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Equity

2017 CFA二级知识框架图



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Framework of CFA II Equity

估值基础

Equity Valuation: Applications and Processes

Return Concepts

估值方法

Discounted Dividend Valuation

Free Cash Flow Valuation

Market-Based Valuation: Price and Enterprise Value Multiples

Residual Income Valuation

估值应用

Private Company Valuation

Industry and Company Analysis

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EQUITY VALUATION: APPLICATIONS AND PROCESSES

Fundamental Of Valuation

Different Kinds Of Values

- Intrinsic value (IV)
 - $IV_{\text{analyst}} - \text{price} = (IV_{\text{actual}} - \text{price}) + (IV_{\text{analyst}} - IV_{\text{actual}})$
- Fair market value
- Investment value
- Liquidation value

Valuation Process

- Understanding the business
- Forecasting company performance
- Selecting the appropriate valuation model
- Converting forecasts to a valuation
- Making the investment decision

Valuation In Investment Decision

- Planning
- Execution
- Feedback

Applications Of Equity Valuation

- Stock selection
- Reading the market
- Projecting the value of corporate actions
- Fairness opinions
- Planning and consulting
- Communication with analysts and investors
- Valuation of private business

不做重点掌握，概念



Forecasting Company Performance

Forecasting Company Performance

- Quantitative factors
- Qualitative factors

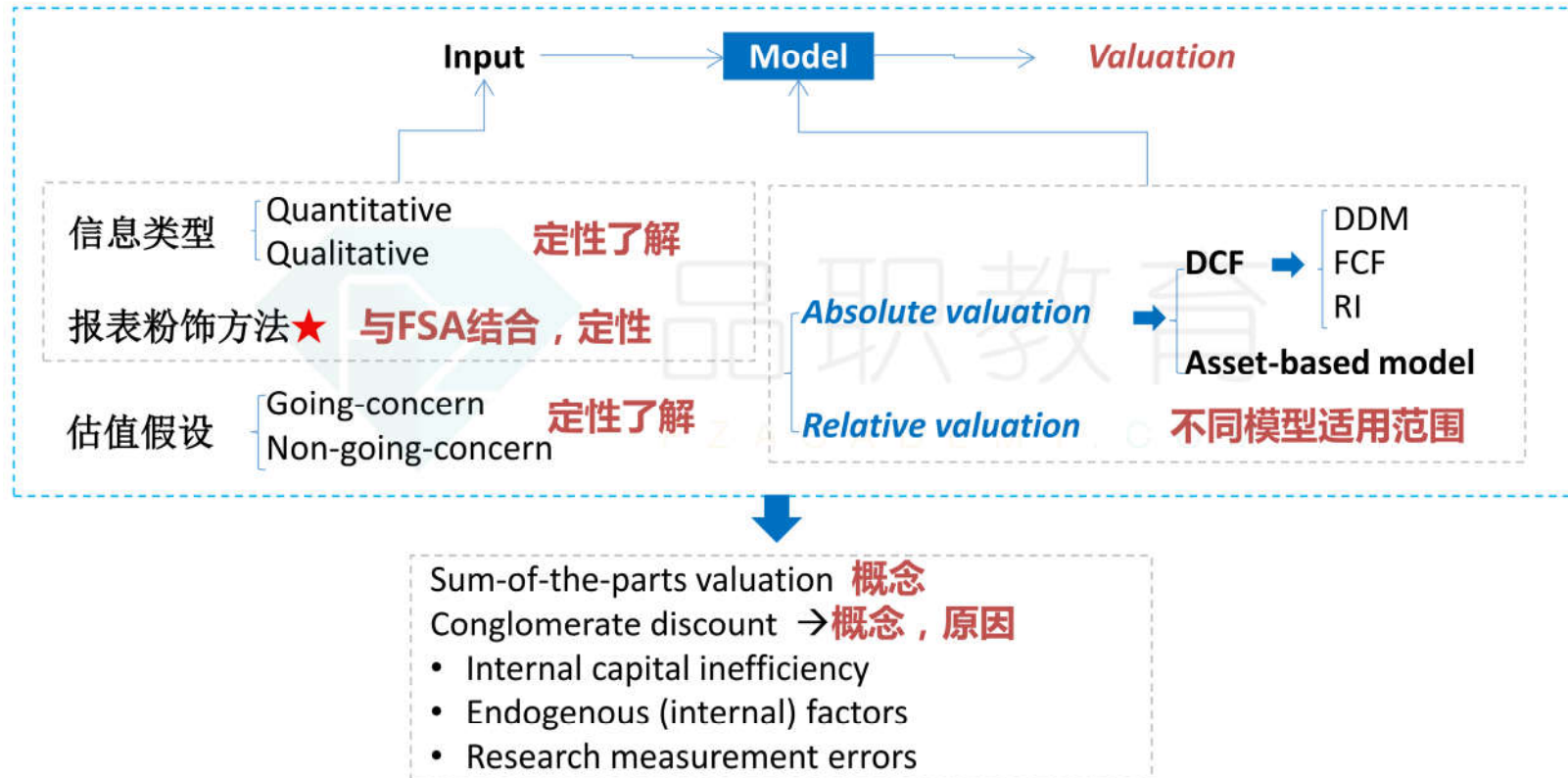
定性了解



➤ Indicators of selected quality of earnings → ★ 与FSA结合，定性

Category	Observation	Example
Revenues and gains	Recognizing revenue early	<ul style="list-style-type: none">• Accelerating or premature recognition of income• Reclassifying gains and non- operating income
Expenses and Losses	Delay of Recognition of Expenses	<ul style="list-style-type: none">• Expense recognition and losses• Amortization, depreciation, and discount rates
Balance Sheet Issues	Off-balance-sheet issues	<ul style="list-style-type: none">• SPEs

Valuation Methods





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RETURN CONCEPTS

Return Concepts

Common Return Concepts

- HPR
- Realized return
- Expected return → *Two Parts*
 - Required return
 - A return from convergence of price to value
- Required return
- Expected return 与要求回报率关系
- IRR → *IRR = required return if market is efficient*

Framework Of Calculating r_e

$$\underset{\textcircled{3}}{r_e} = r_f + \underset{\textcircled{2}}{\beta} \left(\underset{\textcircled{1} \text{ ERP}}{R_M - r_f} \right)$$

Equity risk premium

Historical estimate

- **Rf选择**→短期国债vs长期国债
- **平均值算法**→算术平均vs几何平均（小）
- **Time period**→越长越好
- **Survivorship bias**→over-estimate return

