Exercises

E12-1. Lessee and lessor accounting
(AICPA adapted)

Requirement 1:
The amount of gross profit on the sale is the fair market value (FMV) of the equipment less the cost of the equipment to the lessor. We can assume that the present value of the minimum lease payments is the same as the FMV of the equipment and we are given the cost of the equipment. The computation follows:

PV of minimum lease payments $3,165,000
Cost of equipment 2,675,000
Gross profit on sale of equipment $490,000

Next, we have to compute the amount of interest income for 2001. Keep in mind that the lease has been in effect for only 6 months, so we will need to pro-rate annual interest income in order to show the amount accrued after 6 months. Using the partial lease amortization schedule, we will demonstrate this calculation.

<table>
<thead>
<tr>
<th>Date</th>
<th>Annual Lease Payments</th>
<th>Interest on Net Investment</th>
<th>Net Investment Recovery</th>
<th>Net Investment: PV of Minimum Lease Payments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inception</td>
<td>$3,165,000</td>
<td>0</td>
<td>$500,000</td>
<td>$3,165,000</td>
</tr>
<tr>
<td>7/1/01</td>
<td>$500,000</td>
<td>$0</td>
<td>$500,000</td>
<td>2,665,000</td>
</tr>
</tbody>
</table>

The first scheduled payment is July 1, 2001, at the inception of the lease. This reduces the net investment of the lessor by $500,000. At year end, we need to know the interest accrued on the remaining investment ($2,665,000). We can find this number as follows:

$2,665,000
◊ 12%
◊ 0.5 yrs
= $159,900
So Fox’s interest income for 2001 is $159,900. Interest income for the first 6 months of 2002 is also $159,900. To accrue the interest income, Fox would make the following entry twice, once on December 31, 2001, and once on June 30, 2002:

\[
\begin{align*}
\text{DR} & \quad \text{Accrued interest receivable} & \quad $159,900 \\
\text{CR} & \quad \text{Interest income} & \quad $159,900
\end{align*}
\]

When the $500,000 cash payment is made on July 1, 2002, the balance in accrued interest receivable will be $319,800 (i.e., $159,900 × 2). Fox would make the following entry:

\[
\begin{align*}
\text{DR} & \quad \text{Cash} & \quad $500,000 \\
\text{CR} & \quad \text{Accrued interest receivable} & \quad $319,800 \\
\text{CR} & \quad \text{Net investment in lease} & \quad 180,200
\end{align*}
\]

After making this entry, the net investment in the lease on Fox’s books is $2,665,000 - $180,200 or $2,484,800. Interest for the last half of 2002 would be $2,484,800 × 12% × 1/2 or $149,088. Total interest income for 2002 is therefore:

\[
\begin{align*}
\text{January–June 2002 interest income} & \quad $159,900 \\
\text{July–December 2002 interest income} & \quad 149,088 \\
\hline
\text{Total interest income for 2002} & \quad $308,988
\end{align*}
\]

**Requirement 2:**

To find Tiger’s 2001 depreciation expense, we need to compute depreciation for a full year and then prorate that amount for 6 months.

- **FMV of the equipment:** $3,165,000
- **Economic life of the equipment:** 10 years
- **Straight line depreciation expense for 1 year:** $316,500

Prorated depreciation expense ($316,500/2) $158,250

Next, we must find Tiger’s interest expense. Here, we can use the same method for the lessee as we did for the lessor. (Note: The lease obligation is the present value of the minimum lease payments.)

<table>
<thead>
<tr>
<th>Date</th>
<th>Annual Lease Payments</th>
<th>Interest on Net Investment</th>
<th>Net Investment Recovery</th>
<th>Net Investment: PV of Minimum Lease Payments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inception</td>
<td>$500,000</td>
<td>$0</td>
<td>$500,000</td>
<td>$3,165,000</td>
</tr>
<tr>
<td>7/1/01</td>
<td>$500,000</td>
<td>$0</td>
<td>$500,000</td>
<td>2,665,000</td>
</tr>
</tbody>
</table>

12-2
We can see that since the lessee and lessor use the same discount rate their amortization schedules are identical. We need to again find the amount of interest expense that Tiger has accrued in the 6 months that the lease was in effect during 2001.

\[
\begin{align*}
\text{Amount} & \quad \times \quad \text{Discount Rate} \quad \times \quad \text{Period} \\
$2,665,000 & \quad \times \quad 12\% & \quad \times \quad 0.5 \text{ yrs} \\
& \quad = \quad $159,900
\end{align*}
\]

Tiger’s 2001 interest expense is the same as Fox’s interest income, $159,900. Its journal entries are:

December 31, 2001, and June 30, 2002:

\[\text{DR} \quad \text{Interest expense} \quad $159,900 \]
\[\text{CR} \quad \text{Interest payable} \quad $159,900\]

July 1, 2002

\[\text{DR} \quad \text{Interest payable} \quad $319,800 \]
\[\text{DR} \quad \text{Lease obligation} \quad 180,200 \]
\[\text{CR} \quad \text{Cash} \quad $500,000\]

After making the July 1 entry, the lease obligation on Tiger’s books is $2,665,000 - $180,200 or $2,484,800. Tiger’s interest expense for 2002 mirrors Fox’s interest income computed in part 1:

\[\begin{align*}
\text{January–June 2002 interest expense} & \quad 159,900 \\
\text{July–December 2002 interest expense} & \quad 149,088^* \\
& \quad \text{Total} \quad $308,988
\end{align*}\]

* $2,484,800 \times 12\% \times 1/2

Depreciation expense for 2002 is $316,500.

**E12-2. Lessee accounting**

(AICPA adapted)

Since Lafayette’s lease is structured as an ordinary annuity, there is no reduction of the lease obligation at the inception of the lease as there is if the lease is an annuity due. Interest expense for 2001 is simply 10% of the lease obligation, which is the PV of the minimum lease payments. The computation is shown in the partial amortization schedule that follows.
As we can see from the table, the interest expense for 2001 is:

\[ ($92,170 \times 10\%) = $9,217 \]

Since the lease began at the start of the year, we do not need to prorate these amounts.

Depreciation expense is simply the FMV of the drill press allocated on a straight-line basis over the economic life of the asset. (Note: When title to the asset passes to the lessee in a capital lease, the lessee must accrue depreciation expense over the economic life of the asset, not the lease period.)

\[
\begin{align*}
\text{FMV of drill press} & = $92,170 \\
\text{Economic life of drill press} & = 15 \text{ years} \\
\text{Depreciation expense for 2001} (\frac{92,170}{15}) & = $6,145
\end{align*}
\]

**E12-3. Lessee accounting: Purchase option**  
 *(AICPA adapted)*

Since the purchase option approximates the fair value of the machine in 10 years, it is not a bargain purchase option and is, therefore, not included in our computation.

To find the amount of the capitalized lease, we need to find the present value of the minimum lease payments plus the present value of any guaranteed residual value. There is no guaranteed residual value in this lease, so we need simply to find the PV of the lease payments. The computation is shown below.

\[
\begin{align*}
\text{Annual rental payments} & = $40,000 \\
\text{PV of an annuity due at 14\% for 10 periods} & = x 5.95 \\
\text{Present value of the minimum lease payments} & = $238,000
\end{align*}
\]

So, the amount of the capitalized lease asset is $238,000.
E12-4. Lessee accounting and classification
(AICPA adapted)

**Requirement 1:**
To compute the 12/31/02 lease liability amount, we can construct an amortization schedule.

<table>
<thead>
<tr>
<th>Date</th>
<th>Annual Lease Payments</th>
<th>Interest on Unpaid Obligation</th>
<th>Reduction of Lease Obligation</th>
<th>Lease Obligation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inception</td>
<td>$100,000</td>
<td>$0</td>
<td>$100,000</td>
<td>$676,000</td>
</tr>
<tr>
<td>12/31/01</td>
<td>$100,000</td>
<td>$0</td>
<td>$100,000</td>
<td>576,000</td>
</tr>
<tr>
<td>12/31/02</td>
<td>$100,000</td>
<td>57,600</td>
<td>42,400</td>
<td>533,600</td>
</tr>
</tbody>
</table>

We can see from the amortization table that the reduction of the lease liability in 2001 is the entire $100,000 rental payment. In 2002, interest accrues on only $576,000, so the interest expense for 2002 is 10% of $576,000 ($57,600), and the lease obligation is reduced by $42,400 to **$533,600**.

**Requirement 2:**
To find out what portion of the lease obligation should be classified as a current liability, we need to look at the next year on the amortization schedule.

<table>
<thead>
<tr>
<th>Date</th>
<th>Annual Lease Payments</th>
<th>Interest on Unpaid Obligation</th>
<th>Reduction of Lease Obligation</th>
<th>Lease Obligation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inception</td>
<td>$100,000</td>
<td>$0</td>
<td>$100,000</td>
<td>$676,000</td>
</tr>
<tr>
<td>12/31/01</td>
<td>$100,000</td>
<td>$0</td>
<td>$100,000</td>
<td>576,000</td>
</tr>
<tr>
<td>12/31/02</td>
<td>$100,000</td>
<td>57,600</td>
<td>42,400</td>
<td>533,600</td>
</tr>
<tr>
<td>12/31/03</td>
<td>$100,000</td>
<td>53,360</td>
<td>46,640</td>
<td>486,960</td>
</tr>
</tbody>
</table>

We can see that in 2003, the reduction of the lease obligation will be $46,640. The current portion of the lease obligation on December 31, 2002, is equal to the reduction in the lease obligation that will take place in 2003, i.e., **$46,640**.

E12-5. Lessor accounting
(AICPA adapted)

The following are expenses incurred on the machine in 1998.

Depreciation Expense:

- Cost of machine: $720,000
- Useful life of machine: 10 years
- Cost / Useful life: $72,000
Depreciation expense is $72,000. Maintenance and executory costs are given as $15,000. So, the sum of these two costs is the total expense resulting from the machine—$87,000. Operating profit on this asset is the rental revenue less the expenses Grady incurred:

Rental revenue $125,000
Expenses incurred 87,000
Operating profit on leased asset $38,000

E12-6. Lessor accounting: Sales-type lease
(AICPA adapted)

To find the amount of interest income for 2002, we need to look at the lease amortization schedule below. Benedict accrues the interest over the year. For example, the interest revenue associated with the 1/1/02 payment ($292,000) is actually accrued in 2001.

<table>
<thead>
<tr>
<th>Date</th>
<th>Annual Payment</th>
<th>Interest Revenue</th>
<th>Reduction in Net Investment</th>
<th>Net Investment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inception</td>
<td>$3,520,000</td>
<td>$0</td>
<td>$600,000</td>
<td>$3,520,000</td>
</tr>
<tr>
<td>1/1/01</td>
<td>$600,000</td>
<td>0</td>
<td>308,000</td>
<td>2,920,000</td>
</tr>
<tr>
<td>1/1/02</td>
<td>600,000</td>
<td>292,000</td>
<td>338,800</td>
<td>2,273,200</td>
</tr>
<tr>
<td>1/1/03</td>
<td>600,000</td>
<td>261,200</td>
<td>338,800</td>
<td>2,273,200</td>
</tr>
</tbody>
</table>

We can see from the table that for the second year, ending 12/31/02, the interest revenue that was accrued is $261,200 (see the 1/1/03 payment).

E12-7. Lessor accounting: Direct financing leases
(AICPA adapted)

To find the amount of interest revenue earned over the life of the lease, we need to first determine the amount of the each lease payment. Let $Y$ = amount of each payment.

Fair value of equipment = PV of annuity due factor × $Y$

Fair market value of equipment (PV of lease payments) $323,400
Present value of an annuity due (5 yrs @ 8%) 4.312

$323,400 = 4.312 × Y
$Y = 323,400/4.312 = 75,000

Amount of annual lease payment $75,000
Next, we must find the gross investment or lease payments receivable:

$75,000 \times 5 \text{ yrs} = \$375,000$

The interest revenue earned over the life of the lease is equal to the gross investment less the net investment.

<table>
<thead>
<tr>
<th>Gross investment</th>
<th>$375,000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Net investment (PV of lease payments)</td>
<td>323,400</td>
</tr>
<tr>
<td>Total interest revenue</td>
<td>$51,600</td>
</tr>
</tbody>
</table>

Total interest revenue that Glade will earn over the life of the lease is $51,600.

**E12-8. Lessor accounting: Sales-type lease**  
(AICPA adapted)

The amount of profit on the sale can be determined by the following computation.

Selling price of equipment $3,520,000  
Cost of equipment to Howe (2,800,000)  
Profit on sale $720,000

To find the interest revenue earned on the lease in 2001, we first look at the partial lease amortization schedule below.

<table>
<thead>
<tr>
<th>Date</th>
<th>Annual Payment</th>
<th>Interest on Net Investment</th>
<th>Net Investment Recovery</th>
<th>Net Investment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inception</td>
<td></td>
<td></td>
<td></td>
<td>$3,520,000</td>
</tr>
<tr>
<td>7/1/01</td>
<td>$600,000</td>
<td>$0</td>
<td>$600,000</td>
<td>2,920,000</td>
</tr>
<tr>
<td>7/1/02</td>
<td>600,000</td>
<td>292,000</td>
<td>308,000</td>
<td>2,612,000</td>
</tr>
<tr>
<td>7/1/03</td>
<td>600,000</td>
<td>261,200</td>
<td>338,800</td>
<td>2,273,200</td>
</tr>
</tbody>
</table>

To determine the amount of interest that should be recorded in 2001, we must prorate the interest for the period 7/1/01 to 7/1/02. This interest that was earned between July 1, 2001, and July 1, 2002, is $292,000. We need to allocate 6 months of this interest, or one-half of $292,000, to 2001.

Interest earned between 7/1/01–7/1/02 $292,000  
Portion earned in 2001 (6 mos.) .5  
Amount of interest recorded in 2001 $146,000

Thus, Howe should record profit on sales of $720,000 and interest revenue of $146,000.
E12-9. Lessee accounting: Discount rate
(AICPA adapted)

We can determine the amount of Day’s lease liability at the beginning of the lease term as follows:

Annual rent payable $50,000
Present value of an annuity due (6 yrs @ 12%) × 4.61
Total lease liability at the beginning of the lease $230,500

Since Day knows the lessor’s implicit rate and the implicit rate is less than Day’s incremental borrowing rate, Day must use Parr’s implicit discount rate.

