Discussion

on

Consumption, Dividends, and the Cross-Section of Equity Returns

by

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Punch line

- Cross-sectional differences in the exposure of dividend growth to *low frequency* movements in consumption growth (consumption leverage) can justify much of the observed value, momentum, and size premium spreads.

Model

- A general equilibrium model relating consumption beta, and hence risk premium, to the consumption leverage: Bansal and Yaron (2002).

- Consumption growth follows an ARMA(1,1) process: $g_{t+1} = \mu_c(1-\rho) + \rho g_t + \eta_{t+1} - \omega\eta_t$. Defining x_t to be the slow-moving expected consumption growth rate, then

$$g_{t+1} = \mu_c + (x_t - \mu_x) + \eta_{t+1}$$

$$x_{t+1} = (1-\rho)\mu_x + \rho x_t + (\rho - \omega)\eta_t$$

- $\hat{\rho} = 0.73, \hat{\omega} = 0.40$.

Model: Cont'd

- Epstein and Zin (1989) preference.

- Risk premia:

$$\mathrm{E}_t[R_{i,t+1} - R_{f,t}] = \beta_i(B_M\sigma_\eta^2)$$

where

  - $\beta_i \equiv \mathrm{cov}_t(r_{i,t+1}, \eta_{t+1})/\sigma_\eta^2$ is consumption beta

  - $B_M\sigma_\eta^2$ is the market price of consumption risk:

    - Constant market price of risk.

Consumption Leverage

■ Model I: Growth Rates Projection

- Dividend growth $g_{i,t+1} \equiv d_{i,t+1} - d_{i,t}$ follows

$$g_{i,t+1} = \delta_i + \varphi_i x_t + \eta_{i,t+1}$$

where $\varphi_i \equiv \mathrm{cov}(g_{i,t+1}, x_t)/\mathrm{var}(x_t)$ is consumption leverage

- Consumption beta:

$$\beta_i = \left[\tau_i + \kappa_{i,1}(\rho - \omega)\frac{\varphi_i - 1/\psi}{1 - \kappa_{i,1}\rho}\right]$$

Consumption Leverage: Cont'd

- Model II: Stochastic Cointegration

  - Asset-specific dividend and aggregate consumption are related by:

$$d_{i,t+1} = \mu_i + \delta_i(t+1) + \phi_i c_{t+1} + \epsilon_{i,t+1}$$

  - Consumption beta:

$$\beta_i = \left[\phi_i + \kappa_{i,1}(\rho - \omega)\frac{\phi_i - 1/\psi}{1 - \kappa_{i,1}\rho}\right]$$

Empirical Methods

- Under *certain* conditions, the cross-sectional correlation between β_i and consumption leverage is one — no need to estimate deep structural parameters that enter β_i

  - Estimate consumption leverages for size, value, and momentum deciles and examine their differences.

  - Moreover, the cross-sectional regression:

$$\mathrm{E}[R_{i,t}] = \lambda_0 + \varphi_i \lambda_c$$

provides the same average return and R^2 as a regression of returns on β_i.

Results

- Consumption leverage models outperform unconditional and conditional versions of (C)CAPM and Fama-French three factor model with 10 momentum, 10 size, and 10 book-to-market portfolios.

- Without 10 momentum portfolios, consumption leverage models only underperform Fama-French model, and conditional (C)CAPM provides additional valuable information in explaining the value premium.

Comments

- Striking results!
  - Value stocks are more risky than growth stocks unconditionally!!
    - Fama and French (1992)
  - The risk dispersion between value and growth or the market price of risk may be time-varying: so conditioning strictly improves the model.
    - Lakonishok, Shleifer, and Vishny (1994), Lettau and Ludvigson (2002)
  - Momentum is *purely* an unconditional risk phenomenon!!
    - Jegadeesh and Titman (1993)

Comments: Cont'd

- Under what conditions, correlation between β and consumption leverage is one?
  - $\kappa_{i,1} = \exp(\bar{z}_{i,t})/(1+\exp(\bar{z}_{i,t}))$ is identical across all assets, where $z_{i,t} = \log(P_{i,t}/D_{i,t})$.
  - τ_i is identical across all assets.
    - What's the interpretation of τ_i defined in $\eta_{i,t} = \tau_i \eta_t + u_{i,t}$?
    - What's the relation between τ_i and ϕ_i?

$$\beta_i = \left[\tau_i + \kappa_{i,1}(\rho - \omega)\frac{\varphi_i - 1/\psi}{1 - \kappa_{i,1}\rho}\right]$$

$$\beta_i = \left[\phi_i + \kappa_{i,1}(\rho - \omega)\frac{\phi_i - 1/\psi}{1 - \kappa_{i,1}\rho}\right]$$

Suppose $\text{corr}(\varphi_i, \phi_i) \approx 1$, then shouldn't $\text{corr}(\tau_i, \phi_i) \approx 1$?

More on β and φ, ϕ

- Log-linearization technique is applied in the *cross-section* to derive the linear form of β_i in terms of consumption leverage ϕ_i:
  - For the stochastic co-integration model, the authors assume in (47) that:

$$z_{i,t} = A_{i,0} + A_{i,1} x_t + A_{i,2} \epsilon_{i,t}$$

  - But σ_ϵ is much larger than σ_η: Vuolteenaho (2002)
    - Campbell and Koo (1997)
  - For the growth rate model, the authors assume in (41) that:

$$z_{i,t} = A_{i,0} + A_{i,1} x_t$$

Suggestions

- How accurately consumption leverage proxy β?
  - Compute the two β series using estimates of φ and ϕ, denoted β_i^{φ} and β_i^{ϕ}, for a wide range of structural parameter values.
  - Check whether $\text{corr}(\beta_i^{\varphi}, \varphi_i)$ and $\text{corr}(\beta_i^{\phi}, \phi_i)$ are close to 1?
  - Check whether $\text{corr}(\beta_i^{\varphi}, \beta_i^{\phi})$ is close to 1?

Suggestions: Cont'd

- Out-of-sample tests:
  - Can the model explain the long-run reversal effect and international momentum, size, and value effects?
- Which source of time-variation is more important, risk or risk aversion?
  - Estimate the difference of consumption leverage (and hence risk dispersion) between value and growth portfolios using rolling window and then examine its cyclical behavior.
  - Incorporate time-varying uncertainty (Bansal and Yaron, 2002) and see whether (C)CAPM can be subsumed empirically.

Conclusion

- Very provocative paper!
- Structural approach towards the cross-section of returns:
  - Theoretical model yields straightforward economic interpretation.
  - Empirical work motivated by tight theoretical restrictions alleviates:
    - data-snooping bias
    - Lucas Critique
- The accuracy of log-linearization in the cross-section should be evaluated more carefully in a quantitative way.