



## Establishing an Operating Lease Program

## Introduction

With the coming of age of Finance Leasing in many developing countries (Colombia, Chile, Singapore, India, Turkey), lessors are coming under increasing pressure to enlarge traditional areas of operations and product ranges. The umbilical cord to finance lease programs will need to give way as lessors venture into Operating Lease programs, in the process, acquiring new skills and assuming higher levels of operating and financial risks than ever before. Lessors making the transition to Operating Lease programs can expect to be rewarded by market share, profits, and a high profile in the financial market place. The pool of entrants into Operating Leasing (existing companies or new entrants) will be low, since a high degree of technical and market place support will be needed.

The initial form of equipment leasing activity in a developing country (indeed encouraged by International Financial Institutions) takes the form of the Finance Lease; a finance lease enables a leasing company to keep in abeyance the complexity in operations unleashed by residual values of lease assets; finance leases allow lessors to concentrate on legal, tax, accounting and economic issues to fashion a product that (1) reflects market place expectations and (2) contributes to ROI objectives. Thus, a finance lease enables a lessor to recoup investment in a lease and profit for undertaking the financial intermediation function, from a single source: the lease rental paid by a single lessee. In an Operating Lease, a lessor resorts to multiple lessees and/or sale of the leased asset to meet ROI objectives of leasing operations. The increase in risk associated with operating leases is offset by accretion of value to the leasing product, translating into rewards mentioned earlier.

The classical form of an Operating Lease is the U.S. Automobile lease program, a widely popular lease form, that unfortunately has gained notoriety for its complexity to the average consumer, so much so, that the U.S. Federal Reserve Board recently issued financial disclosure guidelines. A study of the U.S Auto lease program constitutes an excellent basis to appreciate the factors that define an operating lease program.

This article looks at the basics of establishing a U.S. Auto lease program. A typical U.S Auto lease program, drawn from an advertisement in the Wall Street Journal, is set out in Exhibit A.

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## EXHIBIT A

### THE XYZ LEASE PROGRAM TMC Corporation

\$ 299 PER MONTH FOR 36 MONTHS;  
\$ 2,000 DOWN.

(First month's payment and \$ 350 security deposit also due at signing).

- Closed end lease on '98 XL sedan 4-speed automatic with Premium ETR/Cassette and power bucket seat.
- \$ 2,649 due at signing plus applicable taxes and fees.
- \$ 21,171 capitalized cost based on \$ 2,000 down and dealer participation which may vary. MSRP \$ 25,058 including destination charges.
- Monthly payments total \$ 10,764. Your payment may vary depending on final price, taxes, license, title, insurance, other options; dealer charges extra. Lessee responsible for maintenance, excess wear & tear and \$0.10/mi over 12,000 miles/year. Lease end purchase option of \$ 15,035. Disposition fee not to exceed \$ 150 may be due at lease end.
- To qualified lessees through TMC Corporation. Similar lease in AL, FL, GA, NC & SC through WOF Corporation.

## Conceptualizing an Operating Lease Program

Imagine, if you will, that you are a bright financial analyst working for TMC Corporation; for some time now, the company has received requests from its dealer network for a 'finance' program to support marketing efforts. The Corporation has decided it will introduce a finance program in 1998, through a wholly owned finance subsidiary ("TMC Credit Corporation") to support TMC's new 1998 model the '98 XYZ XL Sedan', a 4 speed automatic with premium ETR/Cassette and power bucket seat.

You have been selected by the President of TMC Credit Corporation to develop a finance program that will address two objectives: (1) augmenting marketing efforts of dealers by providing customers with a flexible source of financing; (2) establishing leasing operations that contribute to the parent company's profitability, thereby enhance TMC Corporation's market capitalization. The president of the Credit Corporation has been seconded from Japan to head operations in the U.S. and is largely unfamiliar with the concept of leasing (much less being aware of differences between finance and operating leases). After carrying out some research, your first task will likely be to make a presentation of the following:

- Advantages of leasing for marketing the company's products;
- Why operating leases, rather than finance leases, need to be offered by the credit corporation;
- The risks inherent in offering operating leases;

Your second task is to conceptualize inputs for developing the analytical framework to support the finance program:

- From TMC's perspective, you need to examine the variables influencing the leasing product.