E12-10. Lessee accounting: Purchase option
(AICPA adapted)

To find the amount of lease liability that Robbins should record at the inception of the lease, we need to find the present value of the lease payments and the present value of the bargain purchase option. Robbins’ incremental borrowing rate (14%) is more than the lessor’s 12% implicit rate of return on the lease. Robbins must use 12% in its calculations because it is less than Robbins’ own incremental borrowing rate and because Robbins is aware of the lessor’s implicit rate since it is specified in the lease contract.

Annual rental payments $10,000
Present value of an annuity due (10 yrs @ 12%) × 6.328
Present value of minimum lease payments $63,280

Bargain purchase option $10,000
Present value of a lump sum (10 yrs @ 12%) × 0.322
Present value of bargain purchase option $3,220

Present Value of :

Annual rental payments $63,280
Bargain purchase option $3,220
Liability at beginning of the lease term $66,500

Robbins would record $66,500 as its lease liability at the beginning of the lease term.
E12-11. Lessee accounting
(AICPA adapted)

Annual lease payment $13,000
Present value of an annuity due (5 yrs @ 9%) \( \times 4.24 \)
Present value of minimum lease payments $55,120

Residual value guarantee $10,000
Present value of a lump sum (5 yrs @ 9%) \( \times 0.65 \)
Present value of residual value guarantee $6,500

Present value of minimum lease payments $55,120
Present value of residual value guarantee $6,500
Recorded capital lease liability at inception $61,620

We know that there is no interest accrued when the first payment is made since this is an annuity due. The entire $13,000 payment is a reduction of the lease liability, so after the first payment we have:

<table>
<thead>
<tr>
<th>Date</th>
<th>Annual Payment</th>
<th>Interest on Unpaid Obligation</th>
<th>Reduction of Lease Obligation</th>
<th>Lease Obligation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inception</td>
<td>$61,620</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1/1/01</td>
<td>$13,000</td>
<td>$0</td>
<td>$13,000</td>
<td>48,620</td>
</tr>
<tr>
<td>1/1/02</td>
<td>13,000</td>
<td>$4,376</td>
<td>8,624</td>
<td>39,996</td>
</tr>
</tbody>
</table>

After the first payment, the lease liability is reduced by $13,000 to $48,620.

E12-12. Lessee reporting: Executory costs
(AICPA adapted)

A partial lease amortization table for Roe Company follows. Keep in mind that executory costs are part of the annual payment but they do not reduce the lease obligation. Thus, the $5,000 in executory costs is subtracted from the annual payment in the amortization table.

<table>
<thead>
<tr>
<th>Date</th>
<th>Annual Payment</th>
<th>Executory Costs</th>
<th>Interest on Unpaid Obligation</th>
<th>Reduction of Lease Obligation</th>
<th>Lease Obligation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inception</td>
<td>$417,000</td>
<td>$5,000</td>
<td>0</td>
<td>$100,000</td>
<td>317,000</td>
</tr>
<tr>
<td>12/31/01</td>
<td>$105,000</td>
<td>$5,000</td>
<td>0</td>
<td>$100,000</td>
<td>317,000</td>
</tr>
<tr>
<td>12/31/02</td>
<td>105,000</td>
<td>5,000</td>
<td>31,700</td>
<td>68,300</td>
<td>248,700</td>
</tr>
</tbody>
</table>

As shown in the table, Roe would report $248,700 as its lease liability on the December 31, 2002 balance sheet.
E12-13. Sale and leaseback  
(AICPA adapted)

**Requirement 1:**

<table>
<thead>
<tr>
<th>Description</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sales price</td>
<td>$480,000</td>
</tr>
<tr>
<td>Carrying amount</td>
<td>(360,000)</td>
</tr>
<tr>
<td>Deferred gain on sale of equipment</td>
<td>$120,000</td>
</tr>
</tbody>
</table>

The gain on the sale of equipment in a sale and leaseback is deferred and amortized over the life of the lease. Therefore, no gain is recognized on the sale and leaseback in 2001.

**Requirement 2:**

Lane should defer the $120,000 gain on the sale of equipment and amortize it over the 12-year lease term.
Problems
P12-1. Lease accounting overview: Lessors and lessees

**Requirement 1:**
The computation of the annual lease payments is shown below:

Fair market value of the machine $100,000
Present value of the residual value \( \times 10,000 \) (3.855)
Amount to be recovered by the lessor $96,145

Present value factor for an annuity due for 10 years @10%
Annual lease payments \( \div 6.75902 \) $14,225

**Requirement 2:**
Since the residual value is not guaranteed, it is not included in the lease obligation. The computation of the lessee’s lease obligation at signing is illustrated below.

Annual lease payment $14,225
Present value factor for an annuity due for 10 years @ 10% \( \times 6.759 \)
Lease obligation at signing $96,145 *

*Rounded

**Requirement 3:**
Partial lease amortization schedules appear below for the lessee and lessor, assuming a 10% discount rate. Note that the entire amount of the initial payment goes toward reduction of the lease obligation (receivable). By the end of year 1, the lessee has accrued $8,192 of interest expense based on the present value of the lease obligation of $81,920 following the initial payment.

<table>
<thead>
<tr>
<th>Lessee Co. Lease Amortization Schedule</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Year Inception</strong></td>
</tr>
<tr>
<td>--------------</td>
</tr>
<tr>
<td>Inception</td>
</tr>
<tr>
<td>1</td>
</tr>
<tr>
<td>2</td>
</tr>
</tbody>
</table>
The lessor will recover $100,000 because the machine will have residual value at the end of the lease, even though it may be unguaranteed. Thus, by the end of the first year the lessor has earned $8,758 in interest revenue from the lease based on the present value of the net investment of $85,775 following the initial payment.

**Lessor Co. Lease Amortization Schedule**

<table>
<thead>
<tr>
<th>Year Inception</th>
<th>Annual Payment</th>
<th>Interest Revenue</th>
<th>Net Investment Recovery</th>
<th>Net Investment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inception</td>
<td>$100,000</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>$14,225</td>
<td>$0</td>
<td>$14,225</td>
<td>85,775</td>
</tr>
<tr>
<td>2</td>
<td>14,225</td>
<td>8,578</td>
<td>5,647</td>
<td>80,128</td>
</tr>
</tbody>
</table>

**Requirement 4:**

a) If the residual value were guaranteed, it would change the lease obligation as follows:

- Annual lease payment: $14,225
- Present value factor of an annuity due for 10 years @ 10% \( \times 6.75902 \)
- Present value of 10 annual rental payments (rounded): $96,145
- Guaranteed residual value: $10,000
- Present value factor of a lump sum for 10 years @ 10% \( \times 0.38554 \)
- Present value of guaranteed residual value: $3,855
- Lease obligation at signing \( ($96,145 + $3,855) \): $100,000

b) A revised amortization table for Lessee Co. follows:

<table>
<thead>
<tr>
<th>Year Inception</th>
<th>Annual Payment</th>
<th>Interest Expense</th>
<th>Reduction of Lease Obligation</th>
<th>Lease Obligation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inception</td>
<td>$100,000</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>$14,225</td>
<td>$0</td>
<td>$14,225</td>
<td>85,775</td>
</tr>
<tr>
<td>2</td>
<td>14,225</td>
<td>8,578</td>
<td>5,648</td>
<td>80,128</td>
</tr>
</tbody>
</table>

As shown in the table, the interest expense for Lessee Co. for year 1 is now $8,578 instead of $8,192 under Requirement 3.

The computation for Lessor Co. would not change if the residual value were guaranteed. The reason is that the net investment in the lease ($100,000) is the same irrespective of whether the residual value is guaranteed or unguaranteed.
P12-2. Lessees’ accounting for capital leases

**Requirement 1:**
Given that the leased asset has an expected useful life of 6 years, Seven Wonders must account for the lease as a capital lease since the lease term of 5 years covers more than 75% of the asset’s useful life (5/6 = 83.3%).

**Requirement 2:**
Present value of future lease payments:

\[
\begin{align*}
&= \$277,409.44 \times \text{the present value of an ordinary annuity at} \\
&\quad \text{12% for 5 periods.} \\
&= \$277,409.44 \times 3.60478 \\
&= \$1,000,000
\end{align*}
\]

Appearing below is the amortization schedule for the lease liability:

**Amortization of Capital Lease Liability**

**Seven Wonders Incorporated**

(In thousands)

<table>
<thead>
<tr>
<th>Date</th>
<th>Interest Portion$^1$</th>
<th>Cash Payment$^2$</th>
<th>Liability Reduction$^3$</th>
<th>Lease Liability$^4$</th>
</tr>
</thead>
<tbody>
<tr>
<td>1/1/01</td>
<td></td>
<td>$1,000,000.00</td>
<td></td>
<td>$1,000,000.00</td>
</tr>
<tr>
<td>12/31/01</td>
<td>$120,000.00</td>
<td>$277,409.44</td>
<td>$157,409.44</td>
<td>842,590.56</td>
</tr>
<tr>
<td>12/31/02</td>
<td>101,110.87</td>
<td>277,409.44</td>
<td>176,298.57</td>
<td>666,291.99</td>
</tr>
<tr>
<td>12/31/03</td>
<td>79,955.04</td>
<td>277,409.44</td>
<td>197,454.40</td>
<td>468,837.59</td>
</tr>
<tr>
<td>12/31/04</td>
<td>56,260.51</td>
<td>277,409.44</td>
<td>221,148.93</td>
<td>247,688.66</td>
</tr>
<tr>
<td>12/31/05</td>
<td>29,720.78$^*</td>
<td>277,409.44</td>
<td>247,688.66</td>
<td>0.00</td>
</tr>
</tbody>
</table>

$^*$Rounded by $1.85

---

$^1$ The interest portion is 12% of the carrying amount at the beginning of the period.

$^2$ The cash payment is fixed by the lease at $277,409.44.

$^3$ The reduction in the liability is the difference between the cash payment and the interest portion.

$^4$ The lease liability declines each year by the amount of the liability reduction.
Requirement 3:
The journal entries are:

1/1/01:

\[\text{DR Leased assets—capital leases} \quad \text{CR Obligations under capital leases} \quad \$1,000,000.00 \]

12/31/01:

\[\begin{align*}
\text{DR Interest expense} & \quad \text{CR Cash} \\
\text{DR Obligations under capital leases} & \quad \text{CR Cash} \\
& \quad \$277,409.44
\end{align*}\]

\[\begin{align*}
\text{DR Interest expense} & \quad \$120,000.00 \\
\text{DR Obligations under capital leases} & \quad 157,409.44 \\
\text{CR Cash} & \quad 277,409.44
\end{align*}\]

12/31/02:

\[\begin{align*}
\text{DR Interest expense} & \quad \$101,110.87 \\
\text{DR Obligations under capital leases} & \quad 176,298.57 \\
\text{CR Cash} & \quad 277,409.44
\end{align*}\]

2001 and 2002:

Annual depreciation expense =

\[\frac{1,000,000}{5} = \$200,000\]

\[\begin{align*}
\text{DR Depreciation expense} & \quad \$200,000.00 \\
\text{CR Accumulated depreciation} & \quad \text{—leased assets} \\
& \quad \$200,000.00
\end{align*}\]

Requirement 4:
Under the capital lease method, the total expense recognized in 2001 is the interest expense of $120,000 plus the depreciation of $200,000 for a total of $320,000. Under the operating lease method, the amount of expense would have been $277,409.44. Thus, income before tax will be lower by $42,590.56 in 2001 as a result of classifying the lease as a capital lease because capital lease accounting “front-end loads” lease expense in comparison to the operating lease approach.

P12-3. Lessees’ accounting for capital leases

Requirement 1:
Present value of future lease payments:

\[\begin{align*}
&= 277,409.44 \times \text{the present value of an annuity due at 12\% for 5 periods} \\
&= 277,409.44 \times 4.03735 \\
&= 1,119,999
\end{align*}\]
Appearing below is the amortization schedule for the lease liability:

**Amortization of Capital Lease Liability**
Seven Wonders Incorporated

First payment due at the inception of the lease

<table>
<thead>
<tr>
<th>Date</th>
<th>Interest Portion</th>
<th>Cash Payment</th>
<th>Liability Reduction</th>
<th>Lease Liability</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inception</td>
<td>$0.00</td>
<td>$277,409.44</td>
<td>$277,409.44</td>
<td>$1,119,999.00</td>
</tr>
<tr>
<td>1/1/01</td>
<td>$101,110.75</td>
<td>277,409.44</td>
<td>176,298.69</td>
<td>666,290.87</td>
</tr>
<tr>
<td>1/1/02</td>
<td>79,954.90</td>
<td>277,409.44</td>
<td>197,454.54</td>
<td>468,836.33</td>
</tr>
<tr>
<td>1/1/03</td>
<td>56,260.36</td>
<td>277,409.44</td>
<td>221,149.08</td>
<td>247,687.25</td>
</tr>
<tr>
<td>1/1/04</td>
<td>29,722.19*</td>
<td>277,409.44</td>
<td>247,687.25</td>
<td>0.00</td>
</tr>
</tbody>
</table>

*Rounded by $0.28

1 The interest portion is 12% of the carrying amount at the beginning of the period and is accrued over the year preceding the payment.

2 The cash payment is fixed by the lease at $277,409.44.

3 The reduction in the liability is the difference between the cash payment and the interest portion.

4 The lease liability declines each year by the amount of the liability reduction.

**Requirement 2:**
The journal entries are:

1/1/01:

<table>
<thead>
<tr>
<th>DR</th>
<th>Leased assets—capital leases $1,119,999.00</th>
</tr>
</thead>
<tbody>
<tr>
<td>CR</td>
<td>Obligations under capital leases $842,589.56</td>
</tr>
<tr>
<td>CR</td>
<td>Cash 277,409.44</td>
</tr>
</tbody>
</table>

12/31/01:

<table>
<thead>
<tr>
<th>DR</th>
<th>Interest expense $ 101,110.75</th>
</tr>
</thead>
<tbody>
<tr>
<td>CR</td>
<td>Interest payable $101,110.75</td>
</tr>
</tbody>
</table>

1/1/02:

<table>
<thead>
<tr>
<th>DR</th>
<th>Interest payable $ 101,110.75</th>
</tr>
</thead>
<tbody>
<tr>
<td>DR</td>
<td>Obligations under capital leases 176,298.69</td>
</tr>
<tr>
<td>CR</td>
<td>Cash $277,409.44</td>
</tr>
</tbody>
</table>
12/31/02:

**DR** Interest expense $79,954.90  
**CR** Interest payable $79,954.90

1/1/03:

**DR** Interest payable $79,954.90  
**DR** Obligations under capital leases 197,454.54  
**CR** Cash $277,409.44

2001 - 2005:

Annual depreciation expense =  
\[ \frac{1,119,999}{5} = 223,999.80 \]

**DR** Depreciation expense $223,999.80  
**CR** Accumulated depreciation —leased assets $223,999.80

NOTE: The total amount expensed in these two cases is the same (adjusted for a rounding error).

