What the Course is About...

- Corporate finance: shareholder value can be affected by financial decisions: investment, financing, payout & risk management. Restructuring may be needed to realize latent value.
  - Corporate investment decisions
  - Corporate financing choices
  - Risk management
  - M&A and restructuring
The Decisions that Create Shareholder Value

- CORPORATE INVESTMENT DECISIONS
- CORPORATE FINANCING CHOICES
- CORPORATE PAYOUT POLICIES
- CORPORATE RISK MANAGEMENT
- CREATING CORPORATE ECONOMIC VALUE
Finance in the Corporation
Corporate Investment Decisions: Build or Buy?
Capital Budgeting: Present Value of Cash Flow Streams

Consider SBC Communications’ projections of an investment in South Africa’s Telkom. How much is it worth investing?

- What is the cost of funding this investment?
- What is the required return on this investment?

<table>
<thead>
<tr>
<th>Time</th>
<th>$</th>
<th>$</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>-100</td>
<td>400</td>
</tr>
<tr>
<td></td>
<td></td>
<td>300</td>
</tr>
</tbody>
</table>
How Much Debt? What Kind?

Assets

Value of future cash flows

Liabilities

?
How Much Debt? What Kind?

Assets

Value of future cash flows

Liabilities

Claims on the cash flows
When Debt and Equity are Not Enough

Assets

- Value of future cash flows

Liabilities

Debt
- Contractual int. & principal
- No upside
- Senior claims
- Control via restrictions

Equity
- Residual payments
- Upside and downside
- Residual claims
- Voting control rights
Corporate Balance Sheet and Allocation of Cash Flows

Total Value of Firm’s Assets

Assets equal Liabilities

Total Value of the Firm to Investors in the Financial Markets
Corporate Balance Sheet and Allocation of Cash Flows

Total Value of Firm’s Assets

- B. Firm invests in assets
  - Current Assets
  - Fixed Assets

Total Value of the Firm to Investors in the Financial Markets

- A. Firm issues securities, gets money
- F. Dividends, buybacks, and debt payments
- Financial Markets
  - Short-term debt
  - Long-term debt
  - Equity shares

D. Government (taxes)

C. Cash flow from firm’s assets
- E. Retained cash flows
Sources of Corporate Financial Risk

Uncertain Markets

Uncertain Exposures

Risk!

Mistaken Views

Wrong Risk Measurement Methods
Corporate Finance: The Context
The Firm Must Attract Investors

The Economy

Investors

Financial Markets
**Investors Have Choices**

- **Money market instruments** - Short-term debt instruments, like deposits and bills
- **Bonds** - used by businesses and governments to raise money
- **Common Stock** - Units of ownership, interest, or equity
- **Preferred Stock, Convertibles, other hybrids** - A form of ownership with features of both debt and common stock
# Investors Compare Possible Investments Against Market Benchmarks

