1866
AUB
American University of Beirut
الجامعة الأميركية في بيروت
Maroun Semaan Faculty of
Engineering and Architecture

Introduction to Financial Engineering

ENMG 602

Statement of Cash Flows Overview [Voice over Slides Video] (Chapter 4, Antle)

What is Cash

- **Cash** is readily transferable value. It is the most common way organizations acquire goods and collect their revenues.
- **Currency** (bills of money) is one form of cash.
- Amounts deposited in a bank checking account are also cash.
- MEA Frequent flier miles and Carrefour gift certificates are not cash because they are restricted to given organizations.

Statement of Cash Flows

- A cash flow is a change in cash.
- The cash flow statement describes the change in an entity's cash over a period of time.
- It is compiled due to the interest of investors, creditors and other parties in knowing what is happening to a company's most liquid asset, cash.

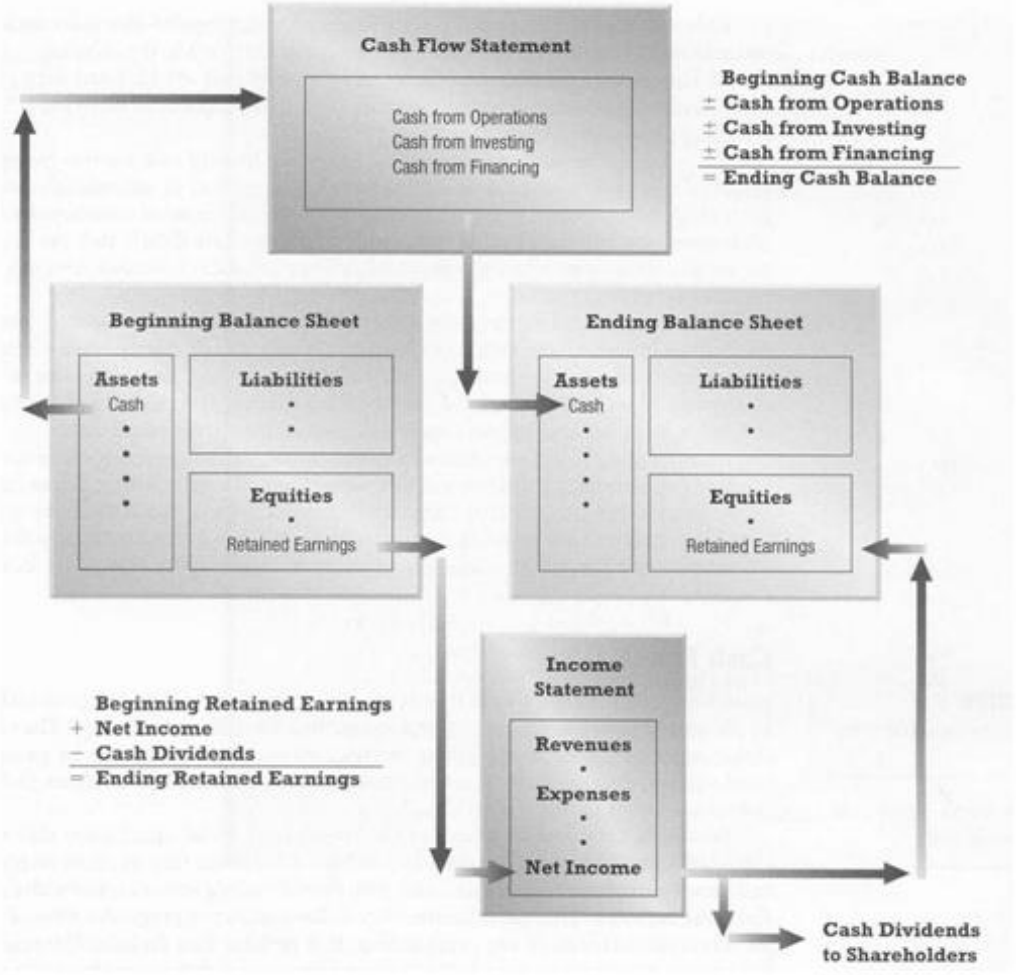
Some Usages of the Statement of Cash Flows

- Assess the ability to generate future cash flows.
- Assess the ability to pay dividends and meet obligations.
- Explain the reasons for the difference between net income and net cash provided (used) by operating activities.
- Explain investing and financing transactions during the accounting period.

