Asset Pricing:
Intermediary Asset Pricing

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Intermediary Asset Pricing

- Intermediary asset pricing is an active research line recent years both in theory and empirics.
- Both academy and industry realize that when we talk about marginal investor, whose SDF prices the assets, they are actually the financial intermediary.
- The reason is that in many markets, household investor delegate their investments to financial intermediaries.
- All of the model of intermediary asset pricing are all actually consumption based asset pricing. Portfolio managers and bankers need to eat as well.

Adiran, Etula and Muir (2014): SDFs based on intermediary as marginal investor

- Adiran, Etula and Muir (2014) propose an empirical implementation of Brunnermeier and Pedersen (2009).
- The key equation in AEM is

$$E_0[R^e_{1j}] = -\frac{Cov_0(R^e_{1j}, \phi_1)}{E[\phi_1]}$$

  where ϕ_1 is the Lagrange multiplier in the first period.
- What's in the Lagrange multiplier

Adiran, Etula and Muir (2014): SDFs based on intermediary as marginal investor

- What's in the Lagrange multiplier?

$$\phi_t = a - b \times \text{Leverage}_t$$

- Empirically, they take the first-order difference of broker-dealer leverage and remove seasonal effects.
- Expected return is positively correlated with intermediary leverage.
- Broker-dealer leverage and household leverage move oppositely.
- Broker-dealers actively increase leverage when asset values rise. Its leverage move procyclical.

Adiran, Etula and Muir (2014): SDFs based on intermediary as marginal investor

- In AEM, increases in financial intermediary leverage are good news (since they make binding margin constraints less likely). Thus, leverage shocks should carry a positive market price of risk.

He, Kelly, and Manela (2017)

- HKM expand the factor from stocks and government bonds to CDS, corporate bonds, options, commodities, FX and sovereign bonds.

- Intermediaries in HKM are the primary dealers, a subset of about 25 broker-dealers that are the counterparties of the NY Fed in open market operations, rather than all broker-dealers as in AEM.

- They focus on the intermediary net worth,

$$\eta_t = \frac{\Sigma_i \text{MktEquity}_{i,t}}{\Sigma_i (\text{MktEquity}_{i,t} + \text{BookDebt}_{i,t})}$$

He, Kelly, and Manela (2017)

- The intuition: : When the intermediaries' net worth falls, their risk-bearing capacity is impaired and they require higher compensation to take on risk.
- The intuition comes from He's research agenda, He and Krishnamurty (2013).
- Periods in which intermediary net worth increases ($\eta_{t+1} > 0$) are good states of the world. The risk price on the η_{t+1} factor, λ_η, is positive.

$$E_t[R^{i,e}_{t+1}] - r^f_t = \beta^i_{m,t}\lambda^m + \beta^i_{\eta,t}\lambda_\eta.$$

He, Kelly, and Manela (2017)

- Note how an increase in intermediary equity ratio (E/A) implies a decrease in intermediary leverage (A/E) and vice versa. A positive price of risk for the intermediary equity capital factor implies a negative price of risk for the intermediary leverage factor, the opposite sign as what AEM postulate and estimate.

- Put differently, in HKM, high intermediary equity capital periods are good states of the world. In AEM, in contrast, they are periods of intermediary distress, bad states of the world.

AEM vs HKM

- There are two main questions between AEM and HKM:
  - Which financial intermediaries matter more for asset pricing?
  - What does theory predict about the sign of the market price of risk on the leverage/equity capital factor?

AEM vs HKM

- AEM's leverage factor has a negative risk price for options, CDS, FX (consistent with HKM), but positive risk price for stocks and Treasuries (consistent with AEM), zero for sov. bonds and commodities.

- AEM use book equity in the construction of their leverage factor while HKM use market equity in their capital ratio factor. Market and book capital ratios have positive correlation of 50% in levels and 30% in first differences. Only partially explains the difference. Even book leverage of primary dealers is counter-cyclical. (Recall AEM find overall broker-dealer leverage to be pro-cyclical.)

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AEM vs HKM

- A more important difference than market vs. book leverage is that HKM measure leverage at the parent-level (holding company) while AEM use broker-dealer subsidiary-level information, aggregated by the Flow of Funds.