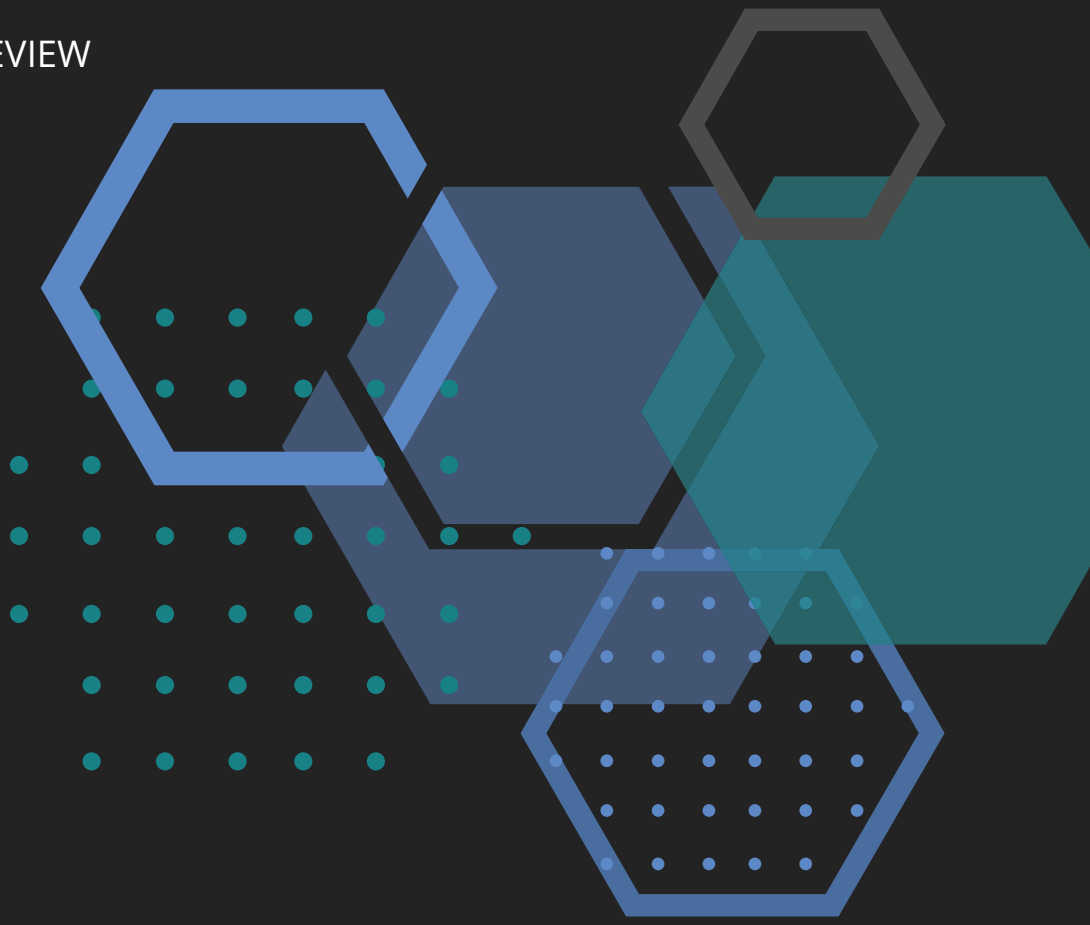
2024

CFA® PROGRAM EXAM REVIEW



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Capital Market Expectations

Capital Market Expectations, Part 1: Framework and Macro Considerations

- Aggregate Equity Market Value

$$V_t^e = \text{GDP}_t \times S_t^k \times PE_t$$

$$= \text{GDP}_t \times \frac{E_t}{\text{GDP}_t} \times \frac{P_t}{E_t}$$

Where GDP is gross domestic product, S^k equals capital's share of income (i.e, corporate earnings as a percentage of GDP), and PE is the price-to-earnings ratio.

