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# Mutual Fund Fragility

Non-bank Runs and Financial Crises  
CME GROUP-MSRI SEMINAR

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# Overview

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- The way investors get paid upon redemption in open-end mutual funds might create a **first-mover advantage** or **strategic complementarities**
- This can amplify redemptions following adverse shocks
- The problem gets more severe when the fund holds more **illiquid assets**
- Implications for fund policies and possibly also for regulation



# Bank Runs

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- Bank runs have plagued the financial system for many years
- The concern of bank runs is a source of vast government intervention and regulation
  - Deposit insurance
  - Bank regulation (capital, liquidity, etc.)
  - Various government authorities involved: FDIC, Federal Reserve System, etc.



# Economic Force behind Runs

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- Basic economic force behind runs is based on (Diamond and Dybvig, 1983):
  - Strategic complementarities
    - Banks create liquidity by holding illiquid assets and liquid liabilities (deposits)
    - Depositors are promised a fixed amount if they want to withdraw
    - If many withdraw, the bank will have to liquidate assets at a loss, hurting those who don't withdraw
    - Run arises as a self-fulfilling belief: People run because they think others will do so



# What about Non-Bank Institutions?

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- Strategic complementarities and run-type behavior are not limited to banks
- Recent Example provided by money-market funds
- One feature that is common to money-market funds and banks is that they have fixed claims
- This clearly enhances the first-mover advantage contributing to run dynamics
- New thinking following the crisis involves moving away from the fixed-NAV model to a floating-NAV model as in other mutual funds

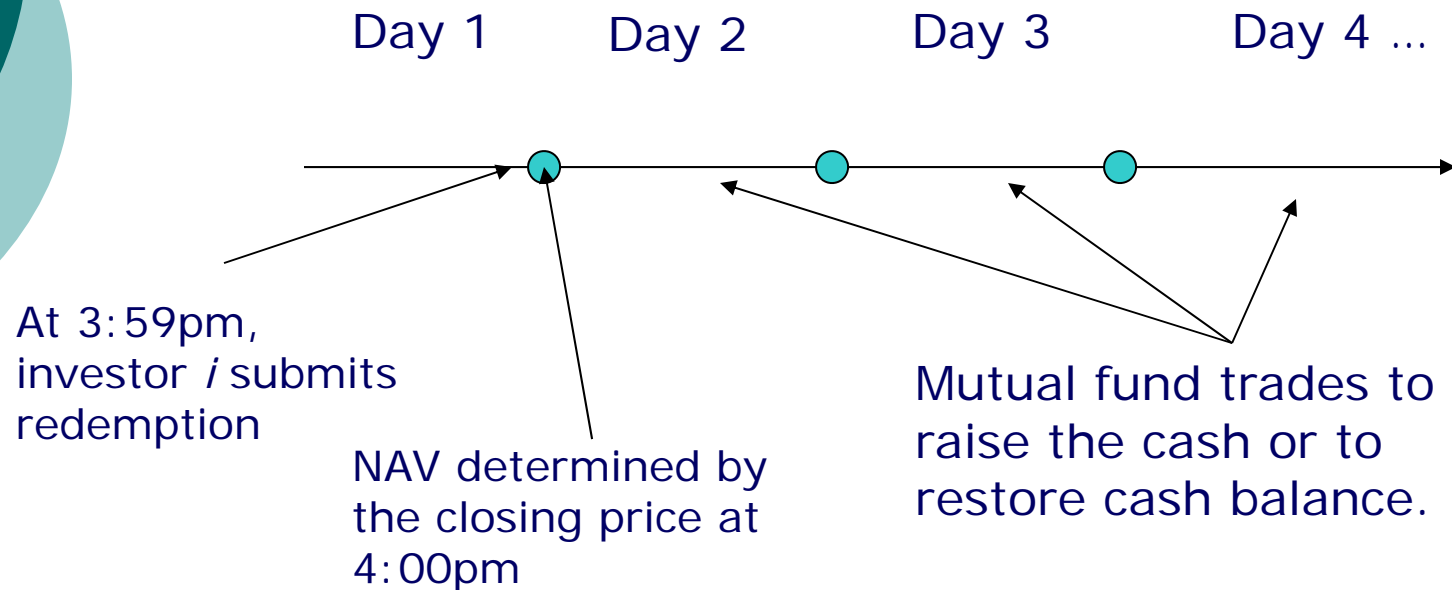


# Run Dynamics in a Floating-NAV Model

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- However, moving to a floating-NAV model does not eliminate the first-mover advantage and the potential for run-like behavior
- In a floating-NAV environment, investors can redeem shares and get the NAV as of the day of redemption
- But, their redemptions will affect fund trading going forward hurting remaining investors in illiquid funds
- This is the source of the first-mover advantage (or strategic complementarities)

# Complementarities in Mutual Funds Redemptions



- Source for complementarities:
  - Redemptions impose costs on remaining investors:
  - Costs include: commissions, bid-ask spread, price impact, forced deviation from desired portfolio, liquidity-based trading.



