

Cross-Sectional Asset Prices Under the Impact of Noise Trading Flows: A Factor Framework

An, Su & Wang (2023)

Discussion by Aditya Chaudhry

The Ohio State University, Fisher College of Business

Overview

Research question

- How & why do flows impact asset prices?

Overview

Research question

- How & why do flows impact asset prices?

Significance

- Large & growing literature shows flows impact prices

Overview

Research question

- How & why do flows impact asset prices?

Significance

- Large & growing literature shows flows impact prices
- No consensus for why “arbitrageurs” don’t undo impact

Overview

Research question

- How & why do flows impact asset prices?

Significance

- Large & growing literature shows flows impact prices
- No consensus for why “arbitrageurs” don’t undo impact

Summary

- New mechanism: Flows expose arbitrageurs to systematic risk
- New empirical measures of factor flows, price impact

Overview

Research question

- How & why do flows impact asset prices?

Significance

- Large & growing literature shows flows impact prices
- No consensus for why “arbitrageurs” don’t undo impact

Summary

- New mechanism: Flows expose arbitrageurs to systematic risk
- New empirical measures of factor flows, price impact

Results

- Factor-driven flows impact stock prices (SMB > HML > MKT)
- Timing factors by trading against flows delivers high Sharpes

Overall: Very Interesting Paper

Novel & elegant mechanism

- Links “demand-based” and “cross-sectional” asset pricing
- Allows for parsimonious characterization of price impact & cross-price impacts of flows

Overall: Very Interesting Paper

Novel & elegant mechanism

- Links “demand-based” and “cross-sectional” asset pricing
- Allows for parsimonious characterization of price impact & cross-price impacts of flows

New measures of flows and price impact at factor level

- Improve on existing measures
- E.g. Inverse price elasticity $(\Delta P/P)/(\Delta Q/Q)$ not defined for long-short portfolios

Overall: Very Interesting Paper

Novel & elegant mechanism

- Links “demand-based” and “cross-sectional” asset pricing
- Allows for parsimonious characterization of price impact & cross-price impacts of flows

New measures of flows and price impact at factor level

- Improve on existing measures
- E.g. Inverse price elasticity $(\Delta P/P)/(\Delta Q/Q)$ not defined for long-short portfolios

Comments:

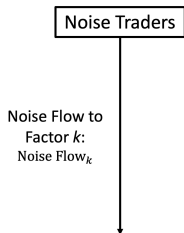
- Reconciling theory with previous empirical results
- Tightening identification in empirical section

Theoretical Framework: 2-Period CARA Model

N risky assets, exact K factor-structure in cash flows

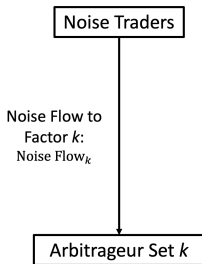
Theoretical Framework: 2-Period CARA Model

N risky assets, exact K factor-structure in cash flows



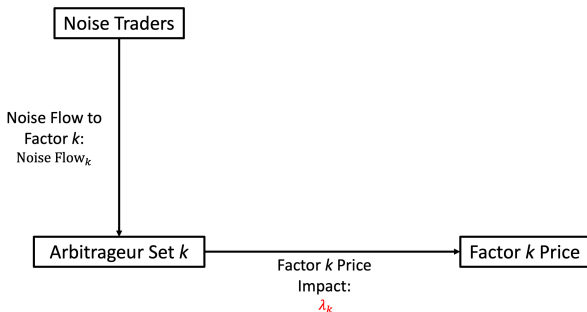
Theoretical Framework: 2-Period CARA Model

N risky assets, exact K factor-structure in cash flows



Theoretical Framework: 2-Period CARA Model

N risky assets, exact K factor-structure in cash flows

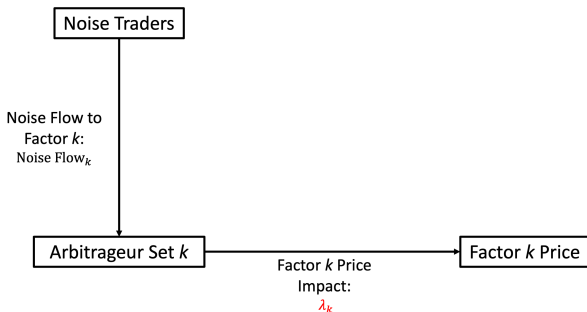


Factor k price drops, expected return rises to compensate arbitrageur

$$\text{Price}_k = \text{Noise Flow}_k \cdot \underbrace{\lambda_k}_{\substack{\text{Price of Risk} \\ = \text{Price Impact}}} \cdot \underbrace{\text{Var}_k}_{\substack{\text{Quantity} \\ \text{of Risk}}} + \underbrace{\text{Fundamental Value}_k}_{\substack{\text{Price if} \\ \text{No Flows}}}$$

