Is Asset Demand Elasticity Set at the Household or Intermediary Level?

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Overview

Research question

• How price elastic are households in rebalancing across intermediaries?
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• Does household rebalancing undo intermediary inelastic demand?
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• Implications for estimates of aggregate price elasticities
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• Implications for “bite” of intermediary frictions
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Methodology

• New two-layer demand system extending Koijen & Yogo (2019)
• Endogenize wealth distribution across intermediaries
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• New two-layer demand system extending Koijen & Yogo (2019)
• Endogenize wealth distribution across intermediaries

Results

• Household elasticity is small
Agenda

Stylized model

• What are authors trying to measure?
• Contextualize with previous elasticity estimates
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Methodology

• How does two-layer demand system work?
• Potential extensions
Stylized Model (Following Gabaix & Koijen (2023))

Representative Household
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Representative Household

- Bond Fund
- Mixed Fund
Stylized Model (Following Gabaix & Kojien (2023))

Representative Household

1 − α              α

Bond Fund          Mixed Fund
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Representative Household

\[1 - \alpha \quad \alpha\]

- Bond Fund
- Mixed Fund

- Risk Free Bond
- Risky Asset
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Representative Household

\[ 1 - \alpha \quad \alpha \]

Bond Fund \quad Mixed Fund

Risk Free Bond \quad Risky Asset
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Representative Household

\[ 1 - \alpha \quad \alpha \]

\[ \text{Bond Fund} \quad \text{Mixed Fund} \]

\[ 1 - \theta \quad \theta \]

\[ \text{Risk Free Bond} \quad \text{Risky Asset} \]
Stylized Model (Following Gabaix & Koijen (2023))

Representative Household

1 - \(\alpha\)  \(\alpha\)

Bond Fund  Mixed Fund

1 - \(\theta\)  \(\theta\)

Risk Free Bond: \(r\)  Risky Asset: \(\pi + r\)
Stylized Model (Following Gabaix & Koijen (2023))

Representative Household

1 – \( \alpha \)  \( \alpha \)

Bond Fund  Mixed Fund

1 – \( \theta \)  \( \theta = e^{kM(\pi - \bar{\pi})} \)

Risk Free Bond: \( r \)  Risky Asset: \( \pi + r \)
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Representative Household

\[ 1 - \alpha \]
\[ \alpha = e^{k_H \theta (\pi - \bar{\pi})} \]

Bond Fund

Mixed Fund: \( \theta \pi + r \)

\[ 1 - \theta \]

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Risk Free Bond: \( r \)

Risky Asset: \( \pi + r \)
Stylized Model (Following Gabaix & Koijen (2023))

Representative Household

1 - \(\alpha\)

\(\alpha = e^{\kappa H \theta (\pi - \bar{\pi})}\)

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Mixed Fund: \(\theta \pi + r\)

1 - \(\theta\)

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Bond Fund

Risky Asset: \(\pi + r\)

Risk Free Bond: \(r\)

\(\omega = e^z\)

Noise Trader
Stylized Model (Following Gabaix & Koijen (2023))

Representative Household

\[ \alpha = e^{\kappa_H \theta (\pi - \bar{\pi})} \]

1 - \alpha

Bond Fund

Mixed Fund: \( \theta \pi + r \)

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1 - \theta

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Noise Trader

Steady State:

\[ z = 0, \pi = \bar{\pi}, \alpha = 1, \theta = 1, \delta = \frac{D}{P} \]
Stylized Model (Following Gabaix & Koijen (2023))

Steady State:
\[ z = 0, \pi = \bar{\pi}, \alpha = 1, \theta = 1, \delta = \frac{D}{P} \]
Shock: \[ z > 0 \]
Stylized Model (Following Gabaix & Koijen (2023))

<table>
<thead>
<tr>
<th>Bond Fund</th>
<th>Mixed Fund: $\theta\pi + r$</th>
</tr>
</thead>
<tbody>
<tr>
<td>$1 - \theta$</td>
<td>$\theta = e^{\kappa^M(\pi - \bar{\pi})}$</td>
</tr>
<tr>
<td>Risk Free Bond: $r$</td>
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</tr>
<tr>
<td>Risky Asset: $\pi + r$</td>
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</tr>
<tr>
<td>Noise Trader</td>
<td>$\Delta q^N = z$</td>
</tr>
</tbody>
</table>

Representative Household

1 - $\alpha$

$\alpha = e^{\kappa^H\theta(\pi - \bar{\pi})}$

Steady State:

$z = 0, \pi = \bar{\pi}, \alpha = 1, \theta = 1, \delta = \frac{D}{P}$

Shock: $z > 0$
Stylized Model (Following Gabaix & Koijen (2023))

Representative Household

\[ \alpha = e^{\kappa^H \theta (\pi - \bar{\pi})} \]

\[ 1 - \alpha \]

\[ \text{Bond Fund} \]

\[ 1 - \theta \]

\[ \text{Risk Free Bond: } r \]

\[ \theta \text{ Mixed Fund: } \theta \pi + r \]

\[ \Delta q^M = - \left( \frac{\kappa^M \delta + \kappa^H \delta}{\zeta^M \zeta^H} \right) \Delta p \]

\[ \theta = e^{\kappa^M (\pi - \bar{\pi})} \]