In the previous problem, the total amount expensed over the term of the lease would be $1,387,047.20 ($387,047.20 interest expense and $1,000,000 of depreciation expense).

In the present problem, the total amount expensed over the term of the lease would be $1,387,047.20 ($267,048.20 of interest expense and $1,119,999.00 of depreciation expense).

The interest expense is less in Problem 12-3 because the first payment was made on the inception date of the lease.
P12-4. Lessees’ accounting for capital leases including executory costs and residual value guarantee

Requirement 1:
This is a capital lease to Bare Trees Company because the lease term of 3 years is equal to 75% of the asset’s useful life of 4 years.

With the residual value guarantee of $15,000, the present value of future lease payments is calculated as:

\[
= (\text{the present value of an ordinary annuity at 9\% for 3 Periods}) + (\text{the present value of 1 at 9\% in 3 periods}).
\]

(The $59,258.09 figure is the $62,258.09 annual lease payment minus the $3,000 annual executory costs).

\[
= (\$59,258.09 \times 2.53130) + (\$15,000 \times 0.77218)
\]

\[
= 161,583
\]

Appearing below is the amortization schedule for the lease liability:

<table>
<thead>
<tr>
<th>Date</th>
<th>Interest Portion(^1)</th>
<th>Cash Payment(^2)</th>
<th>Liability Reduction(^3)</th>
<th>Lease Liability(^4)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1/1/01</td>
<td></td>
<td>$161,583.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>12/31/01</td>
<td>$14,542.47</td>
<td>$59,258.09</td>
<td>$44,715.62</td>
<td>$116,867.38</td>
</tr>
<tr>
<td>12/31/02</td>
<td>$10,518.06</td>
<td>$59,258.09</td>
<td>$48,740.03</td>
<td>$68,127.35</td>
</tr>
<tr>
<td>12/31/03</td>
<td>$6,130.74*</td>
<td>$59,258.09</td>
<td>$53,127.35</td>
<td>$15,000.00</td>
</tr>
</tbody>
</table>

*Rounded by $0.73.

\(^1\)The interest portion is 9\% of the carrying amount at the beginning of the period.
\(^2\)The cash payment is fixed by the lease at $59,258.09, excluding the $3,000 of annual executory costs.
\(^3\)The reduction in the liability is the difference between the cash payment and the interest portion.
\(^4\)The lease liability declines each year by the amount of the liability reduction.
Requirement 2:
The journal entries are:

1/1/01:

DR Leased assets—capital leases $161,583.00
CR Obligations under capital leases $161,583.00

12/31/01:

DR Interest expense $14,542.47
DR Obligations under capital leases 44,715.62
DR Misc. expenses 3,000.00
CR Cash $62,258.09

12/31/02:

DR Interest expense $10,518.06
DR Obligations under capital leases 48,740.03
DR Misc. expenses 3,000.00
CR Cash $62,258.09

2001 - 2003:
Annual depreciation expense =
($161,583 - 15,000)/3 = $48,861.00

DR Depreciation expense $48,861.00
CR Accumulated depreciation
—leased assets $48,861.00

Requirement 3:

DR Obligation under capital leases $15,000.00
CR Assets under capital leases $15,000.00

Requirement 4:

DR Obligation under capital leases $15,000.00
DR Loss on residual value guarantee 3,000.00
CR Assets under capital leases $15,000.00
CR Cash 3,000.00
P12-5. Capital lease effects on ratios and income

**Requirement 1:**
The present value of the minimum lease payments at the inception of the lease is $100,000, i.e., $41,635 \times 2.40183$. The amortization schedule for the lease is shown below.

<table>
<thead>
<tr>
<th>Date</th>
<th>Annual</th>
<th>Interest</th>
<th>Reduction of Lease Obligation</th>
<th>Balance of Lease Obligation</th>
</tr>
</thead>
<tbody>
<tr>
<td>12/31/01</td>
<td>$100,000</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12/31/02</td>
<td>$41,635</td>
<td>$12,000</td>
<td>$29,635</td>
<td>70,365</td>
</tr>
<tr>
<td>12/31/03</td>
<td>41,635</td>
<td>8,444</td>
<td>33,191</td>
<td>37,174</td>
</tr>
<tr>
<td>12/31/04</td>
<td>41,635</td>
<td>4,461</td>
<td>37,174</td>
<td>0</td>
</tr>
</tbody>
</table>

**Requirement 2:**
The adjusted current ratio at December 31, 2001 is:

\[
\text{Current assets} \quad \frac{\$500,000}{\$294,118 + \$29,635} = 1.554
\]


**Requirement 3:**
Pre-tax income on a capital lease basis would be:

- Income on operating lease basis \( \$225,000 \)
- Less: Excess of capital lease over operating lease expense \( 3,698^* \)

\[
\text{Capital lease pre-tax income} = \$221,302
\]

*Computation:
- Depreciation: $100,000/33 \( \$33,333 \)
- 2002 interest expense \( \$12,000 \)
- Capital lease expense \( 45,333 \)
- Operating lease expense \( 41,635 \)
- Excess of capital lease expense over operating lease expense \( 3,698 \)
P12-6. Lessors’ direct financing lease

**Requirement 1:**
The amount of annual periodic lease payments is:

\[
\text{Present value} = \$725,000 - PV \text{ of unguaranteed residual value} \\
= \$725,000 - \$40,835^* \\
= \underline{\$684,165}
\]

*The discount factor for a payment due in 5 years @ 8% = 0.68058
$60,000 \times 0.68058 = \$40,835

\[
\text{Annual payments} = \frac{\$684,165}{4.31213} = \underline{\$158,661}
\]

*The discount factor for a five-year annuity due at 8% = 4.31213

**Requirement 2:**

\[
\text{Gross lease receivable} = 5 \times \$158,661 + 60,000 = \underline{\$853,305}
\]

\[
\text{Unearned interest revenue} = \$853,305 - 725,000 = \underline{\$128,305}
\]

**Requirement 3:**

\[
\text{Present value of lease payments} = 158,661 \times 4.31213 = \underline{\$684,165}
\]

(Since Rakin’s implicit rate of return of 8% is lower than Liska’s incremental borrowing rate, Liska must use 8%.)

\[
\text{Depreciation expense} = \frac{\$684,165}{5 \text{ years}} = \underline{\$136,833}
\]

\[
\text{Interest expense} = (\$684,165 - 158,661) \times 8\% = \underline{\$42,040}
\]

P12-7. Lessors’ direct financing lease

**Requirement 1:**
The lease must be accounted for as a direct financing lease because Railcar Leasing Incorporated is not a manufacturer and because both of the Type II characteristics discussed in the chapter are met, and two of the Type I characteristics (only one is required) are met.

The two Type I characteristics that are met are:

a) The lease covers more than 75% of the asset’s useful life (i.e., $8/8 = 100\%$), and

b) The present value of the future minimum lease payments of $8,345,640 exactly equals the leased asset’s fair market value at the inception of the lease (i.e., it exceeds 90% of the leased asset’s fair market value at the
The present value of the future minimum lease payments is:

\[ = \left( \$1,500,000 \times \text{present value factor of an ordinary annuity for } n = 7 \text{ periods at } r = 12.0\% \right) + \$1,500,000 \text{ (i.e., the present value of the first payment on January 1, 2001)} \]

\[ = (\$1,500,000 \times 4.56376) + \$1,500,000 \]

\[ = \$8,345,640. \]

**Requirement 2:**
The amortization schedule for Railcar Leasing Incorporated is as follows:

**Amortization Schedule for Railcar Leasing Incorporated**

<table>
<thead>
<tr>
<th>Year</th>
<th>Cash Payment</th>
<th>Interest Income</th>
<th>Principal Reduction</th>
<th>Remaining Principal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inception</td>
<td>$8,345,640.00</td>
<td>$0.00</td>
<td>$1,500,000.00</td>
<td>$6,845,640.00</td>
</tr>
<tr>
<td>1/1/01</td>
<td>$1,500,000.00</td>
<td>$0.00</td>
<td>$1,500,000.00</td>
<td>$6,845,640.00</td>
</tr>
<tr>
<td>1/1/02</td>
<td>$1,500,000.00</td>
<td>$821,476.80</td>
<td>$678,523.20</td>
<td>$6,167,116.80</td>
</tr>
<tr>
<td>1/1/03</td>
<td>$1,500,000.00</td>
<td>$740,054.02</td>
<td>$759,945.98</td>
<td>$5,407,170.82</td>
</tr>
<tr>
<td>1/1/04</td>
<td>$1,500,000.00</td>
<td>$648,860.50</td>
<td>$851,139.50</td>
<td>$4,556,031.31</td>
</tr>
<tr>
<td>1/1/05</td>
<td>$1,500,000.00</td>
<td>$546,723.76</td>
<td>$953,276.24</td>
<td>$3,602,755.07</td>
</tr>
<tr>
<td>1/1/06</td>
<td>$1,500,000.00</td>
<td>$432,330.61</td>
<td>$1,067,669.39</td>
<td>$2,535,085.68</td>
</tr>
<tr>
<td>1/1/07</td>
<td>$1,500,000.00</td>
<td>$304,210.28</td>
<td>$1,195,789.72</td>
<td>$1,339,295.96</td>
</tr>
<tr>
<td>1/1/08</td>
<td>$1,500,000.00</td>
<td>$160,704.04*</td>
<td>$1,339,295.96</td>
<td>0.00</td>
</tr>
</tbody>
</table>

*Rounded by $11.48.*

**Requirement 3:**
The journal entries are:

The journal entry to record the purchase of the boxcars by Railcar Leasing Incorporated would be:

\[ \text{DR Equipment} \quad \$8,345,640.00 \]
\[ \text{CR Cash} \quad \$8,345,640.00 \]
1/1/01:
Gross investment in leased asset = Total lease payments over the lease

= $1,500,000 \times 8
= $12,000,000

**DR** Gross investment in leased assets $12,000,000.00
**CR** Equipment $8,345,640.00
**CR** Unearned financing income—leases 3,654,360.00

1/1/01:
**DR** Cash $1,500,000.00
**CR** Gross investment in leased assets $1,500,000.00

12/31/01:
**DR** Unearned financing income—leases $821,476.80
**CR** Financing income—leases $821,476.80

1/1/02:
**DR** Cash $1,500,000.00
**CR** Gross investment in leased assets $1,500,000.00

12/31/02:
**DR** Unearned financing income—leases $740,054.02
**CR** Financing income—leases $740,054.02

**P12-8. Lessor accounting**

**Requirement 1:**
Under the operating lease method, the lessor does not make any entry at the inception of the lease.

The annual lease payment would be recorded as follows:

12/31/01 and 12/31/02:

**DR** Cash $1,500,000
**CR** Rental income—leases $1,500,000

Under the operating lease method, the lessor also depreciates the assets over 8 years, which is their remaining useful life. The annual depreciation charge would be $8,345,640/8 = $1,043,205. The journal entries would be:

12/31/01 and 12/31/02:

**DR** Depreciation expense $1,043,205
**CR** Accumulated depreciation $1,043,205
Requirement 2:
Over the life of the lease, the lessor would recognize income before tax of $456,795 ($1,500,000 - $1,043,205) per year for a total of $3,654,360 over the 8-year life of the lease.

Requirement 3:
The amount of income before tax of $3,654,360 is the same as that which was recognized in P12-7 when the lease was treated as a direct financing lease. One difference is that, when the lease was classified as a direct financing lease in P12-7, the income statement reported financing income each year which totaled $3,654,360 over the life of the lease, while under the operating lease method, the income statement reported rental income of $1,500,000 and depreciation expense of $1,043,205 each year, which net to a total of $3,654,360 over the life of the lease. Another difference is that treating the lease as a direct financing lease would result in higher (lower) income being reported in the early (later) years of the lease relative to treating it as an operating lease.

P12-9. Lessor accounting for sales-type leases

Requirement 1:
The lease must be accounted for as a sales-type lease because ABC Builders Incorporated is a manufacturer and because both of the Type II characteristics discussed in the chapter are met, and two of the Type I characteristics (only one is required) are met.

The two Type I characteristics that are met are:

a) The lease covers more than 75% as the asset’s useful life (i.e., 6/6 = 100.0%), and

b) The present value of the future minimum lease payments of $19,354,730 exactly equals the leased asset’s fair market value at the inception of the lease (i.e., it exceeds 90% of the leased asset’s fair market value at the inception of the lease). The present value of the future minimum lease payments is:

\[
= \left(5,000,000 \times \text{present value factor of an ordinary annuity for } n = 6 \text{ periods at } r = 15.0\% \right) + \left(1,000,000 \times \text{present value factor of } \$1 \text{ for } n = 6 \text{ periods at } r = 15.0\% \right)
\]

\[
= \left(5,000,000 \times 3.78448 \right) + \left(1,000,000 \times 0.43233 \right)
\]

\[
= \$19,354,730.
\]
Requirement 2:
The amortization schedule for ABC Builders Incorporated is as follows:

<table>
<thead>
<tr>
<th>Year</th>
<th>Cash Payment</th>
<th>Interest Income</th>
<th>Principal Reduction</th>
<th>Remaining Principal</th>
</tr>
</thead>
<tbody>
<tr>
<td>1/1/01</td>
<td>$19,354,730.00</td>
<td></td>
<td></td>
<td>$19,354,730.00</td>
</tr>
<tr>
<td>12/31/01</td>
<td>$5,000,000.00</td>
<td>$2,903,209.50</td>
<td>$2,096,790.50</td>
<td>17,257,939.50</td>
</tr>
<tr>
<td>12/31/02</td>
<td>5,000,000.00</td>
<td>2,588,690.93</td>
<td>2,411,309.08</td>
<td>14,846,630.43</td>
</tr>
<tr>
<td>12/31/03</td>
<td>5,000,000.00</td>
<td>2,226,994.56</td>
<td>2,773,005.44</td>
<td>12,073,624.99</td>
</tr>
<tr>
<td>12/31/04</td>
<td>5,000,000.00</td>
<td>1,811,043.75</td>
<td>3,188,956.25</td>
<td>8,884,668.74</td>
</tr>
<tr>
<td>12/31/05</td>
<td>5,000,000.00</td>
<td>1,332,700.31</td>
<td>3,667,299.69</td>
<td>5,217,369.05</td>
</tr>
<tr>
<td>12/31/06</td>
<td>5,000,000.00</td>
<td>782,630.95</td>
<td>4,217,369.05</td>
<td>1,000,000.00</td>
</tr>
</tbody>
</table>

Requirement 3:
The journal entries are:

1/1/01:
Gross investment in leased asset = Total lease payments over the lease + Guaranteed residual value

\[ \text{Gross investment in leased asset} = (\text{Total lease payments over the lease} \times 6) + \$1,000,000 \]

\[ = (\$5,000,000 \times 6) + \$1,000,000 \]

\[ = \$31,000,000 \]

- **DR** Gross investment in leased assets $31,000,000.00
- **CR** Sales $19,354,730.00
- **CR** Unearned financing income—leases $11,645,270.00

- **DR** Cost of goods sold $15,000,000.00
- **CR** Inventory $15,000,000.00

12/31/01:
- **DR** Cash $5,000,000.00
- **CR** Gross investment in leased assets $5,000,000.00

- **DR** Unearned financing income—leases $2,903,209.50
- **CR** Financing income—leases $2,903,209.50

12/31/02:
- **DR** Cash $5,000,000.00
- **CR** Gross investment in leased assets $5,000,000.00

- **DR** Unearned financing income—leases $2,588,690.93
- **CR** Financing income—leases $2,588,690.93
Requirement 4:
The journal entry is:

<table>
<thead>
<tr>
<th>DR</th>
<th>Cash</th>
<th>$1,000,000.00</th>
</tr>
</thead>
<tbody>
<tr>
<td>CR</td>
<td>Gross investment in leased assets</td>
<td>$1,000,000.00</td>
</tr>
</tbody>
</table>

Since the lessee guarantees the residual value, if the leased asset is not worth $1,000,000, the lessee makes up the difference in cash.

