# CHAPTER 22

Accounting Changes and Error Analysis

## OPTIONAL ASSIGNMENT CHARACTERISTICS TABLE

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>BE22-1</td>
<td>Change in principle—long-term contracts <em>(tax effect ⇒ deferred tax liability).</em></td>
</tr>
<tr>
<td>BE22-3</td>
<td>Change in principle—inventory methods <em>(tax effect ⇒ income taxes payable).</em></td>
</tr>
<tr>
<td>BE22-6</td>
<td>Accounting for error <em>(tax effect ⇒ deferred tax liability).</em></td>
</tr>
<tr>
<td>BE22-8</td>
<td>Analyze the effects of errors.</td>
</tr>
<tr>
<td>E22-2</td>
<td>Change in principle—inventory methods.</td>
</tr>
<tr>
<td>E22-4</td>
<td>Accounting change—inventory method.</td>
</tr>
<tr>
<td>E22-6</td>
<td>Accounting changes—depreciation.</td>
</tr>
<tr>
<td>E22-8</td>
<td>Accounting for accounting changes and errors.</td>
</tr>
<tr>
<td>E22-9</td>
<td>Error and change in estimate—depreciation.</td>
</tr>
<tr>
<td>E22-11</td>
<td>Change in estimate—depreciation.</td>
</tr>
<tr>
<td>E22-12</td>
<td>Change in estimate—depreciation (correction: purchase date is 1/1/09 and the $370,000 income before depreciation expense is for 2011)</td>
</tr>
<tr>
<td>E22-13</td>
<td>Change in principle—long-term contracts.</td>
</tr>
<tr>
<td>E22-16</td>
<td>Error analysis and correcting entry.</td>
</tr>
<tr>
<td>E22-17</td>
<td>Error analysis and correcting entry.</td>
</tr>
<tr>
<td>E22-18</td>
<td>Error analysis.</td>
</tr>
<tr>
<td>E22-19</td>
<td>Error analysis and correcting entries.</td>
</tr>
<tr>
<td>E22-20</td>
<td>Error analysis.</td>
</tr>
<tr>
<td>P22-1</td>
<td>Change in estimate and error correction.</td>
</tr>
<tr>
<td>P22-2</td>
<td>Comprehensive accounting change and error analysis problem.</td>
</tr>
<tr>
<td>P22-3</td>
<td>Error corrections and accounting changes.</td>
</tr>
<tr>
<td>P22-6</td>
<td>Accounting changes and error analysis.</td>
</tr>
</tbody>
</table>
BRIEF EXERCISE 22-1 (adjust tax effects through deferred tax liability)

Construction in Process ($120,000 – $80,000)................................................. 40,000
Deferred Tax Liability ($40,000 X 35%)......................................................... 14,000
Retained Earnings ($40,000 – $14,000)......................................................... 26,000

BRIEF EXERCISE 22-3 (adjust tax effects through income taxes payable)

Inventory............................................................................................................... 1,200,000
Income Taxes Payable ($1,200,000 X 40%)......................................................... 480,000
Retained Earnings ($1,200,000 – $480,000)....................................................... 720,000

BRIEF EXERCISE 22-6

Equipment ............................................................................................................. 50,000
Accumulated Depreciation ($50,000 / 5 X 2) ....................................................... 20,000
Deferred Tax Liability ($30,000 X 30%)............................................................. 9,000
Retained Earnings ($30,000 – $9,000)................................................................. 21,000

BRIEF EXERCISE 22-8

<table>
<thead>
<tr>
<th></th>
<th>2012</th>
<th>2013</th>
</tr>
</thead>
<tbody>
<tr>
<td>a.</td>
<td>Overstated</td>
<td>Overstated</td>
</tr>
<tr>
<td>b.</td>
<td>Overstated</td>
<td>Understated</td>
</tr>
<tr>
<td>c.</td>
<td>Understated</td>
<td>Overstated</td>
</tr>
<tr>
<td>d.</td>
<td>Overstated</td>
<td>Understated</td>
</tr>
<tr>
<td>e.</td>
<td>No effect</td>
<td>Overstated</td>
</tr>
</tbody>
</table>