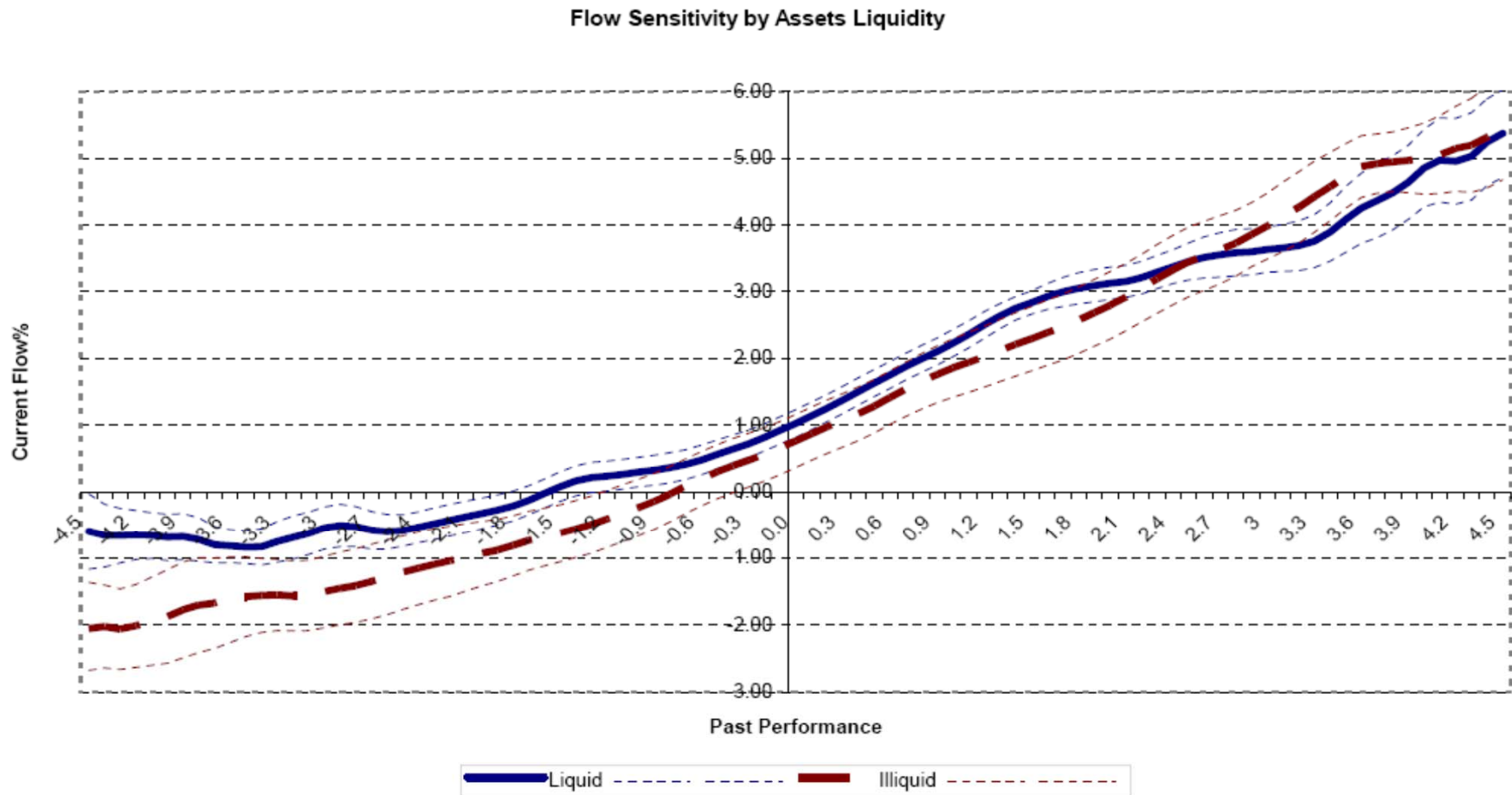
# Empirical Analysis of Flows in Equity Mutual Funds

