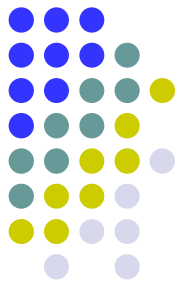


Cash Flow Analysis



15.501/516

Accounting

Spring 2004

Professor S. Roychowdhury

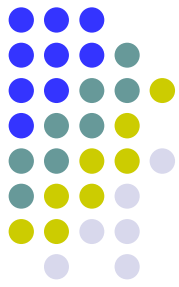
Sloan School of Management

Massachusetts Institute of Technology

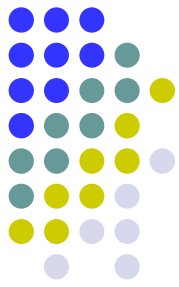
Mar 1/3, 2004



About The Exam

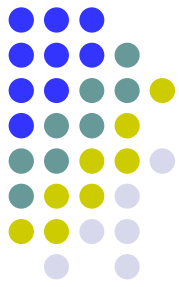


- March 10th – a week from today.
- In class
- Closed book
- TAs will hold a review session. Time and place to be announced shortly.
- March 8th class: in-class exam review.



Statement of Cash Flows

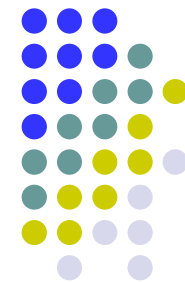
- Reports operating cash flow as well as other cash flow information.
- Provides important information to investors and creditors.
 - In particular, information about differences in the timing of revenue and expense recognition under GAAP and the associated cash inflows and outflows.



Statement of Cash Flows

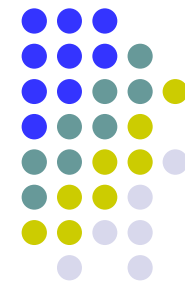
- The cash flow statement separates changes in cash into three categories:
 - operating cash flow
 - investing cash flow
 - financing cash flow.
- The statement sums to the actual change in cash during the year
 - The change equals the difference between the beginning and ending cash balances reported on the balance sheet.

Why focus on a cash flow statement?



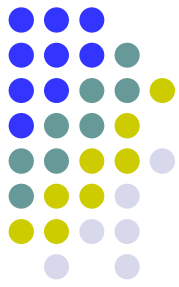
- Net income reported on the income statement provides an important measure of performance.
- However, in the absence of cash flow, income does not pay the bills.
- Interest and dividend payments, required principal reductions on debt, and capital expenditures for plant and equipment and for expansion cannot be made without cash.
- Cash provided by operating activities, also known as operating cash flow, is a primary source of cash to meet these needs.

Why focus on a cash flow statement?



- In the absence of operating cash flow, cash from other sources can be used to cover cash requirements.
- For example, cash can be obtained from on-hand balances or nonrecurring asset sales, new debt or equity financing.
- These non-operating sources of cash flow can be relied upon only in the short run.
- In the long run, operating cash flow is the only reliable source of cash available to meet recurring needs.

2. The company borrows \$3,000 from the bank

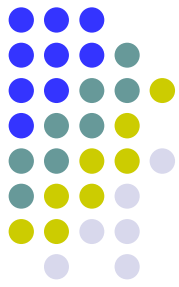


- Assets = Liabilities + Owners' Equity
- Cash Loans Payable
- +\$3,000 +\$3,000

Journal Entry

Dr	Cash		3,000	
	Cr	Loans payable		3,000

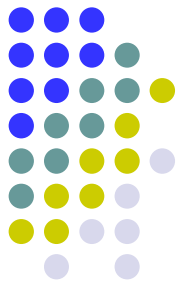
4. Company performs service for \$12,000. The customer pays \$8,000 in cash and promises to pay the balance at a later date.



- Assets = L + Owners' Equity
- Cash Receivables Retained Earnings
- +\$8,000 +\$4,000 +\$12,000

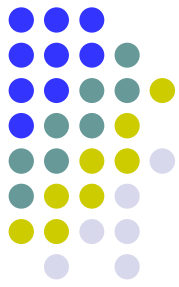
Journal Entry

Dr	Cash	8,000	
Dr	Accounts receivable	4,000	
	Cr Retained earnings (Revenue)		12,000



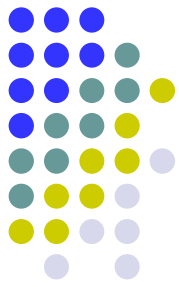
Transactions and the Accounting Equation

Cash	+ A/R	+ Equip.	= L/P	+ C. Cap.	+ R/E
+10,000				+10,000	
+ 3,000			+ 3,000		
- 5,000		+ 5,000			
+ 8,000	+ 4,000				+12,000
- 9,000					- 9,000
- 1,000					- 1,000
6,000	4,000	5,000	3,000	10,000	+ 2,000