Articulation to other Statements

- The cash flow statement relies on information from the income statement and balance sheets.
- Specifically, the income statement for the accounting period and the two balance sheets at its beginning and end.
- The articulation between these statements is as shown on the next slide

Articulation with other Statements



1866
AUB
American University of Beirut
الجامعة الأميركية في بيروت
Maroun Semaan Faculty of
Engineering and Architecture

Introduction to Financial Engineering

ENMG 602

Sections of the Statement of Cash Flows [Voice over Slides Video] (Chapter 4, Antle)

Main Sections of the Statement of Cash Flows

1. Cash flows from operating activities.
2. Cash flows from investing activities.
3. Cash flows from financing activities.
4. Significant non-cash investing and financing activities.

Investing Activities

- Investing activities are aimed at acquiring and disposing of assets that will generate a financial return over a long time.
- Example of investing activities that lead to cash outflows include,
  - Purchase of property, plant and equipment,
  - Purchase of debt or equity securities of other entities,
  - Making loans to other entities.

Investing Activities

- Example of investing activities that lead to cash inflows include,
  - Sale of property, plant and equipment,
  - Sale of debt or equity securities of other entities,
  - Collection of principal on loans to other entities.

- The information needed to compile the cash flows from investing is related to the change in noncurrent assets accounts of the balance sheet.

Financing Activities

- Financing activities are aimed at acquiring and repaying funds to be used over a long time.
- Example of financing activities that lead to cash outflows include,
  - Paying dividends to stockholders.
  - Paying long-term debt.
  - Reacquiring company's stock.
- Example of financing activities that lead to cash inflows include,
  - Issuance of equity securities (company's own stock),
  - Issuance of debt (bonds and notes).

Financing Activities

- The information needed to compile the cash flows from financing is related to the change in noncurrent liabilities and equities accounts in the balance sheet.
- In addition, dividends information from the statement of retained earnings is needed.

Operating Activities

- Operating activities are actions that are neither investing nor financing activities.
- They capture the impact of operating (normal revenues and expenses) transactions on the company's cash flow.
- Example of operating activities that lead to cash inflows include,
  - Sale of goods or services
  - Interest and dividends received

Operating Activities

- Example of operating activities that lead to cash outflows include,
  - Paying suppliers for inventory
  - Paying employees for services
  - Paying government for taxes
  - Paying lenders for interest

- The information needed to compile the cash flows from operations is related to the change in current assets and retained earnings accounts in the balance sheet and income statement accounts.

Net Cash from Operations and Net Income

- It is vital to understand the relation between cash flow from operations and net income as it indicates how "real" the net income actually is.

- Keep in mind that this relates to the concept of accrual accounting discussed in Chapter 3.

Significant Non-Cash Activities

- Transactions that do not affect cash are not reported in body of cash flow statement, but in a separate schedule at the bottom of the cash flow statement, or a separate note.

- Examples of such transactions include
  - Issuance of common stock to purchase assets,
  - Conversion of bonds into common stock,
  - Issuance of debt to purchase assets.