EXERCISE 22-2

(a) Inventory........................................................................................................ 11,000
Retained Earnings ($65,000 – $54,000)*............................................................. 11,000
*FIFO ($19,000 + $21,000 + $25,000) = $65,000; Avg Cost ($16,000 + $18,000 + $20,000) = $54,000
(b) Net Income (FIFO) 2011 = $19,000  2012 = $21,000  2013 = $25,000
(c) Inventory........................................................................................................ 22,000
Retained Earnings ($65,000 – $43,000)*............................................................. 22,000
*LIFO ($12,000 + $14,000 + $17,000) = $43,000
EXERCISE 22-4

(a) Retained earnings, January 1, as reported ......................................................... $160,000
Cumulative effect of change in accounting principle to average cost ............................ (13,000)*
Retained earnings, January 1, as adjusted ............................................................... $147,000
*[2008: ($8,000) + 2009: ($5,000)]

(b) Retained earnings, January 1, as reported ......................................................... $590,000
Cumulative effect of change in accounting principle to average cost ............................ (20,000)*
Retained earnings, January 1, as adjusted ............................................................... $570,000
*[2008: ($8,000) + 2009: ($5,000) + 2010: ($10,000) + 2011: $10,000 + 2012: ($7,000)]

(c) Retained earnings, January 1, as reported ......................................................... $780,000
Cumulative effect of change in accounting principle to average cost ............................ (15,000)*
Retained earnings, January 1, as adjusted ............................................................... $765,000
*[(20,000) from (b) + 2013: $5,000]

(d) these are comparative net income amounts included in the 2013 income statement:

<table>
<thead>
<tr>
<th>Year</th>
<th>Net Income</th>
</tr>
</thead>
<tbody>
<tr>
<td>2011</td>
<td>$130,000</td>
</tr>
<tr>
<td>2012</td>
<td>$293,000</td>
</tr>
<tr>
<td>2013</td>
<td>$310,000</td>
</tr>
</tbody>
</table>

EXERCISE 22-6

(a) Depreciation Expense [($105,000 − $15,000) ÷ 2] ........................................... 45,000
Accumulated Depreciation—Equipment ................................................................. 45,000

Sum-of-the-years’-digits depreciation:
2009 [(($465,000 − $15,000) x 5/15] $150,000
2010 [($465,000 − $15,000) x 4/15] 120,000
2011 [($465,000 − $15,000) x 3/15] 90,000
Accumulated depreciation (12/31/09) $360,000

Book value (12/31/11) = $465,000 − $360,000 = $105,000

(b) Depreciation Expense [(702,000 ÷ (40 − 3)] ..................................................... 18,973
Accumulated Depreciation—Buildings ................................................................. 18,973

Accumulated depreciation (12/31/11) = $780,000 ÷ 30 = $26,000 x 3 years = $78,000
Book value (12/31/11) = $780,000 − $78,000 = $702,000

EXERCISE 22-8

1. b. 2. b. 3. a. 4. b. 5. b. 6. a. 7. b. 8. a. 9. b. 10. a.
EXERCISE 22-9

To correct for the omission of depreciation expense in 2010:
Retained Earnings ($440,000 X 9/55) ........................................ 72,000
Accumulated Depreciation—Machinery .................................. 72,000

To record depreciation for 2012:
Depreciation Expense [($224,000 / (10 – 3)] .................................. 32,000
Accumulated Depreciation—Machinery ................................. 32,000

Cost of Machine ........................................ $440,000
Less: Accumulated Depreciation, 1/1/12:
2009 ($440,000 X 10/55) .................................. $80,000
2010 ($440,000 X 9/55) .................................. 72,000
2011 ($440,000 X 8/55) .................................. 64,000
Book Value at January 1, 2012 ........................................ $224,000

EXERCISE 22-11

(a) No entry necessary. Changes in estimates are treated prospectively.

