are treated as blended payments of principal and interest. The lessee may deduct both CCA and the "deemed" interest portion of the lease payments. The prescribed interest rate (regulation 4302) is computed according to the same procedures as those discussed in the case of the lessor. The lessee is not obligated to elect and the method that is chosen does not affect the lessor's position for tax purposes. On the cancellation, expiration, or assignment of the lease, the leased property is

⁵ Prescribed property includes "exempt property" under regulation 1100(1.13) other than trucks, trailers, subway cars, property valued under \$25,000, and intangible property (regulation 8200).

“deemed” to be disposed of by the lessee for the remaining loan principal outstanding in the year of disposal (section 16.1). Again, this deemed disposal has no effect on the lessor.

THE IMPACT OF THE CHANGES

To examine how the tax changes have affected the lessor, the lessee, and the decision whether to lease or buy, we apply the Levy and Sarnat and, particularly, the Myers et al.⁶ methodology to our analysis to arrive at new formulas for the NPV of leasing for the lessor and the lessee⁷ (see appendix 1). For comparative purposes, the formulas that were applicable before the tax changes, and that are still valid for non-specified leasing properties, are shown in appendix 2, based on the same methodology.

The most intriguing outcome of this legislation compared with the previous tax regime is the fact that, if the lessee elects, *it is now possible for both the lessor and the lessee to deduct CCA on the same asset at the same time*. Lessors of “specified leasing property” face a reduced tax benefit, while lessees should include the “elect or not elect” alternative in their decision making.

The impact of these new tax rules can be better understood by considering a specific numerical example. The formulas contained in appendix 1 have been applied to the assumptions listed below. The example involves the application of sensitivity analysis to a “specified leasing property” asset, a principal leasing company (lessor),⁸ and a lessee considering whether to elect or not elect.

The assumptions that underlie the numerical examples reported in tables 1 and 2 are as follows:

- 1) The overall purchase price of the asset (I_0) is \$1,000,000.
- 2) The lessor is a principal leasing company. Therefore, it is exempt from the half-year CCA rate convention (regulation 1100(16)).
- 3) The property involved is a “specified leasing property” leased after April 26, 1989.

⁶ Haim Levy and Marshall Sarnat, “Leasing, Borrowing, and Financial Risk” (Winter 1979), 8 *Financial Management* 47-54; Stewart C. Myers, David A. Dill, and Alberto J. Bautista, “Valuation of Financial Lease Contracts” (June 1976), 31 *The Journal of Finance* 799-819. See also Thomas E. Copeland and J. Fred Weston, *Financial Theory and Corporate Policy*, 3d ed. (Redding, Mass.: Addison-Wesley, 1988), 618-26. In a recent survey of the literature, Mukherjee concludes that there is now agreement that the methodology adopted in this article is the proper methodology to use to determine the NPV of the lessor and the lessee. See Tarun K. Mukherjee, “A Survey of Corporate Leasing Analysis” (Autumn 1991), 20 *Financial Management* 96-107.

⁷ Formulas have been adapted to the Canadian tax system, as far as CCA tax shields, recaptured depreciation, and terminal loss are concerned, and reflect: (1) lease payments made annually in advance; (2) tax returns filed at the end of the year; and (3) for the lessee, additions to the CCA pool exceed dispositions at the end of the lease.

⁸ A principal leasing company is exempt from the half-year CCA rate convention (regulation 1100(16)).

- 4) The lessor has sufficient income to deduct all CCA.
- 5) The before-tax required rate of return on long-term debt-type instruments (k_d) is the same as the "prescribed" rate. Both are assumed to remain constant during the life of the lease.
- 6) The effect of semi-annual compounding is ignored.
- 7) There are no capital gains.
- 8) The asset is large and ongoing for the leased asset.
- 9) No investment tax credits, loss carryforwards, or operating expenses are involved.
- 10) Tax rates are known and expected to remain constant over the life of the lease.
- 11) Salvage values are determined by incorporating the economic depreciation rates per asset class specified by the Department of Finance—that is, 15.21 percent for CCA class 8, 18.33 percent for CCA class 9, and 10.72 percent for CCA class 39 (previously CCA class 29).