1866
AUB
American University of Beirut
الجامعة الأميركية في بيروت
Maroun Semaan Faculty of
Engineering and Architecture

Introduction to Financial Engineering

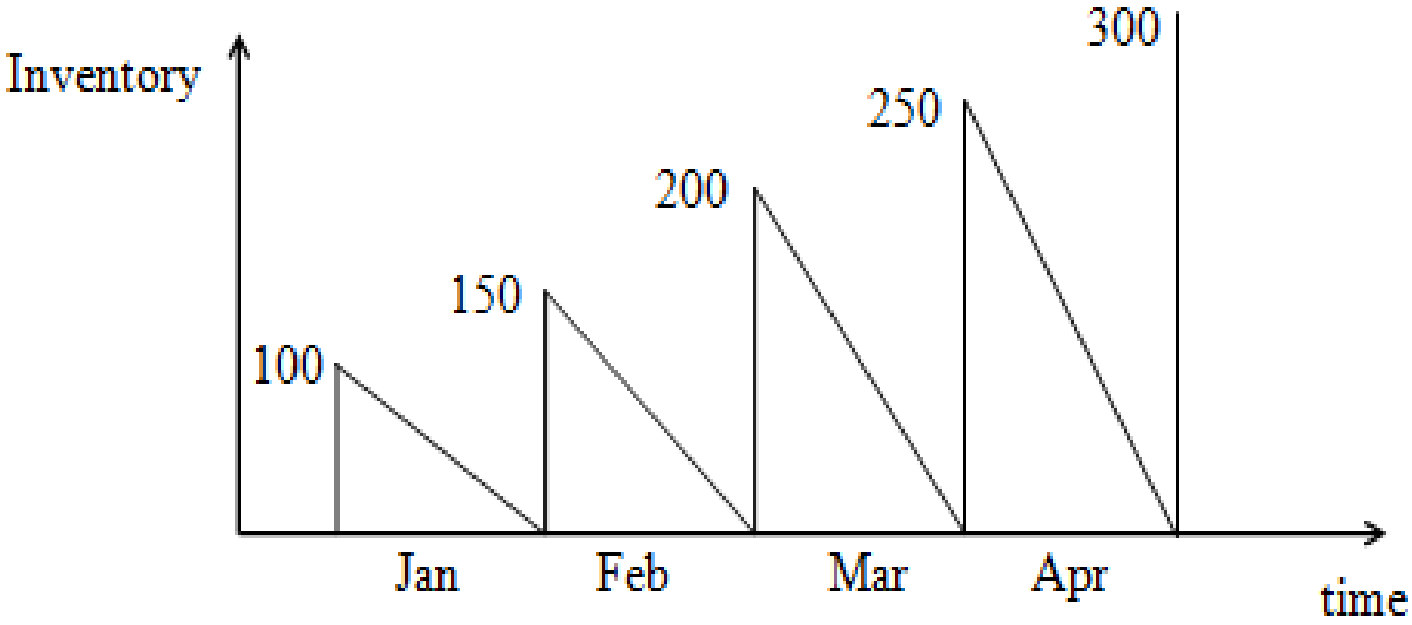
ENMG 602

Example of Net Cash from Operations Vs. Net Income (Total Toy Company) [Voice over Slides Video] (Chapter 4, Antle)

Total Toy Company

- Total Toy Company was incorporated on January 1, 2004 by issuing $7,800 worth of common stocks.
- On January 1, TTC bought 100 dolls from its supplier.
- TTC buys dolls for $19.5 in cash and sells them for $26 (on credit) paid at the end of the month after buying.
- Anticipating an increase in demand, TTC operating strategy is that at the end of each month to buy 50 dolls more than the demand in the previous month.
- Actual demand was high enough and all dolls bought in January through March were sold.
- It's April 30 now and TTC just stocked 300 dolls for May.

