Firms and Financial Markets
The Circular Flow Model

**Expenditures**
- Consumption by Households
- Investment by Firms

**Income**
- Wages for Labor
- Interest for Capital
- Rent for Land
- Profits for Entrepreneurship

**Factor Markets**

**Product Markets**

Households own all resources and receive all income

Firms are the only producers
## Organization of a Firm

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Sole Proprietorship</th>
<th>Partnership</th>
<th>Corporation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ownership</td>
<td>Individual</td>
<td>Partners</td>
<td>Shareholders</td>
</tr>
<tr>
<td>Residual Claimant</td>
<td>Individual</td>
<td>Partners</td>
<td>Shareholders</td>
</tr>
<tr>
<td>Personal Liability</td>
<td>Full</td>
<td>Full</td>
<td>Limited</td>
</tr>
<tr>
<td>Transferability of Ownership</td>
<td>Difficult</td>
<td>Difficult</td>
<td>Easy</td>
</tr>
<tr>
<td>Funding</td>
<td>Borrowing &amp; owner savings</td>
<td>Borrowing &amp; owner savings</td>
<td>Borrowing, stock, and bonds</td>
</tr>
<tr>
<td>Profits &amp; Tax Treatment</td>
<td>Taxed at income rate</td>
<td>Taxed at income rate</td>
<td>Taxed at corporate &amp; income rate “Double Taxation”</td>
</tr>
<tr>
<td>Management</td>
<td>Direct</td>
<td>Direct</td>
<td>Indirect (Principal-Agent Problem)</td>
</tr>
</tbody>
</table>

### Shareholders
- Owners of the corporation
- Elect a Board of Directors

### Board of Directors
- Panel or representatives established to represent the shareholders interests
- Appoint the Chief Executives

### Chief Executives
- Manage the day to day operations of the corporation
- CEO, CFO, COO

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![Pie charts showing distribution of firms, revenue, and profits among sole proprietorships, partnerships, and corporations.](image)
How Firms Raise Funding

**Internal Funding**
- Owner equity
- Retained earnings

**External Funding**
- Indirect Finance
  - Financial Intermediaries (i.e., banks) transfer savings to firms for investment
- Direct Finance
  - "Financial Markets" (i.e., stock & bond markets) transfer savings to firms for investment.

<table>
<thead>
<tr>
<th>Savings</th>
<th>Investment Funds</th>
</tr>
</thead>
<tbody>
<tr>
<td>Indirect</td>
<td>Large &amp; Small Business loans</td>
</tr>
<tr>
<td>CDs</td>
<td>Venture Capital Loans</td>
</tr>
<tr>
<td>Savings Deposits</td>
<td>Corporate Loans</td>
</tr>
<tr>
<td>Checkable Deposits</td>
<td>Working Capital Loans</td>
</tr>
<tr>
<td>Direct</td>
<td>Construction Loans</td>
</tr>
<tr>
<td>Bonds</td>
<td>Stocks</td>
</tr>
</tbody>
</table>

Savers acquire "Assets"
Borrowers acquire "Liabilities"
External Funding and Bonds

- **Bond**
  - A Financial Security that represents a promise to repay a fixed amount of funds in the future and entitles the holder to a return in the form of interest.

- **Bond Markets**
  - Primary
  - Secondary

- **Bond Ratings**
  - Default Risk

- **Bond Terms**
  - Face (Principal)
  - Maturity
  - Coupon
  - Coupon Rate
  - Yield

\[
\text{Coupon Rate} = \frac{\text{Coupon Payment}}{\text{Face Value}}
\]

\[
\text{Yield} = \frac{\text{Coupon Payment}}{\text{Price}}
\]
External Funding and Stocks

• Stock
  – A Financial Security that represents partial ownership in a firm.

• Stock Markets
  – Primary
  – **Secondary**

• Stock Exchanges
  – NYSE
    • Physical Exchange
  – NASDAQ
    • Computer-based exchange
    • “Over the Counter (OTC)” Trading

• Stock Terms
  – Dividends
  – Capital Gains
  – Mutual Funds

• Stock Indexes
  – Dow
  – S&P 500
  – NASDAQ

<table>
<thead>
<tr>
<th>Company</th>
<th>Symbol</th>
<th>Exchange</th>
<th>Open</th>
<th>High</th>
<th>Low</th>
<th>Close</th>
<th>Volume</th>
<th>52 wk Range</th>
<th>Market Cap (mil)</th>
<th>P/E</th>
</tr>
</thead>
<tbody>
<tr>
<td>Starbucks</td>
<td>SBUX</td>
<td>NASDAQ</td>
<td>13.79</td>
<td>14.39</td>
<td>13.72</td>
<td>14.34</td>
<td>17,483,600</td>
<td>7.06-18.56</td>
<td>10,589</td>
<td>119.92</td>
</tr>
<tr>
<td>General Electric</td>
<td>GE</td>
<td>NYSE</td>
<td>12.13</td>
<td>12.27</td>
<td>11.93</td>
<td>11.97</td>
<td>124,480,400</td>
<td>5.73-30.39</td>
<td>128,133</td>
<td>7.52</td>
</tr>
<tr>
<td>McDonalds</td>
<td>MCD</td>
<td>NYSE</td>
<td>58.41</td>
<td>58.83</td>
<td>58.00</td>
<td>58.16</td>
<td>9,605,437</td>
<td>45.79-67.00</td>
<td>64,175</td>
<td>15.23</td>
</tr>
<tr>
<td>Microsoft</td>
<td>MSFT</td>
<td>NASDAQ</td>
<td>24.04</td>
<td>24.34</td>
<td>23.75</td>
<td>23.50</td>
<td>64,038,100</td>
<td>14.87-28.92</td>
<td>214,216</td>
<td>13.83</td>
</tr>
</tbody>
</table>
Firm Financial Statements

Income Statement

- Documents revenues, costs, and profit over a company's Fiscal Year.
- **Accounting Profit**: Revenue – Explicit Costs
- **Economic Profit**: Revenue – (Explicit + Implicit Costs)
- Economists always consider Opportunity Costs which include both Explicit and Implicit Costs
- Opportunity Costs represent the next best alternative use of the resources.