Table 1 shows the lease payments required by the lessor under the restrictions on CCA imposed by the "specified leasing property" regulations for different CCA rates, discount factors, and asset lives. In all cases, the lease payments are now higher than they were under the previous tax rules. As a result, the lessee who chooses not to elect under section 16.1 will have a negative NPV (see table 2), and hence will choose to buy the asset. If, however, the lessee decides to elect, the NPV in many cases will be significantly positive and the lessee will choose to lease.⁹

For example, consider the case of a lessee with a 40 percent tax rate who, when rates are at 15 percent, chooses to lease an asset with a 20-year life and a 20 percent CCA rate from a lessor who pays no taxes and requires a lease payment of \$138,609.90 (see table 1). In this case, the lessee's NPV is \$165,659 if a section 16.1 election is chosen and -\$142,376 if it is not. In addition, table 2 shows that the NPV of the lessee who chooses to elect is inversely related to the differential between the lessor's tax rate and that of the lessee. That is, the smaller the difference is between the tax rates of the lessor and lessee (that is, $T_l - T_e$), the higher will be the NPV of the lease for the lessee. Before the changes, a favourable arrangement occurred when the tax rate of the lessee was lower than that of the lessor.¹⁰ Now,

⁹ Before the tax changes, formulas (4) and (5) shown in appendix 2 were symmetric. That is, for a lessor and a lessee in the same tax bracket, the required lease payments would result in NPV for the lessee equal to zero. As a result of the changes, however, formulas (1) and (2) in appendix 1 are no longer symmetric. Hence, for a lessee and a lessor in the same tax bracket, the NPV of the lease from the point of view of the lessee is now negative. Formula (3) is identical to the one that was applicable before the tax changes (that is, formula (5) in appendix 2). Since it is not symmetric to formula (1), it results in NPVs that are always negative due to the higher lease payments derived from formula (1) as opposed to the ones that were applicable before the changes (that is, NPVs derived from formula (4)).

¹⁰ See A.H.R. Davis and G.E. Pinches, *Canadian Financial Management*, 2d ed. (Toronto: Harper Collins, 1991), 522.

Table 1 Lease Payments Required by Lessor^a for Different Levels of CCA Rates, Tax Rates, Discount Rates, and Life of Asset: The Current Tax Regime

Tax rates ^b		Discount rate (k_d) percent	Time (t) years	Lease payments at CCA rate (d)		
T_e	T_r			20%	25%	30%
40	40	8	175,064.30	188,246.00	171,991.30	
40	40	8	121,960.20	124,244.30	119,311.70	
40	40	8	97,932.00	98,253.70	97,147.60	
40	40	10	188,409.50	200,941.40	185,292.00	
40	40	10	135,133.80	137,148.70	132,766.90	
40	40	10	112,641.90	112,898.60	112,012.40	
40	40	15	221,629.10	232,697.10	218,458.60	
40	40	15	169,973.60	171,442.50	168,194.90	
40	40	15	152,632.10	152,775.80	152,274.70	
40	0	8	162,734.90	174,558.20	142,375.80	
40	0	8	116,128.50	118,569.40	110,351.80	
40	0	8	93,561.20	93,955.00	92,212.70	
40	0	10	174,557.30	185,712.20	155,349.20	
40	0	10	127,551.10	129,677.80	122,517.80	
40	0	10	106,196.00	106,504.90	105,138.10	
40	0	15	202,883.50	212,544.90	186,247.20	
40	0	15	156,277.90	157,777.90	152,728.00	
40	0	15	138,609.90	138,775.10	138,044.20	
0	40	8	175,064.30	188,246.00	171,991.30	
0	40	8	121,960.20	124,244.30	119,311.70	
0	40	8	97,923.00	98,253.70	97,147.60	
0	40	10	188,409.50	200,941.40	185,292.00	
0	40	10	135,133.80	137,148.70	132,766.90	
0	40	10	112,641.90	112,898.60	112,012.40	
0	40	15	221,629.10	232,697.10	218,458.60	
0	40	15	169,973.60	171,442.50	168,194.90	
0	40	15	152,632.10	152,775.80	152,274.70	

^aIn all cases, the lessor will require a higher lease payment now than under the previous tax regime. ^b T_e stands for the corporate combined federal and provincial marginal tax rate for the lessee. T_r stands for the corporate combined federal and provincial marginal tax rate for the lessor.

Table 2 Net Present Value of the Lease^a from the Lessee's Point of View for Different Levels of CCA Rates, Tax Rates, Discount Rates, and Life of Asset: The Current Tax Regime