掌握会高估/低估Re

Forward-looking estimate ★★

各模型优缺点比较

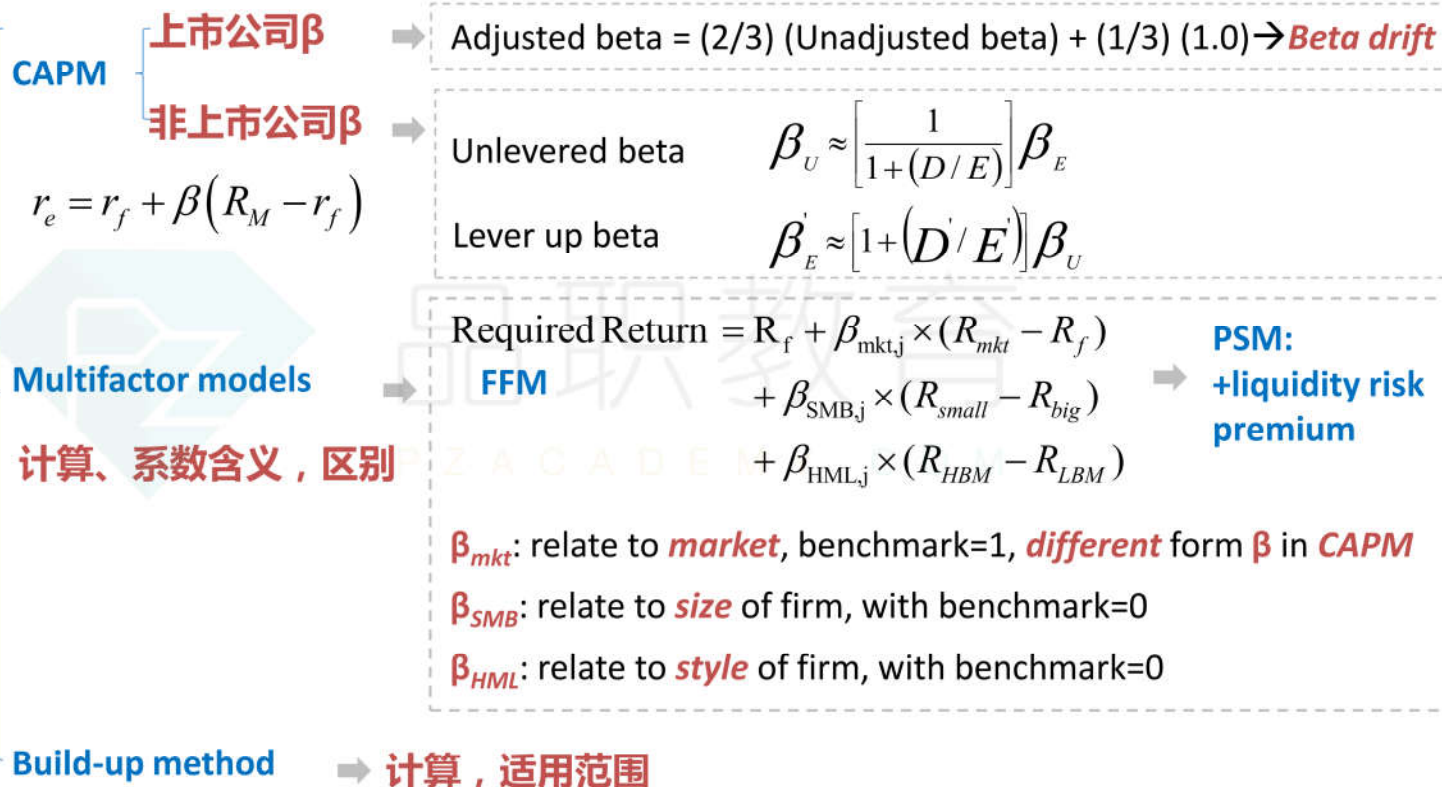
- GGM **计算, 适用条件** → $ERP = r - RFR = \frac{D_1}{P_0} + g - RFR$
- Macroeconomics model **计算** → $ERP = \left[1 + \hat{i}\right] \times \left[1 + r\hat{E}g\right] \times \left[1 + p\hat{E}g\right] - 1 + \hat{Y} - \hat{R}F$
- Survey estimate **概念**



Estimates	Strength	Weakness
Historical Estimates	<ul style="list-style-type: none">➤ A familiar and popular choice➤ Unbiased estimate➤ Objective quality	<ul style="list-style-type: none">➤ Precision, stationary assumption➤ Empirically countercyclical➤ Survivorship bias
Forward-looking Estimates	<ul style="list-style-type: none">➤ Available➤ No non-stationarity	<ul style="list-style-type: none">➤ behavioral biases in forecasting.➤ Subjective

Estimates	Strength	Weakness
GGM	<ul style="list-style-type: none">➤ Popular method;➤ Reasonable when applied to developed economies and markets;➤ Typically sample sources.	<ul style="list-style-type: none">➤ Change through time and need to be updated;➤ Assumption of a stable growth rate.
Supply-Side Estimates	<ul style="list-style-type: none">➤ Proven models;➤ Current information;	<ul style="list-style-type: none">➤ Only appropriate for developed countries;
Survey Estimates	<ul style="list-style-type: none">➤ Easy to obtain	<ul style="list-style-type: none">➤ Wide disparity from different groups

Required Return



on equity ★★★

on Firm

WACC

International Consideration

Country Spread Model
Country Risk Rating Model

定性，把握区别



Comparison Of The Methods

Methods	Strength	Weakness
CAPM	➤ Very simple in that it uses only one factor	➤ Choosing the appropriate factor . ➤ Low explanatory power in some cases
Multifactor	➤ Higher explanatory power (not assured)	➤ More complexity and expensive
Build-up	➤ Simple ➤ Can apply to closely held companies.	➤ Historical values may not be relevant to current market conditions



