

Asset Pricing in Intermediated Markets

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Asset pricing models: SDF and demand system approaches

- ▶ **Any** asset pricing model that starts from preferences, beliefs, . . . , implies
 1. An SDF that can be used to price assets using $\mathbb{E}[MR] = 1$.
 2. A demand system, $Q_i(P)$, that can be used to price assets by imposing market clearing, $\sum_i Q_i(P) = S$.
- ▶ Why can it be useful to study asset demand systems?
 1. **Testing theories** Demand curves depend on ex-ante information and can provide more powerful tests of asset pricing models than Euler equation tests that average ex-post returns.
 2. **New moments** By testing the model's implications for demand curves (e.g., demand elasticities and cross-elasticities), we expand the set of testable moments in a meaningful way.

Asset pricing in intermediated markets

- ▶ The structure of modern asset demand systems:
 - ▶ Households allocate to intermediaries (mutual fund flows, insurers, ...) and invest directly.
 - ▶ Intermediaries allocate to other intermediaries and invest directly.
 - ▶ The traditional view that intermediaries do not matter at all is counterfactual, e.g., CIP deviations [2].
- ⇒ When, and how much, do intermediation frictions matter?

Asset pricing in intermediated markets

- ▶ The structure of modern asset demand systems:
 - ▶ Households allocate to intermediaries (mutual fund flows, insurers, ...) and invest directly.
 - ▶ Intermediaries allocate to other intermediaries and invest directly.
- ▶ The traditional view that intermediaries do not matter at all is counterfactual, e.g., CIP deviations [2].
- ▶ As intermediaries are a key part of the demand system, agency, behavioral, and regulatory frictions may matter for prices, **not only during times of stress**.
- ▶ Demand systems can be used to test theories and to quantify the importance of various frictions.

Examples of new moments

- ▶ Estimates of demand systems yield puzzling facts compared to current asset pricing theories as, empirically,
 1. Demand is more inelastic [7; 4; 5].
 2. Latent demand¹ explains a large fraction of price variation [1; 5].
 3. Consideration sets, i.e., the stocks institutions invest in, are small and persistent [5].

¹**Latent demand:** The component of investors' demand that cannot be explained by prices and observable characteristics.

New targets for empiricists

- ▶ Typical models of preferences combined with the assumptions
 1. Returns follow a factor model
 2. Betas and alphas of stock n depend on $x(n)$imply for the demand of investor i for stock n :

$$\ln Q_i(n) = \beta_{0i} \ln P(n) + \beta'_{1i} x(n) + c_i + \epsilon_i(n),$$

where $\mathbb{E}[\epsilon_i(n) \ln P(n)] \neq 0$.

- ▶ **Questions for empiricists:** How to specify and credibly estimate the asset demand system featuring intermediaries.
- ▶ Estimating demand requires an instrument and asset pricing faces the same **identification challenges** as other fields (e.g., corporate finance and macro, [6; 3]).

New targets for theorists

- ▶ The demand of investor i for stock n :

$$\ln Q_i(n) = \beta_{0i} \ln P(n) + \beta'_{1i} x(n) + c_i + \epsilon_i(n).$$

- ▶ **New targets for theorists**
 - ▶ Which models of beliefs, preferences, regulatory or agency frictions provide quantitatively reasonable values for $\{\beta_{0i}, \beta_{1i}, \epsilon_i(n)\}$?
 - ▶ How do investors select (sparse) consideration sets?
- ▶ These questions can be answered by institutional type (mutual funds, insurance companies, banks, . . .), and for households, which decentralizes the research agenda.

Counterfactual analysis

- ▶ A better understanding of the asset demand system provides more credible answers to counterfactual questions involving quantities.
 - ▶ What is the impact of unconventional monetary policy on asset prices?
 - ▶ How much does the risk regulation of, e.g., banks and insurance companies influence fixed income markets?
 - ▶ How much do different types of institutions amplify or reduce volatility?
 - ▶ How do changes in institutional structure (e.g., the shift from DB to DC pension plans) affect prices?

Conclusions

- ▶ Asset demand systems provide a useful way to understand and test asset pricing models.
- ▶ Big data on portfolio holdings allow us to explore new dimensions of models (see appendix).
- ▶ **What constitutes progress?**
 1. Well-identified estimates of the asset demand system, including consideration sets.
 2. Micro-founded models that can explain the facts documented by the empirical literature for households and intermediaries.
- ▶ By understanding the basics of demand, and the supply response of firms, asset pricing models can become more realistic, micro-founded, and testable.

References

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Data on portfolio holdings

1. SEC Form 13F: Quarterly U.S. stock holdings of institutions managing over \$100m since 1980.
2. Thomson Reuters Ownership, FactSet Ownership, and Morningstar: International stock holdings.
3. Thomson Reuters eMAXX: Quarterly bond holdings of institutions (mutual funds and insurance companies) since 2002.
 - ▶ Insurance companies: Schedule D since 1991.
 - ▶ Fed: System Open Market Accounts since 2003.
4. Securities Holdings Statistics: Comprehensive holdings for the euro area since 2014.
5. Household-level data from Statistics Sweden for 1983–2007 (Calvet et al. 2007).
6. Brokerage data for 1991–1996 (Barber and Odean 2000).