(b) Depreciation Expense [($220,000 − $4,000) / (15 − 7)] .................... 27,000
Accumulated Depreciation—Equipment ................................. 27,000

Book value (1/1/13) = $710,000 − [($710,000 − $10,000) / (10 X 7)] = $220,000

EXERCISE 22-12

(a) No journal entry to record the change, but must revise the depreciation amount for 2012 for the AJE:

Depreciation Expense [($1,012,500 − $100,000) / (8 − 3)] ................. 182,500
Accumulated Depreciation—Plant Assets .............................. 182,500

Cost of Machine ........................................ $2,400,000
Less Accumulated Depreciation, 1/1/12:
2009 [($2,400,000 − $0) X 2/8] = .................................. $600,000
2010 [($2,400,000 − $600,000) X 2/8] = .................................. 450,000
2011 [($2,400,000 − $1,050,000) X 2/8] = .................................. 337,500
Book value at 1/1/12 = ................................. $1,012,500

(b) Income before depreciation expense ........................................ $300,000
Depreciation expense ........................................ 182,500
Net income ........................................ $117,500

EXERCISE 22-13 (note: adjust tax effects through deferred tax liability)

(a) Income before income tax ........................................ $900,000
Income tax (40% X $900,000) ........................................ 360,000
Net income ........................................ $540,000

(b) Construction in Process ($980,000 − $730,000) ......................... 250,000
Deferred Tax Liability (40% X $250,000) ................................. 100,000
Retained Earnings ($250,000 − $100,000) ................................. 150,000
EXERCISE 22-16

1. Wages Expense ................................................................. 3,400
   Wages Payable ............................................................... 3,400

2. Wages Expense ................................................................. 31,100
   Vacation Wages Payable .................................................. 31,100

3. Prepaid Insurance ($3,300 X 10/12) ....................................... 2,750
   Insurance Expense .......................................................... 2,750

4. Sales Revenue [$1,908,000 – ($1,908,000 / 1.06)] ....................... 108,000
   Sales Tax Expense .......................................................... 103,400
   Sales Tax Payable ($108,000 – $103,400) .......................... 4,600

EXERCISE 22-17

(to correct for depreciation errors—net understatement of expense which resulted in overstated NI & RE)

Retained Earnings .................................................................. 19,500
   Accumulated Depreciation—Equipment ($38,500 – $19,000) .......... 19,500

(to correct for inventory errors—12/31/12 error has counterbalanced by 2013, so no entry needed; but must correct 12/31/13 ending inventory overstatement which resulted in understated COGS and overstated NI & RE)

Retained Earnings .................................................................. 14,200
   Inventory ........................................................................... 14,200

EXERCISE 22-18

<table>
<thead>
<tr>
<th>Error effect: overstated (understated)</th>
<th>(a) 2012 net income</th>
<th>(b) 12/31/12 working capital</th>
<th>(c) 12/31/12 retained earnings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Understatement of 2011 ending inventory (&amp; 2012 beg.)*</td>
<td>$9,600</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Overstatement of 2012 ending inventory</td>
<td>7,100</td>
<td>7,100</td>
<td>7,100</td>
</tr>
<tr>
<td>Understatement of 2011 depreciation expense (NE on work. Cap.)</td>
<td>2,300</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Expensing insurance premium in 2011**</td>
<td>20,000</td>
<td>(20,000)</td>
<td>(20,000)</td>
</tr>
<tr>
<td>Failure to record sale of fully depreciated machine in 2012***</td>
<td>(15,000)</td>
<td>(15,000)</td>
<td>(15,000)</td>
</tr>
<tr>
<td>Total effect of errors</td>
<td>$21,700</td>
<td>$(27,900)</td>
<td>$(25,600)</td>
</tr>
</tbody>
</table>