### Market Research

As you start digging into these tasks, you realize there is a strong connection with the residual value of lease assets at the end of the lease term; accordingly, you seek approval for appointing a market research firm to provide the statistical basis for estimating residual values; after about three months, the market research firm provides the following information (amongst others) that you will use in developing the lease program.

Exhibit B sets out residual value of TMC vehicles as a percentage of MSRP of the vehicle and the probability associated with each line item (statistically estimated on the basis of historical experience);

#### EXHIBIT B

##### Residual (as a Percentage of MSRP)

<i>Residual</i>	<i>Probability</i>
50.00%	.02
52.50%	.04
55.00%	.01
57.50%	.30
60.00%	.27
62.50%	.20
65.00%	.16
<b>TOTAL</b>	<b>1.00</b>

**EXHIBIT C**

**Delay in Liquidating 3 year  
old Vehicle**

<i>Delay / Months</i>	<i>Probability</i>
0	.060
1	.065
2	.100
3	.480
4	.195
5	.090
6	.010
<b>TOTAL</b>	<b>1.000</b>

Exhibit C sets out delay in disposing off 3 year old vehicles and the probability values associated with events.

Together, these tables provide valuable information for use in developing the analytical framework for the operating lease program. You need to make practical sense of the information in both tables; accordingly, your third task is to articulate your thoughts on how the information contained in the tables will be used -- what residual value? how many months for liquidating the vehicle? how will these variables impact the lease program?

**More Information**

In the course of your meetings with the president, you gather additional information: TMC Corporation will place debt on the international capital markets and will provide back-to-back financing to the subsidiary; the corporation expects to place debt at LIBOR (assume LIBOR is 5.39%). Since the finance subsidiary is a profit center, the treasurer of the corporation indicates that the subsidiary is to incorporate a 3% mark-up on cost of funds.

At a meeting to discuss the finance subsidiary, dealers agreed to chip-in an average discount of 7.53% of MSRP. The '98 XYZ will have a MSRP of \$ 25,058, including destination charges.

**Features**

After surveying the market place, you decide that the lease will incorporate the following features:

- the lease will be a monthly lease, with rental payable at the beginning of each month (rather than end of the month);
  - to reduce the corporation's capital requirements and to build an equity cushion into the lease, a \$ 2,000 down payment will be due at time of signing;
  - a security deposit of \$ 350 will be payable at the time of the lease, that will be refunded at end of lease;
  - the lease will be a 'close-end' lease of 36 months (i.e., non-extendible beyond 36 months);
  - lessee will be responsible for maintenance; excess wear and tear will be charged at \$ 0.10/mi over 12,000 miles/year.
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## Wrapping-Up

- The ingredients are in place; your task is to assemble these into a finished product.
- To develop the analytical framework, you will allocate cash flow associated with the lease into three distinct categories.
- You will use the Discounted Cash Flow technique to compute the monthly lease rental.
- To compare your lease with TMC's lease, you will generate a 'shadow' advertisement of your lease product, (by filling in a 'blank' TMC advertisement with data from your product).

## Calculation Worksheet

The following worksheet will help you organize your product inputs into categories: (1) to focus on financial relationships, and (2) for carrying out a DCF analysis of cash flow.

## Categorizing Cash Flows

Essentially, cash flow associated with your product falls into one of three categories, set out in Exhibit D. Details of the worksheet are set out in Exhibit E.

<b>EXHIBIT D</b> <b>Cash Flow Profile</b> <b>Operating Lease</b>		
<b>START OF LEASE</b> <b>(Period 0)</b>	<b>DURATION OF LEASE</b> <b>(Period 1 to 36)</b>	<b>END OF LEASE</b> <b>(Period ?)</b>
Cash flow in this category reflects a lessor's net investment in the lease, and is computed as follows:  (1) MSRP; (2) Price of Optional items installed in car;  <u>reduced by</u>  (1) dealer discount; (2) down payment; (3) security deposit; (4) other inflows reducing lessor's cash outflow.	Cash flow in this category is the monthly lease rental paid by the lessee over the period of the lease, in this example, the lease rental that is payable over 36 months  (as computed subsequently)	Cash flow in this category is the inflow to the lessor from the sale of the vehicle on end of lease (either to the lessor or to a third party)  <u>reduced by</u>  outflow of lessor, such as refunding of security deposit.