Total Toy Company Inventory Profile



Total Toy Company Journal Entries

- Jan 1, 2004, issuance of common stock

NCO	NI
$0	$0

Cash 7,800
Common stock 7,800

NCO – Net Cash from Operations
NI – Net Income

- Jan 1, 2004, Jan 1, 2004, purchase of 100 dolls (for Jan) at $19.5/doll

NCO	NI
($1,950)	$0

Inventory 1,950
Cash 1,950

Total Toy Company Journal Entries

- Jan 31, 2004, sales of 100 dolls on credit at $26/doll

NCO	NI
($1,950)	$2,600

Accounts Receivable 2,600
Sales Revenues 2,600

NCO	NI
($1,950)	$750

Cost of goods sold 1,950
Inventory 1,950

- Jan 31, 2004, purchase of 150 dolls (for Feb) at $19.5/doll

NCO	NI
($4,875)	$750

Inventory 2,925
Cash 2,925

Total Toy Company Journal Entries

- Feb 29, 2004, sales of 150 dolls on credit at $26/doll

NCO	NI
($4,875)	$4,650

Accounts Receivable 3,900
Sales Revenues 3,900

NCO	NI
($4,875)	$1,725

Cost of goods sold 2,925
Inventory 2,925

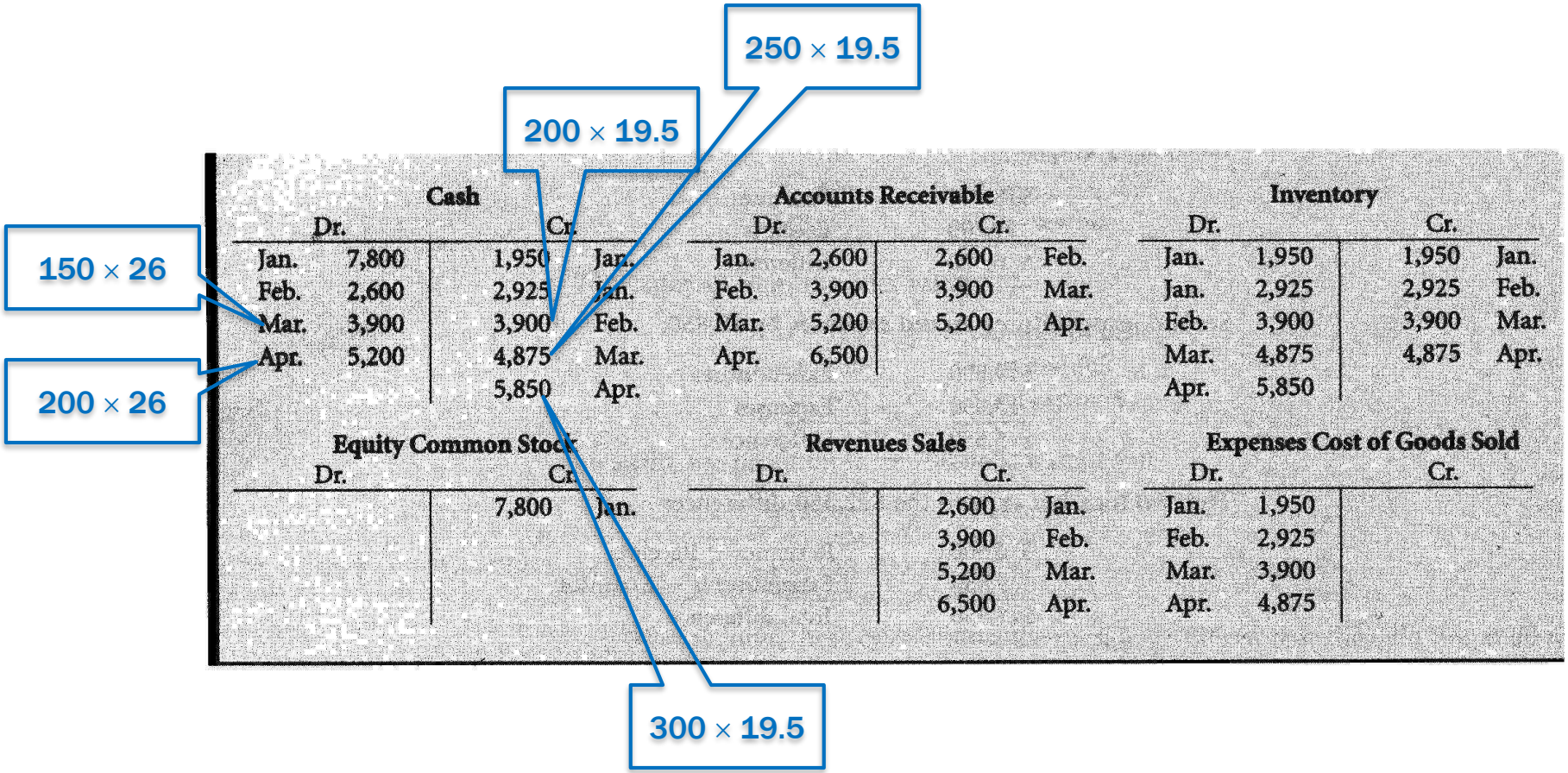
- Feb 29, 2004, collection of January accounts receivable