P12-10. Financial statement effects for lessees: Capital versus operating leases

Requirement 1:
Trans Global must account for the lease as a capital lease. While a lease must only meet one of the four criteria specified for capital leases to be classified as a capital lease, this lease actually meets two of the requirements.

a) The lease term covers 80% of the assets' useful life (i.e., is greater than 75%).

b) The present value of the minimum lease payments is $49,676,400 (see below) which is more than 90% of fair market value of the leased assets ($55,000,000 \times 0.90 = $49,500,000).

Present value of future lease payments:

\[
= 10,000,000 \times \text{the present value of an ordinary annuity, } r = 12\%, \quad n = 8 \text{ periods.}
\]

\[
= 10,000,000 \times 4.96764
\]

\[
= 49,676,400
\]
Requirement 2:
Appearing below is the amortization schedule for the lease liability:

### Amortization of Capital Lease Liability
Trans Global Airlines

<table>
<thead>
<tr>
<th>Date</th>
<th>Interest Portion¹</th>
<th>Cash Payment²</th>
<th>Liability Reduction³</th>
<th>Lease Liability⁴</th>
</tr>
</thead>
<tbody>
<tr>
<td>1/1/01</td>
<td>$49,676,400.00</td>
<td>$49,676,400.00</td>
<td>$49,676,400.00</td>
<td>$49,676,400.00</td>
</tr>
<tr>
<td>12/31/01</td>
<td>$5,961,168.00</td>
<td>$10,000,000.00</td>
<td>$4,038,832.00</td>
<td>45,637,568.00</td>
</tr>
<tr>
<td>12/31/02</td>
<td>5,476,508.16</td>
<td>10,000,000.00</td>
<td>4,523,491.84</td>
<td>41,114,076.16</td>
</tr>
<tr>
<td>12/31/03</td>
<td>4,933,689.14</td>
<td>10,000,000.00</td>
<td>5,066,310.86</td>
<td>36,047,765.30</td>
</tr>
<tr>
<td>12/31/04</td>
<td>4,325,731.84</td>
<td>10,000,000.00</td>
<td>5,674,268.16</td>
<td>30,373,497.14</td>
</tr>
<tr>
<td>12/31/05</td>
<td>3,644,819.66</td>
<td>10,000,000.00</td>
<td>6,355,180.34</td>
<td>24,018,316.79</td>
</tr>
<tr>
<td>12/31/06</td>
<td>2,882,198.01</td>
<td>10,000,000.00</td>
<td>7,117,801.99</td>
<td>16,900,514.81</td>
</tr>
<tr>
<td>12/31/07</td>
<td>2,028,061.78</td>
<td>10,000,000.00</td>
<td>7,971,938.22</td>
<td>8,928,576.58</td>
</tr>
<tr>
<td>12/31/08</td>
<td>1,071,423.42*</td>
<td>10,000,000.00</td>
<td>8,928,576.58</td>
<td>0.00</td>
</tr>
</tbody>
</table>

* Rounded by $5.77.

¹ The interest portion is 12% of the carrying amount at the beginning of the period.

² The cash payment is fixed by the lease at $10,000,000.

³ The reduction in the liability is the difference between the cash payment and the interest portion.

⁴ The lease liability declines each year by the amount of the liability reduction.

The journal entries are:

1/1/01:

| DR       | Aircraft under capital leases $49,676,400.00 |
| CR       | Obligations under capital leases $49,676,400.00 |

12/31/01:

| DR       | Interest expense $5,961,168.00 |
| DR       | Obligations under capital leases 4,038,832.00 |
| CR       | Cash $10,000,000.00 |

12/31/02:

| DR       | Interest expense $5,476,508.16 |
| DR       | Obligations under capital leases 4,523,491.84 |
| CR       | Cash $10,000,000.00 |
12/31/03:
  DR Interest expense $4,933,689.14  
  DR Obligations under capital leases 5,066,310.86  
  CR Cash $10,000,000.00

12/31/08:
  DR Interest expense $1,071,423.42  
  DR Obligations under capital leases 8,928,576.58  
  CR Cash $10,000,000.00

2001 - 2008:
Annual depreciation expense = $49,676,400/8 = $6,209,550.00

  DR Depreciation expense $6,209,550.00  
  CR Accumulated depreciation —leased aircraft $6,209,550.00

Requirement 3:
Journal entries for 2001, 2002, 2003, and 2008, assuming the lease is an operating lease:

  DR Rent expense $10,000,000.00  
  CR Cash $10,000,000.00

Requirement 4:
Year-to-year expense recognition: capital vs. operating lease.

<table>
<thead>
<tr>
<th>Date</th>
<th>Interest Portion</th>
<th>Depreciation</th>
<th>Total</th>
<th>Capital Lease</th>
<th>Operating Lease</th>
<th>Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td>12/31/01</td>
<td>$5,961,168.00</td>
<td>$6,209,550.00</td>
<td>$12,170,718.00</td>
<td>$10,000,000.00</td>
<td>$2,170,718.00</td>
<td></td>
</tr>
<tr>
<td>12/31/02</td>
<td>5,476,508.16</td>
<td>6,209,550.00</td>
<td>11,686,058.16</td>
<td>10,000,000.00</td>
<td>1,686,058.16</td>
<td></td>
</tr>
<tr>
<td>12/31/03</td>
<td>4,933,689.14</td>
<td>6,209,550.00</td>
<td>11,143,239.14</td>
<td>10,000,000.00</td>
<td>1,143,239.14</td>
<td></td>
</tr>
<tr>
<td>12/31/04</td>
<td>4,325,731.84</td>
<td>6,209,550.00</td>
<td>10,535,281.84</td>
<td>10,000,000.00</td>
<td>535,281.84</td>
<td></td>
</tr>
<tr>
<td>12/31/05</td>
<td>3,644,819.66</td>
<td>6,209,550.00</td>
<td>9,854,369.66</td>
<td>10,000,000.00</td>
<td>(145,630.34)</td>
<td></td>
</tr>
<tr>
<td>12/31/06</td>
<td>2,882,198.01</td>
<td>6,209,550.00</td>
<td>9,091,748.01</td>
<td>10,000,000.00</td>
<td>(908,251.99)</td>
<td></td>
</tr>
<tr>
<td>12/31/07</td>
<td>2,028,061.78</td>
<td>6,209,550.00</td>
<td>8,237,611.78</td>
<td>10,000,000.00</td>
<td>(1,762,388.22)</td>
<td></td>
</tr>
<tr>
<td>12/31/08</td>
<td>1,071,423.42</td>
<td>6,209,550.00</td>
<td>7,280,973.42</td>
<td>10,000,000.00</td>
<td>(2,719,026.58)</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>$30,323,600.00</td>
<td>$49,676,400.00</td>
<td>$80,000,000.00</td>
<td>$80,000,000.00</td>
<td>$0.00</td>
<td></td>
</tr>
</tbody>
</table>

Under the capital lease method, the annual income statement effect is the sum of the interest expense recognized plus depreciation expense. Under the operating lease method, the annual income statement effect is the amount of the annual lease payment.
As can be seen from the above table, income before tax would be lower under the capital lease in 2001–2004, and then higher in 2005–2008 when compared to the operating lease method. Over the term of the lease, both methods end up recognizing the same amount of total expense, thus the net difference in income before tax is $0 at the end of the lease. All that differs under the two approaches is the manner and pattern of the expense recognition over the term of the lease.

**Requirement 5:**
Trans Global’s managers are likely to prefer the operating lease approach because it allows them to keep the lease liability, as well as the asset, off the balance sheet.

**P12-11. Direct financing versus operating leases: Lessors’ income statement and balance sheet effects**

The present value of the future minimum lease payments of $99,817,750 (see below) exactly equals the leased asset's fair market value at the inception of the lease. Specifically, the present value of the future minimum lease payments is:

\[
= 25,000,000 \times \text{present value of an ordinary annuity for } n = 5 \text{ periods at } r = 8.0%
\]

\[
= 25,000,000 \times 3.99271
\]

\[
= 99,817,750.
\]

The amortization schedule is as follows:

<table>
<thead>
<tr>
<th>Year</th>
<th>Cash Payment</th>
<th>Interest Income</th>
<th>Principal Reduction</th>
<th>Remaining Principal</th>
</tr>
</thead>
<tbody>
<tr>
<td>1/1/01</td>
<td>$99,817,750.00</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12/31/01</td>
<td>$25,000,000.00</td>
<td>$7,985,420.00</td>
<td>17,014,580.00</td>
<td>82,803,170.00</td>
</tr>
<tr>
<td>12/31/02</td>
<td>25,000,000.00</td>
<td>6,624,253.60</td>
<td>18,375,746.40</td>
<td>64,427,423.60</td>
</tr>
<tr>
<td>12/31/03</td>
<td>25,000,000.00</td>
<td>5,154,193.89</td>
<td>19,845,806.11</td>
<td>44,581,617.49</td>
</tr>
<tr>
<td>12/31/04</td>
<td>25,000,000.00</td>
<td>3,566,529.40</td>
<td>21,433,470.60</td>
<td>23,148,146.89</td>
</tr>
<tr>
<td>12/31/05</td>
<td>25,000,000.00</td>
<td>1,851,853.11*</td>
<td>23,148,146.89</td>
<td>0.00</td>
</tr>
</tbody>
</table>

*Rounded by $1.36

Under the operating method, the firm would recognize rental income of $25,000,000 each year along with depreciation expense of $19,963,550 (i.e., $99,817,750/5).
Based on these calculations, the year-to-year income statement and balance sheet differences under the two methods appear in the following table:

**Operating Method versus Direct Financing Method:**  
**Income Statement and Balance Sheet Comparisons**

<table>
<thead>
<tr>
<th>Year</th>
<th>Lease Payment (a)</th>
<th>Annual Deprec. (b)</th>
<th>Operating Method Income (c)</th>
<th>Direct Financing Income (d)</th>
<th>Income Difference (e)</th>
<th>Operating Method Asset Balance (f)</th>
<th>Direct Financing Method Asset Balance (g)</th>
<th>Asset Balance Difference (h)</th>
</tr>
</thead>
<tbody>
<tr>
<td>12/31/01</td>
<td>25,000,000.00</td>
<td>19,963,550.00</td>
<td>$5,036,450.00</td>
<td>$7,985,420.00</td>
<td>($2,948,970.00)</td>
<td>$79,854,200.00</td>
<td>$82,803,170.00</td>
<td>($2,948,970.00)</td>
</tr>
<tr>
<td>12/31/02</td>
<td>25,000,000.00</td>
<td>19,963,550.00</td>
<td>5,036,450.00</td>
<td>6,624,253.60</td>
<td>(1,587,803.60)</td>
<td>59,890,650.00</td>
<td>64,427,423.60</td>
<td>(4,536,773.60)</td>
</tr>
<tr>
<td>12/31/03</td>
<td>25,000,000.00</td>
<td>19,963,550.00</td>
<td>5,036,450.00</td>
<td>5,154,193.89</td>
<td>(117,743.89)</td>
<td>39,927,100.00</td>
<td>44,581,617.49</td>
<td>(4,654,517.49)</td>
</tr>
<tr>
<td>12/31/04</td>
<td>25,000,000.00</td>
<td>19,963,550.00</td>
<td>5,036,450.00</td>
<td>3,566,529.40</td>
<td>1,469,920.60</td>
<td>19,963,550.00</td>
<td>23,148,146.89</td>
<td>(3,184,596.89)</td>
</tr>
<tr>
<td>12/31/05</td>
<td>25,000,000.00</td>
<td>19,963,550.00</td>
<td>5,036,450.00</td>
<td>1,851,853.11</td>
<td>3,184,596.89</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
</tr>
</tbody>
</table>

$125,000,000.00 $99,817,750.00 $25,182,250.00 $25,182,250.00 $0.00

(a) The annual payment is given as $25,000,000.
(b) Annual depreciation under the operating method is: $99,817,750/5 = $19,963,550.
(c) Income under the operating method is equal to a - b.
(d) Income under the direct financing method was calculated in the table above.
(e) The income difference is c - d. A negative (positive) number means income under the operating method was lower (higher).
(f) The original cost of $99,817,750 minus the accumulated depreciation charges of $19,963,550 per year.
(g) The asset balance under the direct financing method was calculated in the above table.
(h) The difference in asset balances is f - g. A negative (positive) number means the asset balance under the operating method was lower (higher).
P12-12. Asset acquisition: Cash purchase vs. lease vs. note payable

Requirement 1:
The option with the lowest present value to the firm should be selected. The present value of the three options are as follows:

Option I: Non-interest bearing note:
To calculate the present value of this option, discount the note using Corporal Motors’ incremental borrowing rate of 8%. Specifically,

\[
\text{Present value} = 125,000 \times \text{Present value of } \$1 \text{ for } r = 8\% \text{ and } n = 5 \text{ periods.}
\]

\[
= 125,000 \times 0.68058 = 85,073
\]

Option II: Lease the machine at a cost of $22,000 per year for 5 years:
To calculate the present value of this option, discount the 5 lease payments using Corporal Motors’ incremental borrowing rate of 8%. Specifically,

\[
\text{Present value} = 22,000 \times \text{Present value of an ordinary annuity for } r = 8\% \text{ and } n = 5 \text{ periods.}
\]

\[
= 22,000 \times 3.99271 = 87,840
\]

Option III: The present value of this option is simply the purchase price of $90,000.