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**EXHIBIT E**

**Filling in the blanks in the Worksheet**

<b>Cash Flow Start of Lease (Period 0)</b>		<b>Cash Flow During Lease (Periods 1 to 36)</b>	<b>Cash Flow End of Lease (Period 39)</b>
(1) MSRP (2) Options <b>(A) Outflow</b>	(\$ 25,058) ( NIL ) <u>(\$ 25,058)</u>	<b>Lease Rental</b> To compute the monthly lease rental, you need to first compute the lease pricing rate, by adding the target spread (3.39%) to cost of funds (5.00%)	Cash Flow from residual value of vehicle at end of lease <u>less</u> refunding of security deposit (\$350). (use Exhibits A and B to arrive at residual value and period)
(1) Dealer Discount (7.53% of MSRP) (2) Down Payment (3) Security Deposit <b>(B) Inflow</b>	\$ 1,887 \$ 2,000 \$ 350 <u>\$ 4,237</u>	<b>Lease Pricing Rate</b> 8.39% per annum or  .6992% per month	Say, 60% of MSRP and 3 month delay in liquidating vehicle (\$ 25,058 * .6) - \$350
<u>Month 0</u> Net Outflow (A) - (B)	(\$ 20,821)	<u>Months 1 to 36</u> Inflow of lease rental  (To be computed)	<u>Month 39</u> Inflow of \$ 14,685  {residual \$ 15,035 <u>less</u> refund of security deposit \$ 350}

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### Computing the monthly lease rental

The monthly lease rental can be computed using either an algebraic equation or a spread sheet model; the algebraic equation is compact and ‘clean’; however, it is abstract; the spread sheet model is intuitive and easy. If the spread sheet route is used, the analyst has two choices: he can either create a cell based solution (Annex One) or opt for a user defined function by creating a function using Visual Basic for Applications (a programming language for Excel). In reality, it is convenient to compute the lease rental using a spread sheet; Annex one sets out a spread sheet format to calculate lease rental and to display period cash flow.

**Mathematically, the three categories of cash flow are related as follows:**

$$\begin{aligned} (1) & \quad \text{Net Cash Flow (Month 0) } + \\ (2) & \quad \text{Present Value of Cash Flow (Months 1 to 36) } + \\ (3) & \quad \text{Present Value of Cash Flow (Month 39) } = 0 \end{aligned}$$

Note that (1) and (3) are known variables; while the lease rental (2) is the unknown variable in the equation. Also note that the present values of (2) and (3) are needed in the equation (and have been substituted by a formula that computes the present value).

If we use ‘LR’ to represent the unknown lease rental, the above equation can be re-written as follows (since we are computing the lease rental in advance (rather than in arrears), the lease rental and residual move up one period in the equation). Exhibit F sets out the steps to compute lease rental that is in line with a lessor’s financial objectives.

<b>EXHIBIT F</b>	
<b>Equation for calculating monthly lease rental in Advance</b>	
Step 1	$\{(\$20,821) + LR\} + \{LR * ((1-(1+i)^{-n})/i)\} + 14,685/(1+i)^n = 0$
Step 2	$\{(\$20,821) + LR\} + \{LR * ((1-(1.06992)^{-35})/.06992)\} + 14,685/(1.06992)^{38} = 0$
Step 3	$(\$20,821) + LR + (LR * 30.9512) + \$11,269.14 = 0$
Step 4	$(LR * 31.9512) = \$9,551.86$
Step 5	$LR = \$ 298.95 \text{ or } \$ 299$

## **Conclusion**

The several annexes to this article relate variables to examine the sensitivity of leasing operations to leasing variables - for example, examining the effect of a delay in receipt of residual value and its impact on a lessor's internal rate of return. An Operating Lease Program exposes a lessor to a number of risks, principal being risk of residual value; lessors overestimating residual values will be on course to run up losses in their leasing operations, while underestimation of residual values will lead to overpricing of leases, that could lead to an erosion of market share. To establish profitable and abiding operating lease programs, lessors need to master the complex financial relationship that glues the components of an operating lease program. This article has set out the analytical route for establishing Operating Lease programs.