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- Chen, Goldstein and Jiang (2010)
  - Study flows in 4,393 actively-managed equity funds from 1995-2005
  - Find stronger sensitivity of outflows to negative performance in illiquid funds
    - These funds generate greater complementarities
    - Illiquid funds are: small-cap & mid-cap equity funds (domestic or international), or single-country funds excluding US, UK, Japan and Canada.
      - Or continuous measure of liquidity of portfolio
  - Pattern is weaker in funds that are mostly held by institutional investors
    - Externalities are better internalized



# Evidence from Chen, Goldstein, and Jiang (2010)



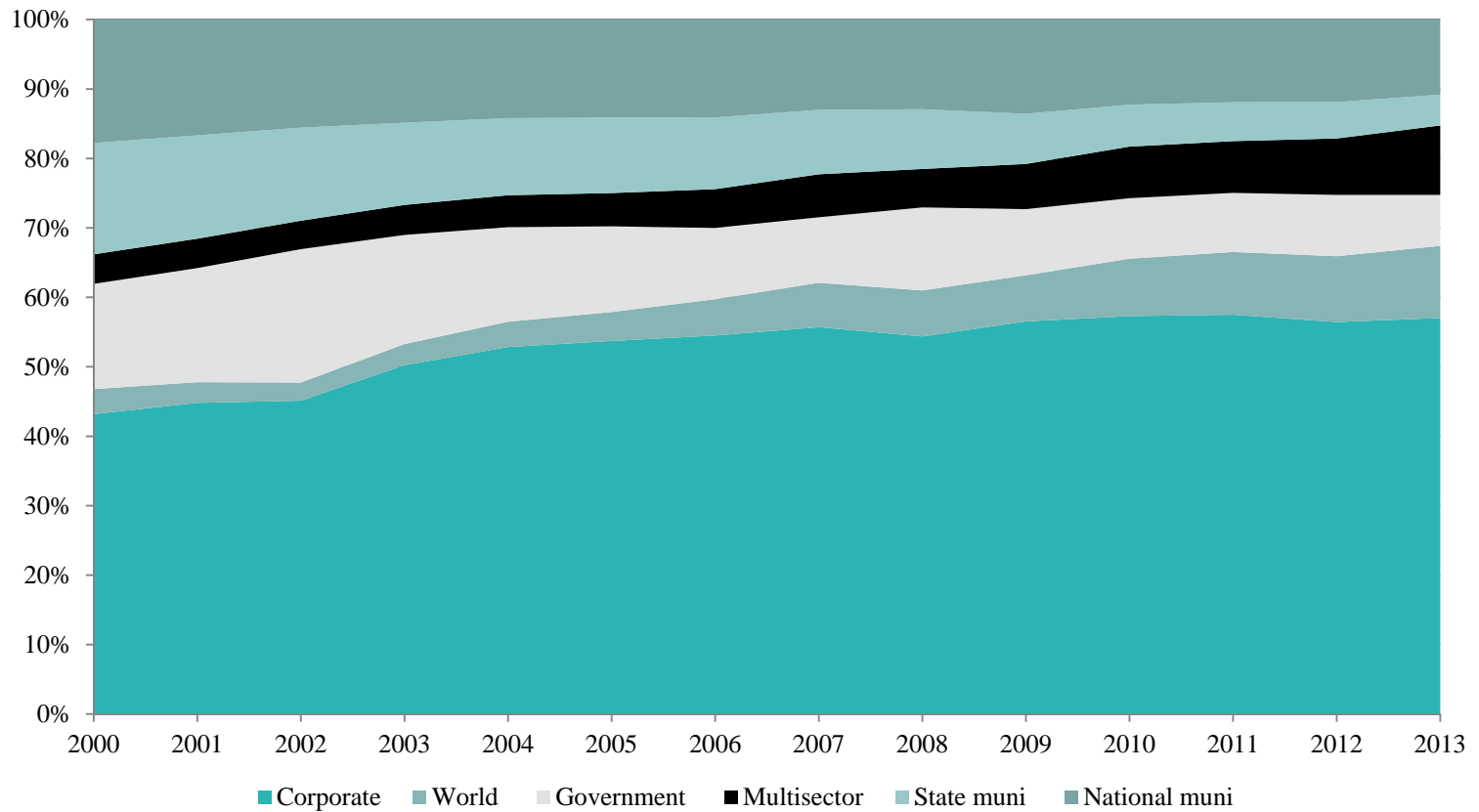


# Corporate Bond Funds

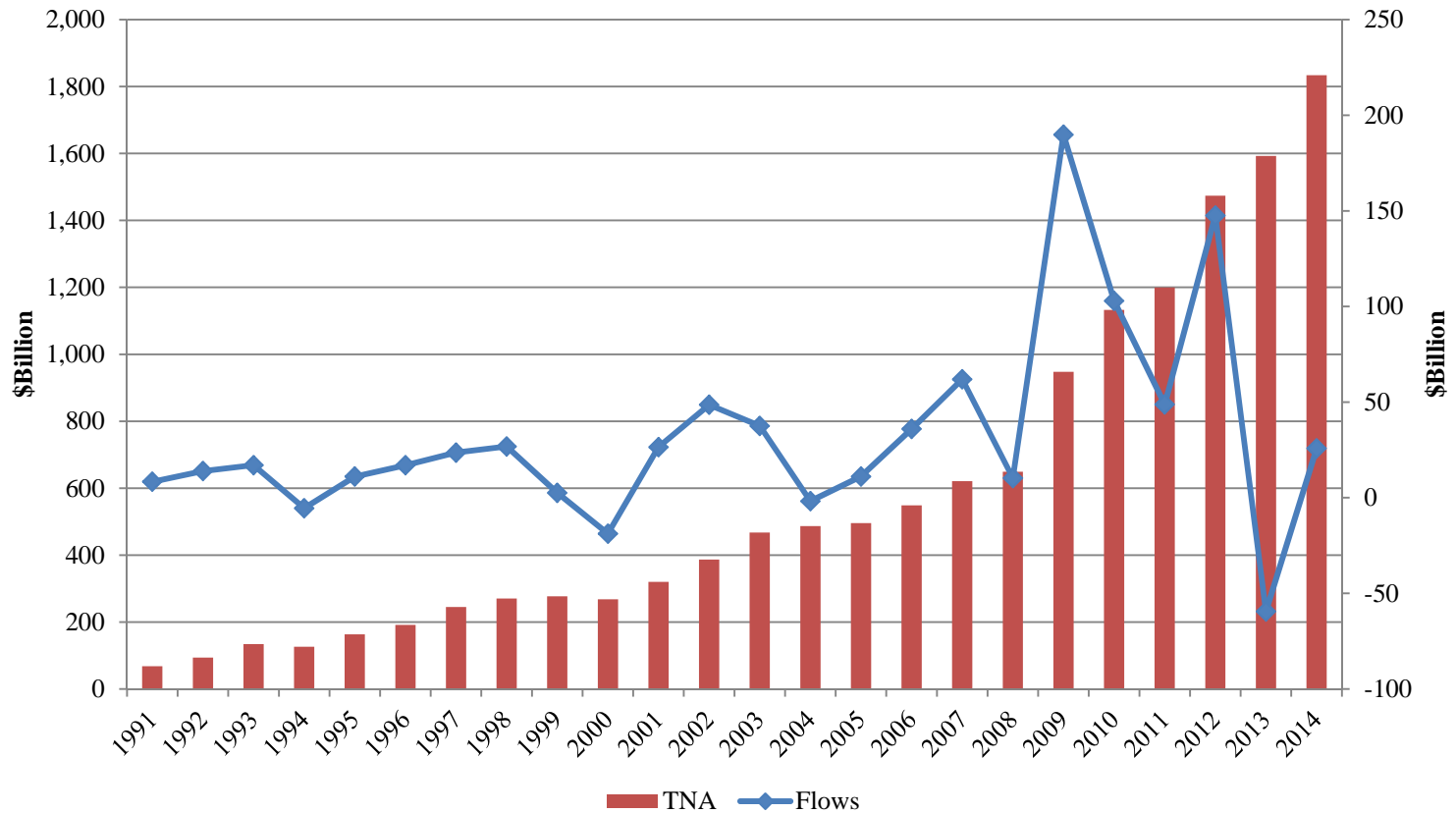
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- Recently, there is growing interest in Corporate bond mutual funds in this context
  - They are growing fast
  - Their assets can be very illiquid and so they generate stronger complementarities
  - Concern for fragility: Investors will pull their money out following signs of bad performance, amplified by the strategic complementarities