Balance Sheet as at December 31, 1997

Assets	Amount	Liabilities and Owners' Equity	Amount
Cash	6,000	Loans Payable	3,000
Receivables	4,000	Contributed Capital	10,000
Equipment	5,000	Retained Earnings	2,000
	<hr/>		<hr/>
Total Assests	\$15,000	Total Liabilities and Owners' Equity	\$15,000
	<hr/>		<hr/>

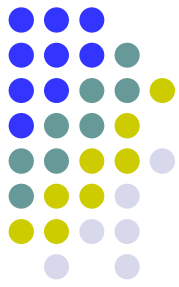


Income Statement

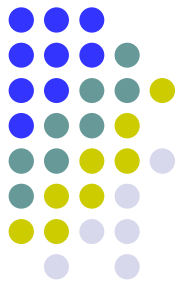
For the year ended December 31, 1997

Revenues: Fees earned for service	\$12,000
Expenses: Wages, interest, maintenance	<u>\$ 9,000</u>
Net income	<u>\$ 3,000</u>

Transactions and Accounting Equation



Cash	+ A/R	+ Equip.	=	L/P	+ C. Cap.	+ R/E
<hr/>						
+10,000					+10,000	
+ 3,000				+ 3,000		
- 5,000		+ 5,000				
+ 8,000	+ 4,000					+12,000
- 9,000						- 9,000
- 1,000						- 1,000
<hr/>						
6,000	4,000	5,000		3,000	10,000	+ 2,000
<hr style="border: 2px solid black;"/>						

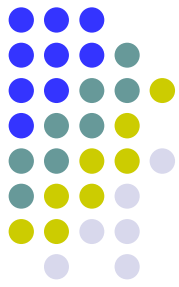


Statement of Cash Flows

For the year ended December 31, 1997

Operating activities:		
Sale of a service (4)	8,000	
Payments for expenses (5)	(9,000)	
Net cash from operating activities	<u> </u>	(1,000)
Investing activities:		
Purchase of equipment (3)	(5,000)	
Net cash from investing activities	<u> </u>	(5,000)
Financing activities:		
Borrowings (2)	3,000	
Owner contributions (1)	10,000	
Payment of dividends (6)	(1,000)	
Increase in cash balance	<u> </u>	<u>6,000</u>
Cash balance at the beginning of the year		0
Cash balance at the end of the year		<u>6,000</u>

Indirect versus Direct Cash Flow Formats



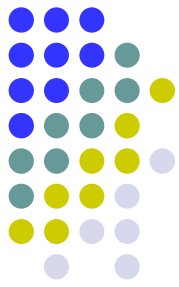
- Affects only the operating section of the cash flow statement

- Direct Cash Flow Statement

Sale of a service (4)	8,000
(-) Payments for expenses (5)	(9,000)
Net cash from operating activities	(1,000)

- Indirect Cash Flow Statement

Net Income	3,000
(-) Sales to customer on account	(4,000)
Net cash from operating activities	(1,000)



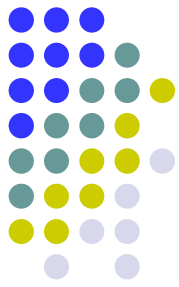
Cash flow statement

- In general, differences between net income and CFO (cash flow from operations) are captured in **operating** current asset and **operating** current liability accounts
- Think accrued salaries expense: If employees have not been paid for the last three days of the year, the journal entry made to recognize salaries expense is:

Dr Wage Expense (-RE)	4,000	
		4,000
Cr Wages Payable (+L)		

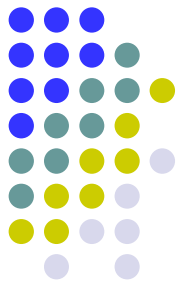
- Thus, to arrive at CFO, adjustments that need to be made to Net Income:
 - Subtract net increase in **operating** current assets other than cash itself
 - Add net increase in **operating** current liabilities

Indirect cash flow statement - depreciation



- What about depreciation?
- Net Income =
Revenues –
Depreciation expenses –
Other expenses
- What is the cash consequence of recording depreciation expense?
- How are depreciation expenses recorded? Quick tutorial!
- Say, buy PP&E for \$ 10 million at the beginning of Year 1
- Estimated life is 10 years
- Estimated scrap value after 10 years: 0
- Depreciation method: straight line
- Depreciation expense every year: $\$(10 \text{ million} / 10) = \$ 1 \text{ million}$

Quick tutorial on depreciation – contd.