NCO	NI
($2,275)	$1,725

Cash 2,600
Accounts Receivable 2,600

And so on, till the end of April …

Total Toy Company T-Accounts on April 30



Cash

Dr.		Cr.	
Jan.	7,800	1,950	Jan.
Feb.	2,600	2,925	Jan.
Mar.	3,900	3,900	Feb.
Apr.	5,200	4,875	Mar.
		5,850	Apr.

Accounts Receivable

Dr.		Cr.	
Jan.	2,600	2,600	Feb.
Feb.	3,900	3,900	Mar.
Mar.	5,200	5,200	Apr.
Apr.	6,500		

Inventory

Dr.		Cr.	
Jan.	1,950	1,950	Jan.
Jan.	2,925	2,925	Feb.
Feb.	3,900	3,900	Mar.
Mar.	4,875	4,875	Apr.
Apr.	5,850		

Equity Common Stock

Dr.		Cr.	
		7,800	Jan.

Revenues Sales

Dr.		Cr.	
		2,600	Jan.
		3,900	Feb.
		5,200	Mar.
		6,500	Apr.

Expenses Cost of Goods Sold

Dr.		Cr.	
Jan.	1,950		
Feb.	2,925		
Mar.	3,900		
Apr.	4,875		

TTC Balance Sheet and Income Statement

No more cash!

Total Toy Company
Balance Sheet on
April 30, 2004

ASSETS		LIABILITIES	
Cash	$ 0	Total liabilities	$ 0
Accounts receivable	6,500		
Inventory	5,850	EQUITY	
		Retained earnings	4,550
		Common stock	7,800
Total assets	$12,350	Total liabilities & equity	$12,350

But business is good ☺

Total Toy Company
Income Statement
1/1/2004 to 4/30/2004

Sales (700 @ $26)	$18,200
Cost of goods sold (700 @ $19.50)	13,650
Net income	$ 4,550

TTC Statement of Cash Flows

Total Toy Company
Statement of Cash Flows
1/1/2004 to 4/30/2004

Cash flow from operations:	
Collections from customers	$ 11,700
Payments to suppliers	(19,500)
Net cash flow from operations	$ (7,800)
Cash flow from financing:	
Sale of common stock	$ 7,800
Net cash flow	$ 0
Cash balance, April 30, 2004	$ 0
Cash balance, January 1, 2004	0
Increase (decrease) in cash	$ 0

Net Cash is not good ☹

1866
AUB
American University of Beirut
الجامعة الأميركية في بيروت
Maroun Semaan Faculty of
Engineering and Architecture

Introduction to Financial Engineering

ENMG 602

Construction of the Statement of Cash Flows [Voice over Slides Video] (Chapter 4, Antle)

Construction of the Cash Flow Statement

- The cash flow statement is constructed in two ways, the direct and indirect methods.
- The direct method is based on tracking the transaction that affect the cash T-account, similar to TTC case.
- The indirect method emphasizes the relation between cash flow from operations and net income through adjustments to reconcile net income to net cash from operations.
- The net cash from operations sections resulting from the two methods are different. Investing and financing sections are the same.

Construction of the Cash Flow Statement

- According to one study, 99% of companies prefer the indirect method because
  - It is easier to prepare 
  - It focuses on the difference between income and cash from operations
  - It reveals less company information

