

Module 4

MEASURING CASH FLOWS

Background

- Management's ability to make decisions that generate cash over time is essential to a firm's long-term survival
 - Because the firm's suppliers, bankers, and the tax authorities require payments in cash, not profits
- This Module presents a framework for analyzing cash flows and their relation to business decisions

Background

- After reading this Module, students should understand:
 - The relationship between cash and cash flows
 - The relationship between profit and cash flows
 - How business decisions affect cash flows
 - How to use a firm's balance sheets and income statements to calculate the cash flows generated by the firm's operating, investing and financing activities
 - How to prepare and interpret a cash flow statement

Cash Flows And Their Sources

■ Total net cash flow

- Difference between the firm's cash inflows and outflows
 - Equal to the change in the firm's cash position during a period of time
- A firm's cash position changes as a result of decisions related to its operating, investment, and financing activities

EXHIBIT 4.1a:

OS Distributors' Balance Sheets.

Figures in millions of dollars

| | DEC. 31, 1998 | DEC. 31, 1999 | DEC. 31, 2000 |
|---------------------------------|-----------------------|-----------------------|-----------------------|
| <u>ASSETS</u> | | | |
| <i>CURRENT ASSETS</i> | \$104.0 | \$119.0 | \$137.0 |
| Cash | \$6.0 | \$12.0 | \$8.0 |
| Accounts receivable | 44.0 | 48.0 | 56.0 |
| Inventories | 52.0 | 57.0 | 72.0 |
| Prepaid expenses | 2.0 | 2.0 | 1.0 |
| <i>NONCURRENT ASSETS</i> | 56.0 | 51.0 | 53.0 |
| Financial assets & intangibles | 0.0 | 0.0 | 0.0 |
| Property, plant, & equip. (net) | 56.0 | 51.0 | 53.0 |
| Gross value | \$90.0 | \$90.0 | \$93.0 |
| Accumulated depreciation | (34.0) | (39.0) | (40.0) |
| TOTAL ASSETS | <u>\$160.0</u> | <u>\$170.0</u> | <u>\$190.0</u> |

EXHIBIT 4.1b:

OS Distributors' Balance Sheets.

Figures in millions of dollars

| | DEC. 31, 1998 | DEC. 31, 1999 | DEC. 31, 2000 |
|----------------------------------------------|-----------------------|-----------------------|-----------------------|
| <u>LIABILITIES AND OWNERS' EQUITY</u> | | | |
| <i>CURRENT LIABILITIES</i> | \$54.0 | \$66.0 | \$75.0 |
| Short-term debt | \$15.0 | \$22.0 | \$23.0 |
| Owed to banks | \$7.0 | \$14.0 | \$15.0 |
| Current portion of long-term debt | 8.0 | 8.0 | 8.0 |
| Accounts payable | 37.0 | 40.0 | 48.0 |
| Accrued expenses | 2.0 | 4.0 | 4.0 |
| <i>NONCURRENT LIABILITIES</i> | 42.0 | 34.0 | 38.0 |
| Long-term debt | 42.0 | 34.0 | 38.0 |
| <i>Owners' equity</i> | 64.0 | 70.0 | 77.0 |
| | 64.0 | 70.0 | 77.0 |
| TOTAL LIABILITIES AND OWNERS' EQUITY | <u>\$160.0</u> | <u>\$170.0</u> | <u>\$190.0</u> |

EXHIBIT 4.2: Sources of Cash Inflow and Cash Outflow.