## *References*

1. An exhaustive discussion of the conceptual and analytical basis for pricing leases is contained in the book "The Principles and Practice of Leasing" published by Lease Asia (U.K.). See Chapter 4 'Principles of Evaluation' and Chapter 5 'Lease Pricing Techniques'.
2. Financial analysis of the Operating Lease Program discussed in this article has been carried out using LeaseEx 2000, a Project Appraisal and Operations Structuring Model of VTA Financial statements and project reports of TMC corporation have been prepared for years 1 through 10, incorporating assumptions discussed in the article and a few others; while these have not been included in the article, copies are available with the author.



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**ANNEX 1**

<b>Lessor's Out flow in Period 0</b>		
<b>Outflow</b>	MSRP	(\$25,058)
<b>Inflows</b>	Dealer Discount	\$1,887
	(7.53% of MSRP)	
	Down Payment	\$2,000
	Security De-posit	\$350
<b>Outflow in Period 0</b>		<b>(\$20,821)</b>

<b>Lessor's inflow in Period 38</b>		
<b>Inflow</b>	Residual	\$15,035
	(60% of MSRP)	
<b>Outflow</b>	Security Deposit	(\$350)
<b>Inflow in Period 38</b>		<b>\$14,685</b>

Monthly Lease Rental
\$299
Annualized IRR Of Lease
8.39%

<b>Lessor's Cash Flow from Lease</b>			
Period	Net Out Flow on Lease	Rental / Residual	Period Cash Flow of Lessor
0	(\$20,821)	\$299	(\$20,522)
1	\$0	\$299	\$299
2	\$0	\$299	\$299
3	\$0	\$299	\$299
4	\$0	\$299	\$299
5	\$0	\$299	\$299
6	\$0	\$299	\$299
..	...	...	...
..	...	...	...
33	\$0	\$299	\$299
34	\$0	\$299	\$299
35	\$0	\$299	\$299
36	\$0	\$0	\$0
37	\$0	\$0	\$0
38	\$0	\$14,685	\$14,685

**ANNEX 2**  
**RELATIONSHIP BETWEEN LEASE RENTAL**  
**AND LESSOR'S IRR**

	<b>Monthly Lease Rental</b>	<b>Annualized IRR</b>
As can be seen, a monthly lease rental of \$ 250 provides for an IRR of 5.18% (barely covering the lessor's assumed cost of capital of 5%), while at the high end, a monthly lease rental of \$ 355 provides an IRR of 12.08% (a 141% mark-up over cost; the competition in the market place may not sustain this pricing); note that these are pre-tax and pre-SG&A returns.	\$250	5.18%
	\$255	5.51%
	\$260	5.84%
	\$265	6.16%
	\$270	6.49%
	\$275	6.82%
	\$280	7.15%
	\$285	7.47%
	\$290	7.80%
	\$295	8.13%
	\$300	8.46%
	\$305	8.79%
	\$310	9.11%
	\$315	9.44%
	\$320	9.77%
	\$325	10.10%
	\$330	10.43%
	\$335	10.76%
	\$340	11.09%
	\$345	11.42%
	\$350	11.75%
	\$355	12.08%

**ANNEX 3**  
**RELATIONSHIP BETWEEN**  
**RESIDUAL AND LESSOR'S IRR**

This table sets out the relationship between the residual value of the lease asset and the lessor's pre-tax return.

The table highlights the sensitivity of IRR to the residual value, focusing on the risks that a lessor faces in estimating residual. As can be seen, a lessor requires a minimum residual of around 51% of MSRP just to remain above water. As can also be seen, a residual of 60% provides the lessor with the target IRR of 8.39% that he has set for himself. Note the high sensitivity around the expected residual value of 60% - - for example, a residual of 50% would put the lessor in a loss, since the rate of return (4.15%) is lower than cost of capital (5%).