## World Indices

<table>
<thead>
<tr>
<th>Description</th>
<th>Value</th>
<th>Net Change</th>
<th>% Change</th>
<th>Time</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>North/Latin America</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>DOW JONES INDUS. AVG</td>
<td>8695.31</td>
<td>-145.28</td>
<td>-1.66</td>
<td>01/08</td>
</tr>
<tr>
<td>S&amp;P 500 INDEX</td>
<td>909.93</td>
<td>-13.00</td>
<td>-1.41</td>
<td>01/08</td>
</tr>
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<td>NASDAQ COMPOSITE INDEX</td>
<td>1401.07</td>
<td>-30.50</td>
<td>-2.13</td>
<td>01/08</td>
</tr>
<tr>
<td>S&amp;P/TSX COMPOSITE INDEX</td>
<td>6723.11</td>
<td>-79.67</td>
<td>-1.17</td>
<td>01/08</td>
</tr>
<tr>
<td>MEXICO BOLSA INDEX</td>
<td>6266.48</td>
<td>-12.80</td>
<td>-0.20</td>
<td>01/08</td>
</tr>
<tr>
<td>BRAZIL Bovespa Stock Index</td>
<td>11785.54</td>
<td>-90.55</td>
<td>-0.76</td>
<td>01/08</td>
</tr>
<tr>
<td><strong>Europe/Africa</strong></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>DJ EURO STXX 50 P INDEX</td>
<td>2416.08</td>
<td>-33.70</td>
<td>-1.38</td>
<td>07/03</td>
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<td>FTSE 100 INDEX</td>
<td>3882.70</td>
<td>-42.10</td>
<td>-1.07</td>
<td>07/03</td>
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<td>CAC 40 INDEX</td>
<td>3068.54</td>
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<td>-0.83</td>
<td>07/17</td>
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<td>DAX INDEX</td>
<td>2345.76</td>
<td>-47.22</td>
<td>-1.98</td>
<td>07/18</td>
</tr>
<tr>
<td>IBEX 35 INDEX</td>
<td>6275.20</td>
<td>-102.00</td>
<td>-1.63</td>
<td>06/57</td>
</tr>
<tr>
<td>MILAN MIB30 INDEX</td>
<td>2426.00</td>
<td>-324.00</td>
<td>-1.29</td>
<td>07/03</td>
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<tr>
<td>AMSTERDAM EXCHANGES INDEX</td>
<td>323.47</td>
<td>-5.26</td>
<td>-1.60</td>
<td>07/18</td>
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<tr>
<td>SWISS MARKET INDEX</td>
<td>4005.20</td>
<td>-77.10</td>
<td>-1.93</td>
<td>07/17</td>
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<tr>
<td><strong>Asia/Pacific</strong></td>
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<td></td>
<td></td>
<td></td>
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<tr>
<td>NIKKEI 225 INDEX</td>
<td>8497.93</td>
<td>-19.87</td>
<td>0.23</td>
<td>03/12</td>
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<td>HANG SENG INDEX</td>
<td>9675.41</td>
<td>-12.80</td>
<td>0.13</td>
<td>03/06</td>
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<td>S&amp;P/ASX 200 INDEX</td>
<td>3064.90</td>
<td>-9.90</td>
<td>0.32</td>
<td>00/07</td>
</tr>
</tbody>
</table>

Source: Bloomberg.com

## Key Rates

<table>
<thead>
<tr>
<th>Rate</th>
<th>Current</th>
<th>1 Month</th>
<th>2 Months</th>
<th>3 Months</th>
<th>6 Months</th>
<th>1 year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fed Funds</td>
<td>1.50</td>
<td>1.25</td>
<td>1.06</td>
<td>1.75</td>
<td>1.75</td>
<td>1.75</td>
</tr>
<tr>
<td>3 Month Libor</td>
<td>1.38</td>
<td>1.41</td>
<td>1.40</td>
<td>1.77</td>
<td>1.86</td>
<td>1.84</td>
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<tr>
<td>Prime Rate</td>
<td>4.25</td>
<td>4.25</td>
<td>4.25</td>
<td>4.75</td>
<td>4.75</td>
<td>4.75</td>
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<tr>
<td>2-Year AAA Industrial</td>
<td>2.14</td>
<td>2.36</td>
<td>2.22</td>
<td>2.28</td>
<td>2.95</td>
<td>3.15</td>
</tr>
<tr>
<td>10-Year AAA Industrial</td>
<td>4.51</td>
<td>4.83</td>
<td>4.68</td>
<td>4.74</td>
<td>5.43</td>
<td>5.92</td>
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</tbody>
</table>

## Mortgage Rates

<table>
<thead>
<tr>
<th>Bankrate.com</th>
<th>Current</th>
<th>1 Month</th>
<th>2 Months</th>
<th>3 Months</th>
<th>6 Months</th>
<th>1 year</th>
</tr>
</thead>
<tbody>
<tr>
<td>15 year mortgage</td>
<td>5.02</td>
<td>5.15</td>
<td>5.09</td>
<td>5.15</td>
<td>5.54</td>
<td>6.12</td>
</tr>
<tr>
<td>30 year mortgage</td>
<td>5.50</td>
<td>5.73</td>
<td>5.67</td>
<td>5.71</td>
<td>6.08</td>
<td>6.65</td>
</tr>
<tr>
<td>1 year ARM</td>
<td>3.31</td>
<td>3.34</td>
<td>3.35</td>
<td>4.10</td>
<td>4.06</td>
<td>5.13</td>
</tr>
</tbody>
</table>

