Institutional Herding and Its Price Impact: Evidence from the Corporate Bond Market

Fang Cai    Song Han    Dan Li    Yi Li

Federal Reserve Board


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Motivation

Two post crisis trends in the fixed income market

1. Increasing share of corporate bonds held by institutional investors, particularly open-ended mutual funds, who may demand liquidity at the same time.

2. Decreasing willingness of broker-dealers to supply balance sheet to make market, especially during stress times.

![Figure 1a](image1.png)

**Figure 1a: Number of Institutional Investors**

- Insurance Company
- Mutual Fund
- Pension Fund

![Figure 1b](image2.png)

**Figure 1b: Number of Corporate Bonds**

- Held by Insurance Company
- Held by Mutual Fund
- Held by Pension Fund
- Held by All

![Figure 1c](image3.png)

**Figure 1c: Holding Amount of Corporate Bonds in Billion $**

- Insurance Company
- Mutual Fund
- Pension Fund

![Corporate Debt](image4.png)

**Corporate Debt**

- Weekly
- Net outright position
- Revised survey

- Billions of dollars

2001 2003 2005 2007 2009 2011 2013 2015
0 50 100 150 200 250 300 350 400

Fang Cai, Song Han, Dan Li, Yi Li
Institutional Herding in Bonds
Motivation

These two trends raise a major concern:

- Institutional investors who act simultaneously can pose financial stability threat
  - For example: Feroli, Kashyap, Schoenholtz, and Shin (2014); OFR(2013); IMF(2015)

Thus, our main research questions are:

- Do institutional investors of corporate bonds trade simultaneously?
- Does such trading behavior destabilize prices?
Contributions

- Existing studies on institutional herding focus on the equity market.
  - The level of herding was generally found to be low, and its price impact is small in magnitude, if any (e.g., Lakonishok, Shleifer, and Vishny (1992); Sias (2004); Brown, Wei, and Wermers (2013))

- Little is known about the $8 trillion U.S. corporate bond market.
  - We expect that institutional herding is more intense and has larger destabilizing effect here
  - The market is more illiquid, opaque and dominated by institutional investors.

- We fill the gap by providing a comprehensive analysis of the level, cause, and effect of institutional herding in the corporate bond market
  - Moreover, we contrast behaviors of different types of investors (mutual funds, insurance companies, pension funds)
Overview

1 Data and Herding Measures
   - Data
   - Herding Measures

2 Empirical Results
   - Levels of Institutional Herding
   - Determinants of Herding
   - Price Impact of Herding

3 Conclusions
Data Source

- Merrill Lynch: Daily quotes on bond prices
- TRACE: Intraday transaction
- FISD: Bond characteristics
**Herding Measures: Definition**

- **Overall Herding Measure:** \( HM_{i,t} = |p_{i,t} - E[p_{i,t}]| - E|p_{i,t} - E[p_{i,t}]| \)
  - Following Lakonishok, Shleifer, and Vishny (1992); Wermers (1999).
  - \( p_{i,t} \). Buy intensity of bond \( i \) in quarter \( t \)
  - \( E[p_{i,t}] \). Expected buy intensity of all bonds in quarter \( t \).
  - \( E|p_{i,t} - E[p_{i,t}]| \). Adjustment factor that ensures a zero-mean herding measure under the null hypothesis of no herding behavior.

- **Buy Herding Measure:** \( BHM_{i,t} = HM_{i,t} |p_{i,t} > E[p_{i,t}]| \)
  - Calculated for bonds bought more intensely than average market buying

- **Sell Herding Measure:** \( SHM_{i,t} = HM_{i,t} |p_{i,t} < E[p_{i,t}]| \)
  - Calculated for bonds sold more intensely than average market selling
Herding Measures: Interpretation

- Herding measure HM
  - Has zero mean if there is no herding behavior.
  - Quantifies the extent to which a bond’s buy/sell pattern deviates from the overall market in the same quarter.
  - It is adjusted for the overall trading trend in each quarter, making it comparable across time.

Example

- What does it mean if we have $SHM = 0.08$ for bond $i$ in quarter $t$?
  - If 100 institutional investors trade bond $i$ in quarter $t$, 8 more investors trade on the sell side than would be expected under the null hypothesis that investors trade independently and randomly.
Levels of institutional herding in corporate bonds are substantially higher than what are documented for stocks, for all investor types.