<b>Residual</b>	<b>Annualized IRR</b>
20.00%	-14.50%
22.50%	-12.38%
25.00%	-10.40%
27.50%	-8.56%
30.00%	-6.83%
32.50%	-5.21%
35.00%	-3.67%
37.50%	-2.21%
40.00%	-0.82%
42.50%	0.51%
45.00%	1.77%
47.50%	2.99%
50.00%	4.15%
52.50%	5.27%
55.00%	6.35%
57.50%	7.39%
60.00%	8.39%
62.50%	9.36%
65.00%	10.30%
67.50%	11.22%
70.00%	12.10%
72.50%	12.96%
75.00%	13.79%
77.50%	14.61%
80.00%	15.40%

**ANNEX 4**  
**RELATIONSHIP BETWEEN DELAY IN LIQUIDATING A VEHICLE**  
**AND LESSOR'S IRR**

This table sets out the relationship between delay in liquidating the leased vehicle and the lessor's pre-tax return.

The table highlights the sensitivity of IRR to the residual value, focusing on the risks that a lessor faces in estimating residual.

As can be seen, the lessor's IRR varies from a high of 8.91% (when there is no delay in liquidating the vehicle) to a low of 7.16% (in case of a delay of 12 months).

Estimates of residual value and of delay in liquidating a vehicle, profoundly influence the profitability of a lessor's operations.

<b>Delay in Liquidat- ing Vehicle</b>	<b>Lessor's IRR</b>
0 Month	8.91%
1 Month	8.73%
2 Month	8.56%
3 Month	8.39%
4 Month	8.23%
5 Month	8.08%
6 Month	7.94%
7 Month	7.80%
8 Month	7.66%
9 Month	7.53%
10 Month	7.40%
11 Month	7.28%
12 Month	7.16%

**ANNEX 5**  
**RELATIONSHIP BETWEEN OPTIONAL ITEMS**  
**AND LEASE RENTAL**

This table sets out the relationship between Optional items added to the car and the monthly lease rental you would need to pay. As can be seen, more optional items means more lease rental.

<b>Optional Items</b>	<b>Monthly Lease Rental</b>
\$0	\$299
\$500	\$315
\$1,000	\$330
\$1,500	\$346
\$2,000	\$362
\$2,500	\$377
\$3,000	\$393
\$3,500	\$409
\$4,000	\$424
\$4,500	\$440
\$5,000	\$455
\$5,500	\$471
\$6,000	\$487
\$6,500	\$502
\$7,000	\$518
\$7,500	\$534
\$8,000	\$549
\$8,500	\$565
\$9,000	\$581
\$9,500	\$596
\$10,000	\$612

**ANNEX 6**  
**RELATIONSHIP BETWEEN DEALER DISCOUNT**  
**AND LEASE RENTAL**

This table sets out the relationship between the dealer discount that you are able to negotiate at the time of signing a lease and your monthly lease rental. As can be seen, the higher the discount, the lower is the monthly lease rental.

<b>Dealer Discount</b>	<b>Monthly Lease Rental</b>
3.00%	\$334
3.50%	\$331
4.00%	\$327
4.50%	\$323
5.00%	\$319
5.50%	\$315
6.00%	\$311
6.50%	\$307
7.00%	\$303
7.50%	\$299
8.00%	\$295
8.50%	\$291
9.00%	\$287
9.50%	\$284
10.00%	\$280

**ANNEX 7**  
**RELATIONSHIP BETWEEN DOWN PAYMENT**  
**AND LEASE RENTAL**

This table sets out the relationship between the down payment made by a lessee and the monthly lease rental. As can be seen, the higher the down payment, the lower is the monthly lease rental.

Note that when down payment equals \$ 11,550 the monthly lease payment will be reduced to zero. The lessee can use the car for 36 months (without having to pay lease rental) and return the same at the end of the lease.

<b>Down Payment</b>	<b>Monthly Lease Rental</b>
\$8,000	\$111
\$8,500	\$96
\$9,000	\$80
\$9,500	\$64
\$10,000	\$49
\$10,250	\$41
\$10,500	\$33
\$10,750	\$25
\$11,000	\$17
\$11,250	\$9
\$11,500	\$2
\$11,550	\$0