Tax rates ^b		Net present value at CCA rate (d)											
T_e	T_r	Discount rate (k_d)	Time (n)	20%			25%			30%			
				Elects	Elects not	dollars	Elects	Elects not	dollars	Elects	Elects not	dollars	
40	40	8	5	-34,392	-46,466	-38,474	-52,117	-92,022	-119,657				
40	40	8	12	-26,869	-77,499	-25,768	-83,304	-52,282	-126,868				
40	40	8	20	-21,377	-129,520	-21,034	-139,520	-30,096	-161,803				
40	40	10	5	-36,095	-52,366	-40,319	-58,504	-91,271	-125,626				
40	40	10	12	-29,443	-94,884	-28,884	-102,385	-52,396	-144,720				
40	40	10	20	-25,269	-159,763	-25,506	-171,841	-33,141	-193,676				
40	40	15	5	-39,917	-67,797	-44,554	-76,060	-89,681	-141,218				
40	40	15	12	-35,627	-140,405	-36,437	-151,534	-54,296	-190,311				
40	40	15	20	-34,386	-230,698	-36,063	-246,496	-41,647	-267,146				
40	0	8	5	7,367	-11,684	7,079	-13,503	5,296	-36,109				
40	0	8	12	18,817	-43,625	17,911	-50,341	15,807	-74,823				
40	0	8	20	34,912	-93,618	33,349	-104,240	31,535	-121,267				
40	0	10	5	11,707	-13,855	11,230	-16,164	8,653	-42,380				
40	0	10	12	30,863	-52,872	29,383	-61,046	26,401	-88,008				
40	0	10	20	59,865	-110,966	57,287	-123,439	54,591	-141,637				
40	0	15	5	27,065	-18,487	25,909	-12,974	21,110	-54,767				
40	0	15	12	77,068	-72,736	73,537	-84,019	68,109	-113,891				
40	0	15	20	165,659	-142,376	159,197	-158,310	153,433	-177,512				
0	40	8	5	-53,166	-53,166	-59,023	-59,023	-127,706	-127,706				
0	40	8	12	-47,464	-47,464	-46,188	-46,188	-72,925	-72,925				
0	40	8	20	-46,346	-46,346	-45,582	-45,582	-52,327	-52,327				
0	40	10	5	-57,762	-57,762	-63,504	-63,504	-124,858	-124,858				
0	40	10	12	-56,833	-56,833	-55,995	-55,995	-76,818	-76,818				
0	40	10	20	-60,366	-60,366	-59,877	-59,877	-64,376	-64,376				
0	40	15	5	-72,264	-72,264	-77,686	-77,686	-124,174	-124,174				
0	40	15	12	-85,375	-85,375	-85,181	-85,181	-96,416	-96,416				
0	40	15	20	-100,935	-100,935	-100,780	-100,780	-102,435	-102,435				

^aThe net present values for each case have been calculated by inputting corresponding lease payments derived in table 1. bT_e stands for the corporate combined federal and provincial marginal tax rate for the lessee. T_r stands for the corporate combined federal and provincial marginal tax rate for the lessor.

when the lessee chooses to elect, the opposite is true. The traditional positive relationship, however, is still maintained when the lessee does not elect. Finally, table 2 shows that when the NPV of the lease is greater than zero, its magnitude is positively related to the level of interest rates and the length of the life of the asset, and negatively related to the CCA rate.

Although the government achieved its original objective as a result of the tax changes, it has provided new opportunities for profitable lease arrangements. Non-taxable corporations or companies in a loss (or a loss carryforward) position have now had the window of opportunity for leasing closed by the recent tax revisions. At the same time, profitable lessees in a high tax bracket now have new leasing opportunities when their tax rate exceeds that of the lessor and the NPV is positive. Therefore, non-taxable corporations, charities, or companies in a loss position have an incentive to establish profitable leasing operations.

Finally, although the net effect of these tax changes is difficult to establish at present, it is probable that they will increase the volatility and risk involved in the leasing activity. During recessions, when companies are in loss (or loss carryforward) positions and would have preferred to lease under the former tax system, they will now avoid leasing, which will reinforce the effects of the recession on the leasing industry. This may force many lessors who would have otherwise survived into bankruptcy. In a period of economic expansion, however, the leasing industry should experience increased demand.

APPENDIX 1: THE CURRENT TAX REGIME

In the following formulas:

- I_0 = the overall purchase price of the asset.
- CLA_0 = the cost of the leased asset to be depreciated.
- L_t = the before-tax lease payment in year t .
- CCA_j = the appropriate CCA claim based on the declining balance CCA rate for year j (for the first year, no half-rate rule applies).
- AC_j = the actual claim for capital cost allowance in year j .
- P_j = the principal payment portion of the blended payment (L_t , the lease payment, is now considered as a blended payment of interest and principal).
- UCC_n = the undepreciated capital cost of the asset after n years.
- D_t = the debt level outstanding at the end of each year before principal payments are applied; if there is no downpayment involved and the leasing company finances the full amount of the purchase value of equipment, then $D_0 = I_0$.
- S_n^* = the deemed value of disposition of the asset after n years (that is, the remaining principal amount outstanding in the year of lease expiration or cancellation, in accordance with section 16.1 of the Act).

- S_n = the salvage (residual) value of the asset after n years.
 T_r = the corporate combined federal and provincial marginal tax rate for the lessor.
 T_e = the corporate combined federal and provincial marginal tax rate for the lessee.
 k_d = the before-tax required rate of return on long-term debt-type instruments.
 d = the prescribed declining balance CCA rate for the specific asset class.
 n = the duration of lease in years.

