Securities & Investments Analysis

• Last 2 Weeks: Part IV
  – Bond Portfolio Management
  – Risk Management + Primer on Derivatives
• Lecture #10: Part V
  – Individual equity valuation
  – Fundamental Analysis
    • “Top-Down Analysis”
    • Three valuation methods

Part V:
Fundamental Analysis

Top-Down Approach
• “Top-Down” Security Analysis
  – terminology
    • fundamental analysis
  – typical approach
    • macroeconomic analysis
      » domestic and global economic analysis
    • industry analysis
    • firm-level analysis
      » company analysis
Macroeconomic Analysis

- Global Economic Considerations
  - Performance in countries and regions
    - highly variable
  - Political risk
  - Exchange rate risk
    - Sales
    - Profits
    - Stock returns

Macroeconomic Analysis 2

- Key Economic Variables
  - GDP
    - Gross Domestic Product vs. Industrial Production
  - Unemployment rate
    - also, capacity utilization
  - Interest rate & Inflation
  - Budget deficit (federal vs. local)
  - International measures
  - Consumer sentiment

Macroeconomic Analysis 3

- Federal Government Policy
  - Fiscal Policy
    - What? (Tools)
      - government spending
      - taxing actions
    - Why?
      - stimulate or cool down the economy
      - FX rate considerations (non-US)
    - How?
      - cumbersome to implement
      - fairly direct impact (caveats?)
Macroeconomic Analysis 4

- Federal Government Policy
  - Monetary Policy
    - What? (Tools)
      - Discount rate
      - Reserve requirements
      - Open market operations
        » Fed buys or sells bonds on its own account
    - Why?
      » affect money supply to influence economic activity
    - How?
      » initial & feedback effects
      » easy to implement, but indirect & slow?

Macroeconomic Analysis 5

- Demand shock
  - definition
    » event that affects demand for goods & services
    » in the economy
  - examples
    » tax rate cut
    » increases in government spending
  - why do we care?

Macroeconomic Analysis 6

- Supply shock
  - definition
    » event that influences production capacity
    » or production costs
  - examples
    » commodity price changes (oil, etc.)
    » educational level of economic agents
  - why do we care?
Macroeconomic Analysis 7

- Business Cycle
  - Peak
  - Trough
- Technical aspects
  - Identifying cycles & Procyclicality (handout)
- Industry relationship to business cycles
  - Cyclic
  - Defensive

Macroeconomic Analysis 8

Defining the real business cycle

Least-squares forecasting. Deviations from a trend (--- underlying model; mechanical growth model)

\[ \sum_{i=1}^{n} (\epsilon_t - \hat{\epsilon}_t)^2 \]

Concentrations of the cyclical components of the series determine procyclicality or countercyclicality.

Macroeconomic Analysis 9
Macroeconomic Analysis 13

- NBER Cyclical Indicators
  - **Leading Indicators**
    - rise and fall in advance of the economy
    - examples
      - avg. weekly hours of production workers
      - stock prices (useful?), yield spreads, TSOIR slope
  - **Coincident Indicators**
    - change directly with the economy
    - examples
      - industrial production
      - manufacturing and trade sales

Macroeconomic Analysis 14

- NBER Cyclical Indicators (continued)
  - **Lagging Indicators**
    - lag economic performance
    - examples
      - ratio of trade inventories to sales
      - ratio of consumer credit outstanding to personal income
Industry Analysis

- Defining “industry”
- Sensitivity to business cycles
- Factors affecting sensitivity
  - Sensitivity of sales
  - Operating leverage
  - Financial leverage
- Industry life cycles
Industry Life Cycles

<table>
<thead>
<tr>
<th>Stage</th>
<th>Sales Growth</th>
</tr>
</thead>
<tbody>
<tr>
<td>Start-up</td>
<td>Rapid &amp; Increasing</td>
</tr>
<tr>
<td>Consolidation</td>
<td>Stable</td>
</tr>
<tr>
<td>Maturity</td>
<td>Slowing</td>
</tr>
<tr>
<td>Relative Decline</td>
<td>Minimal or Negative</td>
</tr>
</tbody>
</table>

Industry Analysis 4

• Intrinsic Value (IV) vs. Market Price (MP)

• IV=? Models of Equity Valuation
  – Basic Types of Models (“Job Interview Questions”)
    • Balance Sheet Models <-> Financial Ratios
    • Dividend Discount Models <-> DCF
      = growth rates?
    • Price/Earning Ratios <-> Comparables?
  – Estimating Growth Rates & Opportunities

Fundamental Stock Analysis:

Intrinsic Value vs. Market Price

• Intrinsic Value
  • “IV” = Self assigned Value
  • Variety of models are used for estimation

• Market Price
  • “MP” = Consensus value of all potential trader’s IV

• Trading Signal
  • IV > MP => Buy
  • IV < MP => Sell or Short Sell
  • IV = MP => Hold (“Fairly Priced”)
General Dividend Discount Model

\[ V_0 = \sum_{t=1}^{\infty} \frac{D_t}{(1 + k)^t} \]

- \( V_0 \) = Value of Stock
- \( D_t \) = Dividend
- \( k \) = “required return”

General Dividend Discount Model 2

- 1. No Growth Model

\[ V_0 = \frac{D}{k} \]

• Why?
  - stocks with earnings *and* dividends
  - that are expected to remain constant
• Preferred Stock?

