Deep Habits and the cross section of expected returns
by Jules van Binsbergen

Discussion by
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UNC, Chapel Hill
Three papers at the price of one!

1. Does the cross-section of surplus consumption ratios generate cross-sectional dispersion in equity premia?

2. Does sorting industries according to their relative product price change generate a sizeable and significant cross-sectional spread in equity returns?

3. Can capital stock variation together with deep habits fix some of the shortcomings of Jermann (1998)?
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Preferences:

\[ U_t = \sum_{j=t}^{\infty} \beta^{j-t} \frac{1}{1-\gamma} \left[ \int_0^1 (C_{i,j} - \theta S_{i,j})^{1-1/\eta} \, di \right]^{1-\gamma/1-\eta} \]
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- Productivity follows a stationary AR(1) process
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Euler equations

\[ E_t [M_{t+1} R_{i,t+1}] = 1 \]
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Stochastic discount factor

\[ \log M_{t+1} = -\gamma \Delta \log X_{t+1} \]
Key insight

- Euler equations
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- Cash flows (if firms cannot adjust prices)
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Cash flows (if firms cannot adjust prices)

\[ \Delta \Phi_{i,t+1} = \Delta \log C_{i,t+1} \]
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$$\Delta \Phi_{i,t+1} \approx \frac{C_{i,t+1} - \theta S_{i,t+1}}{C_{i,t+1}} \Delta \log X_{t+1}$$
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Surplus consumption ratio and expected returns

- Expected Return Difference: $E_t(R_{1t+1} - R_{2t+1})$
- Product Price Difference: $p_{1t} - p_{2t}$
- Consumption Surplus Ratio Difference: $SR_{1t} - SR_{2t}$
Firms with high surplus consumption ratios should command a relatively higher risk premium.
Main finding

Firms with high surplus consumption ratios should command a relatively higher risk premium

Can we measure this?
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$$\frac{\Delta \log C_{i,t}}{\Delta \log P_{i,t}} = -\eta \left( \frac{C_{i,t} - \theta S_{i,t}}{C_{i,t}} \right)$$
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Can we measure this?

$$\frac{\Delta \log C_{i,t}}{\Delta \log P_{i,t}} = -\eta \left( \frac{C_{i,t} - \theta S_{i,t}}{C_{i,t}} \right)$$

Is this enough to explain the cross section of expected returns?
Quarterly Data

1. Consumption by industry (from BEA, NIPA Table 6.1)
2. Producer Price Index (from BLS)
Quarterly Data

1. Consumption by industry (from BEA, NIPA Table 6.1)
2. Producer Price Index (from BLS)

Matching is required (using 2 Digit SIC codes)

<table>
<thead>
<tr>
<th>SIC Code</th>
<th>Industry Description</th>
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<tbody>
<tr>
<td>(01-09)</td>
<td>Agric, Forestry, Fishing</td>
</tr>
<tr>
<td>(10-14)</td>
<td>Mining</td>
</tr>
<tr>
<td>(15-17)</td>
<td>Construction</td>
</tr>
<tr>
<td>(20-39)</td>
<td>Manufacturing</td>
</tr>
<tr>
<td>(40-49)</td>
<td>Transportation</td>
</tr>
<tr>
<td>(50-51)</td>
<td>Wholesale/distributors</td>
</tr>
<tr>
<td>(52-59)</td>
<td>Retail</td>
</tr>
<tr>
<td>(60-67)</td>
<td>Finance, Insur/Real Estate</td>
</tr>
<tr>
<td>(70-89)</td>
<td>Services</td>
</tr>
<tr>
<td>(91-97)</td>
<td>Public Admin</td>
</tr>
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</table>
Average difference of surplus-consumption ratios
What can we do?
What can we do?

- E.g. lower $\eta$
Rigorous measure of the cross section of surplus consumption ratios
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Results with more than two firms
Rigorous measure of the cross section of surplus consumption ratios

Results with more than two firms

Formal test of the model
## Paper 2: cross sectional regressions

### Sorting on relative price changes...

<table>
<thead>
<tr>
<th>Quintile</th>
<th>Constant</th>
<th>Mktrf</th>
<th>hml</th>
<th>smb</th>
<th>umd</th>
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<tbody>
<tr>
<td>Quintile 1 - Rf</td>
<td>0.0047*</td>
<td>1.015**</td>
<td>0.1246</td>
<td>0.1329*</td>
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<td>(0.0597)</td>
<td>(0.0906)</td>
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<td>Quintile 4 - Rf</td>
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<td>(0.0565)</td>
<td>(0.0856)</td>
<td>(0.0693)</td>
<td>(0.0484)</td>
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<tr>
<td>Quintile 5 - Rf</td>
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<td>0.8433**</td>
<td>0.2622**</td>
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<td>0.0016</td>
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<tr>
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<td>(0.0512)</td>
<td>(0.0777)</td>
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<td>(0.0439)</td>
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<tr>
<td>DMI (Q1-Q5)</td>
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<td>0.1481**</td>
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<td>0.0693</td>
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<tr>
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<td>(0.0660)</td>
<td>(0.1001)</td>
<td>(0.0810)</td>
<td>(0.0565)</td>
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</tbody>
</table>
Is sorting on price change the same as sorting on surplus-consumption ratios?
Is sorting on price change the same as sorting on surplus-consumption ratios?

Average correlation is 0.04
1. Is sorting on price change the same as sorting on surplus-consumption ratios?

![Bar chart showing correlation between price change and surplus-consumption ratios. The average correlation is 0.04.]

2. Model is quarterly, but regressions are monthly: does sampling frequency matter?
Concluding remarks

- Paper 1: empirical evidence for theoretical model?
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- Paper 2: theoretical model for empirical evidence?
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- Paper 1: empirical evidence for theoretical model?
- Paper 2: theoretical model for empirical evidence?
- Paper 3: what are the implications for the cross-section of expected returns?