Lessor's Point of View

$$\begin{aligned}
 NPV_{Lessor} = & -I_0 + \sum_{t=1}^n \frac{T_r \min \left\{ \sum_{j=1}^t CCA_j - \sum_{j=0}^{t-1} AC_j; \sum_{j=1}^t P_j - \sum_{j=0}^{t-1} AC_j \right\}}{\{1 + (1 - T_r) k_d\}^t} \\
 & + L_0 + \sum_{t=1}^{n-1} \frac{L_t}{\{1 + (1 - T_r) k_d\}^t} - \sum_{t=1}^n \frac{L_{t-1} T_r}{\{1 + (1 - T_r) k_d\}^t} \\
 & + \frac{S_n}{\{1 + (1 - T_r) k_d\}^n} + \frac{T_r(UCC_n - S_n)}{\{1 + (1 - T_r) k_d\}^{n+1}} \quad (1)
 \end{aligned}$$

Lessee's Point of View

$$\begin{aligned}
 NPV_{lessee}^{Elect} = & I_0 - L_0 - \sum_{t=1}^{n-1} \frac{L_t}{\{1 + (1 - T_e) k_d\}^t} + \sum_{t=1}^n \frac{D_t k_d T_e}{\{1 + (1 - T_e) k_d\}^t} \\
 & - \frac{1}{\{1 + (1 - T_e) k_d\}^n} \frac{T_e d S_n^*}{(1 - T_e) k_d + d} \frac{1 + \frac{(1 - T_e) k_d}{2}}{1 + (1 - T_e) k_d} \quad (2) \\
 & + \frac{1}{\{1 + (1 - T_e) k_d\}^n} \frac{T_e d S_n}{(1 - T_e) k_d + d} \frac{1 + \frac{(1 - T_e) k_d}{2}}{1 + (1 - T_e) k_d} - \frac{S_n}{\{1 + (1 - T_e) k_d\}^n}
 \end{aligned}$$

$$\begin{aligned}
 NPV_{lessee}^{Not\ elect} = & I_0 - \frac{1 + \frac{(1 - T_e) k_d}{2}}{1 + (1 - T_e) k_d} \frac{T_e d CLA_0}{(1 - T_e) k_d + d} \\
 & + \frac{1}{\{1 + (1 - T_e) k_d\}^n} \frac{T_e d S_n}{(1 - T_e) k_d + d} \frac{1 + \frac{(1 - T_e) k_d}{2}}{1 + (1 - T_e) k_d} - \frac{S_n}{\{1 + (1 - T_e) k_d\}^n} \\
 & - L_0 - \sum_{t=1}^{n-1} \frac{L_t}{\{1 + (1 - T_e) k_d\}^t} + \sum_{t=1}^n \frac{L_{t-1} T_e}{\{1 + (1 - T_e) k_d\}^t} \quad (3)
 \end{aligned}$$

APPENDIX 2: THE PRE-1989 TAX REGIME

Lessor's Point of View

$$\begin{aligned}
 NPV_{Lessor} = & -I_0 + \frac{1 + \frac{(1 - T_r)k_d}{2}}{1 + (1 - T_r)k_d} \frac{T_r dCLA_0}{(1 - T_r)k_d + d} \\
 & - \frac{1}{\{1 + (1 - T_r)k_d\}^n} \frac{T_r dS_n}{(1 - T_r)k_d + d} \frac{1 + \frac{(1 - T_r)k_d}{2}}{1 + (1 - T_r)k_d} \\
 & + \frac{S_n}{\{1 + (1 - T_r)k_d\}^n} + L_0 + \sum_{t=1}^{n-1} \frac{L_t}{\{1 + (1 - T_r)k_d\}^t} \\
 & - \sum_{t=1}^n \frac{L_{t-1}T_r}{\{1 + (1 - T_r)k_d\}^t} \tag{4}
 \end{aligned}$$

Lessee's Point of View

$$\begin{aligned}
 NPV_{Lessee} = & I_0 - \frac{1 + \frac{(1 - T_e)k_d}{2}}{1 + (1 - T_e)k_d} \frac{T_e dCLA_0}{(1 - T_e)k_d + d} \\
 & + \frac{1}{\{1 + (1 - T_e)k_d\}^n} \frac{T_e dS_n}{(1 - T_e)k_d + d} \frac{1 + \frac{(1 - T_e)k_d}{2}}{1 + (1 - T_e)k_d} - \frac{S_n}{\{1 + (1 - T_e)k_d\}^n} \\
 & - L_0 - \sum_{t=1}^{n-1} \frac{L_t}{\{1 + (1 - T_e)k_d\}^t} \tag{5}
 \end{aligned}$$