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DISCOUNTED DIVIDEND VALUATION

Discounted Dividend Valuation

优先股 $\rightarrow V_p = \frac{D_p}{k_p}$

GGM ★★★★★

$$p_0 = \frac{D_0(1+g_c)}{r_e - g_c} = \frac{D_1}{r_e - g_c}$$

$$D_0 = (1 - RR) \times EPS$$

$$p_0 = \frac{D_0(1+g_c)}{r_e - g_c}$$

$$g_c = ROE \times RR$$

$$r_e = RFR + \beta(R_{mkt} - RFR)$$

计算
假设

1. $D > 0$
2. D 以 g 速度永续增长
3. $Re > g$

优缺点

The Implied Dividend Growth Rate

$$g = r_e - \frac{D_1}{P_0}$$

普通股 \rightarrow

PVGO ★★★★★

计算 $\rightarrow V_0 = E_1 / r + PVGO \rightarrow E_1 = \text{no-growth earnings level}$

PRAT模型

$$g = ((\text{net income} - \text{dividends}) / \text{net income}) \times \text{profit margin} \times \text{the asset turnover} \times \text{financial leverage}$$

Multi-Stage Model ★

计算

Two Stage

Three Stage

H-Model ★ 与三阶段模型结合

$$V_o = \frac{[D_0 \times (1 + g_L)] + [D_0 \times H(g_s - g_L)]}{r - g_L} \quad H = \frac{t}{2}$$



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Free Cash Flow Valuation

Computing Free Cash Flow And Valuation

FCF 计算

NI, EBIT, EBITDA, CFO 等出发计算



proxy for FCF

Net income, EBITDA → poor proxy

FCFF

- **From NI:** $FCFF = NI + \text{Int} \times (1-T) + NCC - WC_{\text{inv}} - FC_{\text{inv}}$
- **From EBIT:** $FCFF = EBIT \times (1-T) + \text{Dep} - WC_{\text{inv}} - FC_{\text{inv}}$
- **From EBITDA:** $FCFF = (EBITDA - \text{Dep}) \times (1-T) + \text{Dep} - WC_{\text{inv}} - FC_{\text{inv}}$
- **From CFO:** $FCFF = CFO + \text{Int} \times (1-T) - FC_{\text{inv}}$

FCFE

- **From NI:** $FCFE = NI + \text{Dep} - WC_{\text{inv}} - FC_{\text{inv}} + NB$
- **From EBIT:** $FCFE = EBIT \times (1-T) + \text{Dep} - WC_{\text{inv}} - FC_{\text{inv}} - \text{Int} \times (1-T) + NB$
- **From EBITDA:** $FCFE = (EBITDA - \text{Dep}) \times (1-T) + \text{Dep} - WC_{\text{inv}} - FC_{\text{inv}} - \text{Int} \times (1-T) + NB$
- **From CFO:** $FCFE = CFO - FC_{\text{inv}} + NB$
- **From FCFF:** $FCFE = FCFF - \text{Int} \times (1-T) + NB$
- **Given Debt ratio:** $NB = (WC_{\text{inv}} + FC_{\text{inv}} - \text{Dep}) \times DR$



FCF 估值

计算, 同DDM

Single-Stage Model

Two-Stage Model

Three-Stage Model



Firm value → Discounted with WACC

Equity value → Discounted with r_e



求终值★

Single-stage
Multiple approach

Dividends, share repurchases, and share issues → no effect on FCFF and FCFE;
leverage changes → minor effect on FCFE and no effect on FCFF

Special Issues

NCC★★★

Depreciation/ Amortization → +
restructuring charges and other noncash losses → +
Income from restructuring charge → -
amortization of a bond discount → +, bond premium → -
DTL → +, DTA → -

Calculation WC_{Inv} ★

$$WC_{Inv} = WC_t - WC_{t-1}$$

Excluding cash, cash equivalents, notes payable, and current portion of long-term debt

Calculation FC_{Inv} ★

无处置

$$FC_{Inv} = \text{Capital Expenditure} = \text{gross PP\&E}_t - \text{gross PP\&E}_{t-1}$$

$$FC_{Inv} = \text{net PP\&E}_t - \text{net PP\&E}_{t-1} + \text{depreciation}$$

有处置

$$FC_{Inv} = \text{Capital Expenditure} - \text{Proceeds from sales}$$

Calculation net borrowing

Net Borrowing = long- and short-term new debt – long- and short-term debt repayments