**15 year Mortgage**

**30 year Mortgage**

**1 year ARM**

**Credit Spread**

* = 10 yr BAA rated industrial bonds minus yield on 10 yr Treasury.
Total Yield is What Investors Seek

- “Yield to maturity” combines coupons and capital gains - all cash flows.
- The yield to maturity on any bond, is the rate that will make the present value of the cash flows from the investment equal to the price of the investment.
- Also known as the internal rate of return or IRR.
Longer-Term Investments Generally Offer Higher Interest Rates

Term Structure of Interest Rates

◆ More commonly known as a *yield curve*, it shows the relationship between the *interest rate*, or rate of return, and the *time to maturity* of securities with similar issuer characteristics.

◆ Yield curves can be downward-sloping, flat, or upward sloping.

◆ The three theories of term structure are the expectations hypothesis, liquidity preference theory, and market segmentation theory.

◆ A *normal yield curve* is upward-sloping.
The US Treasury Yield Curve

January 2003
Source: bondsonline.com
Interest Rates and Required Rates of Return

Interest Rate Fundamentals

- The interest rate is the "price" of borrowed funds
- The required return is the owner's expected return
- The *real rate of interest* \((k^*)\) is the cost of money that balances the supply of and demand for funds
- The *risk-free rate of interest* \((R_F)\) represents the real rate of interest plus inflationary expectations
- The *nominal rate of interest* \((k)\) is the actual rate of interest charged by the supplier of funds
- Interest rates differ between *currencies*, based on exchange-rate expectations
Risk and Return

- A positive relationship exists between risk and nominal or expected return.
- The actual return earned on a security will affect the subsequent actions of investors.
- Investors must be compensated for accepting greater risk with the expectation of greater return.

Risk

Return

Risk

Risker Investments Have to Offer Higher Returns
Riskier Investments Have to Offer Higher Returns: Example

Bridge Corporate Spreads for Industrials

<table>
<thead>
<tr>
<th>Rating</th>
<th>1 yr</th>
<th>2 yr</th>
<th>3 yr</th>
<th>5 yr</th>
<th>7 yr</th>
<th>10 yr</th>
<th>30 yr</th>
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<tbody>
<tr>
<td>AAA</td>
<td>30</td>
<td>91</td>
<td>0</td>
<td>113</td>
<td>0</td>
<td>66</td>
<td>89</td>
</tr>
<tr>
<td>AA+</td>
<td>93</td>
<td>53</td>
<td>0</td>
<td>85</td>
<td>0</td>
<td>85</td>
<td>102</td>
</tr>
<tr>
<td>AA</td>
<td>59</td>
<td>88</td>
<td>0</td>
<td>40</td>
<td>0</td>
<td>96</td>
<td>106</td>
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<tr>
<td>AA-</td>
<td>87</td>
<td>83</td>
<td>0</td>
<td>114</td>
<td>0</td>
<td>97</td>
<td>82</td>
</tr>
<tr>
<td>A+</td>
<td>66</td>
<td>115</td>
<td>0</td>
<td>102</td>
<td>0</td>
<td>87</td>
<td>119</td>
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<tr>
<td>A</td>
<td>109</td>
<td>132</td>
<td>0</td>
<td>132</td>
<td>0</td>
<td>115</td>
<td>155</td>
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<tr>
<td>A-</td>
<td>139</td>
<td>170</td>
<td>0</td>
<td>153</td>
<td>0</td>
<td>131</td>
<td>148</td>
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<tr>
<td>BBB+</td>
<td>146</td>
<td>211</td>
<td>0</td>
<td>181</td>
<td>0</td>
<td>171</td>
<td>199</td>
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<tr>
<td>BBB</td>
<td>213</td>
<td>266</td>
<td>0</td>
<td>247</td>
<td>0</td>
<td>225</td>
<td>259</td>
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<tr>
<td>BBB-</td>
<td>399</td>
<td>352</td>
<td>0</td>
<td>318</td>
<td>0</td>
<td>295</td>
<td>282</td>
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<tr>
<td>BB+</td>
<td>496</td>
<td>542</td>
<td>0</td>
<td>460</td>
<td>0</td>
<td>440</td>
<td>697</td>
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<tr>
<td>BB</td>
<td>648</td>
<td>654</td>
<td>0</td>
<td>602</td>
<td>0</td>
<td>517</td>
<td>1207</td>
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<tr>
<td>BB-</td>
<td>649</td>
<td>660</td>
<td>0</td>
<td>594</td>
<td>0</td>
<td>559</td>
<td>1044</td>
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<tr>
<td>B+</td>
<td>585</td>
<td>818</td>
<td>0</td>
<td>782</td>
<td>0</td>
<td>689</td>
<td>470</td>
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</tbody>
</table>