* errors affecting 2011 & 2012 NI counterbalanced for 12/31/12 RE

** 2011: expense overstated by $40,000 ($60,000 – $20,000 that s/b expensed each year) ⇒ NI understated
2012: expense understated by $20,000 ⇒ NI overstated; 12/31/12 prepaid insurance understated by $20,000 for 1 remaining year; 12/31/12 RE has cumulative understatement of $20,000 (2011 NI understated $40,000 & 2012 NI overstated $20,000)

*** understated 2012 gain & 12/31/12 cash
EXERCISE 22-19

(a) 1. Supplies Expense ($2,500 – $1,100) ......................................................... 1,400
    Supplies ................................................................. 1,400

2. Salary and Wages Expense ($4,400 – $1,500) ........................................... 2,900
    Salaries and Wages Payable ........................................... 2,900

3. Interest Revenue ($5,100 – $4,350) ............................................................. 750
    Interest Receivable ...................................................... 750

4. Insurance Expense ($90,000 – $65,000) ....................................................... 25,000
    Prepaid Insurance ........................................................ 25,000

5. Rental Revenue ($24,000 / 2) ................................................................. 12,000
    Unearned Rent Revenue ................................................ 12,000

6. Depreciation Expense ($50,000 – $5,000) ..................................................... 45,000
    Accumulated Depreciation .............................................. 45,000

7. Retained Earnings ................................................................................... 7,200
    Accumulated Depreciation .............................................. 7,200

(b) 1. Retained Earnings ................................................................................... 1,400
    Supplies ................................................................. 1,400

2. Retained Earnings ................................................................................... 2,900
    Salaries and Wages Payable ........................................... 2,900

3. Retained Earnings ................................................................................... 750
    Interest Receivable ...................................................... 750

4. Retained Earnings ................................................................................... 25,000
    Prepaid Insurance ........................................................ 25,000

5. Retained Earnings ................................................................................... 12,000
    Unearned Rent Revenue ................................................ 12,000

6. Retained Earnings ................................................................................... 45,000
    Accumulated Depreciation .............................................. 45,000

7. Same as in (a).
EXERCISE 22-20

Income before tax

<table>
<thead>
<tr>
<th></th>
<th>2012</th>
<th>2013</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$101,000</td>
<td>$77,400</td>
</tr>
</tbody>
</table>

Corrects:

1. Sales erroneously included in 2012 income       (38,200)  38,200
2. Understatement of 2012 ending inventory*     8,640     (8,640)
3. Adjustment to bond interest expense**         (1,800)    (1,926)
4. Repairs charged to equipment & depreciated*** (7,200)    (7,660)

Corrected income before tax

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$  62,440</td>
<td>$97,374</td>
</tr>
</tbody>
</table>

*Beginning inventory
+ purchases
- ending inventory

**Adjustment to Bond interest expense:

<table>
<thead>
<tr>
<th></th>
<th>2012</th>
<th>2013</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$15,000</td>
<td>$15,000</td>
</tr>
</tbody>
</table>

Effective

<table>
<thead>
<tr>
<th></th>
<th>2012</th>
<th>2013</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>16,800</td>
<td>16,926</td>
</tr>
</tbody>
</table>

Understatement of interest expense

Date       | Cash paid | 7% interest | Disc amort | CV bonds
-----------|-----------|-------------|------------|---------|
1/1/12      | $240,000  |             |            |         |
12/31/12    | $15,000   | $16,800     | $1,800     | 241,800 |
12/31/13    | 15,000    | 16,926      |            |         |

***Understatement of repair expense

<table>
<thead>
<tr>
<th></th>
<th>2012</th>
<th>2013</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$8,000</td>
<td>$9,400</td>
</tr>
</tbody>
</table>

Overstatement of depreciation expense

2012: ($8,000 x 10%) = (800)
2013: [($8,000 + $9,400) x 10%] = (1,740)

Net understatement of expenses

<table>
<thead>
<tr>
<th></th>
<th>2012</th>
<th>2013</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$7,200</td>
<td>$7,660</td>
</tr>
</tbody>
</table>