Amounts are OS Distributors' cash flows in millions of dollars in 2000

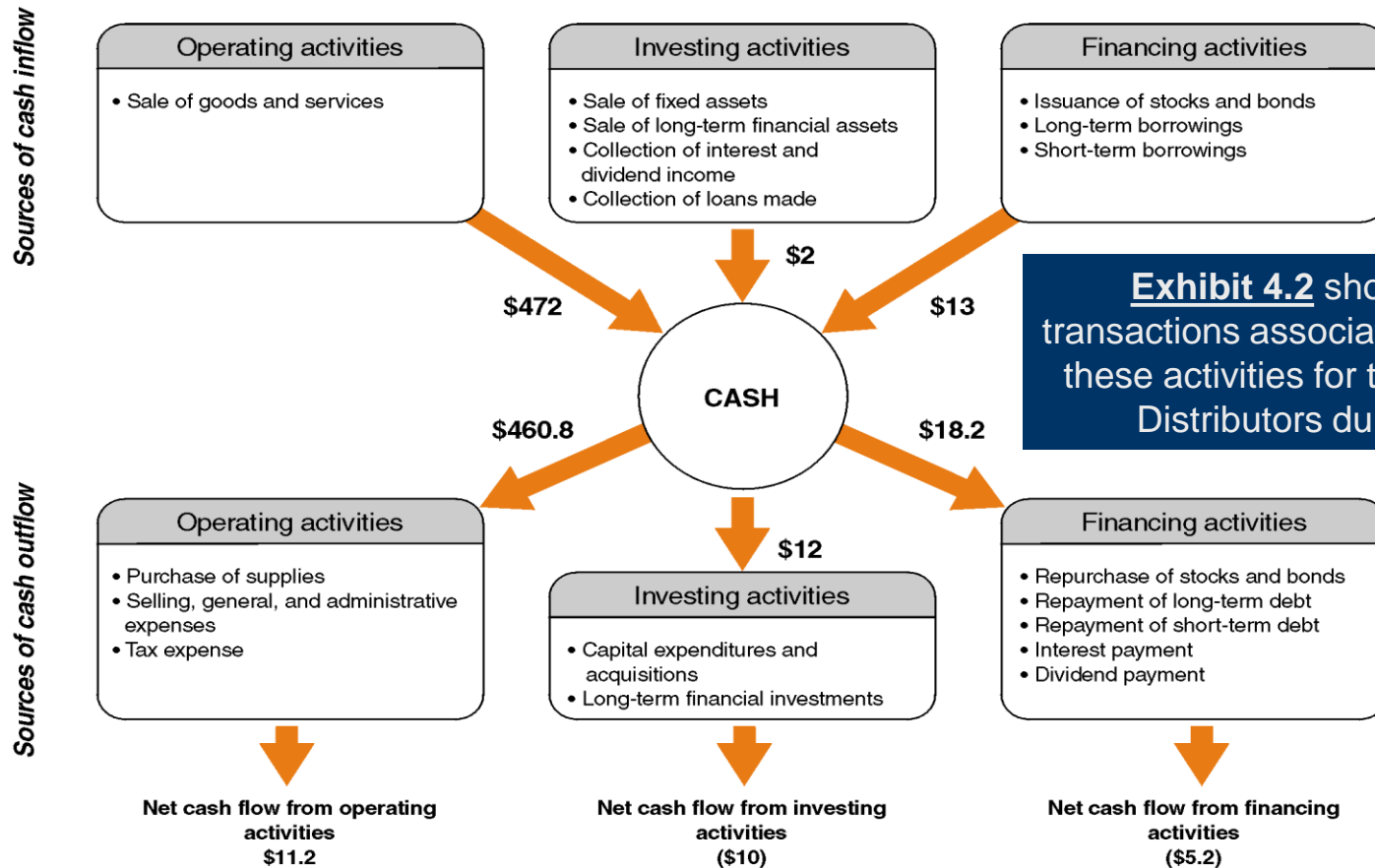


Exhibit 4.2 shows typical transactions associated with each of these activities for the case of OS Distributors during 2000.

EXHIBIT 4.3:

OS Distributors' Preliminary Cash Flow Statement for 2000.

Figures in millions of dollars

• CASH ON JANUARY 1, 2000 **\$12**

| | | |
|-------------------------------------------|----------|-------|
| Net operating cash flow (NOCF) | \$11.2 | |
| + Net cash flow from investment decisions | (\$10.0) | |
| + Net cash flow from financing decisions | (\$5.2) | |
| Total net cash flow for year 2000 | | (\$4) |

CASH ON DECEMBER 31, 2000 **\$8**

¹Cash on January 1, 2000, is the same as cash on December 31, 1999. See balance sheets in Exhibit 4.1.

Exhibit 4.3 contains a preliminary cash flow statement for OS Distributors for 1997 using the information in **Exhibit 4.2**.

EXHIBIT 4.4:

OS Distributors' Income Statements.