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Steady State:

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Steady State:
\[ z = 0, \pi = \bar{\pi}, \alpha = 1, \theta = 1, \delta = \frac{D}{P} \]
Shock: \( z > 0 \)
Market Clearing: \( \Delta q^N + \Delta q^M = 0 \)
\[ \rightarrow \Delta p = \frac{1}{\zeta^M + \zeta^H} z \]
Aggregate Demand Elasticity has Two Components

\[ \zeta^{Agg} = \zeta^M + \zeta^H \]

Previous elasticity estimates

- Holdings data: \(\zeta^M\) is small
  - Koijen & Yogo (2019), Haddad, et al. (2022)
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- Exogenous demand shocks: \( \zeta^{\text{Agg}} \) is small
  - **Mutual fund flows**: Lou (2012), Ben-David, et al. (2020), Li (2021), Chaudhary, et al. (2023)
  - **Cash payments**: Schmickler & Tremacoldi-Rossi (2022), Greenwood, et al. (2022), Hartzmark & Solomon (2022)
  - **Index inclusion**: Chang, et al. (2014), Pavlova & Sikorskaya (2020)
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- Implication: \( \zeta^{H} \) is small

This paper: First direct evidence \( \zeta^{H} \) is small
Two-Layer Asset Demand System

Intermediary level: Following Koijen & Yogo (2019)

\[
\frac{w_{i,t}(n)}{w_{i,t}(0)} = \exp \left\{ \beta_{0,i,t} m e_t(n) + \sum_{k=1}^{K-1} \beta_{k,i,t} x_{k,t}(n) + \beta_{K,i,t} \right\} \epsilon_{i,t}(n)
\]

- Investor \( i \) weight in stock \( n \) in quarter \( t \)
- Function of market equity, stock characteristics
Two-Layer Asset Demand System

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Innovation: Household level endogenizes wealth distribution

\[
\frac{\alpha_{HH,t}(i)}{\alpha_{HH,t}(0)} = \exp \left\{ \beta_{0,HH,t} \tilde{m}e_t(i) + \sum_{k=1}^{K-1} \beta_{k,HH,t} \tilde{x}_{t,k}(i) + \beta_{K,HH,t} \right\} \epsilon_{HH,t}(i)
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- Representative household weight in intermediary \(i\)
- Function of average market equity, stock characteristics for \(i\)
Two-Layer Asset Demand System

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Aggregate elasticity depends on \( \beta_{0,i,t} \) and \( \beta_{0,HH,t} \)
Two-Layer Asset Demand System

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\]

- Investor $i$ weight in stock $n$ in quarter $t$
- Function of market equity, stock characteristics

Innovation: Household level endogenizes wealth distribution

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\frac{\alpha_{HH,t}(i)}{\alpha_{HH,t}(0)} = \exp \left\{ \beta_{0,HH,t} \tilde{m}_{e_t}(i) + \sum_{k=1}^{K-1} \beta_{k,HH,t} \tilde{x}_{t,k}(i) + \beta_{K,HH,t} \right\} \epsilon_{HH,t}(i)
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- Representative household weight in intermediary $i$
- Function of average market equity, stock characteristics for $i$

Aggregate elasticity depends on $\beta_{0,i,t}$ and $\beta_{0,HH,t}$
Main Result: Household Elasticity is Small
Comments

Household layer is an important methodological advancement

Household inelasticity consistent with previous results
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More can be done with two-layer demand system

- Scope to analyze rich substitution patterns

\[
\frac{\alpha_{HH,t}(i)}{\alpha_{HH,t}(0)} = \exp \left\{ \beta^i_{0,HH,t} \tilde{m}e_t(i) + \sum_{k=1}^{K-1} \beta_{k,HH,t} \tilde{x}_{t,k}(i) + \beta_{K,HH,t} \right\} \epsilon_{HH,t}(i)
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- Are households more elastic for cheaper, less specialized funds?
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\frac{\alpha_{HH,t}(i)}{\alpha_{HH,t}(0)} = \exp \left\{ \beta_{0,HH,t}^i \tilde{m}e_t(i) + \sum_{k=1}^{K-1} \beta_{k,HH,t} \tilde{x}_{t,k}(i) + \beta_{K,HH,t} \right\} \epsilon_{HH,t}(i)
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- How do households substitute between value/growth, funds?
- Are households more elastic for cheaper, less specialized funds?

- Apply household layer at lower frequency
  - How slow is slow-moving capital?
Conclusion

Households are inelastic in rebalancing across intermediaries

- Develop new two-layer asset demand system
- Consistent with previous elasticity estimates

Households do not undo intermediary inelasticity, frictions

Authors can push the methodology further

- Richer substitution patterns
- Dynamics