Indirect Method for Constructing the Cash Flow Statement

- The indirect method is related to the accounting identity

$$\Delta(A) = \Delta(L) + \Delta(E)$$

$$\Rightarrow \Delta(C) + \Delta(OCA) + \Delta(NCA) = \Delta(CL) + \Delta(NCL) + NI - D + \Delta(S)$$

$$\Rightarrow \Delta(C) = \underbrace{NI + \Delta(CL) - \Delta(OCA) + Dp}_{\text{Operations CF}} + \underbrace{\Delta(NCL) + \Delta(S) - D}_{\text{Financing CF}} + \underbrace{SNCA - BNCA}_{\text{Investing CF}}$$

where C = Cash, L= Liability, E = Equity, OC = other current,

NC = noncurrent, NI = net income, D = Dividend, S = stock,

$\Delta(E) = NI - D + \Delta(S)$, Dp = depreciation, $SNCA$ = sold NCA,

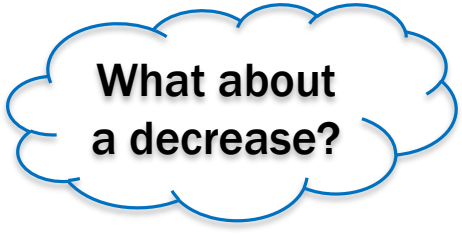
$BNSA$ = bought NCA, $\Delta(NCA) = BNCA - SNCA - Dp$.

Indirect Method for Constructing the Cash Flow Statement

- That is, to get net cash flow from operations, net income should be adjusted by
  - Adding the change in current liabilities
  - Subtracting the change in current assets
  - Adding (non-cash) depreciation and amortization
- Another adjustment due to a non-cash item is adding (subtracting) the loss (gain) due to sale of assets

Indirect Method for Constructing the Cash Flow Statement

- The rationale behind these adjustments relates to *accrual accounting.*



- E.g., an increase in accounts receivable is accounted for as a revenue in calculating net income.
- However, this revenue has not generated any cash yet, so it must subtracted from net income when calculating net cash.

Indirect Method for Constructing the Cash Flow Statement

- An increase in accounts payable represents an expense that has not been paid for in cash yet,
- So, it is added back to net income when calculating net cash.
- Selling an asset at a loss involves no payments of cash,
- So, it is added back to net income to calculate net cash.

Indirect Method for Constructing the Cash Flow Statement

- To compile the cash flows from investing section, one subtracts changes in non-current asset accounts (i.e., property, plant and equipment)
  - Purchase of equipment is a cash outflow.
  - Sale of equipment is a cash inflow.

Indirect Method for Constructing the Cash Flow Statement

- To compile the cash flows from investing section, one subtracts changes in non-current asset accounts (i.e., property, plant and equipment)
  - Purchase of equipment is a cash outflow.
  - Sale of equipment is a cash inflow.

- To compile the cash flows from financing section, one adds changes in non-current liabilities (long-term debt) and in equity (stock) accounts and subtracts dividends.

Maroun Semaan Faculty of Engineering and Architecture

American University of Beirut

Introduction to Financial Engineering

ENMG 602

Example of the Indirect Method for Constructing the Statement of Cash Flows - Websell [Voice over Slides Video] (Chapter 4, Antle)

Example of the Indirect Method: Websell

- Consider the balance sheets for Websell on Jan 1, and Jun 30, 2004 and the income statement in-between.

	JANUARY 1, 2004		JUNE 30, 2004	
	DEBIT	CREDIT	DEBIT	CREDIT
Accounts Receivable	$0		$ 10,000	
Supplies	0		500	
Prepaid Insurance	0		7,500	
Prepaid Rent	0		37,500	
Prepaid Telephone	0		1,000	
Software	0		37,500	
Copyright Permissions	0		90,000	
Equipment	0		300,000	
Accumulated Depreciation		$0		$ 30,000
Internet Access Rights	0		35,000	
Web Site	0		1,100,000	
Accounts Payable		0		1,000
Wages Payable		0		33,000
Interest Payable		0		60,000
Bond Payable		0		2,000,000
Common Stock		0		1,000,000
Retained Earnings		0		730,000
	$0	$0	$1,619,000	$3,854,000

Websell, Inc.
Income Statement for the Six Months Ended June 30, 2004
(amounts in thousands)

REVENUES	
Software sales—Web	$ 762.0
Software sales—retail	620.0
Consulting revenues	123.0
Total revenues	$1,505.0
EXPENSES	
Wages	$ 410.0
Amortization	127.5
Commissions	62.0
Interest	60.0
Marketing & distribution	38.0
Rent	37.5
Depreciation	30.0
Insurance	7.5
Miscellaneous	2.5
Total expenses	$ 775.0
Net Income	$ 730.0

(The 127.5 in amortization consists of website, 100, copyright, 10, software, 12.5, and internet, 5.)

