Note on Cash Flow Statements

Indirect Cash Flow Statements can be pretty confusing, but they don't have to be if you think about their relationship to the other financial statements. Here I present several examples to help you to intuitively think about how you can use the income statement and the balance sheet to determine the statement of cash flows using the indirect method. After looking at these examples, you can construct even more complicated ones for yourself to strengthen your intuition.

There is a mathematical method for thinking about the indirect method. Here I will repeat the derivation that you saw in class. You should also have this information in

- the note entitled "Understanding the Statement of Cash Flow" in the course packet, and
- the class slides "The Statement of Cash Flow."

Balance Sheet Equation:

\[ A(t) = L(t) + SE(t) \]

Beginning Balance Sheet Equation (at time t)

\[ A(t+1) = L(t+1) + SE(t+1) \]

Ending Balance Sheet Equation (at time t+1 period)

Differences:

\[ \Delta A = \Delta L + \Delta SE \]

Decompose:

\[ \Delta \text{Cash} + \Delta \text{OCA} + \Delta \text{NCA} = \Delta \text{CL} + \Delta \text{NCL} + \Delta \text{CC} + \Delta \text{OE} + \Delta \text{RE} \]

Note that \( \Delta \text{RE} = \text{NI} - \text{Div} \) so we have:

\[ \Delta \text{Cash} + \Delta \text{OCA} + \Delta \text{NCA} = \Delta \text{CL} + \Delta \text{NCL} + \Delta \text{CC} + \Delta \text{OE} + \text{NI} - \text{Div} \]

Since we are interested in the change in cash, we re-arrange to solve for the change in cash:

\[ \Delta \text{Cash} = - \Delta \text{OCA} - \Delta \text{NCA} + \Delta \text{CL} + \Delta \text{NCL} + \Delta \text{CC} + \Delta \text{OE} + \text{NI} - \text{Div} \]

Putting in the accounts we know about:

\[ \Delta \text{Cash} = + \text{NI} - \Delta \text{netA/R} - \Delta \text{Inv.} - \Delta \text{OCA} + \Delta \text{CL} - \Delta \text{netPPE} - \Delta \text{NCA} + \Delta \text{NCL} + \Delta \text{CC} + \Delta \text{OE} - \text{Div} \]

But the change in net PP&E can be broken down even further into B/S and I/S effects:

\[ \Delta \text{netPPE} = \Delta \text{PPE} - \Delta \text{AccDepreciation} \]

\[ \Delta \text{PPE} = \text{Acquisition} - \text{Disposal at Original Cost} \]

\[ \Delta \text{AccDepreciation} = \text{DepExp} - \text{AccDepreciation of Disposed Item} \]

Thus:

\[ \Delta \text{PPE} - \Delta \text{AccDepreciation} - \text{Gain(Loss)} + \text{DepExp} = \text{Acquisition} - (\text{Disposal at Original Cost} - \text{AccDepreciation of Disposed Item}) - \text{Gain(Loss)} \]

Rearranging:

\[ \Delta \text{Cash} = + \text{NI} + \text{DepExp} - \Delta \text{netA/R} - \Delta \text{Inv.} - \Delta \text{OCA} + \Delta \text{CL} - \text{Gain(Loss)} - \text{DepExp} + (\Delta \text{PPE} - \Delta \text{AccDepreciation}) + \text{Gain(Loss)} - \text{DepExp} - \Delta \text{NCA} + \Delta \text{NCL} + \Delta \text{CC} + \Delta \text{OE} - \text{Div} \]

Further:

\[ \Delta \text{PPE} = \text{Acquisition} - \text{Disposal at Original Cost} \]

\[ \Delta \text{AccDepreciation} = \text{DepExp} - \text{AccDepreciation of Disposed Item} \]

Thus:

\[ \Delta \text{PPE} - \Delta \text{AccDepreciation} - \text{Gain(Loss)} + \text{DepExp} = \text{Acquisition} - (\text{Disposal at Original Cost} - \text{AccDepreciation of Disposed Item}) - \text{Gain(Loss)} \]

Sloan School of Management, 15.515
Example 1 - Revenues and the indirect statement of cash flows
A Simple Example - Services sold with no COGS

<table>
<thead>
<tr>
<th>Transaction</th>
<th>Assets</th>
<th>Liabilities</th>
<th>Shareholders' Equity</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Make a sale for cash</td>
<td>$30,000</td>
<td>$30,000</td>
<td></td>
<td>Sales Revenue</td>
</tr>
<tr>
<td>Make a sale on credit</td>
<td>$42,000</td>
<td>$42,000</td>
<td></td>
<td>Sales Revenue</td>
</tr>
<tr>
<td>Customer pays part of A/R</td>
<td>37,000</td>
<td>(37,000)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>$67,000</td>
<td>$5,000</td>
<td>$72,000</td>
<td></td>
</tr>
</tbody>
</table>

Cash Collected of $67,000 Equals Increase in A/R of $5,000 Minus the Net Income of $72,000

Statement of Cash Flows
Cash from Operating
Net Income $ 72,000
Adjustments
(Less increase\(^1\) in Current Assets)
Increase in A/R (5,000)