PROBLEM 22-1

(a) 1. Depreciation Expense [($61,000 - $3,000) / 4] ............................................. 14,500
    Accumulated Depreciation—Equipment ............................................. 14,500

    Accumulated Depreciation (1/1/12) = [($85,000 - $5,000) / 10 = $8,000 x 3 yrs] = $24,000
    Book value (1/1/12) = ($85,000 - $24,000) = $61,000

2. Depreciation Expense [($192,000 - $30,000) / (10 - 2)] .................. 20,250
    Accumulated Depreciation—Building ............................................. 20,250

    Book value (January 1, 2012) = [$300,000 - ($60,000 + $48,000)] = $192,000

3. Depreciation Expense [($120,000 - $16,000) / 8] ............................... 13,000
    Accumulated Depreciation—Machine ............................................. 13,000

    Accumulated Depreciation—Machine ($22,500 - $19,500) .................. 3,000
    Retained Earnings ................................................................. 3,000

    Depreciation recorded in 2010 & 2011: [($120,000 / 8) x 1.5] = $22,500
    Depreciation that should have been recorded in 2010 & 2011: ($13,000 x 1.5) = $19,500
PROBLEM 22-1 continued

(b) HOLTZMAN COMPANY
Comparative Income Statements
For the Years 2012 and 2011

<table>
<thead>
<tr>
<th></th>
<th>2012</th>
<th>2011</th>
</tr>
</thead>
<tbody>
<tr>
<td>Income before</td>
<td>$300,000</td>
<td>$310,000</td>
</tr>
<tr>
<td>depreciation expense</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Depreciation</td>
<td>47,750</td>
<td>69,000</td>
</tr>
<tr>
<td>expense*</td>
<td>$352,250</td>
<td>$241,000</td>
</tr>
<tr>
<td>Net income</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Depreciation Expense 2011 = $8,000 equipment + $48,000 building + $13,000 machine = $69,000

*Depreciation Expense 2012 = $1,4500 equipment + $20,250 building + $13,000 machine = $47,750

PROBLEM 22-2

(a) 1. Bad debt expense for 2010 should not have been reduced by $10,000. A change in the experience rate is considered a change in estimate, which should be handled prospectively.
2. A change from LIFO to FIFO is considered a change in accounting principle, which must be handled retrospectively.
3. (a) The inventory error in 2012 is a prior period adjustment and the 2012 and 2013 financial statements should be restated.
   (b) The entertainment expenses have been correctly treated.

(b) BOTTICELLI INC.
Comparative Income Statements

<table>
<thead>
<tr>
<th></th>
<th>2010</th>
<th>2011</th>
<th>2012</th>
<th>2013</th>
</tr>
</thead>
<tbody>
<tr>
<td>Income before</td>
<td>$145,000</td>
<td>$135,000</td>
<td>$201,000</td>
<td>$274,000</td>
</tr>
<tr>
<td>extraordinary item</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Extraordinary gain</td>
<td></td>
<td>30,000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Net income (see below)</td>
<td>$145,000</td>
<td>$165,000</td>
<td>$201,000</td>
<td>$274,000</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>2010</th>
<th>2011</th>
<th>2012</th>
<th>2013</th>
</tr>
</thead>
<tbody>
<tr>
<td>Net income (unadjusted)</td>
<td>$140,000</td>
<td>$160,000</td>
<td>$205,000</td>
<td>$276,000</td>
</tr>
</tbody>
</table>

1. Bad debt expense adjustment
2. Inventory adjustment (FIFO)
3. Inventory overstatement

Net income (adjusted) $145,000 $165,000* $201,000 $274,000

*The income before extraordinary item in 2011 is $135,000 ($165,000 – $30,000).