Target Debt Ratio ★

$$\text{Net borrowing} = (WC_{Inv} + FC_{Inv} - Dep) \times DR$$

With Preferred Stocks

$$FCFF = (NI + NCC - WC_{Inv}) + Int \times (1 - T) + Div_{pre} - FC_{Inv}$$

$$FCFE = FCFF - Int \times (1 - T) - Div_{pre} + \text{Net Borrowing}$$

注意NI to common

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RESIDUAL INCOME VALUATION

Valuation Using Residual Income

Concepts★

概念, 计算

Residual income (economic profit) 与corporate finance定义不同

$$RI_t = EPS_t - r_e \times B_{t-1} = (ROE - r_e) \times B_{t-1}$$

假设

Clean surplus relation

EVA (economic value added)

$$EVA = NOPAT - WACC \times \text{invested capital} = EBIT \times (1 - t) - \$WACC$$

Market value added (MVA) = market value - total capital

Valuation★★

概念, 计算,
适用范围

与DDM & FCFE区别★

- The **assumptions** are difference
- Residual income → a **book value** + PVRI
- DDM & FCFE measure value by **DCF**

Valuation★★

Single-Stage Valuation 计算

Continuing residual income

justified P/B

$$\frac{P_0}{B_0} = 1 + \frac{ROE - r_e}{r_e - g}$$

4种假设计算,
本质就是GGM

1. $PVRI_{T-1} = RI_{T-1} / r$
2. $PVRI_{T-1} = 0$
3. $PVRI_{T-1} = P/B \times B_{T-1} - B_{T-1}$
4. $PVRI_{T-1} = RI_{T-1} \times \omega / (1 + r - \omega)$

Strength, Weakness And Appropriateness

Strengths

- **Terminal value** does not dominate
- **Accounting** data, which is **easy to find**;
- Applicable to firms that **do not pay dividends** or do **not** have **positive expected** free cash flows in the short run or have **volatile cash** flows;
- Applicable even when cash flows are **volatile**;
- Focus on **economic profitability** rather than just on **accounting profitability**.

Weaknesses

- Rely on accounting data that can be **manipulated** by management;
- Reliance on accounting data requires numerous and significant **adjustments**;
- Assume that the **clean surplus relation** holds or that its failure to hold has been properly taken into account. (I.E., Ending BV = beginning BV + earnings - dividend)

Summary Of Valuation Methods

	Advantages	Disadvantages	Suitability
Dividends	<ul style="list-style-type: none"> • Theoretically justified • Less volatile than other measures 	<ul style="list-style-type: none"> • Difficult for firms don't pay dividends • Perspective of minority 	<ul style="list-style-type: none"> • The company has a history of dividend payments. • The dividend policy is clear and related to the earnings of the firm. • The perspective is that of a minority shareholder.
Free Cash Flow	<ul style="list-style-type: none"> • Regardless of dividend policies or capital structures 	<ul style="list-style-type: none"> • Very difficult 	<ul style="list-style-type: none"> • Firms that do not have dividend histories or have a dividend payment history that is not clearly and appropriately related to earnings. • Firms with free cash flow corresponds to profitability. • When the valuation is for controlling shareholder.
Residual income	<ul style="list-style-type: none"> • Firms with negative free cash flow and to non-dividend-paying 	<ul style="list-style-type: none"> • More difficult to apply 	<ul style="list-style-type: none"> • Firms that do not have dividend histories. • Firms that have negative free cash flow for the foreseeable future (usually due to capital demands). • Firms with transparent financial reporting and high quality earnings.