The firm should choose Option I.

Requirement 2:
Under Option I, the acquisition of the asset would be recorded as follows:

1/1/01:
\[
\begin{align*}
\text{DR} & \quad \text{Property, plant, and equipment} & \quad \$85,073 \\
\text{DR} & \quad \text{Discount on note payable} & \quad 39,927 \\
\text{CR} & \quad \text{Note payable} & \quad 125,000
\end{align*}
\]

The discount on note payable represents interest expense that must be recognized each year over the term of the note. The following table sets forth the amortization of the discount (i.e., recognition of interest expense over the term of the note):

12-30
### Interest Expense Recognition Under Option I

<table>
<thead>
<tr>
<th>Date</th>
<th>Interest Expense (a)</th>
<th>Amortization of Discount (b)</th>
<th>Balance in Discount on N/P (c)</th>
<th>Carrying Amount of N/P (d)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1/1/01</td>
<td>39,927</td>
<td>85,073</td>
<td></td>
<td></td>
</tr>
<tr>
<td>12/31/01</td>
<td>6,806</td>
<td>6,806</td>
<td>33,121</td>
<td>91,879</td>
</tr>
<tr>
<td>12/31/02</td>
<td>7,350</td>
<td>7,350</td>
<td>25,771</td>
<td>99,229</td>
</tr>
<tr>
<td>12/31/03</td>
<td>7,938</td>
<td>7,938</td>
<td>17,833</td>
<td>107,167</td>
</tr>
<tr>
<td>12/31/04</td>
<td>8,573</td>
<td>8,573</td>
<td>9,259</td>
<td>115,741</td>
</tr>
<tr>
<td>12/31/05</td>
<td>9,259</td>
<td>9,259</td>
<td>0</td>
<td>125,000</td>
</tr>
</tbody>
</table>

(a) = 0.08% times the previous balance in column (d) (i.e., times the carrying amount of the liability).

(b) = Since the note is non-interest bearing, the amount of the discount amortized is equal to the amount of imputed interest expense in column (a).

(c) = The previous balance in the column minus (b) (i.e., the existing discount minus the amount amortized in the current year).

(d) = $125,000 (the face amount of the note), minus the amount of unamortized discount on the note.

In addition to the annual interest expense recognized in accordance with the above table, the firm would also depreciate the asset over its 5-year useful life. The annual depreciation expense would be:

Annual depreciation = $85,073/5 = $17,015.

The total expense for 2001 under this option would be $6,806 of interest and $17,015 of depreciation expense for a total of $23,821.

**Requirement 3:**
Over the entire 5-year period, the total expense under Option I would be $125,000. This would consist of $39,927 of interest expense (see the table above) and $85,073 of depreciation expense ($17,015 \times 5).

**Requirement 4:**
If Option II is adopted and the lease were to be accounted for as an operating lease, the total expense recognized in 2001 would be the amount of the annual lease payment, $22,000.
**Requirement 5:**
If Option II is adopted and the lease were to be accounted for as an operating lease, the total expense recognized over the 5-year lease term would be $110,000 (i.e., $22,000 \times 5).

**Requirement 6:**
If Option II is adopted and the lease were to be accounted for as a capital lease, the total expense recognized in 2001 would consist of interest expense and depreciation on the leased asset. As shown under question (1), the present value of the lease payments is $87,840. Based on this and the firm’s incremental borrowing rate of 8%, the amortization of the lease liability would be as follows:

<table>
<thead>
<tr>
<th>Date</th>
<th>Interest Portion (^1)</th>
<th>Cash Payment (^2)</th>
<th>Liability Reduction (^3)</th>
<th>Lease Liability (^4)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1/1/01</td>
<td>$7,027</td>
<td>$22,000</td>
<td>$14,973</td>
<td>$72,867</td>
</tr>
<tr>
<td>12/31/01</td>
<td>5,829</td>
<td>22,000</td>
<td>16,171</td>
<td>56,697</td>
</tr>
<tr>
<td>12/31/02</td>
<td>4,536</td>
<td>22,000</td>
<td>17,464</td>
<td>39,232</td>
</tr>
<tr>
<td>12/31/03</td>
<td>3,139</td>
<td>22,000</td>
<td>18,861</td>
<td>20,371</td>
</tr>
<tr>
<td>12/31/04</td>
<td>1,629*</td>
<td>22,000</td>
<td>20,371</td>
<td>0</td>
</tr>
</tbody>
</table>

*Rounded by $1.

1. The interest portion is 8% of the carrying amount at the beginning of the period.
2. The cash payment is fixed by the lease at $22,000.
3. The reduction in the liability is the difference between the cash payment and the interest portion.
4. The lease liability declines each year by the amount of the liability reduction.

The total expense recognized in 2001 would be $24,595, and would consist of $7,027 of interest expense and $17,568 ($87,840/5) of depreciation expense.

**Requirement 7:**
If Option II is adopted and the lease were to be accounted for as a capital lease, the total expense recognized over the 5-year lease term would be $110,000 (the same as that for the operating lease). This would consist of interest expense of $22,160 and depreciation expense of $87,840.
Requirement 8:
If Option III were adopted, the firm would record an asset with a cost of $90,000. With a 5-year useful life and no salvage value, the annual depreciation expense would be $18,000. Thus, the total expense recognized in 2001 would be $18,000 and would consist entirely of depreciation expense.

Requirement 9:
Under Option III, the total expense recognized over the 5-year period would be $90,000 and would consist entirely of depreciation expense.

P12-13. Constructive capitalization of operating leases

Requirement 1:
The implicit interest rate is calculated as follows:

\[
\frac{70}{77} = \text{Present value of } \$1 \text{ for 1 period at } r\%
\]

\[
0.90909 = \text{Present value of } \$1 \text{ for 1 period at } r\%
\]

To find the rate, examine the table for the present value of $1 for 1 period, and try to find the rate that gives a present value factor that is close to 0.90909. In this case, the exact rate is 10%.

Requirement 2:
The 1998 capital lease payment:

\[
\begin{array}{ccc}
\text{DR} & \text{Obligations under capital leases} & \$70 \\
\text{DR} & \text{Interest expense} & 7 \\
\text{CR} & \text{Cash} & \$77 \\
\end{array}
\]

Requirement 3:
First, calculate the amount of the four payments due after 2002. These four payments are:

\[
= \frac{12,979}{4}
\]

\[
= \$3,245 \text{ (rounded)}
\]

The following table illustrates the calculation of the present value of the operating lease payments:
<table>
<thead>
<tr>
<th>Year</th>
<th>Payment</th>
<th>$1@ 10%</th>
<th>Present Value of Payment</th>
</tr>
</thead>
<tbody>
<tr>
<td>1998</td>
<td>$8,494</td>
<td>0.9091</td>
<td>$7,722</td>
</tr>
<tr>
<td>1999</td>
<td>6,835</td>
<td>0.8264</td>
<td>5,649</td>
</tr>
<tr>
<td>2000</td>
<td>4,952</td>
<td>0.7513</td>
<td>3,721</td>
</tr>
<tr>
<td>2001</td>
<td>4,740</td>
<td>0.6830</td>
<td>3,237</td>
</tr>
<tr>
<td>2002</td>
<td>4,023</td>
<td>0.6209</td>
<td>2,498</td>
</tr>
<tr>
<td>2003</td>
<td>3,245</td>
<td>0.5645</td>
<td>1,832</td>
</tr>
<tr>
<td>2004</td>
<td>3,245</td>
<td>0.5132</td>
<td>1,665</td>
</tr>
<tr>
<td>2005</td>
<td>3,245</td>
<td>0.4665</td>
<td>1,514</td>
</tr>
<tr>
<td>2006</td>
<td>3,245</td>
<td>0.4241</td>
<td>1,376</td>
</tr>
</tbody>
</table>

PV of operating leases: $29,214

**Requirement 4:**

- **DR** Leased assets—capital leases $29,214
- **CR** Obligations under capital leases $29,214

**Requirement 5:**

The interest portion of the payment would be:

\[ = \$29,214 \times 0.10 \]

\[ = \$2,921 \]

The reduction in the lease liability would be:

\[ = \text{Payment} - \text{Interest portion} \]

\[ = \$8,494 - \$2,921 \]

\[ = \$5,573 \]

The journal entry would be:

- **DR** Interest expense $2,921
- **DR** Obligations under capital leases 5,573
- **CR** Cash $8,494

**Requirement 6:**

The effect is indeterminable in general, given the information in the problem. If we assume that the present value of the capitalized operating leases are depreciated straight-line over 9 years, annual depreciation is $29,214 \div 9 = \$3,246$. The effect on the interest coverage ratio is:
Income = \frac{+8,494 - 3,246}{+2,921} = +5,248
\frac{\text{Interest}}{+2,921} = +2,921

To know whether this increases or decreases the interest coverage ratio would require information not provided in the problem regarding the initial levels of 1) operating income before taxes and interest and 2) interest expense.

**Requirement 7:**
All of the firm’s leverage ratios would deteriorate. That is, they would indicate a greater amount of leverage because reported financial statement numbers do not incorporate operating leases.

**Requirement 8:**
The payment of $8,494 would impact the cash flow statement in two distinct ways. The interest portion ($2,921) would be imbedded as part of cash from operating activities, while the reduction in liability ($5,573) would be classified as a financing activity.

**Requirement 9:**
In the case of an operating lease, the entire amount of the payment ($8,494) would be imbedded as part of cash from operating activities.

**Requirement 10:**
The basic rationale for treating certain leases as capital leases is that when they meet any one of the four criteria discussed in the chapter, they transfer valuable property rights from the lessor to the lessee. As a result, the lease should be accounted for in a manner more reflective of the acquisition of an asset. In the case of a capital lease, this entails recognizing the leased asset as an asset on the balance sheet and the present value of the future payments to be made as a liability on the balance sheet. When none of the four criteria is met, then property rights are not considered to have been transferred, and the operating lease approach must be used.

**P12-14. Capital leases: Visualizing the asset-liability relationship over time**

**Requirement 1:**
a) At 8%, the accrual of interest causes the liability at the end of the first year to total $103,718.87 (i.e., a beginning balance of $96,035.99 plus accrued interest of $7,682.88) which exceeds the asset amount of $100,734.19. However, after making the second $10,000 payment, the liability drops to $93,718.87. The liability does not permanently exceed the asset until early in the fourth year.
b) At 12%, the accrual of interest causes the liability at the end of the first year to total $82,496.70 (i.e., a beginning balance of $73,657.77 plus accrued interest of $8,838.93) which exceeds the asset amount of $79,474.88. However, after making the second $10,000 payment, the liability drops to $72,496.70. Again, the liability does not permanently exceed the asset until early in the fourth year.

c) As in parts 1(a) and (b), the accrual of interest causes the liability to exceed the asset starting at the end of year one. But after making the $10,000 payment, the liability amount is lower than the asset amount through the start of year 5. The liability amount does not permanently overtake the asset amount until early in the year 5.

**Requirement 2:**

a) With payments at the end of each year, the carrying value of the asset will never exceed the liability when the discount rate is 8% and the lease runs for twenty years.

b) Raising the interest rate and/or shortening the duration of the lease does not change this result. The carrying value of the asset will always be lower than the liability when payments are made at the end of the year.
Cases
C12-1. Arcadia Financial Ltd.: Lessee accounting and constructive capitalization

Requirement 1:
Summary journal entries ($ in thousands)

Capital Lease:
- **DR** Interest expense (12.0%* × $2,774**) $332.88
- **DR** Lease obligation (plug) 1,645.12
- **CR** Cash (from lease footnote) $1,978.00

* Incremental borrowing rate. ** Present value of capital leases on 12/31/99.

- **DR** Depreciation expense ($9,926/4) $2,481.50
- **CR** Accumulated depreciation —leased equipment $2,481.50

Operating Lease:
- **DR** Rent expense (from lease footnote) $9,369
- **CR** Cash $9,369
### Requirement 2: Effect of capitalizing operating leases on various ratios ($ in millions)

<table>
<thead>
<tr>
<th>Ratio</th>
<th>Before</th>
<th>After</th>
</tr>
</thead>
<tbody>
<tr>
<td>Debt-to-Equity Ratio (Debt/Equity)</td>
<td>Total Debt 12/31/99 Total Stk. Equity 12/31/99</td>
<td>($693.2 + $16.9) ($172.1 - $2.5) = 4.19</td>
</tr>
<tr>
<td></td>
<td>$693.2/$172.1 = 4.03</td>
<td></td>
</tr>
<tr>
<td>Interest Coverage (IBIT/Interest Expense)</td>
<td>($[88.5]* + $55.2**)/55.2 = ($33.3)/$55.2 = -0.60</td>
<td>$(27.4)/57.9 = -0.47</td>
</tr>
</tbody>
</table>

1 Present value of leases on 12/31/99 (see Exhibit A which follows).
2 Difference between change in assets ($14.4) and change in liabilities ($16.9) from capitalizing operating leases. The $2.5 cannot be accurately broken down between deferred taxes and owners’ equity. The entire effect has been put in equity.
3 Operating lease payment in 1999 that would not be expensed if leases are capitalized.

* Operating loss before tax
** Interest expense

12% × 12/31/98 Present value of operating leases = $22.5 × .12 = $2.7
<table>
<thead>
<tr>
<th>Ratio</th>
<th>Before</th>
<th>After</th>
</tr>
</thead>
<tbody>
<tr>
<td>Return on Assets (NI + Interest Expense)</td>
<td>($92.5) * + $55.2</td>
<td>$(92.5) + $8.3&lt;sup&gt;(1)&lt;/sup&gt; - $2.7&lt;sup&gt;(2)&lt;/sup&gt; - $2.4&lt;sup&gt;(3)&lt;/sup&gt; + ($55.2 + $2.7&lt;sup&gt;(4)&lt;/sup&gt;)</td>
</tr>
<tr>
<td></td>
<td>($865.3 + $727.7)/2</td>
<td>($865.3 + $14.4&lt;sup&gt;(5)&lt;/sup&gt; + $727.7 + $19.1&lt;sup&gt;(6)&lt;/sup&gt;)/2</td>
</tr>
<tr>
<td></td>
<td>$37.3</td>
<td>- 3.86%</td>
</tr>
<tr>
<td></td>
<td>$796.5</td>
<td></td>
</tr>
<tr>
<td></td>
<td>-4.68%</td>
<td></td>
</tr>
<tr>
<td></td>
<td>*(Net loss after taxes)</td>
<td></td>
</tr>
</tbody>
</table>

<sup>(1)</sup> 1999 Operating lease payment.