- **Pension Fund**: 8.6% (Bonds) vs. 2.7% (Stocks)
  - Lakonishok, Shleifer, and Vishny (1992)
- **Mutual Funds**: 9.6% (Bonds) vs. 3.4% (Stocks)
  - Wermers (1999); Brown, Wei, and Wermers (2013)
- **Insurance Companies**: 13.2% (Bonds)

Herding is significantly stronger on the sell side than on the buy side, a result driven by mutual funds.

Herding is more likely to occur in riskier bonds.

- **Investment-Grade Bonds**: 8.9%.
- **High-Yield (Junk) Bonds**: 11.6%
- **Unrated Bonds**: 21.8%
All institutional investors herd to buy winning bonds and herd to sell losing bonds, with insurance companies’ herding behavior most sensitive to past performance.

Nonlinear relationship: Extreme bad past performances may trigger disproportionally large selling herds, while top performance do not attract disproportionally large buying herds.

Insurance companies react more to rating-change events, particularly down-grades.

Institutional investors herd more in lower-rated and smaller-sized bonds.
A key issue of interest in studying institutional herding is whether herding stabilizes or destabilizes asset prices.

What We Found

- Asymmetric Effects between Buy and Sell Herding:
  - Buy herding facilitates price discovery (stabilizing).
  - Sell herding results in significant price distortions (destabilizing).
- The price destabilizing effect of sell herding is particularly strong for
  - High-yield bonds
  - Smal-sized bonds
  - Illiquid bonds
  - During the global financial crisis
Price Impact of Herding: Methodology

**Step I: Group bonds into quintiles based on BHM and SHM**
- **B1 (B5):** Consisting of bonds with the lowest (highest) BHM
- **S1 (S5):** Consisting of bonds with the lowest (highest) SHM

**Step II: Construct three zero-investment portfolios**
- **S5-B5:** Longs S5 and shorts B5.
- **S5-S1:** Longs S5 and shorts S1.
- **B1-B5:** Longs B1 and shorts B5.
- All three portfolios represent contrarian trading strategies.

**Step III: Examine abnormal returns on these contrarian portfolios**
- A return reversal after portfolio formation would imply that herding plays a destabilizing role by distorting bond prices.
- A close-to-zero flat return after portfolio formation would imply that herding plays a stabilizing role by accelerating price discovery.
Price Impact of Herding: By Bond Type

Panel A: Quarterly Abnormal Returns, in Percent

Panel B: Cumulative Abnormal Returns

Portfolio S5-B5, in Percent

Portfolio S5-S1, in Percent

Portfolio B1-B5, in Percent

Portfolio S5-B5

Portfolio S5-S1

Portfolio B1-B5

Panel B: Cumulative Abnormal Returns
Price Impact of Herding: By Investor Type

Portfolio S5-B5
- Insurance Company
- Mutual Fund
- Pension Fund

Portfolio S5-S1
- Insurance Company
- Mutual Fund
- Pension Fund

Portfolio B1-B5
- Insurance Company
- Mutual Fund
- Pension Fund

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Institutional Herding in Bonds
Price Impact of Herding: By Market Condition

Portfolio S5-B5

Portfolio S5-S1

Portfolio B1-B5

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Institutional Herding in Bonds 15
Our finding that institutions’ sell herding destabilizes asset prices is the first in the fixed-income literature.

- Different from the results in earlier papers on the stock market.
  - Lakonishok, Shleifer, and Vishny (1992); Nofsinger and Sias (1999); Wermers (1999).
  - Consistent with papers on the stock market that focus on more recent periods, but much stronger in magnitude and significance.
    - Brown, Wei, and Wermers (2013); Dasgupta, Prat, and Verardo (2011).

Our evidence clearly points to the vulnerabilities associated with institutional herding.

- The price-destabilizing effect is strongest for the most risky bonds during periods of market distress.
The level of institutional herding is much higher in the corporate bond market compared to the equity market, particularly among high-yield bonds.

Persistence in herding is largely driven by institutions imitating the trades of others in the previous quarter, rather than autocorrelations in their own trades.

There is an asymmetry in the price impact of herding.

- While buy herding facilitates price discovery, sell herding results in transitory yet significant price distortions.
- The destabilizing effect of sell herding is particularly strong for high-yield bonds, small bonds, and illiquid bonds, and during the global financial crisis.