# Distribution of Bond Fund Assets



# Total Net Assets and Flows of Active Corporate Bond Funds



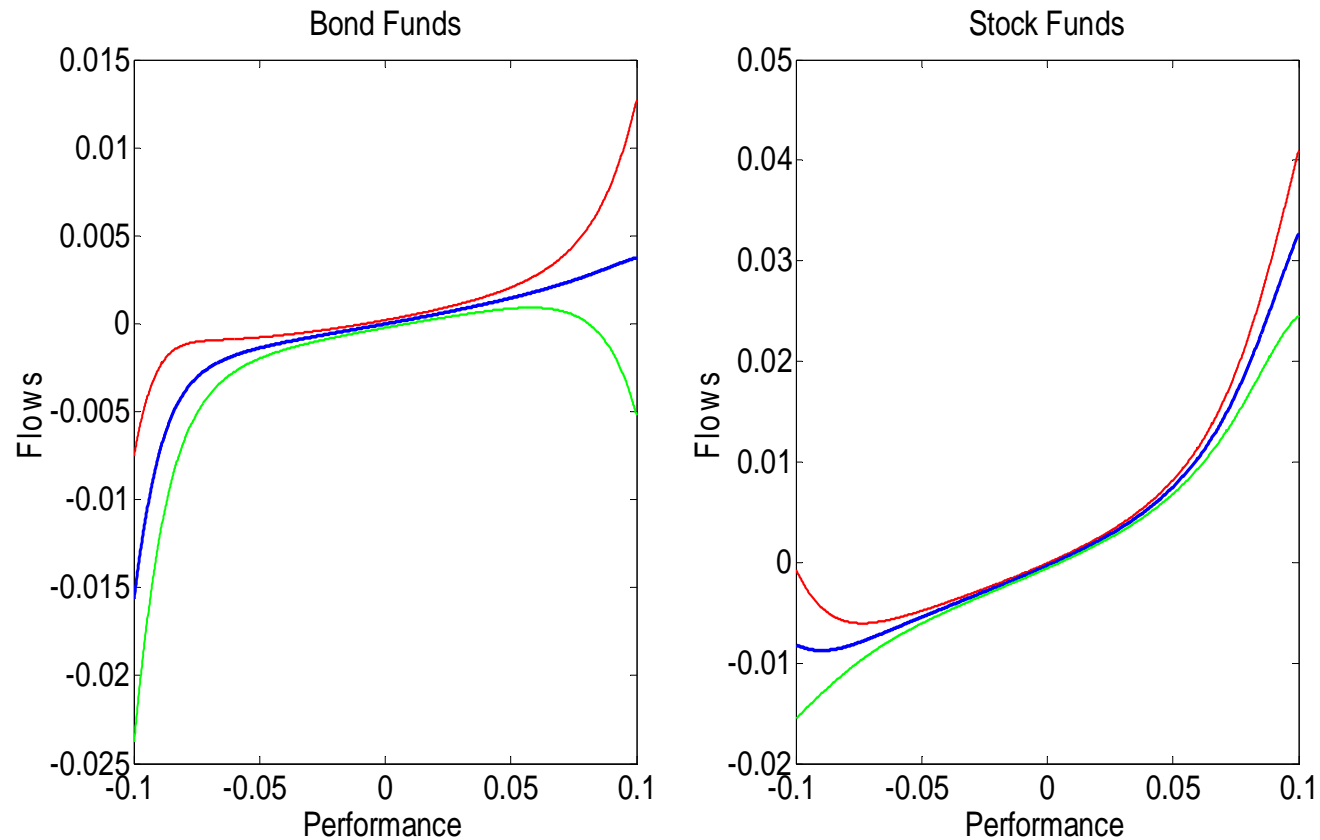


# Empirical Analysis of Flows in Corporate Bond Mutual Funds

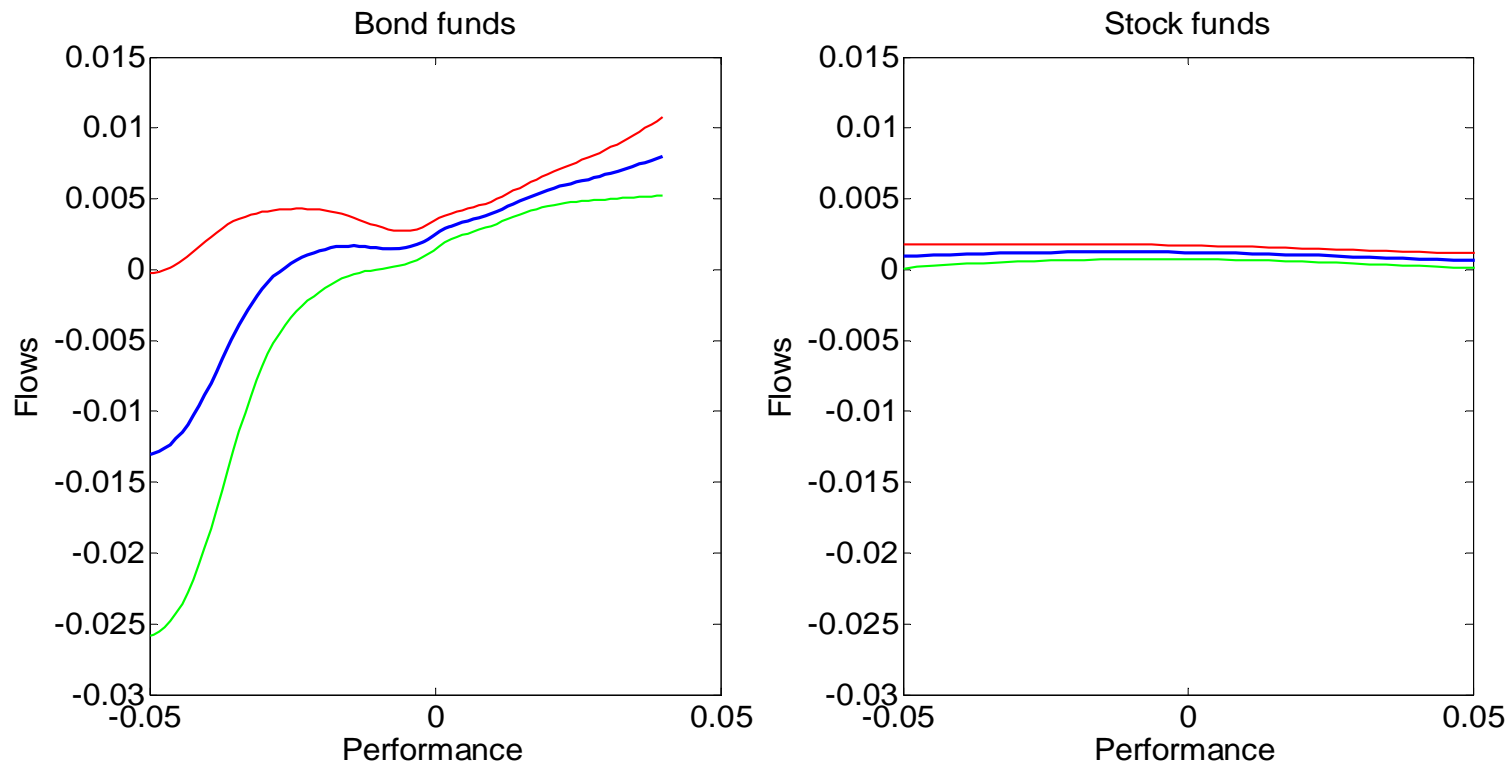
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- Goldstein, Jiang and Ng (2015)
  - Study flows in 1,660 actively-managed corporate bond funds from 1992-2014
  - Compare the pattern with that of equity funds
  - Link pattern to illiquidity
- Large literature on the flow-to-performance relation in equity funds, finding convex relation (greater sensitivity on upside than on downside)
- We find that corporate bond funds are different:
  - flow-to-performance relation tends to be concave (greater sensitivity on downside than on upside)
  - Pattern strengthens with illiquidity
    - Funds that hold less cash or periods with greater aggregate illiquidity