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MARKET-BASED VALUATION: PRICE AND ENTERPRISE VALUE MULTIPLES

P/E Multiple

- *justified price multiple*
- *warranted price multiple*
- *intrinsic price multiple*



Market Price
Intrinsic Value

P/E

Leading

Trailing

$$P/E_1 = \frac{1-b}{r-g}$$

$$P/E_0 = \frac{(1-b)(1+g)}{r-g}$$



补充

Normalizing EPS★

method of historical average EPS
method of average ROE → *preferred*

计算, 比较

PEG

$$\text{PEG ratio} = \frac{\text{P/E Ratio}}{g}$$

PEG 计算 缺点

Portfolio or index P/E

$$\text{weighted harmonic mean} = \frac{1}{\sum_{i=1}^n \frac{W_i}{X_i}}$$

put more weights on smaller values, outliers excluded

Other Multiples

Price Multiple →

P/B → *justified P/B*: $P/B = (ROE - g) / (r - g)$

P/S → Justified P/S $\frac{P_0}{S_0} = \frac{(E_0 / S_0)(1 - b)(1 + g)}{r - g}$

P/CF ★ 四种CF计算 补充 → EV/EBITDA ★★ EV计算, 优缺点

• *Earning-plus-noncash-charges*

- CF = net income + depreciation + amortization
- Limitation: ignore net working capital

• *Adjusted CFO*

- Adjusted CFO = CFO + [(net cash interest outflow) × (1 - tax rate)]
- Limitation: includes the items related to financing and investing activities

• *FCFE* → $FCFE = CFO - FCInv + \text{net borrowing}$

• *EBITDA* → Used in enterprise value-to-EBITDA ratio

Dividend Yield → Justified D/P: $D/P = r - g / 1 + g$

Momentum Valuation Indicators 技术分析指标, 简单了解

定性为主, 优缺点★, *intrinsic multiple(Leading/trailing)* ★★, 判断低估高估

Multiple	Advantages	Disadvantages
P/E	<ul style="list-style-type: none"> •Earning power is focused on; •popular; •related to long-run average stock returns 	<ul style="list-style-type: none"> •Earnings < 0; •Volatile earning; •Management discretion distorts
P/B	<ul style="list-style-type: none"> •BV almost always > 0, more stable than EPS. •Suitable for companies with liquid assets, such as finance institutions. •related to long-run average stock returns 	<ul style="list-style-type: none"> •Size differences •Influenced by accounting choices. •$BV \neq MV$ due to inflation/ technology.
P/S	<ul style="list-style-type: none"> •Meaningful even for distressed firms. •Sales not easily manipulated, not as volatile •Suitable for mature, cyclical, and start-up firms. •related to long-run average stock returns 	<ul style="list-style-type: none"> •not imply high profits and cash flows. •cost structure differences. •distort sales
P/CF	<ul style="list-style-type: none"> •less subject to manipulate •More stable than P/E •Handles the quality of reported earning •Empirical evidence supported 	<ul style="list-style-type: none"> •Difficult to estimate true CFO •FCFE better but more volatile and more frequently negative
EV/EBITDA	<ul style="list-style-type: none"> •different degrees of financial leverage •Suitable for capital-intensive business EB •EBITDA is usually > 0. 	<ul style="list-style-type: none"> •If working capital is growing, EBITDA will overstate CFO •FCFF is more strongly linked with valuation



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PRIVATE COMPANY VALUATION

Private Company and valuation

Company-specific factors

- Stage of life-cycle: typically less mature
- Size: less capital, riskier;
- Quality and depth of management
- Management/shareholder overlap
- long-term investors;
- Less financial and other information
- Taxes: more concerned with taxes.

Stock-specific Factors

- Liquidity: less liquid;
- Restrictions on Marketability
- Concentration of control

非上市公司及股票特点→了解

Private Company and Stock

估值 ★★★

Income approach

概念, 了解

CF调整

Normalized earnings ★

计算

Strategic and nonstrategic buyers ★

用FCF估值

The capitalized cash flow method

The free cash flow method

用EEM估值★★★

计算

Market approach

计算, 适用范围

Guideline Public Company Method (GPCM)

Guideline Transactions Method (GTM)

Prior Transaction Method (PTM)