<sup>(2)</sup> Additional interest expense in 1999 if operating leases are capitalized

(12/31/98 PV 12%) = $22.5 12% = $2.7

<sup>(3)</sup> Depreciation expense

(12/31/98 PV 85%/8 yrs) = $22.5 85% = $19.12/8 yrs. = $2.39

85% is our approximation of the ratio of asset carrying value to lease liability carrying value for the combination of interest rate, total lease life and asset life expired in this case. See Table 3 of Imhoff, Lipe, and Wright, “Operating Leases: Impact of Constructive Capitalization,” Accounting Horizons (March 1991), pp 51-62. This is an approximation since Table 3 does not include factors for an eight year life.

<sup>(4)</sup> Interest expense for capitalized operating leases in 1999

12%  $22.5 (PV of operating leases on 12/31/98)

= $2.7

<sup>(5)</sup> See Exhibit A for asset book values added on 12/31/99.

<sup>(6)</sup> See Exhibit A for asset book values added on 12/31/98.
Exhibit A
Effect of Capitalizing Operating Lease Commitment
Arcadia Financial ($ in millions)

<table>
<thead>
<tr>
<th>Year</th>
<th>Scheduled Cash Flows</th>
<th>12% PV Factor</th>
<th>PV on 12/31/98</th>
<th>12% PV Factor</th>
<th>PV on 12/31/99</th>
</tr>
</thead>
<tbody>
<tr>
<td>1999</td>
<td>$8.3</td>
<td>0.89286</td>
<td>$  7.4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2000</td>
<td>9.4</td>
<td>0.79719</td>
<td>7.5</td>
<td>0.89286</td>
<td>$  8.4</td>
</tr>
<tr>
<td>2001</td>
<td>6.4</td>
<td>0.71178</td>
<td>4.6</td>
<td>0.79719</td>
<td>5.1</td>
</tr>
<tr>
<td>2002</td>
<td>3.0</td>
<td>0.63552</td>
<td>1.9</td>
<td>0.71178</td>
<td>2.1</td>
</tr>
<tr>
<td>2003</td>
<td>1.4</td>
<td>0.56743</td>
<td>.8</td>
<td>0.63552</td>
<td>.9</td>
</tr>
<tr>
<td>2004</td>
<td>.4</td>
<td>0.50663</td>
<td>.2</td>
<td>0.56743</td>
<td>.2</td>
</tr>
<tr>
<td>2005-2007</td>
<td>.1*</td>
<td>1.21684**</td>
<td>.1</td>
<td>1.52641***</td>
<td>.2</td>
</tr>
</tbody>
</table>

Lease obligation $22.5 $16.9

Ratio of asset book value to lease obligation**** 85% 85%

Asset Book Value $19.13 $14.37

*.366/3 years = $.122/year

** PV factor @ 12% for 9 years - PV factor @ 12% for 6 years

***PV factor @ 12% for 8 years - PV factor @ 12% for 5 years

****Asset book values are the approximate ratio of asset to liability balance based on a combination of total lease life, the interest rate used to discount the lease obligation, and the percentage of original lease life expired [see Table 3 of Imhoff, Lipe, and Wright, “Operating Leases: Impact of Constructive Capitalization,” Accounting Horizons (March 1991), pp. 51-62]. The 85% ratio is imprecise since Table 3 does not give ratio figures for an eight-year lease life. The instructor should consider assigning this article as a reading to accompany this case. Alternatively, the instructor may wish to give the students the 85% ratio.
**Exhibit B**

**Effect of Capitalizing Operating Leases on the 12/31/99 Balance Sheet**

**Arcadia Financial**

<table>
<thead>
<tr>
<th>Assets:</th>
<th>Liabilities:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unrecorded net assets $14.4</td>
<td>Unrecorded leases $16.9</td>
</tr>
<tr>
<td>(from Exhibit A)</td>
<td>(from Exhibit A)</td>
</tr>
<tr>
<td>Net debit to balance 2.5*</td>
<td></td>
</tr>
<tr>
<td>Total assets $16.9</td>
<td>Total liabilities and equity $16.9</td>
</tr>
</tbody>
</table>

*This is a combination of a debit to deferred taxes and a debit or credit to owners equity. These two effects cannot be separated.

**Requirement 3:**
In many cases bond ratings would probably go down if constructive capitalization of operating leases was not already factored into the rating since the debt/equity ratio, times interest earned, and ROA usually deteriorate after operating leases are treated as capital leases. But here the effects are very small. Indeed, two of the ratios improve slightly after constructive capitalization.

**C12-2. May Department Stores (CW): Constructive capitalization of operating leases**

(all $ amounts in millions)

**Requirement 1:**
1/29/00:

- **DR** Leased assets—capital leases $291
- **CR** Obligation under capital leases $291

**Requirement 2:**
Long-term debt-to-equity ratio based on reported numbers:

\[
= \frac{3,560}{4,077} = .873
\]

**Requirement 3:**
Long-term debt-to-equity ratio based on reported numbers after giving effect to operating leases:

\[
= \frac{(3,560 + 291)}{4,077} = .944
\]

The ratio increases by about 8.1% as a result of “capitalizing” the firm’s operating leases. While the increase is not dramatic, it does illustrate that
using reported balance sheet figures to calculate a firm’s leverage position has the potential to understate a firm’s “true” leverage.

**Requirement 4:**
To see if the rate implicit in the leases is closer to 8% or 9%, discount the future operating lease payments using the two rates and see which yields the estimate that is closest to the $291,000,000 that May reports in its footnotes. The following table reports these calculations:

**Calculation of the approximate interest rate that is implicit in May’s operating leases.**

<table>
<thead>
<tr>
<th>Year</th>
<th>Operating Lease Payment</th>
<th>PV of Operating Lease at 8%</th>
<th>PV of Operating Lease at 9%</th>
</tr>
</thead>
<tbody>
<tr>
<td>2000</td>
<td>$51.00</td>
<td>0.92593 $47.22</td>
<td>0.91743 $46.79</td>
</tr>
<tr>
<td>2001</td>
<td>46.00</td>
<td>0.85734 39.44</td>
<td>0.84168 38.72</td>
</tr>
<tr>
<td>2002</td>
<td>43.00</td>
<td>0.79383 34.13</td>
<td>0.77218 33.20</td>
</tr>
<tr>
<td>2003</td>
<td>40.00</td>
<td>0.73503 29.40</td>
<td>0.70843 28.34</td>
</tr>
<tr>
<td>2004</td>
<td>38.00</td>
<td>0.68058 25.86</td>
<td>0.64993 24.70</td>
</tr>
<tr>
<td>2005</td>
<td>26.40</td>
<td>0.63017 16.64</td>
<td>0.59627 15.74</td>
</tr>
<tr>
<td>2006</td>
<td>26.40</td>
<td>0.58349 15.40</td>
<td>0.54703 14.44</td>
</tr>
<tr>
<td>2007</td>
<td>26.40</td>
<td>0.54027 14.26</td>
<td>0.50187 13.25</td>
</tr>
<tr>
<td>2008</td>
<td>26.40</td>
<td>0.50025 13.21</td>
<td>0.46043 12.16</td>
</tr>
<tr>
<td>2009</td>
<td>26.40</td>
<td>0.46319 12.23</td>
<td>0.42241 11.15</td>
</tr>
<tr>
<td>2010</td>
<td>26.40</td>
<td>0.42888 11.32</td>
<td>0.38753 10.23</td>
</tr>
<tr>
<td>2011</td>
<td>26.40</td>
<td>0.39711 10.48</td>
<td>0.35553 9.39</td>
</tr>
<tr>
<td>2012</td>
<td>26.40</td>
<td>0.36770 9.71</td>
<td>0.32618 8.61</td>
</tr>
<tr>
<td>2013</td>
<td>26.40</td>
<td>0.34046 8.99</td>
<td>0.29925 7.90</td>
</tr>
<tr>
<td>2014</td>
<td>26.40</td>
<td>0.31524 8.32</td>
<td>0.27454 7.25</td>
</tr>
<tr>
<td></td>
<td>Total PV $296.61</td>
<td>Total PV $281.87</td>
<td></td>
</tr>
</tbody>
</table>

Based on the calculations in the above table, it appears that the interest rate implicit in the present value of May’s operating leases is closer to 8% than to 9%.
Requirement 5:
2000 Lease payment:

Interest portion = $291.0 \times 0.08

= $23.3

Reduction in lease liability = $51.0 - 23.3

= $27.7

<table>
<thead>
<tr>
<th>DR</th>
<th>Interest expense</th>
<th>$23.3</th>
</tr>
</thead>
<tbody>
<tr>
<td>DR</td>
<td>Obligation under capital leases</td>
<td>27.7</td>
</tr>
<tr>
<td>CR</td>
<td>Cash</td>
<td>$51.0</td>
</tr>
</tbody>
</table>

C12-3. Tuesday Morning Corporation (CW): Comprehensive leasee reporting

Requirement 1:
No. The 1993 balance sheet lists a zero balance for current installments on capital lease obligation (current liability) and capital lease obligations, excluding current installments (long-term liability).

Requirement 2:
It had a bargain purchase option. See Note 6.

Requirement 3:
$2,642,000. See Note 6.

Requirement 4:
A: Total lease payments is just the sum of the annual payments from 1995-1999.

= $933 + 933 + 707 + 255 + 170

= $2,998

B: Amount representing interest is equal to A - C = $570.

C: Present value of minimum lease payments is equal to $607 + 1,821 = $2,428.

Requirement 5:
The interest portion is:

= $2,428 \times 0.125

= $304
The reduction in the liability is:

\[
\begin{align*}
&= \$933 - 304 \\
&= \$629
\end{align*}
\]

**DR** Interest expense $304  
**DR** Obligation under capital leases 629  
**CR** Cash $933*  
* From Note 6.

**Requirement 6:**  
The following table presents the calculation of the present value of the operating lease payments based on an interest rate of 12%.

<table>
<thead>
<tr>
<th>Year</th>
<th>Payment</th>
<th>Present Value Factor at 12.00%</th>
<th>Present Value of Payment</th>
</tr>
</thead>
<tbody>
<tr>
<td>1995</td>
<td>$12,437</td>
<td>0.8929</td>
<td>$11,104</td>
</tr>
<tr>
<td>1996</td>
<td>10,487</td>
<td>0.7972</td>
<td>8,360</td>
</tr>
<tr>
<td>1997</td>
<td>8,211</td>
<td>0.7118</td>
<td>5,845</td>
</tr>
<tr>
<td>1998</td>
<td>6,239</td>
<td>0.6355</td>
<td>3,965</td>
</tr>
<tr>
<td>1999</td>
<td>3,106</td>
<td>0.5674</td>
<td>1,762</td>
</tr>
<tr>
<td>2000</td>
<td>1,985</td>
<td>0.5066</td>
<td>1,006</td>
</tr>
<tr>
<td>Total</td>
<td>$42,465</td>
<td></td>
<td>$32,042</td>
</tr>
</tbody>
</table>

Estimated present value of capital lease obligation using a rate of 12%  
= $32,042

**Requirement 7:**  
**DR** Leased assets—capital leases $32,042  
**CR** Obligation under capital leases $32,042

**Requirement 8:**  
The interest portion is:

\[
\begin{align*}
&= \$32,042 \times 0.12 \\
&= \$3,845
\end{align*}
\]

The reduction in the liability is:

\[
\begin{align*}
&= \$12,437 - \$3,845 \\
&= \$8,592
\end{align*}
\]
**Requirement 9:**
Long-term debt to shareholders’ equity ratio:

Based on reported balance sheet numbers:

\[ \frac{(-4,952 + 1,821 + 2,920)}{58,630} \]

\[ = 16.5\% \]

Long-term debt to shareholders’ equity ratio after adjusting for the constructive capitalization of the operating leases:

\[ \frac{(-4,952 + 1,821 + 2,920 + 32,042)}{58,630} \]

\[ = 71.2\% \]

**Requirement 10:**
The “reported” leverage of the firm increases by over 400% after giving effect to the present value of the future operating lease payments.

---

**C12-4. Delta Air Lines, Inc. (CW): Constructive capitalization of operating leases:**

**Requirement 1:**
Long-term capital lease obligations (E) can be obtained from the balance sheet information provided as part of the case. The amount is $196.

Current obligations under capital leases (D) can be obtained from the balance sheet information provided as part of the case. The amount is $39.

Present value of future minimum capital lease payments (C) is simply the sum of D and E. $196 + $39 = $235.

Total minimum lease payments (A) is simply the sum of the amounts listed in the lease footnote. That is, $63 + $57 + $57 + $48 + $32 + $40 = $297.

Amounts representing interest (B) is the difference between the undiscounted future capital lease payments minus the discounted value of the future capital lease payments (i.e., B = A - C). B = $297 - $235 = $62.
**Requirement 2:**
The two payments after 2004 are assumed to be the same. The amount of each payment is estimated to be $40/2 = $20.0

**Requirement 3:**
Using an interest rate of 10.0%, the present value of the capital lease payments is $221.5. The calculation appears in the following table.

**Calculation of the Present Value of Delta’s Capital Lease Obligation Based on an Interest Rate of 10%**

<table>
<thead>
<tr>
<th>Year</th>
<th>Payment</th>
<th>Present Value Factor at 10.0%</th>
<th>Present Value of Payment</th>
</tr>
</thead>
<tbody>
<tr>
<td>2000</td>
<td>$63</td>
<td>0.90909</td>
<td>$57.3</td>
</tr>
<tr>
<td>2001</td>
<td>57</td>
<td>0.82645</td>
<td>47.1</td>
</tr>
<tr>
<td>2002</td>
<td>57</td>
<td>0.75132</td>
<td>42.8</td>
</tr>
<tr>
<td>2003</td>
<td>48</td>
<td>0.68301</td>
<td>32.8</td>
</tr>
<tr>
<td>2004</td>
<td>32</td>
<td>0.62092</td>
<td>19.9</td>
</tr>
<tr>
<td>2005</td>
<td>20</td>
<td>0.56447</td>
<td>11.3</td>
</tr>
<tr>
<td>2006</td>
<td>20</td>
<td>0.51316</td>
<td>10.3</td>
</tr>
<tr>
<td>Total</td>
<td>$297</td>
<td></td>
<td>$221.5</td>
</tr>
</tbody>
</table>

The estimated present value of the capital lease obligation using a rate of 10.0% is $221.5.