Cash Increase from Operating $ 67,000
Cash from Investing $ 0
Cash from Financing $ 0
Change in cash $ 67,000
Beginning cash balance 0
Ending cash balance $ 67,000

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\(^1\) Decreases in Current Assets would be Added
Example 2 - Revenues with COGS and the indirect statement of cash flows

An Example - Goods sold with COGS (Goods sold at 10 times the value of COGS)

Note that each sale is split up into 2 transactions on the BSE: a Revenue component and COGS component

<table>
<thead>
<tr>
<th>Transaction</th>
<th>Assets</th>
<th>Liabilities</th>
<th>Shareholders' Equity</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Purchase Inv w/cash</td>
<td>($10,000)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Make a sale for cash COGS</td>
<td>30,000</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Make a sale on credit COGS</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Customer pays part of A/R</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Make a sale for cash COGS</td>
<td>$10,000</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Make a sale on credit COGS</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Customer pays part of A/R</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cash</td>
<td>$57,000</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A/R</td>
<td>$5,000</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Inventory</td>
<td></td>
<td>$2,800</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>$57,000</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Statement of Cash Flows

Cash from Operating
Net Income                        $64,800

Adjustments
Less increases in Current Assets
Increase in A/R                   $(5,000)
Increase in Inventory             $(2,800)
Cash Change in Operating          $57,000
Cash from Investing                $0
Cash from Financing                $0

Change in cash                    $57,000
Beginning cash balance            $0
Ending cash balance               $57,000

2 Decreases would be added
**Example 3 - Expenses**

**An Example - Salary Expenses**

<table>
<thead>
<tr>
<th>Transaction</th>
<th>Assets</th>
<th>Liabilities</th>
<th>Shareholders' Equity</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pay Salaries</td>
<td>($13,000)</td>
<td>$1,000</td>
<td>$(13,000)</td>
<td>Salary Expense</td>
</tr>
<tr>
<td>Accrue Salaries</td>
<td></td>
<td></td>
<td>(1,000)</td>
<td>Salary Expense</td>
</tr>
<tr>
<td></td>
<td>($13,000)</td>
<td>$1,000</td>
<td>$(14,000)</td>
<td></td>
</tr>
</tbody>
</table>

- Cash Spent of $13,000 equals Increase in Salary Pay. of $1,000 plus the Net Income of $(14,000).

**Statement of Cash Flows**

**Cash from Operating**
- Net Income: $(14,000)
- Adjustments:
  - Less increases\(^3\) in Current Assets: none
  - Plus increases\(^4\) in Current Liabilities: Change in Salaries Payable: 1,000

- Cash Increase from Operating: $(13,000)

**Cash from Investing**: $0

**Cash from Financing**: $0

**Change in cash**:
- Beginning cash balance: $0
- Ending cash balance: $(13,000)

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\(^3\) Decreases in Current Assets would be added
\(^4\) Decreases in Current Liabilities would be subtracted
### Example 4 - PP&E

**An Example - Acquiring and Selling PP&E**

<table>
<thead>
<tr>
<th>Transaction</th>
<th>Assets</th>
<th>= Liabilities</th>
<th>+ Shareholders' Equity</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Cash</td>
<td>PP&amp;E</td>
<td>- Accum. Deprec.</td>
<td>Retained Earnings</td>
</tr>
<tr>
<td>Buy PP&amp;E</td>
<td>($60,000)</td>
<td>$60,000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sell PP&amp;E (gain)</td>
<td>9,000</td>
<td>(30,000)</td>
<td>($25,000)</td>
<td>$4,000 Gain on sale</td>
</tr>
<tr>
<td>Deprec. Exp.</td>
<td>($51,000)</td>
<td>$30,000</td>
<td>$10,000</td>
<td>($31,000) Deprec. Exp.</td>
</tr>
</tbody>
</table>

Cash spent of $51,000 equals Increase in PP&E of $30,000 minus Increase in Accum Deprec of $10,000 add Net Income of ($31,000).

### Statement of Cash Flows

**Cash from Operating**
- Net Income ($31,000)
- Adjustments:
  - (Less increases in Current Assets): none
  - (Plus increases in Current Liabilities): none
- Add back Depreciation Exp: 35,000
- Subtract (add) Gain (Loss): (4,000)

Cash Increase from Operating: $0

**Cash from Investing**
- Purchase of PP&E: ($60,000)
- Sale of PP&E: 9,000
- Cash from Financing: $0
- Change in PP&E: Beginning cash balance ($51,000)
- Change in Accum Deprec: Ending cash balance ($51,000)

**Alternate method for determining Cash from Investing:**

<table>
<thead>
<tr>
<th>Less Change Net PP&amp;E</th>
<th>Change in PP&amp;E</th>
<th>Change in Accum Deprec</th>
</tr>
</thead>
<tbody>
<tr>
<td>($30,000)</td>
<td>$20,000</td>
<td>$10,000</td>
</tr>
<tr>
<td>Plus Gains</td>
<td>4,000</td>
<td></td>
</tr>
<tr>
<td>Less Deprec. Exp</td>
<td>(35,000)</td>
<td></td>
</tr>
<tr>
<td>TOTAL Cash from Investing</td>
<td>($51,000)</td>
<td></td>
</tr>
</tbody>
</table>