Figures in millions of dollars

| | 1998 | 1999 | 2000 |
|--------------------------------------------------|----------------|----------------|----------------|
| Net Sales | \$390.0 | \$420.0 | \$480.0 |
| Cost of goods sold | (\$328.0) | (\$353.0) | (\$400.0) |
| Gross profit | 62.0 | 67.0 | 80.0 |
| Selling, general, & administrative expenses | (39.8) | (43.7) | (48.0) |
| Depreciation expenses | (5.0) | (5.0) | (8.0) |
| Operating profit | 17.2 | 18.3 | 24.0 |
| Extraordinary items | 0 | 0 | 0 |
| Earnings before interest & tax (EBIT) | 17.2 | 18.3 | 24.0 |
| Net interest expenses | (5.5) | (5.0) | (7.0) |
| Earnings before tax (EBT) | 11.7 | 13.3 | 17.0 |
| Income tax expense | (4.7) | (5.3) | (6.8) |
| Earnings after tax (EAT) | \$7.0 | \$8.0 | \$10.2 |
| Dividends | \$2.0 | \$2.0 | \$3.2 |
| Retained earnings | \$5.0 | \$6.0 | \$7.0 |

Preparing a Detailed Cash Flow Statement

- **Net cash flow from operating activities**
 - Sources of operating cash flows
 - Operating revenues
 - However, an increase in revenues does not necessarily imply a corresponding cash inflow because cash comes in only when the customer pays
 - Expenses
 - Likewise, an increase in expenses does not necessarily imply a corresponding cash outflow because expenses are recorded only when they generate revenues, not when they are paid

Preparing a Detailed Cash Flow Statement

- Procedure for estimating operating cash flows consists of reconciling the dollar amount of an income statement account with the change in the corresponding balance sheet account
 - Balance sheet accounts used for the adjustments are exclusively those related to the firm's operating cycle (*i.e.*, comprising the firm's working capital requirement)
- Formulas required to calculate net operating cash flow (NOCF)
 - $\text{NOCF} = \text{Sales} - \text{COGS} - \text{SG\&A expenses} - \text{Tax expenses} - \Delta \text{WCR}$
 - $\text{EBIT} + \text{Depreciation expenses} = \text{Sales} - \text{COGS} - \text{SG\&A expenses}$

Increases in WCR represent amounts of cash the firm has used to finance the growth of its investment in operations.

Preparing a Detailed Cash Flow Statement

- **Net cash flow from investing activities**
- **Net cash flow from Assets**
 - Sum of the net cash flows from operating and investment activities (AKA: **free cash flow**)
 - Measure of the net cash flow generated by the firm's invested capital or net assets
 - Remaining portion of a firm's net cash flow is the cash flow from its financing activities
- **Net cash flow from financing activities**
 - Net cash flow from financing activities corresponds to the capital employed shown in the managerial balance sheet (See **Exhibit 4.6**)

EXHIBIT 4.5a:

OS Distributors' Cash Flow Statements.

Figures in millions of dollars

| | 1999 | 2000 |
|--------------------------------------------------------------|---------------|-----------------|
| CASH FLOWS FROM OPERATING ACTIVITIES | | |
| (+) Net sales | \$420.0 | \$480.0 |
| (-) Cost of goods sold | (353.0) | (400.0) |
| (-) Selling, general, & administrative expenses ¹ | (43.7) | (48.0) |
| (-) Tax expenses | (5.3) | (6.8) |
| (-) Change in working capital requirement | (4.0) | (14.0) |
| A. NET OPERATING CASH FLOW (NOCF) | \$14.0 | \$11.2 |
| • CASH FLOWS FROM INVESTING ACTIVITIES | | |
| (-) Sale of fixed assets | 0 | 2.0 |
| (-) Capital expenditures and acquisitions | 0 | (12.0) |
| B. NET CASH FLOW FROM INVESTING ACTIVITIES | \$0 | (\$10.0) |

¹ Excluding depreciation expenses

EXHIBIT 4.5b:

OS Distributors' Cash Flow Statements.

