Financial Shock Transmission to Heterogeneous Firms: The Earnings-Based Borrowing Constraint Channel

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Motivation

Current environment: US corporate sector is hit simultaneously by 2 large shocks: monetary policy (MP) tightening and global risk (GR) aversion
What we know: Heterogeneity in firm fundamentals affects transmission of MP shocks to funding costs
What we understand less: how GR shocks may transmit heterogeneously, through which pricing channels, and due to which financial constraints

This paper’s contribution

- We disentangle MP and GR shocks in an integrated daily BVAR exploiting cross-asset price movements
- We study two interrelated dimensions: (1) firm heterogeneity (2) the type of shocks to understand how shocks transmit to firms’ funding costs (bonds & equity) and default prospects
- We tease out mechanisms by contrasting asset-based with earnings-based borrowing constraint hypothesis, differentiating firms across leverage and earnings

Hypotheses

Heterogeneous effects across firms depending on type of borrowing constraint:
(1) Asset-based collateral constraint: Expect stronger responses of firms in upper tail of the leverage distribution (i.e. higher leveraged firms)
(2) Earnings-based borrowing constraint: Expect stronger responses of firms in lower tail of the leverage distribution (i.e. less profitable firms)

Shock identification

We exploit cross-asset price movements in a daily BVAR based on US financial conditions identified through sign, relative magnitude, and narrative restrictions:
- US monetary tightening: pushes up long-term yield (more than foreign monetary policy), depresses equity prices, USD appreciates
- US positive macro: flight to safety into bonds, out of equities, safe USD
- Global risk shock: flight into US, reduces the demand for riskier investments
- Foreign positive macro: flight to safety into US

Table 1: Sign restriction identification

<table>
<thead>
<tr>
<th></th>
<th>US MP</th>
<th>US macro risk</th>
<th>global risk</th>
<th>foreign MP</th>
<th>foreign macro risk</th>
</tr>
</thead>
<tbody>
<tr>
<td>Short-term yield</td>
<td>+</td>
<td>+</td>
<td>-</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Long-term yield</td>
<td>+</td>
<td>+</td>
<td>-</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Equities (&gt;&lt; foreign MP)</td>
<td>+</td>
<td>+</td>
<td>-</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Effective FX rate (&gt;&lt; foreign macro)</td>
<td>+</td>
<td>+</td>
<td>-</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Corporate spread</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

Table 2: Sensitivity of asset prices of tail firms upon impact of shocks

<table>
<thead>
<tr>
<th></th>
<th>Spread</th>
<th>EBP</th>
<th>Default risk</th>
<th>In( EqPrice)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Panel (a): Monetary policy shock</td>
<td>$\phi^a$</td>
<td>7.42(***$</td>
<td>$ $p &lt; 0.01$)</td>
<td>0.027**</td>
</tr>
<tr>
<td>Short-term yield</td>
<td>-1.136</td>
<td>-1.24</td>
<td>-0.093</td>
<td>0.002</td>
</tr>
<tr>
<td>Long-term yield</td>
<td>$\alpha^a$</td>
<td>1.021</td>
<td>0.174</td>
<td>-0.034</td>
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<tr>
<td>Equities (&gt;&lt; foreign MP)</td>
<td>$\gamma^a$</td>
<td>-0.41</td>
<td>-0.591</td>
<td>-0.004</td>
</tr>
<tr>
<td>Effective FX rate (&gt;&lt; foreign macro)</td>
<td>$\zeta^a$</td>
<td>2.004</td>
<td>0.343</td>
<td>0.008*</td>
</tr>
<tr>
<td>Corporate spread</td>
<td>0.007</td>
<td>0.490</td>
<td>-0.069</td>
<td>-0.012*</td>
</tr>
</tbody>
</table>

Panel (b): Global risk shock

<table>
<thead>
<tr>
<th></th>
<th>Spread</th>
<th>EBP</th>
<th>Default risk</th>
<th>In( EqPrice)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Global risk</td>
<td>$\phi^g$</td>
<td>7.42(***$</td>
<td>$ $p &lt; 0.01$)</td>
<td>0.027**</td>
</tr>
<tr>
<td>Short-term yield</td>
<td>-0.492</td>
<td>-0.517</td>
<td>-0.005</td>
<td>-0.003</td>
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<tr>
<td>Long-term yield</td>
<td>$\alpha^g$</td>
<td>10.458</td>
<td>1.000*</td>
<td>0.006</td>
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<tr>
<td>Equities (&gt;&lt; foreign MP)</td>
<td>$\gamma^g$</td>
<td>-0.545</td>
<td>-0.599**</td>
<td>-0.022</td>
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<tr>
<td>Effective FX rate (&gt;&lt; foreign macro)</td>
<td>$\zeta^g$</td>
<td>3.506*</td>
<td>-2.165</td>
<td>-0.011**</td>
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<tr>
<td>Corporate spread</td>
<td>1.995</td>
<td>-0.793</td>
<td>-0.013</td>
<td>-0.056</td>
</tr>
</tbody>
</table>

Observations: 222,029, 224,572, 221,718, 220,064

Figure 2: Cumulative responses to MP (GR) shock equiv. to 10 basis point (decrease) in US 10y yield

In a nutshell

Shocks:
- Global risk shocks have stronger and more heterogeneous effects on corporate funding costs, in particular for firms with low earnings/ cash flow coverage
- Monetary policy shocks have homogeneous impact across weak/strong firms
- Both shocks have a stronger and more persistent effect on the excess bond premium reflecting risk that is unexplained by firm fundamentals

Channels:
- Responses of firms’ funding costs are not significant for the tails of firms with above and below average leverage...
- ...but significant and pronounced for the tails of firms with below average earnings in the distribution of firms

Robustness tests

- Modified sign restrictions in BVAR and model validation with other shocks
- Shorter sample period 2005-2021 to exclude years with fewer bonds
- Lagged dependent variables to account for autocorrelation in asset prices
- Week + week + week
- Modified sign restrictions in BVAR and model validation with other shocks supports long... stronger and more persistent effect on the excess bond premium reflecting risk that is unexplained by firm fundamentals

Conclusions

- We propose an integrated framework to identify MP and GR shocks
- We analyze to which extent these shocks affect corporate funding costs heterogeneously depending on the type of borrowing constraint
- Key Takeaway: GR shocks (relative to MP shocks) have stronger and more heterogeneous effects on corporate funding costs which depend on firms’ position within the earnings distribution → the earnings-based borrowing constraint transmission channel

References


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