- Taylor Rule

$$i^* = r_{\text{neutral}} + \pi_e + 0.5(\hat{Y}_e - \hat{Y}_{\text{trend}}) + 0.5(\pi_e - \pi_{\text{target}})$$

where:

i^* = target nominal policy rate
r_{neutral} = real policy rate targeted with trend growth and target inflation
$\hat{Y}_e$, $\hat{Y}_{\text{trend}}$ = expected and trend real GDP growth rates
π_e, π_{target} = expected and target inflation rates

- Macroeconomic Linkages

$$(X - M) = (S - I) + (T - G)$$

where:
X = exports
M = imports
S = domestic saving
I = domestic investment
T = taxes
G = government spending

Capital Market Expectations, Part 2: Forecasting Asset Class Returns

- Grinold-Kroner Model

$$E(R_e) = \frac{D}{P} + (\%\Delta E - \%\Delta S) + \%\Delta P/E$$

where:

$\frac{D}{P}$ = Dividend yield
$\%\Delta E$ = Nominal earnings growth rate
$\%\Delta S$ = Expected percentage change in shares outstanding
$\%\Delta P/E$ = Growth rate of the P/E ratio (the "repricing return")

Some points of note:

1. The term $-\%\Delta S$ is referred to as the "rate of net share repurchases" and represents income from company buybacks. Hence, the "income" component of expected return is $D/P - \%\Delta S$.
2. Expected capital gains are composed of the nominal earnings growth rate, $\%\Delta E$, plus the repricing return, $\%\Delta P/E$.
3. The term $(\%\Delta E - \%\Delta S)$ represents the estimated rate of change of earnings *per share*.

- Singer and Terhaar

Under full integration, every asset could be priced 100 percent against the global capitalization-weighted market portfolio:

$$RP_i^G = \beta_{i,GM} RP_{GM} = \rho_{i,GM}\sigma_i\left(\frac{RP_{GM}}{\sigma_{GM}}\right)$$

where:

$$\beta_{i,GM} = \frac{\text{Cov}(R_i, R_{GM})}{\text{Var}(R_{GM})} = \rho_{i,GM}\left(\frac{\sigma_i}{\sigma_{GM}}\right)$$

With less than perfect integration, the relationships are adjusted using the degree to which assets are integrated with the global portfolio:

$$RP_i = \varphi RP_i^G + (1 - \varphi)RP_i^S$$

where:
φ = degree of global integration
RP_i^G = risk premium under global equilibrium (integrated)
RP_i^S = risk premium under local-market equilibrium (segmented)

Considering the risk premium equals the product of asset standard deviation and the Sharpe ratio, the fully segmented, fully integrated, and partially integrated equations are:

$$RP_i^G = \rho_{i,\,GM} \times \sigma_i \times \frac{RP_{GM}}{\sigma_{GM}}$$

$$RP_i^S = \sigma_i \times \textit{Sharpe Ratio}(i)$$

$$RP_i = \varphi RP_i^G + (1 - \varphi)RP_i^S$$

- Capitalization Rate

The capitalization rate is like dividend yield for equities, and may be used in a similar way in developing expected return for the property:

$$E(R_e) = \text{DIV YLD} + g_{\text{DIV}}$$

$$E(R_{re}) = \text{Cap rate} + g_{\text{NOI}}$$

The long-term NOI growth rate, g_{NOI}, should be close to the nominal GDP growth rate. Short-term estimates may require an analyst to adjust the cap rate (rather than the NOI growth rate) to determine cyclical impacts:

$$E(R_{re}) = \text{Cap rate} + g_{NOI} - \%\Delta \text{ Cap rate}$$

Capitalization rates will tend to rise along with long-term interest rates and real estate values will therefore tend to be pro-cyclical.

- Capital Flows

Exchange rate differences will reflect differences in the short-term interest rates, term premiums, credit premiums, equity premiums, and liquidity premiums between two countries:

$$E(\%\Delta S_{d/f}) = (r^d - r^f) + (\text{Term}^d - \text{Term}^f) + (\text{Credit}^d - \text{Credit}^f) + (\text{Equity}^d - \text{Equity}^f) + (\text{Liquidity}^d - \text{Liquidity}^f)$$