Math Camp

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Unit 4

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Unit 4 Outline

- Asset-Liability Identity
- Double-Entry/T-Accounts
- Financial Statements
  - Balance Sheet
  - Income Statement
  - Cash Flow
- Analysis and Interpretation

Math Camp

Interlude

Why Accounting?

Translating environmental objectives into financial terms is a vital element in motivating sustainability.

- Understand the financial context in which the organization operates
- Identify and allocate shared costs correctly to 'clean' and 'dirty' products
- Evaluate the benefits of environmental action and the potential risks of inaction
- Identify new revenue sources created by eco-efficient products and processes

Asset-Liability Identity

Assets = Liabilities + Equity (double entry):

- Balance sheet provides snapshot of investing (assets) and financing activities (liabilities & equity) of a business at a point in time
- **Assets**: economic resources with the potential to provide future benefits, generally carried at acquisition cost
- **Liabilities**: creditors' claims on the assets of a firm resulting from benefits received but not paid for.
- **Equity**: owners' *residual* claim on the assets of the firm

Business example

Natalie & Sam, while researching biodiversity, learn that neem is a tropical plant with natural antiseptic properties which is made into a dental ointment in India. They decide to market a neem toothpaste in the US.

Business goals:

- Maximize return to the owners of the business (Natalie & Sam)
- Provide a stimulating and stable lifetime working environment for employees
- Further biodiversity

Business Example

Obtaining Financing:

- Owners
- Creditors:
  - Bonds
  - Bank loans
  - Credit card debt
  - Vendor financing
  - Employee financing

Business Example

Making Investments:

- Purchasing assets that facilitate business operations, e.g. land, buildings and equipment, or patents, licenses or other contractual rights
- Purchasing assets intended for resale, e.g. inventory of toothpaste
- Purchasing assets required to effect a sale, e.g. accounts receivable
- Depositing cash in a bank account or to fund a letter of credit.

Business Example

Carrying out operations:

- Purchasing toothpaste and cardboard boxes
- Marketing toothpaste to grocery stores
- Managing the process: coordinating all activities, dealing with anticipated and unanticipated problems, continuous re-evaluation and development etc.

Double Entry Bookkeeping

Carry out T-accounts for some business transactions of Natalie & Sam :

1. Incorporate at mycorp.com
2. Pay incorporation fees with Natalie's credit card
3. Open a bank account
4. Obtain a small business credit card
5. Buy a computer with Peachtree accounting software
6. Place an order for a shipment of toothpaste
7. Receive the shipment of toothpaste
8. Buy a box of packaging
9. Put tubes into cardboard boxes
10. Sell some toothpaste to Whole Foods

Financial Reporting Context

- Target audience: owners, creditors
- Other users: regulators (SEC), “capital markets,” vendors, employees, competitors, IRS, courts
- Acceptable accounting standards (set by FASB and known as GAAP in the US)

Annual Report Roadmap

MD&A
Auditor's opinion
Balance sheet
Income statement
Cash Flow statement
Notes to the financial statements

Financial Statement Concepts

Materiality
Misstatement
Presents fairly
US GAAP

Example

	Year 1	Year 2	Year 3
Current Assets	1546	?	1466
Noncurrent Assets	?	9080	8998
Total Assets	10547	?	?
Current Liabilities	1489	?	?
Noncurrent Liabilities	4643	4915	?
Shareholders’ Equity	?	4434	4029
Total Liabilities & Shareholders’ Equity	?	10591	?
Current Assets/Current Liabilities	?	?	1.024

Compute the missing amounts.