# Flow Performance Relation of Corporate Bond Funds vs. Equity Funds



# Does redemption sensitivity disappear in aggregation?





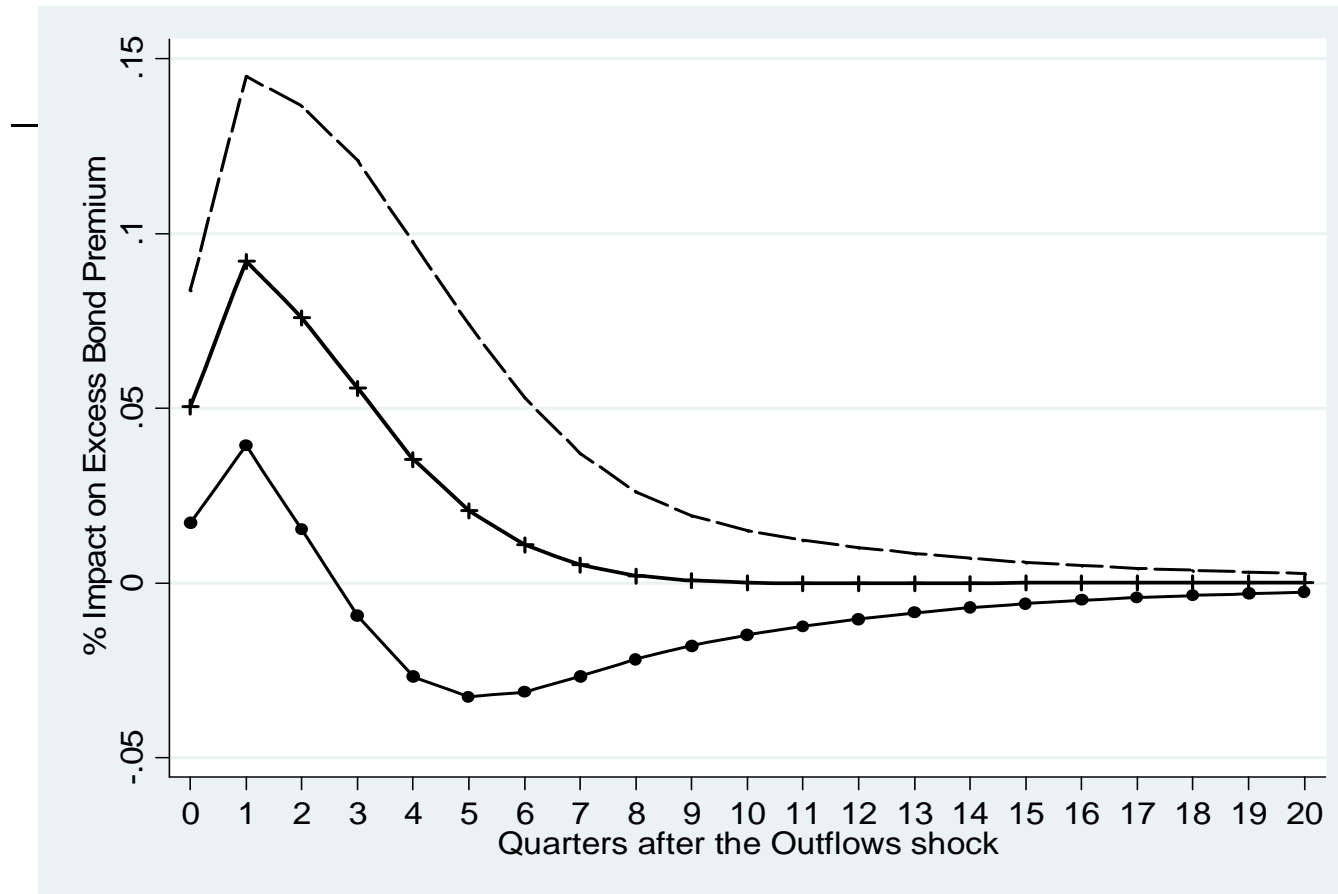
# Economic impact of Corporate Bond Fund Flows

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- Do outflows in bond funds have significant implications on market prices and the real economy?
- Exploratory evidence
  - Evaluate how corporate bond fund flows are related to Gilchrist and Zakrajsek (2012)'s excess bond premium.
  - Conduct a bivariate VAR with quarterly corporate bond fund outflows and excess bond premium on a quarterly basis, and estimate the response of EBP to shocks to the corporate bond fund outflow.
  - Estimate the effect of corporate bond fund outflows on real-economy variables.
  - Sample period is from 1991Q1 to 2010Q3 with two lags of the endogenous variables.