Source: bondsonline.com
The Value of Money
The Role of Time Value in Finance

- Future Value versus Present Value
- A dollar tomorrow is worth less than a dollar today
- *Compounding* is used to find future value
- *Discounting* is used to find present value
The Concept of Future Values

\[ FV_n = PV \cdot (1+r)^n \]

- \( FV_n \) = Future value at the end of the year \( n \)
- \( PV \) = Present value, or original principal amount
- \( r \) = Annual rate of interest paid
- \( n \) = Number of periods (usually years) separating the present value and the future value, or number of years the money is left on deposit

Note: The term \( (1+r)^n \) is the future value of interest factor, or \( FVIF_{r,n} \)
**IBM’s Eurodollars**

If IBM deposits $8 million today in a Eurodollar account paying 9% annual interest, how much will IBM have at the end of three years?

\[
PV = $8 \text{ m} \\
FV_3? \\
0 \hspace{2cm} 1 \hspace{2cm} 2 \hspace{2cm} 3
\]

\[
PV = $8, \quad r = 9\% , \quad n = 3 \\
FV_3 = $8 \times (1 + .09)^3 = $8 \times (1.295) = $10.36 \text{ m}.
\]
Compounding More Frequently Than Annually

New variable: \( m = \text{number of compounding periods per year} \)

- Divide \( r \) by \( m \)
- Multiply \( m \) times \( n \)

Thus:

\[
FV_n = PV \times (1 + \frac{r}{m})^{mxn}
\]
The Effective Rate of Interest

\[ r_{\text{eff}} = (1 + \frac{r}{m})^m - 1 \]

- \( r \) is the nominal, or stated, rate
- \( r_{\text{eff}} \) is the effective rate
- \( m \) is the number of times per year interest is paid

Only $499 a month!
Only 11.99% APR!
## Effective Rate of Interest

### Nominal Rate, \( r = 12\% \)

<table>
<thead>
<tr>
<th>Compounding</th>
<th>Period</th>
<th>( m )</th>
<th>( r_{eff} = (1 + r/m)^m - 1 )</th>
<th>Effective Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Annual</td>
<td>1</td>
<td>((1 + .12/1)^1 - 1) = (1 + .12 - 1)</td>
<td>(.12) = 12.00%</td>
<td></td>
</tr>
<tr>
<td>Semiannual</td>
<td>2</td>
<td>((1 + .12/2)^2 - 1) = (1.1236 - 1)</td>
<td>(.1236) = 12.36%</td>
<td></td>
</tr>
<tr>
<td>Quarterly</td>
<td>4</td>
<td>((1 + .12/4)^4 - 1) = (1.1255 - 1)</td>
<td>(.1255) = 12.55%</td>
<td></td>
</tr>
<tr>
<td>Monthly</td>
<td>12</td>
<td>((1 + .12/12)^{12} - 1) = (1.1268 - 1)</td>
<td>(.1268) = 12.68%</td>
<td></td>
</tr>
<tr>
<td>Daily</td>
<td>360</td>
<td>((1 + .12/360)^{360} - 1) = (1.1275 - 1)</td>
<td>(.1275) = 12.75%</td>
<td></td>
</tr>
<tr>
<td>Continuously</td>
<td>(\infty)</td>
<td>((1 + .12/\infty)^\infty - 1) = (e^r - 1)</td>
<td>(.1275) = 12.75%</td>
<td></td>
</tr>
</tbody>
</table>
Future Value of an Annuity