Figures in millions of dollars

| | 1999 | 2000 |
|---------------------------------------------------|----------------|----------------|
| CASH FLOWS FROM FINANCING ACTIVITIES | | |
| (+) Increase in long-term borrowings | 0 | 12.0 |
| (+) Increase in short-term borrowings | 7.0 | 1.0 |
| (-) Long-term debt repaid | (8.0) | (8.0) |
| (-) Interest payment | (5.0) | (7.0) |
| (-) Dividend payment | (2.0) | (3.2) |
| C. NET CASH FLOW FROM FINANCING ACTIVITIES | (\$8.0) | (\$5.2) |
| D. TOTAL NET CASH FLOW (A + B + C) | \$6.0 | (\$4.0) |
| E. OPENING CASH | \$6.0 | \$12.0 |
| F. CLOSING CASH (E + D) | \$12.0 | \$8.0 |

The Cash Flow Statement

- Firm's total net cash flow must be equal to the firm's change in its cash position during the period
 - Cash flow statement reconciles the firm's cash flows with the change in the cash position and tells how and why the firm's cash position has changed

Two Variations Of The Cash Flow Statement

- **Nondiscretionary versus discretionary cash flows**
 - For internal purposes, some firms prefer to classify the cash flows from investing and financing activities as cash flows they cannot control and cash flows they can control
- **Nondiscretionary cash flows**
 - Cash outflows that the firm is legally obligated to meet
- **Discretionary cash flows**
 - Cash flow available for strategic investment decisions and strategic financing decisions after the firm's financial obligations are met

EXHIBIT 4.7a:

OS Distributors' Cash Flow Statements: Nondiscretionary Versus Discretionary Cash Flows.

Figures in millions of dollars

| | 1999 | 2000 |
|---------------------------------------------------------------|-----------------|-----------------|
| CASH FLOWS FROM OPERATING ACTIVITIES | | |
| (-) Net sales | \$420.0 | \$480.0 |
| (-) Cost of goods sold | (353.0) | (400.0) |
| (-) Selling, general, & administrative expenses ¹ | (43.7) | (48.0) |
| (-) Tax expenses | (5.3) | (6.8) |
| (-) Change in working capital requirement | (4.0) | (14.0) |
| A. NET OPERATING CASH FLOW (NOCF) | \$14.0 | \$11.2 |
| NONDISCRETIONARY CASH FLOWS | | |
| (-) Long-term debt repaid | (8.0) | (8.0) |
| (-) Interest payment | (5.0) | (7.0) |
| B. NONDISCRETIONARY NET CASH FLOW | (\$13.0) | (\$15.0) |
| C. CASH FLOW AVAILABLE FOR STRATEGIC DECISIONS (A + B) | \$1.0 | (\$3.8) |

¹ Excluding depreciation expenses

EXHIBIT 4.7b:

OS Distributors' Cash Flow Statements:

Nondiscretionary Versus Discretionary Cash Flows.

Figures in millions of dollars

| | 1999 | 2000 |
|-------------------------------------------|---------------|----------------|
| <i>DISCRETIONARY CASH FLOWS</i> | | |
| (+) Increase in long-term borrowings | 0 | 12.0 |
| (+) Increase in short-term borrowings | 7.0 | 1.0 |
| (+) Sale of fixed assets | 0 | 2.0 |
| (-) Capital expenditures and acquisitions | 0 | (12.0) |
| (-) Dividend payment | (2.0) | (3.2) |
| D. DISCRETIONARY NET CASH FLOW | \$5.0 | (\$0.2) |
| E. TOTAL NET CASH FLOW (C + D) | \$6.0 | (\$4.0) |
| E. OPENING CASH | \$6.0 | \$12.0 |
| F. CLOSING CASH (E + F) | \$12.0 | \$8.0 |

The Statement Of Cash Flows

- Firms are required by the FASB to issue a statement of cash flows
 - However, the way cash flows are calculated and the allocation of cash flows to the three activities is somewhat different from those reflected earlier in **Exhibit 4.5**
 - **Exhibit 4.8** provides OS Distributors' statements of cash flows for 1999 and 2000 prepared in accordance with FASB 95

The Statement Of Cash Flows

■ Cash flows from operating activities

- The net cash flow from operating activities in the statement of cash flows (Exhibit 4.8) is different from the net operating cash flow (NOCF) in Exhibit 4.5 in that
 - The statement of cash flows is created using the **indirect method**
 - The firm's interest expenses are part of operating, not financing, activities according to the statement of cash flows

■ Cash flows from investing and financing activities

- Differ from Exhibit 4.5 in that interest payments and interest and dividends received from financial investments are included by default in earnings after tax
 - Thus are automatically included in the cash flows from operating activities

EXHIBIT 4.8a:

OS Distributors' Statements of Cash Flow: Financial Accounting Standards Board (FASB) 95.