乘数调整★★★

DLOC/DLOM/total discount, 计算

$$DLOC = 1 - \left[\frac{1}{1 + \text{control premium}} \right]$$

$$\text{Total discount} = 1 - [(1 - DLOC)(1 - DLOM)]$$

Asset-based approach

Natural resource firms

概念, 适用范围 → liquidation, Finance firms, early stage companies,



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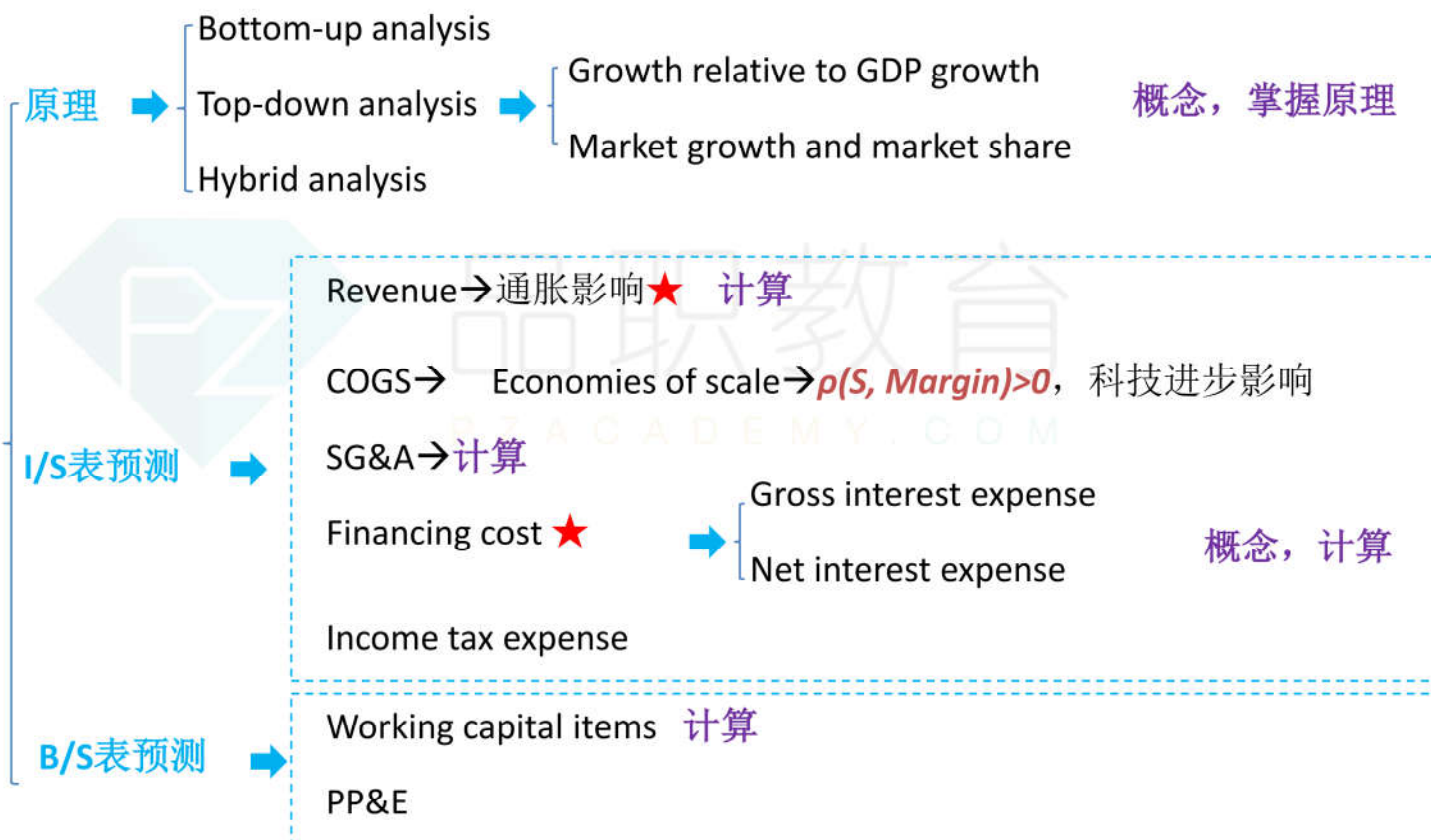


INDUSTRY AND COMPANY ANALYSIS

Industry And Company Analysis

DCF预测未来CF

本章比较难出题，
学会预测CF即可



*Thank
You!*