An annuity is a series of equal payments over time

\[ FVA_n = PMT \times (FVIFA_{r,n}) \]

Where: \( PMT \) = payment, or the amount of one cash flow; \( n \) is the number of payments. FVIFA factors are found in table; or:

\[ FVIFA_{r,n} = \sum_{t=1}^{n} (1 + r)^{t-1} = \frac{(1 + r)^n - 1}{r} \]
**Future Values: Summary**

**Single amount:**
the amount times the *future value of interest factor*, or FVIF$_{k,n}$:

$$FV_{r,n} = PV \times FVIF_{r,n} = PV \times (1 + r)^n$$

**Annuity:**
the periodic payment times *the future value of annuity factor*, or FVIFA$_{r,n}$:

$$FVA_{r,n} = PMT \times FVIFA_{r,n} = PMT \times \frac{(1 + r)^n - 1}{r}$$
Present Value

Present Value is the current dollar value (today's value) of a future amount of money.
Present Value of a Single Amount

\[ PV_n = \frac{FV}{(1+r)^n} \]

\[ = FV_n \times (PVIF_{r,n}) \]

PVIF\(_{r,n}\) or \((1+r)^n\) is called the present value of interest factor. PVIF factors can be computed or found in tables.
Present Value of Cash Flow Streams

Present Value Of A Mixed Stream
Mixed streams are non-annuity cash flows, i.e. they reflect no particular pattern. Consider projections of a new investment’s profits:

| Time | ? | $100 | $400 | $1,000 | $300 |

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Present Value of an Equal Stream of Payments

\[ PVA_n = PMT \times (PVIFA_{k,n}) \]

Where:

PVIFA_{k,n} is the present-value interest factor for an annuity, found from tables, or:

\[ PVIFA_{r,n} = \sum_{t=1}^{n} \frac{1}{(1 + r)^t} = \frac{1 - 1/(1 + r)^n}{r} \]
**Brotherly Love**

You lend $300 to your brother; he says he can repay it in 3 installments of $100 on your birthday. The current Treasury note rate is 6%. What’s brotherly love worth? The PV of a three-year annuity of $100 discounted at 6% can be found by discounting each cash flow by the appropriate PVIF.

Value:  
- Yr 1: $100 \times (.943) = \$94.30 
- Yr 2: $100 \times (.890) = \$89.00 
- Yr 3: $100 \times (.840) = \$84.00 
- Total \$267.30 

or can be simplified as $100 (0.943 + 0.890 + 0.840) = \$100 \times (2.673).
Present Values: Summary

Single amount:
the amount times the present value of interest factor, or $PVIF_{r,n}$ :

$$PV_{r,n} = FV \times PVIF_{r,n} = FV \times \frac{1}{(1 + r)^n}$$

Annuity:
the periodic payment times the present value of annuity factor, or $PVIFA_{r,n}$ :

$$PVA_{r,n} = PMT \times PVIFA_{r,n} = PMT \times \frac{1 - 1/(1 + r)^n}{r}$$
Present Value Of A Perpetuity

\[ PV_\infty = \frac{PMT}{r} \]

A perpetuity is an annuity that goes on forever... and (1/k) is the present value interest factor for a perpetuity,

\[ PVIFA_{r,\infty} = \frac{1}{r} \]
Application: Basic Bond Pricing

The formula for a bond’s price is

\[ B_0 = \frac{I}{(1 + k)^1} + \frac{I}{(1 + k)^2} + \ldots + \frac{M}{(1 + k)^n} \]
Contact

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