- To record depreciation

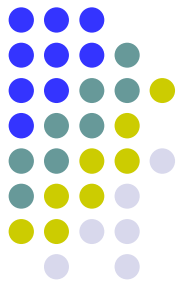
Dr Depreciation (-RE)	1million
Cr Accumulated depreciation(+XA)	1million

- Accumulated depreciation is a contra-asset account attached to long-term depreciable assets (like PP&E)
- At the end of one year, on balance sheet

<i>Gross value of PP&E:</i>	<i>10 million</i>
<i>Less: accumulated depreciation:</i>	<i>01 million</i>
<i>Net PP&E:</i>	<i>09 million</i>

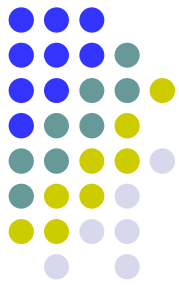
- Therefore:
 1. Depreciation expense affects Net income (negatively).
 2. The cash effect is zero
 3. The difference is in the Accumulated Depreciation account, NOT an **operating** current asset or an **operating** current liability

To arrive at CFO from net income



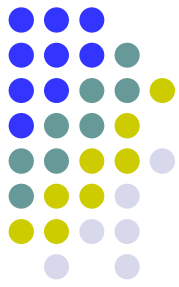
- Start with Net Income
 - *Add* depreciation expense
 - *Subtract* increases in *operating* non-cash current assets
 - *Add* increases in *operating* current liabilities
 - Arrive at CFO
-
- Some gray areas
 - What do you do with interest expense? (where are dividends recorded in the cash flow statement?)
 - What do you do with marketable securities? (usually recorded as current assets on the balance sheet)

To arrive at CFO from net income



- Start with Net Income
 - *Add* depreciation expense
 - *Add* any other non-cash (or accrued) expense that does not affect operating current assets or current liabilities
 - *Subtract* increases in operating non-cash current assets
 - *Add* increases in operating current liabilities
 - Arrive at CFO
-
- Some gray areas
 - What do you do with interest expense? (where are dividends recorded in the cash flow statement?)
 - What do you do with marketable securities? (usually recorded as current assets on the balance sheet)

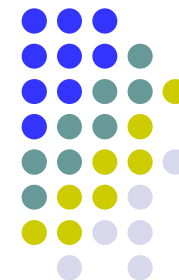
Cash Flow Statement: Indirect-Method



Scientific Technologies, Inc.
Year Ending December 31, 1994

<i>Cash flows from operating activities</i>	
Net income	\$3,698
Adjustments to reconcile net income	
Depreciation and amortization	337
Changes in assets and liabilities	
A/R, net	(18,411)
Inventories	(652)
Receivable from parent company	675
Trade accounts payable	670
Accrued expenses	590
Other	(98)
Cash flows from operating activities	<u>3,379</u>

Cash Flow Statement: Indirect-Method



Cash flows from investing activities

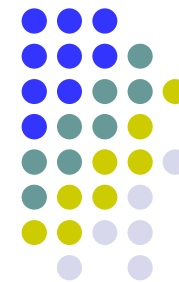
Property and equipment	(1,041)
Sale (purchase) of S-T investments	809
Cash flows from investing activities	<u>(232)</u>

Cash flows from financing activities

Payments on debt	(50)
Reissuance of treasury stock	4
Dividends	(957)
Cash flows from financing activities	<u>(1,003)</u>

Change in cash and cash equivalent	2,144
Cash and cash equivalent at beginning of year	103
Cash and cash equivalent at end of year	<u>2,247</u>

Cash Flow Statement: Direct Method

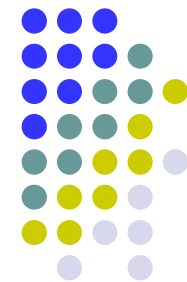


Scientific Technologies, Inc.
Year Ending December 31, 1994

Cash flows from operating activities

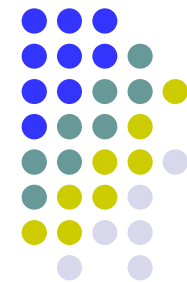
Cash received from customers	\$24,274
Interest received and other cash income	685
Cash paid to suppliers and employees	(19,107)
Income taxes paid	(2,446)
Interest paid	(7)
Cash flows from operating activities	<hr/> \$3,379

Preparing a cash flow statement



- CF from Operating activities
 - Net Income
 - Adjust for Non-Cash Changes in Current Accounts
 - Subtract increase in net accounts receivable
 - Subtract increase in inventory
 - Subtract increase in prepaid expenses
 - Add increase in accounts payable
 - Add increase in miscellaneous expenses payable
 - Add increase in taxes payable

Preparing a cash flow statement



- CF from Operating activities
 - Net Income
 - Adjust for Non-Cash Changes in Current Accounts
 - Adjust for Non-Cash Changes in Non-Current Accounts
 - Add Depreciation & Amortization
 - Add Loss on Sale of Assets
 - Subtract Gain on Sales of Assets