Example of the Indirect Method: Websell

- The cash flow from operations is compiled as follows,

Net income	730
+ Expenses not requiring cash (from income statement)	
Depreciation	30
Amortization	127.5
+ Change in current liabilities (from balance sheet)	
Wages payable	33
Interests payable	60
Accounts payable	1
− Change in current assets (from balance sheet)	
Accounts receivable	10
Inventory (supplies)	0.5
Prepaid insurance, rent, Tel.	46
Cash flows from operations	925

Example of the Indirect Method: Websell

- The cash flow from investing is compiled as follows,

– Change in noncurrent assets

(from journal or add amortized values from balance sheets and amortization from income statement)

Website	1,200
Equipment	300
Copyrights	90
Software	50
Internet Access	40
Cash flows from investing	(1,690)

Example of the Indirect Method: Websell

- The cash flow from financing is compiled as follows,

+ Change in equity and noncurrent liabilities

(from balance sheet)

Common stock	1,000
Bond	2,000
Cash flows from financing	3,000

Example of the Indirect Method: Websell

Websell, Inc.
Statement of Cash Flows
For the Six Months Ended June 30, 2004
(amounts in thousands)

OPERATIONS:	
Net income	$ 730.0
Add: Expenses not requiring cash	
Amortization expense	127.5
Depreciation expense	30.0
Add: Increases in current liabilities	
Wages payable	33.0
Interest payable	60.0
Accounts payable	1.0
Deduct: Increases in current assets	
Accounts receivable	(10.0)
Inventory	(0.5)
Prepaid insurance, rent, telephone, supplies	(46.0)
CASH FLOWS FROM OPERATIONS	$ 925.0
INVESTING:	
Web site	$(1,200.0)
Equipment	(300.0)
Copyright permissions	(100.0)
Software	(50.0)
Internet access rights	(40.0)
CASH FLOWS FROM INVESTING	$(1,690.0)
FINANCING:	
Common stock	$ 1,000.0
Bonds	2,000.0
CASH FLOWS FROM FINANCING	$ 3,000.0
Net cash flow	$ 2,235.0

1866
AUB
American University of Beirut
الجامعة الأميركية في بيروت
Maroun Semaan Faculty of
Engineering and Architecture

Introduction to Financial Engineering

ENMG 602

Example of the Indirect Method for Constructing the Statement of Cash Flows – Rhody Company [Voice over Slides Video] (Chapter 4, Antle)

Example of the Indirect Method: Rhody Company

Rhody Company
Balance sheet
December 31, 2004

Assets	2004	2003	Change
Cash	$56,000	$34,000	$22,000
Accounts Receivable	20,000	30,000	(10,000)
Prepaid Expenses	4,000	0	4,000
Land	130,000	0	130000
Building	160,000	0	160,000
Accumulated depreciation-building	(11,000)	0	(11,000)
Equipment	27,000	10,000	17,000
Accumulated depreciation-equipment	(3,000)	0	(3,000)
Total	$383,000	$74,000	
Liabilities and Stockholders' Equity			
Accounts payable	$59,000	$4,000	$55,000
Bonds payable	130,000	0	130,000
Common stock	50,000	50,000	0
Retained earnings	144,000	20,000	124,000
Total	$383,000	$74,000	

Example of the Indirect Method: Rhody Company

Rhody Company
Income Statement
For the Year 1/1/04 through 12/31/04

Revenues	$507,000
Expenses	
Operating expenses	261,000
Depreciation expenses	15,000
Total Expenses	276,000
Income from operations	231,000
Loss on sale of equipment	3,000
Income tax expense	89,000
Net income	**$139,000**

Example of the Indirect Method: Rhody Company

- We also have some additional information on RC's activities in 2004
  - In 2004, the company declared and paid a $15,000 cash dividend.
  - The company obtained land through the issuance of $130,000 of long-term bonds.
  - An office building costing $160,000 was purchased for cash; equipment costing $25,000 was also purchased for cash.
  - During 2004, the company sold equipment with a book value of $7,000 (original cost $8,000 less accumulated depreciation $1,000) for $4,000 cash.