PROBLEM 22-3

1. Retained Earnings (U expense in 2011 overstated NI & RE) .. 3,500
   Sales Commissions Payable ............................................................... 2,500
   Sales Commissions Expense ($3,500 O from 2011 – $2,500 U from 2012) 1,000

2. Cost of Goods Sold (to correct 2012 understatement) .. 25,700
   Retained Earnings (to correct 2010 & 2011 understatement of NI) .... 19,000
   Inventory (to correct 2012 overstatement of ending inventory) ........ 6,700

Overstated (Understated)

<table>
<thead>
<tr>
<th></th>
<th>2010</th>
<th>2011</th>
<th>2012</th>
</tr>
</thead>
<tbody>
<tr>
<td>Beginning inventory</td>
<td>$ (16,000)</td>
<td>$ (19,000)</td>
<td></td>
</tr>
<tr>
<td>+ Purchases</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Ending inventory</td>
<td>$ (16,000)</td>
<td>(19,000)</td>
<td>6,700</td>
</tr>
<tr>
<td>= COGS</td>
<td>$16,000</td>
<td>$3,000</td>
<td>$25,700</td>
</tr>
</tbody>
</table>
PROBLEM 22-3 continued

3. Accumulated Depreciation—Equipment ........................................ 4,800
   Depreciation Expense ($12,800 – $8,000) .................................. 4,800*

   *Depreciation recorded = $12,800
   Correct depreciation (SL: ([($100,000 – $36,000) = $64,000 / (10 – 2)] = $8,000

4. Construction in Process ($150,000 – $105,000) ................................ 45,000
   Deferred Tax Liability ($45,000 x 40%) ........................................ 18,000
   Retained Earnings ($45,000 – $18,000) ....................................... 27,000

PROBLEM 22-6

(a) 1. Depreciation Expense ($378,000 X 7/28*) ............................. 94,500
    Accumulated Depreciation—Asset A ........................................... 94,500

    Cost of Asset A ................................................................. $540,000
    Less: Accumulated Depreciation, 1/1/12 [(540,000 / 10) X 3] ... 162,000
    Book value, 1/1/12 ............................................................ $378,000

    * (10 – 3) = 7 years remaining; SYD = [7(7 + 1)] / 2 = 28

2. Depreciation Expense [($132,000 – $3,000) / (9 – 4)] ..................... 25,800
    Accumulated Depreciation—Asset B ......................................... 25,800

    Cost of Asset B ................................................................. $180,000
    Less: Accumulated depreciation, 1/1/12 [(180,000 / 15) X 4] ... 48,000
    Book value, 1/1/12 ............................................................ $132,000

3. Asset C ................................................................. 160,000
    Accumulated Depreciation—Asset C ($16,000 x 4) ...................... 64,000
    Retained Earnings ............................................................. 96,000
    Depreciation Expense ($160,000 / 10) ..................................... 16,000
    Accumulated Depreciation—Asset C ......................................... 16,000

(b) MADRASA INC.
    Retained Earnings Statements
    For the Years Ended December 31

<table>
<thead>
<tr>
<th></th>
<th>2012</th>
<th>2011</th>
</tr>
</thead>
<tbody>
<tr>
<td>Retained earnings, January 1, as previously reported</td>
<td>$200,000</td>
<td></td>
</tr>
<tr>
<td>Add: Prior period adjustment for error in recording asset</td>
<td></td>
<td>112,000*</td>
</tr>
<tr>
<td>Retained earnings, January 1, as adjusted</td>
<td>$666,000</td>
<td>312,000</td>
</tr>
<tr>
<td>Add: Net income</td>
<td>208,700**</td>
<td>354,000***</td>
</tr>
<tr>
<td>Retained earnings, December 31</td>
<td>$874,700</td>
<td>$666,000</td>
</tr>
</tbody>
</table>

*Amount expensed incorrectly in 2008—overstated
Understated depreciation prior to 2011 ($16,000 X 3) .......................... 48,000
Prior period adjustment for income—add since NI was understated ............... $112,000

**($400,000 net income before depreciation expense – $191,300 depreciation expense) = $208,700
Depreciation expense = ($94,500 Asset A + $25,800 Asset B + $16,000 Asset C + $55,000 other)

***($370,000 net income as reported – $16,000 asset C depreciation expense) = $354,000