Basic Accounting

Assets = Liabilities + Equity (double entry)

- **Equity** = Contributed Capital + Retained Earnings
  - Retained Earnings = Prior year retained earnings + current year net income – dividends paid

Financial Accounting Overview

- Balance Sheet
  - Assets & liabilities
    - Recognition of executed transactions and some unexecuted transactions
    - Valuation (historic cost, entry value, exit value & present value)
    - Classification (current, intangibles)
- Income Statement
  - Cash basis vs. accruals basis

Impact of Timing

- Historic cost vs current valuation:
  - Historic cost is the cumulative trace of past valuations, as validated by past transactions
  - Current valuation will generally differ from historic cost
  - The ratio of current valuation to historic cost is informative. How so?
- Price/Book Value Variation:
  - Apple Inc. AAPL : 3.96x
  - Blackberry Ltd. BBRY: 0.44x
  - Exxon Mobil Corp. XOM: 2.36x
  - Hess Corp. HES: 1.31x

Impact of Timing

Accruals & matching:

- Cash basis inadequately matches revenues and expenses, unnecessarily delays the recognition of revenue and may provide opportunities to distort operating performance
- Accrual basis attempts to match revenues with expenses, either by transaction when feasible and by time period otherwise. Significant judgment is involved in the matching process.

Liabilities

Precise:

- Trade creditors
- Notes payable

Imprecise:

- Pension liabilities
- Reserves for potential environmental liabilities

Question

Where do the following environmental assets and liabilities appear in the balance sheet of an airline company such as Virgin Atlantic?

1. The ability to emit greenhouse gases to generate profit
2. The potential future damage caused by such emissions

Cash Flow Statement

- Classification:
  - Operating cash flows
  - Investing cash flows
  - Financing cash flows
- More difficult to manage
- Cash Flow Concepts:
  - Free Cash Flow (EBITDA – non-discretionary capital expenditure)

Financial Analysis (Return)

- Adjusted ROA: (Net Income + after-tax interest expense)/Average Total Assets
- Profit Margin
- Assets Turnover Ratio
- Return on Common Equity: (Net Income – preferred dividends)/Average common equity

Financial Analysis (Capital structure)

Common size income statement:
- Payments to vendors
- Payments to employees
- Payments to financiers
- Returns to owners

In good times, ROA > ROE

How much greater depends on leverage

Leverage

- Increase returns to equity-holders by:
  - Tax deductibility of interest
  - Increasing risk of insolvency
- ST Liquidity Risk
  - Current ratio, Quick ratio, CFO over current liabilities, Days current assets held
- LT Liquidity Risk
  - Debt-Equity, CFO over Total liabilities, Interest coverage

Capital Structure

Rights in Bankruptcy
Advisors and lawyers
Employees and vendors
Secured creditors
Senior debt
Subordinated debt
Preferred equity
Common equity

Example Problem

	($ in millions)	
	Company A	Company B
Earnings before interest and taxes	300	560
Interest expense	20	160
Earnings before tax	280	400
Taxes at 40%	112	160
Earnings after tax	168	240
Debt	200	1600
Equity	800	400

Calculate each company's ROE, ROA and ROIC.

Example Problem

	($ in millions)	
	Company A	Company B
ROE = earnings after tax / equity	21%	60%
ROA = earnings after tax / (debt+equity)	16.8%	12%
ROIC = after tax ebit / (debt+equity)	18%	16.8%

Why is Company B's ROE so much higher than A's? Does this mean B is a better company? Why or why not?

Why is Company A's ROA so much higher than B's? What does this tell you about the two companies?

How do the two companies' ROICs compare? What does this suggest about the companies?

Example Problem

($ in millions)		
	TJX	Gap
Net Sales	$ 21,942	$ 14,664
Interest Expense, net	$ 39	$ (14)
Net Income	$ 1,343	$ 1,204
Average Stockholders' Equity	$ 2,995	$ 4,486
Average Total Assets (average of beginning and end)	$ 7,718	$ 7,525

Compute the net income margin, return on assets and return on equity for both companies.

Example Problem

	TJX	Gap
Net Income Margin	6%	8%
ROA	17%	16%
ROE	45%	27%

How might The Gap increase its return on equity to match that of TJX? Why might that be a bad idea for The Gap?.

Ratio Analysis

Profitability

A. Operating Profit Margin
B. Return on Equity
C. Return on Assets

Liquidity
A. Current Ratio
B. Net Debt/Equity
C. Free Cash Flow

Market Valuation
A. EV/EBITDA Multiple
B. P/E