Example of the Indirect Method: Rhody Company

- The cash flow from operations is compiled as follows,

Net income	139
+ Expenses not requiring cash (from income statement)	
Depreciation	15,000
Loss on sale of equipment	3,000
+ Change in current liabilities (from balance sheets)	
Accounts payable	55,000
– Change in current assets (from balance sheets)	
Accounts receivable	(10,000)
Prepaid Expenses	4,000
Cash flows from operations	218,000

Example of the Indirect Method: Rhody Company

- In the balance sheet, the equipment account increased by $17,000.
- The additional information provided reveals that this net increase resulted from two transactions
  1. Sale of equipment costing $8,000 for $4,000.
  2. A purchase of equipment for $25,000
- The purchase of equipment should be shown as a $25,000 cash outflow and the sale of equipment should be shown as a cash inflow of $4,000.

Example of the Indirect Method: Rhody Company

- The cash flow from investing is compiled as follows,
  - Change in noncurrent assets

    (from additional information and balance sheet)

Purchase of building	160,000
Purchase of equipment	25,000
Sale of equipment	(4,000)
Cash flows from investing	(181,000)

Example of the Indirect Method: Rhody Company

- The cash flow from financing is compiled as follows,

  \+ Change in equity and noncurrent liabilities
  (from additional info)

Payment of dividends	(15,000)
Cash flows from financing	(15,000)

- The land of $130,000 was purchased through the issuance of long-term bonds.
- This is a significant noncash investing and financing activity that must be disclosed.

Example of the Indirect Method: Rhody Company

Rhody Company
Statement of Cash Flows
For the Year Ended December 31, 2004

Cash flows from operating activities:	
Net income	139,000
Depreciation & amortization	15,000
Loss on sale of equipment	3,000
Decrease in Accounts receivable	10,000
Increase in Prepaid expenses	(4,000)
Increase in Accounts payable	55,000
Net cash flow from operations	218,000
Cash flows from investing activities:	
Purchase of building	(160,000)
Purchase of equipment	(25,000)
Sale of equipment	4,000
Net cash flow from investing	(181,000)
Cash flows from financing investing activities:	
Payment of dividends	(15,000)
Net cash flow from financing	(15,000)
Net Increase (Decrease) in Cash	22,000
Cash at beginning of period	34,000
Cash at end of period	56,000
Noncash investing and financing activities:	
Issuance of bonds payable to buy land	130,000

1866
AUB
American University of Beirut
الجامعة الأميركية في بيروت
Maroun Semaan Faculty of
Engineering and Architecture

Introduction to Financial Engineering

ENMG 602

Analysis based on the Statement of Cash Flows [Voice over Slides Video] (Chapter 4, Antle)

Analysis Based on the Statement of Cash Flows

- Recall that liquidity is ability of a business to meet its immediate obligations and that one measure of liquidity is current ratio.

- A disadvantage of current ratio is that it uses year-end balances of current assets and current liabilities (may not be representative of the situation during the year.)

Analysis Based on the Statement of Cash Flows

- A ratio that partially corrects this is current cash debt coverage ratio defined as

$$\frac{\text{Cash provided by operations}}{\text{Average current liabilities}}$$

- Since cash from operations involves the entire year, it is often considered a better representation of liquidity on an average day.

Analysis Based on the Statement of Cash Flows

- Recall that solvency is the ability of a firm to survive over long term. A measure of solvency is debt to total assets ratio.

- A measure of solvency that uses cash figures is cash debt coverage ratio

$$\frac{\text{Cash provided by operations}}{\text{Average total liabilities}}$$

- This ratio measures a company's ability to repay its liabilities from cash generated from operations.