The amount appearing in the footnote for the present value of the capital leases is $235.0. The amounts are not that far apart, indicating that our estimated interest rate of 10.0% is reasonably accurate. The accuracy of our estimated rate is important to know since we will be using it to capitalize Delta’s operating leases. Finally, since the present value of $221.5 that we estimate is less than that reported in the footnote ($235.0), the 10% rate is slightly more than the rate implicit in Delta’s capital lease obligation.

**Requirement 4:**
The amount of the capital lease payment is $63.0. Using our 10.0% interest rate, the journal entry would be:

- **DR** Interest expense (.10 x $221.5) $22.2
- **DR** Obligation under capital leases (plug) 40.8
- **CR** Cash $63.0
**Requirement 5:**
The ten payments after 2004 are assumed to be the same. The amount of each payment is estimated to be $9,440/10 = $944.0.

**Requirement 6:**
Using the weighted average interest rate of 10.0%, the present value of the operating lease payments is $7,466.7. The calculation appears in the following table:

<table>
<thead>
<tr>
<th>Year</th>
<th>Payment</th>
<th>10.0% Present Value Factor</th>
<th>Payment Value of Payment</th>
</tr>
</thead>
<tbody>
<tr>
<td>2000</td>
<td>$1,020</td>
<td>0.90909</td>
<td>$927.3</td>
</tr>
<tr>
<td>2001</td>
<td>1,030</td>
<td>0.82645</td>
<td>851.2</td>
</tr>
<tr>
<td>2002</td>
<td>1,040</td>
<td>0.75132</td>
<td>781.4</td>
</tr>
<tr>
<td>2003</td>
<td>1,020</td>
<td>0.68301</td>
<td>696.7</td>
</tr>
<tr>
<td>2004</td>
<td>980</td>
<td>0.62092</td>
<td>608.5</td>
</tr>
<tr>
<td>2005</td>
<td>944</td>
<td>0.56447</td>
<td>532.9</td>
</tr>
<tr>
<td>2006</td>
<td>944</td>
<td>0.51316</td>
<td>484.4</td>
</tr>
<tr>
<td>2007</td>
<td>944</td>
<td>0.46651</td>
<td>440.4</td>
</tr>
<tr>
<td>2008</td>
<td>944</td>
<td>0.42410</td>
<td>400.3</td>
</tr>
<tr>
<td>2009</td>
<td>944</td>
<td>0.38554</td>
<td>363.9</td>
</tr>
<tr>
<td>2010</td>
<td>944</td>
<td>0.35049</td>
<td>330.9</td>
</tr>
<tr>
<td>2011</td>
<td>944</td>
<td>0.31863</td>
<td>300.8</td>
</tr>
<tr>
<td>2012</td>
<td>944</td>
<td>0.28966</td>
<td>273.4</td>
</tr>
<tr>
<td>2013</td>
<td>944</td>
<td>0.26333</td>
<td>248.6</td>
</tr>
<tr>
<td>2014</td>
<td>944</td>
<td>0.23939</td>
<td>226.0</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>$14,530</strong></td>
<td></td>
<td><strong>$7,466.7</strong></td>
</tr>
</tbody>
</table>

Estimated present value of operating leases is: $7,466.7

**Requirement 7:**
- **DR** Leased aircraft—capital leases $7,466.7
- **CR** Obligation under capital leases $7,466.7

**Requirement 8:**
The amount of the payment is $1,020.0. Using our 10.0% interest rate, the journal entry would be:

- **DR** Interest expense (.10 × $7,466.7) $746.7
- **DR** Obligation under capital leases ($1,020.0 - $746.7) 273.3
- **CR** Cash $1,020.0
**Requirement 9:**
a) Rations based on reported balance sheet numbers:

Long-term debt to shareholders’ equity (using just “long-term debt”):

\[ \frac{\$1,756}{\$4,448} = 39.5\% \]

Long-term debt to shareholders’ equity (using total noncurrent liabilities):

\[ \frac{\$5,856}{\$4,448} = 131.7\% \]

Total liabilities to total assets:

\[ \frac{\$5,327 + \$5,856 + \$913}{\$16,544} = 73.1\% \]

These ratios reveal that Delta has moderately high leverage.

b) Ratios adjusted for the present value of Delta’s operating lease payments:

Long-term debt to shareholders’ equity (using just long-term debt):

\[ \frac{\$1,756 + \$7,466.7}{\$4,448} = 207.3\% \]

Long-term debt to shareholders’ equity (using total noncurrent liabilities):

\[ \frac{\$5,856 + \$7,466.7}{\$4,448} = 299.5\% \]

Total liabilities to total assets:

\[ \frac{\$5,327 + \$5,856 + \$913 + \$7,466.7}{\$16,544 + \$7,466.7} = 81.5\% \]

All three ratios increase from those based simply on the reported numbers.

**Requirement 10:**
The most often cited reason is to keep debt off of the firm’s balance sheet. As was shown above, long-term debt-to-equity ratios tend to increase dramatically when operating leases are constructively capitalized. Another reason to prefer operating leases over capital leases is that the interest coverage ratio will tend to be higher when operating leases are used in place
of capital leases. Finally, for firms that enter into new leases at a rate faster than that at which older leases are terminating, their income will tend to be lower (year in and year out) when the leases are capitalized versus when they are accounted for as operating leases. This is because the combined effect of the interest expense and depreciation expense under the capital lease treatment will tend to exceed the amount of rent expense that would have been recorded under the operating lease method. As a result, income will be lower.

C12-5. Nationsbank (KR): Lease classification and the times interest earned ratio

Requirement 1:
As discussed throughout the book, companies do have some discretion in how they choose to report a given economic transaction. For instance, a company might be able to convert a true “capital” lease into an operating lease by carefully designing the lease agreement. In addition, GAAP financial statements are general purpose financial statements, and, consequently, different users might make different modifications to the GAAP numbers to make them suitable for their own purposes.

Lenders are not bound by the GAAP definition of financial leverage; instead, they are more interested in measuring the “true” financial leverage of their borrowers. Typically, textbooks define the coverage ratio as income before interest and taxes divided by interest expense. The GAAP definition for interest expense also includes interest expense on capital leases. Consequently, the classification of a lease agreement into operating versus capital lease might impact the fixed coverage ratio. This is especially true after a borrower enters into a credit agreement where the thresholds have already been defined.

Assume the company treats its lease as a capital lease for accounting purposes. Based on its current income figures, the company enters into a credit agreement that requires the company to maintain a times interest earned ratio of 1.20 on June 30, 1997, which will increase to 1.50 at the end of September 30, 1997. After entering into the credit agreement, the company “somehow” restructures the lease agreement to satisfy the definition of an operating lease. The effect of this restructuring on the times interest earned ratio is provided below:
Capital Operating Lease

Income before interest and taxes $120,000 $60,000
Interest on capital lease $ 60,000
Interest on borrowings 40,000 $40,000
Total interest expense $100,000 $40,000

Times interest earned 1.20 1.50

Now, the $60,000 interest expense will be part of the lease rent expense, and, therefore, will be subtracted from the income before interest and taxes. This raises the times interest earned ratio to 1.50. The higher ratio provides more flexibility to the borrower. For instance, the company’s income before interest and taxes can go down by as much as $12,000 (from $120,000 to $108,000) without violating the covenant for the times interest earned ratio. Consequently, the company may be inclined to take on riskier projects that increase the variance in earnings. Of course, higher earnings variability increases the risk credit risk, and, therefore, the lender might be worse off. Alternatively, without increasing its “true” performance, the company will have already reached the threshold for September 30, 1997, by treating the capital lease as an operating lease. Once again, this might provide greater flexibility to managers, which may not be in the best interest of the lender.

In order to reduce such managerial opportunism, most lenders provide their own definitions for financial ratios. For instance, Nationsbank of Texas includes rent expenses from operating leases as part of the fixed charges in calculating the coverage ratio. Consequently, a borrower will not be able to increase the coverage ratio by merely restructuring some of the capital leases as operating leases. In fact, the ratio will go down since the rent expense under operating leases is likely to be greater than the interest expense component of the capital lease. To illustrate this point, let us assume that the depreciation on the leased equipment is $30,000. Also assume that if the capital lease were structured as an operating lease, the annual lease expense will equal the sum of the depreciation and interest expense under the capital lease ($30,000 + $60,000). Based on these assumptions, the fixed charges coverage ratio is calculated under the two accounting methods:
Income before deprec., rent, interest and taxes

(-) Depreciation on leased equipment

Income before rent, interest and taxes

Rent for operating lease

Interest on capital lease

Interest on borrowings

Fixed charges

Fixed charges coverage ratio

While $30,000 is assumed for the illustrative purposes, the fixed charges coverage ratio will decline for any depreciation number. In essence, by providing its own definition for the coverage ratio, Nationsbank of Texas has tried to mitigate the effects of any opportunistic behavior on the part of its borrowers.

Requirement 2:
Note that if the times interest earned ratio is more than 1.00, recategorization of the lease into an operating lease will increase the ratio from 1.20 to 1.50. In contrast, if the ratio is less than 1.00, this recategorization will decrease the ratio. This is illustrated through the following example (assume that income before interest and taxes was $95,000 under the capital lease scenario):

In the above case, a company might have incentives to reclassify the operating lease into a capital lease to increase the times-interest-earned ratio. Does the fixed charges coverage ratio used by Nationsbank solve this incentive problem? To examine this, let us recalculate the fixed charges coverage ratio assuming the lower income level:
<table>
<thead>
<tr>
<th></th>
<th>Capital Lease</th>
<th>Operating Lease</th>
</tr>
</thead>
<tbody>
<tr>
<td>Income before depreciation, rent, interest and taxes</td>
<td>$125,000</td>
<td>$125,000</td>
</tr>
<tr>
<td>(-) Depreciation on leased equipment</td>
<td>30,000</td>
<td></td>
</tr>
<tr>
<td>Income before rent, interest and taxes</td>
<td>$ 95,000</td>
<td>$125,000</td>
</tr>
</tbody>
</table>

Rent for operating lease | $ 70,000 |
Interest on capital lease | $ 40,000 |
Interest on borrowings | 60,000 |
Fixed charges | $100,000 |

Fixed charges coverage ratio | 0.95 |

Unlike the times interest earned ratio, the fixed charges coverage ratio actually decreases from 0.96 to 0.95. Consequently, it takes away the incentives to switch from operating to capital leases when the borrower is performing poorly.

**Note:** In addition to the fixed charges coverage ratio, bankers also typically include a leverage ratio. For instance, Nationsbank had the following leverage covenant in the lending agreement:

Borrower shall not permit the ratio of Total Liabilities to Tangible Net Worth to be greater than as indicated below, (a) as at the end of each fiscal quarter of Borrower, ending during the period indicated or (b) on the date indicated:

- Effective Date through December 31, 1996: 2.50 to 1.00
- March 31, 1997 and thereafter: 1.75 to 1.00

“Tangible Net Worth” means, with respect to Borrower, shareholders’ equity, as shown on a balance sheet prepared in accordance with GAAP on a consolidated basis, less the aggregate book value of intangible assets shown on such balance sheet.

“Total Liabilities” means all liabilities of Borrower which would be classified as total liabilities on a balance sheet prepared in accordance with GAAP on a consolidated basis.

If a borrower attempts to switch from an operating to a capital lease, it might adversely affect the borrower’s compliance with the leverage covenant since capital leases are included under liabilities in GAAP financial statements. In summary, by including multiple financial ratio covenants, lenders try to effectively monitor and control any ex-post opportunistic behavior on the part of borrowers.
The instructor should point out to students that different assumptions were made regarding the duration of the operating lease payments after 2001 for each of the companies. The specific duration was chosen to reflect the decay function in each firm’s five-year payment schedule. That is, the computed 2002 payment (and those of following years) is lower than the 2001 payment by an “appropriate” amount. Similarly, the discount rate for each firm’s operating leases was calculated using the approach for Sears in Requirement 1, which immediately follows.
Requirement 1:
The capital lease payments due after 2001 are assumed equal and made over a 15-year period. The amount of the assumed payment is $40 ($600/15).

The following table calculates the present value of the capital lease payments at interest rates of 12% and 13%. Since the present value of $335.75 at 12% is closer to the $333.0 amount reported by the firm, the interest rate implicit in the capital lease obligation is closer to 12% than to 13%.