Facebook's Income Statement 2012

<table>
<thead>
<tr>
<th>Revenue</th>
<th>$5,089</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating expenses</td>
<td></td>
</tr>
<tr>
<td>Cost of revenues</td>
<td>1,364</td>
</tr>
<tr>
<td>Research and development</td>
<td>1,399</td>
</tr>
<tr>
<td>Sales and marketing</td>
<td>896</td>
</tr>
<tr>
<td>General and administrative</td>
<td>892</td>
</tr>
<tr>
<td>Total operating expenses</td>
<td>4,551</td>
</tr>
<tr>
<td>Operating income</td>
<td>538</td>
</tr>
<tr>
<td>Investment income</td>
<td>(44)</td>
</tr>
<tr>
<td>Income before income taxes</td>
<td>494</td>
</tr>
<tr>
<td>Income taxes</td>
<td>(441)</td>
</tr>
<tr>
<td>Net income (accounting profit)</td>
<td>53</td>
</tr>
</tbody>
</table>

Note: All numbers are in millions of dollars.
Firm Financial Statements

Balance Sheet

- Documents a firm's Assets, Liabilities, and Net Worth at a specific point of time.
- Assets – Liabilities = Stockholder’s Equity

Facebook’s Balance Sheet Dec. 31st 2012

<table>
<thead>
<tr>
<th>Assets</th>
<th>Liabilities and Stockholders' Equity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Current assets</td>
<td>$11,267</td>
</tr>
<tr>
<td>Property and equipment</td>
<td>2,391</td>
</tr>
<tr>
<td>Goodwill</td>
<td>1,388</td>
</tr>
<tr>
<td>Other long-term assets</td>
<td>57</td>
</tr>
<tr>
<td>Total assets</td>
<td>$15,103</td>
</tr>
</tbody>
</table>

*Note: All values are in millions of dollars.*
Present Value & Asset Pricing

• Present Value: How much funds in the future are worth today?

\[
\text{Present value} = \frac{\text{Future value}_n}{(1+i)^n}
\]

Where \(i\) is the return available on an alternative investment. i.e. discount rate.

• Example, suppose you receive $50,000 immediately and $50,000 each year for four subsequent years. Assuming a 10% interest rate, the present value is calculated as:

\[
\begin{align*}
$50,000 + \frac{$50,000}{(1+0.10)} + \frac{$50,000}{(1+0.10)^2} + \frac{$50,000}{(1+0.10)^3} + \frac{$50,000}{(1+0.10)^4} \\
$50,000 + $45,454.55 + $41,322.31 + 37,565.74 + $34,150.67 = $208,493
\end{align*}
\]

• The Discount Rate used depends on how each persons time preference.
  
  – A high rate describes people who more present oriented.
  
  – A low rate is describes people who are more future oriented.
  
  – Typically, an individual’s discount rate becomes related to the rates at which they can borrow or save.
Present Value Calculation for a Bond

\[
\text{Bond price} = \frac{\text{Coupon}_1}{(1+i)} + \frac{\text{Coupon}_2}{(1+i)^2} + \ldots + \frac{\text{Coupon}_n}{(1+i)^n} + \frac{\text{Face value}}{(1+i)^n}
\]

• Example: present value of a bond with a face value of $1000 that pays a coupon of $20 annually and has a maturity of 2 years.

\[
$926.66 = \frac{$20}{1.06^1} + \frac{$20}{1.06^2} + \frac{$1,000}{1.06^2}
\]

• Notice, as the discount rate increases, the present value of a bond goes down and vice versa.

Present Value Calculation for Stock

\[
\text{Stock price} = \frac{\text{Dividend}}{(i - \text{Growth rate})}
\]

Since stocks do not have a maturity the formula is modified slightly; accounting for the growth rate of dividends over time.

• Example: present value of a stock yielding $5.00 annual dividends in perpetuity, assuming the dividends do not grow over time.

\[
$83.33 = \frac{$5.00}{0.06}
\]

• Notice, as the discount rate increases, the present value of the stock goes down and vice versa.
Application:

1. Calculate the present value of a bond with a coupon rate of 3%, a principal of $1000, a maturity of 3 years and a discount rate of 6%.

2. Recalculate question #1 assuming your time-preference has changed and the discount rate has increased to 10%; assume all other variables are the same.

3. Using a discount rate of 10%, calculate the value of a stock that is expected to pay a dividend of $5 in perpetuity and has a dividend growth rate of 5%.

4. Using the value of the stock from #3 as the current market price, calculate the price-to-earnings ratio of assuming an annual return of $1.50 per share.

5. Calculate the value in 10 years of $1,000,000 received today assuming a discount rate of 6%.

6. Assume you win the lottery and are offered the option of receiving $10,000,000 today or $900,000 each year for the rest of your life (your young so this reasonably approximates a perpetuity). Assuming a discount rate of 10%, which option makes the most financial sense?