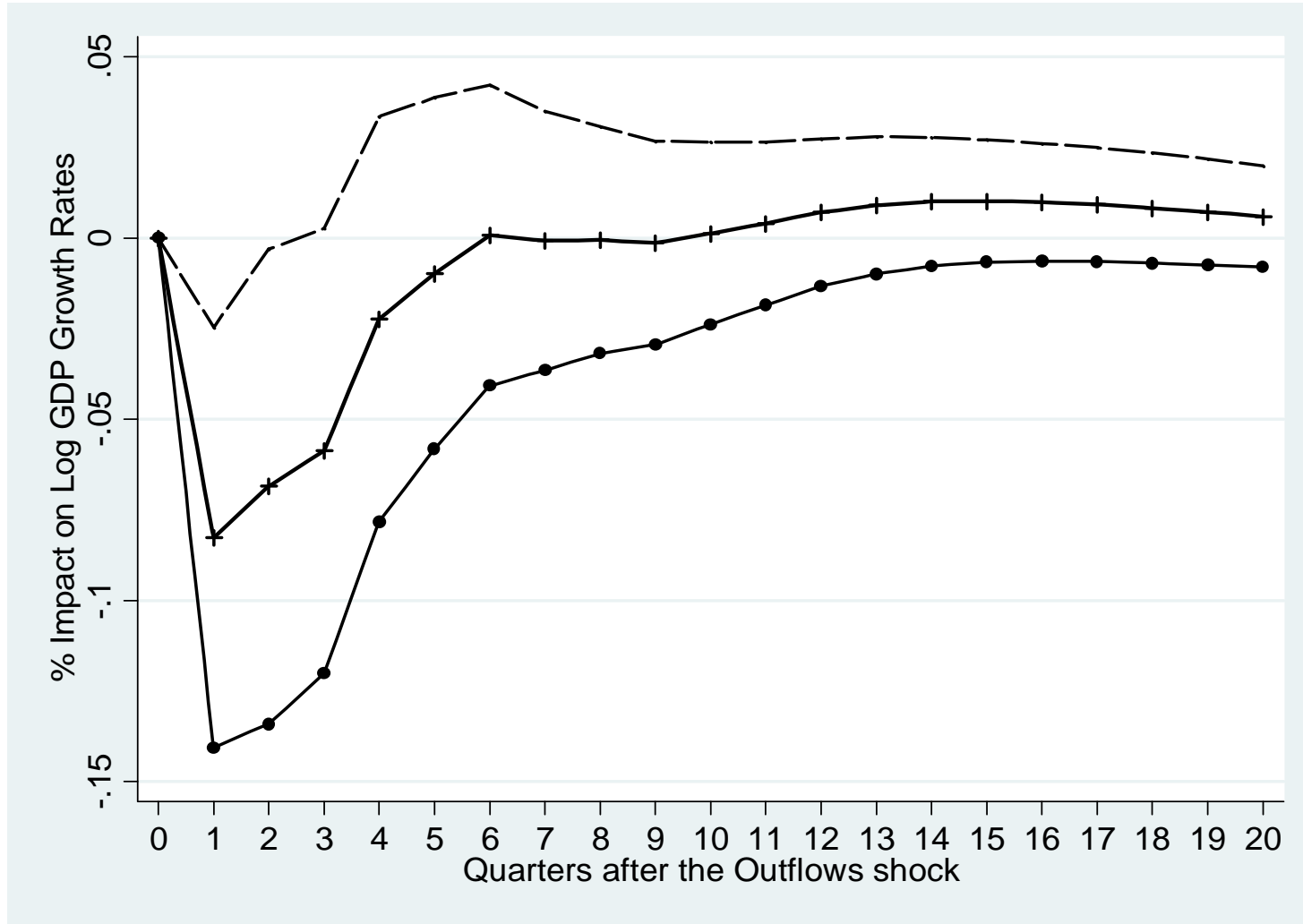


# Impact of Corporate Bond Fund Outflows on Excess Bond Premium



Following 1% increase in corporate bond fund outflows during a quarter, the excess bond premium rises during the contemporaneous quarter, and jumps up further by 9.2 and 7.6 basis points in next two quarters.

# Impact of Corporate Bond Fund Outflows on GDP growth





# Some Lessons

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- We need to pay attention to the liquidity mismatch created by mutual funds
- Measures to reduce 'first-mover advantage' should be considered/implemented more prominently:
  - Fund holding more liquidity/cash reserves (but, costly to performance)
  - Restriction on redemption frequency (but, compromising liquidity to investors)
  - Emergency rules: suspension of redemption; redemption in kind...(but, seldom used, hard to implement)
  - Forward looking NAV calculation, e.g., swing pricing (but, hard to implement)



## Some Lessons – Cont'd

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- Regulation may be needed if there are externalities going beyond the individual fund
  - Fire-sale pricing leading to real implications
- More broadly, regulating one part of the financial system will change the operation of other parts and create new risks
  - Money market funds were largely a response to tightened bank regulation
  - Large activity in bond markets and bond funds is also motivated by the need that cannot be easily filled by traditional banks
  - 'Shadow banking' more generally