General Dividend Discount Model 3

- Example

\[ V_0 = \frac{D}{k} \]

given: \( E_1 = D_t = $5.00 \)
  \( k = 0.15 \)
\( V_0 = $5.00 / 0.15 = $33.33 \)
General Dividend Discount Model 4

- 2. Constant Growth Model

\[ V_0 = \frac{D_0(1 + g)}{k - g} \]

\( g = \) constant perpetual growth rate

General Dividend Discount Model 5

- Estimating Dividend Growth Rates

\[ g = ROE \times b \]

\( g \) = growth rate in dividends
\( ROE \) = Return On Equity for the firm
\( b \) = plowback or retention percentage rate
\( (1 - \text{dividend payout percentage rate}) \)

General Dividend Discount Model 6

- Example

\[ V_0 = \frac{D_0(1 + g)}{k - g} \]

given: \( E_i = $5.00; \ b = 40\%; \ k = 15\%; \ ROE = 20\% \)
\( 1 - b = 60\% \)
\( D_1 = $3.00 \)
\( g = ROE \times b = 8\% \)
\( V_0 = 3.00 / (0.15 - 0.08) = $42.86 \)
Specified Holding Period Model

\[ V_0 = \frac{D_1}{(1+k)^1} + \frac{D_2}{(1+k)^2} + \cdots + \frac{D_N + P_N}{(1+k)^N} \]

\(P_N\) = expected sales price for the stock at time \(N\)
\(N\) = the specified number of years the stock is expected to be held

Partitioning Value:
Growth & No-Growth Components

\[ V_o = \frac{E_1}{k} + PVGO \]

\[ PVGO = \frac{D_1(1+g)}{(k-g)} \cdot \frac{E_1}{k} \]

\(PVGO\) = Present Value of Growth Opportunities
\(E_1\) = Earnings Per Share for period 1

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Partitioning Value:
Growth & No-Growth Components 2

– Example

given: \(\text{ROE} = 20\%; \ d = 60\%; \ b = 40\%\)
\(E_1 = \$5.00; \ D_1 = \$3.00; \ k = 15\%\)

g = ROE x plowback
\(= 0.20 \times 0.40 = 0.08\) or 8%

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Partitioning Value:
Growth & No-Growth Components 3

\[ V_o = \frac{3}{0.15 - 0.08} = 42.86 \]
\[ NGV_o = \frac{5}{0.15} = 33.33 \]
\[ PVGO = 42.86 - 33.33 = 9.52 \]

- \( V_o \) = value with growth
- \( NGV_o \) = no growth component value
- \( PVGO \) = Present Value of Growth Opportunities

Price Earnings Ratios

- P/E Ratios are a function of two factors
  - Required Rates of Return (k)
  - Expected growth in Dividends (g)
- Uses
  - Relative valuation
  - Extensive Use in industry

a. P/E Ratio: No Expected Growth

\[ P_0 = \frac{E_1}{k} \]
\[ \frac{P_0}{E_1} = \frac{1}{k} \]

- \( E_1 \) = expected earnings for coming year
- \( E_1 \) is equal to \( D_1 \) under no growth
- \( k \) = required rate of return
Numerical Example: No Growth

Given: \( E_0 = $2.50 \quad g = 0 \quad k = 12.5\% \)

\[ P_0 = \frac{D}{k} = \frac{2.50}{0.125} = $20.00 \]

\[ PE = \frac{1}{k} = \frac{1}{0.125} = 8 \]

b. P/E Ratio: Constant Growth

\[ P_0 = \frac{D_1}{k - g} = \frac{E_1(1 - b)}{k - (b \times ROE)} \]

\[ P_0 = \frac{1 - b}{E_1 \times k - (b \times ROE)} \]

\( b = \) plowback ratio = retention ratio

\( ROE = \) Return on Equity

Numerical Example with Growth

Given: \( E_0 =$2.50; k=12.5\%; b=60\% ; \) \( ROE=15\% \)

\( (1-b) = 40\% \)

\[ E_1 = $2.50 \times (1 + (0.6)(0.15)) = $2.73 \]

\[ D_1 = $2.73 \times (1 - 0.6) = $1.09 \]

\( k = 12.5\% \quad g = ROE \times \text{plowback} = 15\% \times 60\% = 9\% \)

\[ P_0 = \frac{1.09}{(0.125 - 0.09)} = \frac{1.09}{0.035} = 31.14 \]

\[ PE = \frac{31.14}{2.73} = 11.4 \]

\[ PE = \frac{(1 - 0.60) / (0.125 - 0.09)} = 11.4 \]
Pitfalls in P/E Analysis

- Use of accounting earnings
  - Historical costs
  - May not reflect economic earnings
- Reported earnings
  - Fluctuate around the business cycle

Inflation & Equity Valuation

- **NOT Exam Material**
- Inflation has an impact on equity valuations
- Historical costs
  - Underestimate economic costs
- Empirical research
  - Inflation has an adverse effect on equity values
  - Real rates of return are lower with high rates of inflation

Inflation & Equity Valuation 2

- Problem
  - Lower Equity Values with Inflation
- Explanations?
  - Shocks cause expectation of lower earnings
    - By market participants
  - Returns are viewed as being riskier
    - With higher rates of inflation
  - Real dividends are lower
    - Because of taxes