Figures in millions of dollars

| | 1999 | 2000 |
|-----------------------------------------------------|--------------|-----------------|
| CASH FLOWS FROM OPERATING ACTIVITIES | | |
| (+) Earnings after tax | \$8.0 | 10.2 |
| (+) Depreciation expenses | 5.0 | 8.0 |
| (-) Change in working capital requirement | (4.0) | (14.0) |
| A. NET CASH PROVIDED BY OPERATING ACTIVITIES | \$9.0 | \$4.2 |
| CASH FLOWS FROM INVESTING ACTIVITIES | | |
| (+) Sale of fixed assets | 0 | 2.0 |
| (-) Capital expenditures and acquisitions | 0 | (12.0) |
| B. NET CASH FLOW FROM INVESTING ACTIVITIES | \$0 | (\$10.0) |

EXHIBIT 4.8b:

OS Distributors' Statements of Cash Flow: Financial Accounting Standards Board (FASB) 95.

Figures in millions of dollars

| | 1999 | 2000 |
|---------------------------------------------------|----------------|----------------|
| CASH FLOWS FROM FINANCING ACTIVITIES | | |
| (+) Increase in long-term borrowings | 0 | 12.0 |
| (+) Increase in short-term borrowings | 7.0 | 1.0 |
| (-) Long-term debt repaid | (8.0) | (8.0) |
| (-) Dividend payment | (2.0) | (3.2) |
| C. NET CASH FLOW FROM FINANCING ACTIVITIES | (\$3.0) | \$1.8 |
| D. TOTAL NET CASH FLOW (A + B + C) | \$6.0 | (\$4.0) |
| E. OPENING POSITION | \$6.0 | \$12.0 |
| F. CLOSING POSITION (E + D) | \$12.0 | \$8.0 |

Bankers' Cash Flow Versus Net Operating Cash Flow

■ Bankers' cash flow or cash earnings

- Bankers' cash flow = Earnings after tax (EAT) + Depreciation expense
 - Derived exclusively from income statement accounts ignoring any balance sheet adjustments—is not really a measure of cash flow

■ Bankers' cash flow and net operating cash flow are equivalent only when

- There is no variation in the firm's WCR and
- Net interest expenses are zero
 - The chance of both of these occurring is quite unlikely

■ Bankers' cash flow behaves like a profit measure

- Because it ignores changes in WCR

Managerial Implications

- Net operating cash flow can be looked at as a
 - Margin component less an investment component
 - Where the margin component is sales minus the sum of COGS, SG&A, and tax expenses and the investment component is the change in WCR
- Firms should run and monitor their operating activities on the basis of net operating cash flow rather than margin
 - Will encourage managers to widen the firm's margin without letting investment in operations grow too fast

EXHIBIT 4.9: Margin and Investment Components for OS Distributors' Net Operating Cash Flow.

| | 1999 | 2000 | PERCENT CHANGE |
|-------------------------------------------------------------|---------------|---------------|-------------------|
| Sales | \$420.0 | \$480.0 | 14.3% |
| less COGS | (353.0) | (400.0) | |
| less SG&A expenses | (43.7) | (48.0) | |
| less tax expenses | (5.3) | (6.8) | |
| = margin component | \$18.0 | \$24.2 | 40% |
| Working capital requirement at the beginning of the year | \$59.0 | \$63.0 | |
| less working capital requirement at the end of the year | 63.0 | 77.0 | |
| = investment component | (\$4.0) | (\$14.0) | 250% |
| NOCF = Margin – Investment | \$14.0 | \$11.2 | -20% |

Exhibit 4.9 shows the two components of net operating cash flow for OS Distributors and demonstrates that although the firm's margin component increased by 40 percent in 2000, its investment component grew much faster (by 250 percent) over the same period, which resulted in a decline in the firm's net operating cash flow of 20 percent.