<table>
<thead>
<tr>
<th>Year</th>
<th>Payment</th>
<th>Present Value Factor @ 12%</th>
<th>Present Value of Payment @ 12%</th>
<th>Present Value Factor @ 13%</th>
<th>Present Value of Payment @ 13%</th>
</tr>
</thead>
<tbody>
<tr>
<td>1997</td>
<td>56.00</td>
<td>0.8929</td>
<td>$50.00</td>
<td>0.8850</td>
<td>$49.56</td>
</tr>
<tr>
<td>1998</td>
<td>52.00</td>
<td>0.7972</td>
<td>41.45</td>
<td>0.7831</td>
<td>40.72</td>
</tr>
<tr>
<td>1999</td>
<td>49.00</td>
<td>0.7118</td>
<td>34.88</td>
<td>0.6931</td>
<td>33.96</td>
</tr>
<tr>
<td>2000</td>
<td>47.00</td>
<td>0.6355</td>
<td>29.87</td>
<td>0.6133</td>
<td>28.83</td>
</tr>
<tr>
<td>2001</td>
<td>44.00</td>
<td>0.5674</td>
<td>24.97</td>
<td>0.5428</td>
<td>23.88</td>
</tr>
<tr>
<td>2002</td>
<td>40.00</td>
<td>0.5066</td>
<td>20.27</td>
<td>0.4803</td>
<td>19.21</td>
</tr>
<tr>
<td>2003</td>
<td>40.00</td>
<td>0.4523</td>
<td>18.09</td>
<td>0.4251</td>
<td>17.00</td>
</tr>
<tr>
<td>2004</td>
<td>40.00</td>
<td>0.4039</td>
<td>16.16</td>
<td>0.3762</td>
<td>15.05</td>
</tr>
<tr>
<td>2005</td>
<td>40.00</td>
<td>0.3606</td>
<td>14.42</td>
<td>0.3329</td>
<td>13.32</td>
</tr>
<tr>
<td>2006</td>
<td>40.00</td>
<td>0.3220</td>
<td>12.88</td>
<td>0.2946</td>
<td>11.78</td>
</tr>
<tr>
<td>2007</td>
<td>40.00</td>
<td>0.2875</td>
<td>11.50</td>
<td>0.2607</td>
<td>10.43</td>
</tr>
<tr>
<td>2008</td>
<td>40.00</td>
<td>0.2567</td>
<td>10.27</td>
<td>0.2307</td>
<td>9.23</td>
</tr>
<tr>
<td>2009</td>
<td>40.00</td>
<td>0.2292</td>
<td>9.17</td>
<td>0.2042</td>
<td>8.17</td>
</tr>
<tr>
<td>2010</td>
<td>40.00</td>
<td>0.2046</td>
<td>8.18</td>
<td>0.1807</td>
<td>7.23</td>
</tr>
<tr>
<td>2011</td>
<td>40.00</td>
<td>0.1827</td>
<td>7.31</td>
<td>0.1599</td>
<td>6.40</td>
</tr>
<tr>
<td>2012</td>
<td>40.00</td>
<td>0.1631</td>
<td>6.52</td>
<td>0.1415</td>
<td>5.66</td>
</tr>
<tr>
<td>2013</td>
<td>40.00</td>
<td>0.1456</td>
<td>5.82</td>
<td>0.1252</td>
<td>5.01</td>
</tr>
<tr>
<td>2014</td>
<td>40.00</td>
<td>0.1300</td>
<td>5.20</td>
<td>0.1108</td>
<td>4.43</td>
</tr>
<tr>
<td>2015</td>
<td>40.00</td>
<td>0.1161</td>
<td>4.64</td>
<td>0.0981</td>
<td>3.92</td>
</tr>
<tr>
<td>2016</td>
<td>40.00</td>
<td>0.1037</td>
<td>4.15</td>
<td>0.0868</td>
<td>3.47</td>
</tr>
</tbody>
</table>

Total present value: $335.75 $317.25
Requirement 2:
The operating lease payments due after 2001 are assumed equal and made over a 6-year period. The amount of the assumed payment is $175 ($1,050/6). The present value of the operating lease payments of Sears is given in the following table. The amount is $1,267.05 (in millions of $s).

Calculation of the Present Value of the Operating Lease Payments
Sears Roebuck
(In Millions)

<table>
<thead>
<tr>
<th>Year</th>
<th>Payment</th>
<th>Present Value Factor @ 12%</th>
<th>Present Value of Payment @ 12%</th>
</tr>
</thead>
<tbody>
<tr>
<td>1997</td>
<td>$279.00</td>
<td>0.8929</td>
<td>$249.11</td>
</tr>
<tr>
<td>1998</td>
<td>259.00</td>
<td>0.7972</td>
<td>206.47</td>
</tr>
<tr>
<td>1999</td>
<td>231.00</td>
<td>0.7118</td>
<td>164.42</td>
</tr>
<tr>
<td>2000</td>
<td>207.00</td>
<td>0.6355</td>
<td>131.55</td>
</tr>
<tr>
<td>2001</td>
<td>189.00</td>
<td>0.5674</td>
<td>107.24</td>
</tr>
<tr>
<td>2002</td>
<td>175.00</td>
<td>0.5066</td>
<td>88.66</td>
</tr>
<tr>
<td>2003</td>
<td>175.00</td>
<td>0.4523</td>
<td>79.15</td>
</tr>
<tr>
<td>2004</td>
<td>175.00</td>
<td>0.4039</td>
<td>70.68</td>
</tr>
<tr>
<td>2005</td>
<td>175.00</td>
<td>0.3606</td>
<td>63.11</td>
</tr>
<tr>
<td>2006</td>
<td>175.00</td>
<td>0.3220</td>
<td>56.35</td>
</tr>
<tr>
<td>2007</td>
<td>175.00</td>
<td>0.2875</td>
<td>50.31</td>
</tr>
</tbody>
</table>

Total present value: $1,267.05
**Requirement 3:**
The operating lease payments due after 2001 are assumed equal and made over a 7-year period. The amount of the assumed payment is $21,000 ($147,000/7). The present value of the operating lease payments of Dillard's is given in the following table. The amount is $147.49 (in millions of $s).

**Calculation of the Present Value of the Operating Lease Payments**

<table>
<thead>
<tr>
<th>Year</th>
<th>Payment (In Thousands)</th>
<th>Present Value Factor @ 12%</th>
<th>Present Value @ 12%</th>
</tr>
</thead>
<tbody>
<tr>
<td>1997</td>
<td>$29,444.00</td>
<td>0.8929</td>
<td>$26,290.55</td>
</tr>
<tr>
<td>1998</td>
<td>26,241.00</td>
<td>0.7972</td>
<td>20,919.32</td>
</tr>
<tr>
<td>1999</td>
<td>24,746.00</td>
<td>0.7118</td>
<td>17,614.20</td>
</tr>
<tr>
<td>2000</td>
<td>24,093.00</td>
<td>0.6355</td>
<td>15,311.10</td>
</tr>
<tr>
<td>2001</td>
<td>22,857.00</td>
<td>0.5674</td>
<td>12,969.06</td>
</tr>
<tr>
<td>2002</td>
<td>21,000.00</td>
<td>0.5066</td>
<td>10,638.60</td>
</tr>
<tr>
<td>2003</td>
<td>21,000.00</td>
<td>0.4523</td>
<td>9,498.30</td>
</tr>
<tr>
<td>2004</td>
<td>21,000.00</td>
<td>0.4039</td>
<td>8,481.90</td>
</tr>
<tr>
<td>2005</td>
<td>21,000.00</td>
<td>0.3606</td>
<td>7,572.60</td>
</tr>
<tr>
<td>2006</td>
<td>21,000.00</td>
<td>0.3220</td>
<td>6,762.00</td>
</tr>
<tr>
<td>2007</td>
<td>21,000.00</td>
<td>0.2875</td>
<td>6,037.50</td>
</tr>
<tr>
<td>2008</td>
<td>21,000.00</td>
<td>0.2567</td>
<td>5,390.70</td>
</tr>
<tr>
<td><strong>Total present value:</strong></td>
<td></td>
<td></td>
<td><strong>$147,485.83</strong></td>
</tr>
</tbody>
</table>
**Requirement 4:**
The operating lease payments due after 2001 are assumed equal and made over a 10-year period. The amount of the assumed payment is $125.0 ($1,250/10). The present value of the operating lease payments of Federated is given in the following table. The amount is $982.6 (in millions of $s).

### Calculation of the Present Value of the Operating Lease Payments
**Federated**
*(In Millions)*

<table>
<thead>
<tr>
<th>Year</th>
<th>Payment</th>
<th>Present Value Factor @ 11%</th>
<th>Present Value @ 11%</th>
</tr>
</thead>
<tbody>
<tr>
<td>1997</td>
<td>$174.60</td>
<td>0.9009</td>
<td>$157.30</td>
</tr>
<tr>
<td>1998</td>
<td>151.40</td>
<td>0.8116</td>
<td>122.88</td>
</tr>
<tr>
<td>1999</td>
<td>139.00</td>
<td>0.7312</td>
<td>101.64</td>
</tr>
<tr>
<td>2000</td>
<td>132.80</td>
<td>0.6587</td>
<td>87.48</td>
</tr>
<tr>
<td>2001</td>
<td>128.70</td>
<td>0.5935</td>
<td>76.38</td>
</tr>
<tr>
<td>2002</td>
<td>125.00</td>
<td>0.5346</td>
<td>66.83</td>
</tr>
<tr>
<td>2003</td>
<td>125.00</td>
<td>0.4817</td>
<td>60.21</td>
</tr>
<tr>
<td>2004</td>
<td>125.00</td>
<td>0.4339</td>
<td>54.24</td>
</tr>
<tr>
<td>2005</td>
<td>125.00</td>
<td>0.3909</td>
<td>48.86</td>
</tr>
<tr>
<td>2006</td>
<td>125.00</td>
<td>0.3522</td>
<td>44.03</td>
</tr>
<tr>
<td>2007</td>
<td>125.00</td>
<td>0.3173</td>
<td>39.66</td>
</tr>
<tr>
<td>2008</td>
<td>125.00</td>
<td>0.2858</td>
<td>35.73</td>
</tr>
<tr>
<td>2009</td>
<td>125.00</td>
<td>0.2575</td>
<td>32.19</td>
</tr>
<tr>
<td>2010</td>
<td>125.00</td>
<td>0.2320</td>
<td>29.00</td>
</tr>
<tr>
<td>2011</td>
<td>125.00</td>
<td>0.2090</td>
<td>26.13</td>
</tr>
</tbody>
</table>

Total present value: $982.56
**Requirement 5:**
Ratios based on reported balance sheet data:

Long-term debt to shareholders’ equity:

Sears: $12,170/$4,945 = 246.1%
Dillard: $1,186.7/$2,717.2 = 43.7%
Federated: $4,605.9/$4,669.2 = 98.6%

Long-term debt to total assets:

Sears: $12,170/$36,167 = 33.7%
Dillard: $1,186.7/$5,059.7 = 23.5%
Federated: $4,605.9/$14,264.1 = 32.3%

**Requirement 6:**
Ratios adjusted for the effect of operating leases:

Long-term debt to shareholders’ equity:

Sears: ($12,170 + $1,267.05)/$4,945 = 271.7%
Dillard: ($1,186.7 + $147.49)/$2,717.2 = 49.1%
Federated: ($4,605.9 + $982.6)/$4,669.2 = 119.7%

Long-term debt to total assets:

Sears: ($12,170 + $1,267.05)/($36,167 + $1,267.06) = 35.9%
Dillard: ($1,186.7 + $147.49)/($5,059.7 + $147.49) = 25.6%
Federated: ($4,605.9 + $982.6)/($14,264.1 + $982.6) = 36.7%

Discussion of long-term debt to shareholders’ equity:

All of the firms’ ratios increase as a result of capitalizing their operating leases. However, only Sears’ and Federated’s increases seem significant, while that of Dillard is not large. Specifically, Sears’ ratio increases by about twenty-five percentage points, Federated’s increases by about nineteen percentage points, while Dillard’s increases by only about five percentage points.
Discussion of long-term debt to total assets:

All of the firms’ ratios increase as a result of capitalizing their operating leases. However, all of the increases are quite modest. Across the three firms, the increase in the ratios range from about two to four percentage points.

C12-7. United Airlines: Capital lease criteria and reporting incentives
(The Case of the Curious Speech)

This case setting encompasses two primary issues. First, there is the technical question of what constitutes a “bargain purchase option.” Exploring this issue allows the instructor to discuss the flexibility (“looseness”) inherent in both SFAS No. 13 and in financial reporting in general as well as the ambiguity surrounding materiality judgments. Second, the case provides an excellent vehicle for outlining managerial motivations for “off-balance sheet” transactions.

Requirement 1:
Whether the lease with the Export/Import Bank contains a bargain purchase option is open to some interpretation. Clearly, the opportunity to buy the DC-10s at the end of the lease “for the fair market value at that time or for 50 percent of the original amount of financing, whichever is less” raises the possibility of a bargain acquisition.

SFAS No. 13 defines a bargain purchase option as follows (para. 5.d.):

A provision allowing the lessee, at his option, to purchase the leased property for a price which is sufficiently lower than the expected fair value of the property at the date the option becomes exercisable, that exercise of the option appears, at the inception of the lease, to be reasonably assured.

The key issue is what is meant by “exercise of the option appears . . . to be reasonably assured.”

Let’s examine the two possibilities that could exist at lease expiration. First, fair market value could be lower than 50% of the original amount of financing. In this instance, on the surface there would appear to be no special inducement to exercise the option. On the other hand, if United needs the aircraft, there still may be a positive incentive to acquire these specific aircraft. The reasoning is as follows: Prevailing market price incorporates “market for lemons” considerations1. However, after 15-1/4 years of use,

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United will know the operating condition of these three aircraft with virtual certainty. If United knows these aircraft to be of superior quality, then this information asymmetry could make acquisition even at the fair market price a “bargain” nonetheless. Second, if fair market value exceeds 50% of the original amount of financing, a “bargain” exists, and there is an obvious incentive to exercise the option. Under these conditions, the option would be exercised independent of whether United’s load factors justify acquisition since the aircraft could be resold immediately to others at a profit.

Considering both possible alternatives at lease expiration, there is a real possibility that the purchase option would be exercised. Indeed, this likelihood increases dramatically if United perceives that it will need the capacity at lease expiration. But does this “likelihood” constitute “reasonable assurance”? Judgments of this sort permeate financial reporting, and this setting provides a good forum for discussing the issue.

Although this lease option falls into a gray area, it is evident that classifying this as an operating lease is somewhat aggressive, as Ferris himself points out. If time permits, the instructor might use this as a vehicle for discussing the pressures on auditors to accede to clients’ reporting choices in a competitive audit environment. Issues that could be introduced here include the cost structure of repeat engagements (i.e., the slope of the learning curve), auditors’ power (i.e., are audits becoming commodity goods), and the prevalence of auditor changes.

**Requirement 2:**
This is the most intriguing part of the case. What motivated Ferris to advertise to the analyst community that UAL’s statements may not reflect the underlying economics of the lease transaction?

One possibility is that he was simply alerting the analysts to the sophistication of UAL’s management. The ability to engineer admittedly clever terms in order to circumvent capital lease treatment told the airline analysts that UAL was in financially expert hands and this expertise could lead to extraordinary future performance. While it is possible that this may have been Ferris’ motive, it is likely that the real reason for discussing the off-balance sheet financing was more subtle.

Consider the following alternative motivation. By 1984, it was widely recognized that the deregulated environment made airline growth not only feasible, it also made such growth essential in order to be economically competitive in the newly created “hub and spoke” route structure. But United (along with several major competitors) experienced financial difficulties and large operating losses over the several years preceding the speech. It is reasonable to assume that the analysts may have feared that future expansion needs would be stymied by loan covenant restrictions and/or
impending covenant violations. If so, then Ferris was probably signaling the analysts that United Airlines had the financial acumen and requisite borrowing capacity to acquire the new aircraft necessary to compete in the deregulated environment.

Notice that this interpretation is consistent with two major themes in the speech: (1) the considerable emphasis on UAL, Inc.’s improved debt-to-equity ratio (“one of the strongest ratios in the industry”) and (2) the announced intention of continuing “similar [lease] transactions in the future without putting debt on our balance sheet.” In this view, the “curious” element in the speech is understandable in light of the newly deregulated airline environment: Ferris was signaling the analysts that United had the ability to grow and to thereby be in a strong position to compete effectively.