Theoretical Framework: 2-Period CARA Model

N risky assets, exact K factor-structure in cash flows



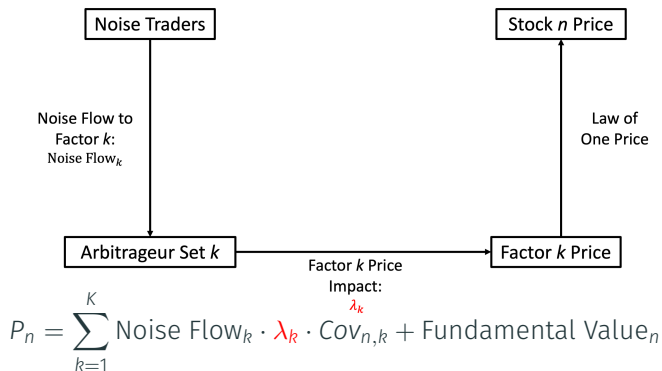
Factor k price drops, expected return rises to compensate arbitrageur

$$\text{Price}_k = \text{Noise Flow}_k \cdot \underbrace{\lambda_k}_{\substack{\text{Price of Risk} \\ = \text{Price Impact}}} \cdot \underbrace{\text{Var}_k}_{\substack{\text{Quantity} \\ \text{of Risk}}} + \underbrace{\text{Fundamental Value}_k}_{\substack{\text{Price if} \\ \text{No Flows}}}$$

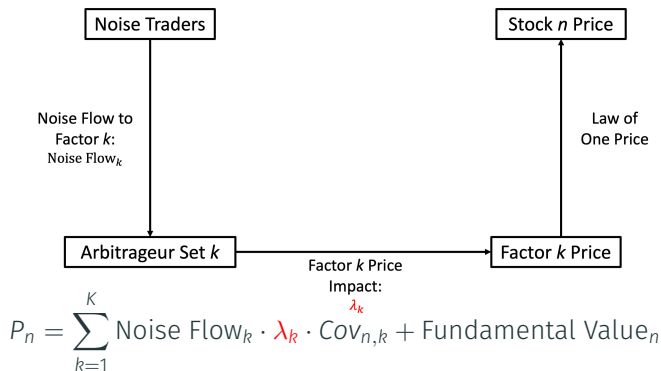
\$1 noise inflow to factor k raises price $\$ \lambda_k$

- New measure of price impact: defined for long-short portfolios

Law of One Price: Factor Structure of Price Impacts



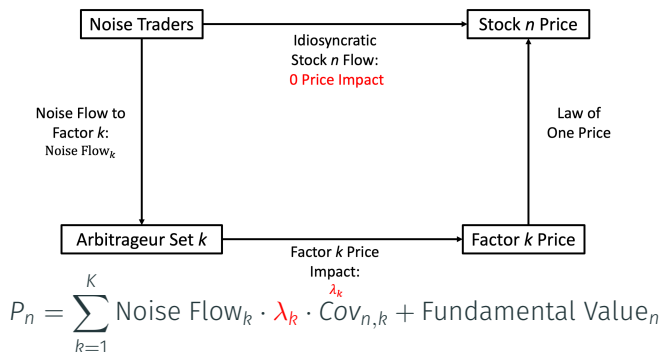
Law of One Price: Factor Structure of Price Impacts



Implication: Factor-driven flows impact stock price

- By forcing arbitrageur to bear more/less systematic risk

Law of One Price: Factor Structure of Price Impacts



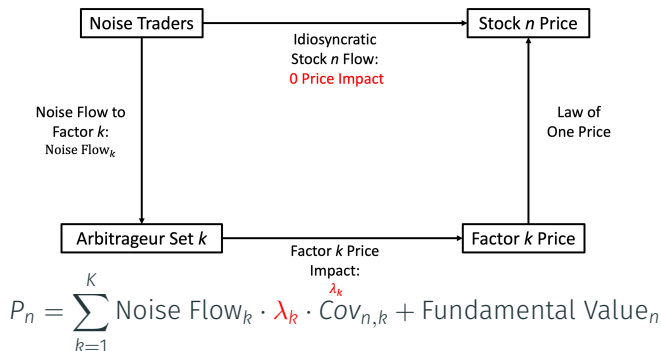
Implication: Factor-driven flows impact stock price

- By forcing arbitrageur to bear more/less systematic risk

Implication: Idiosyncratic flows have no price impact

- Empirics allows for idiosyncratic risk in fundamentals, flows

Law of One Price: Factor Structure of Price Impacts



Implication: Factor-driven flows impact stock price

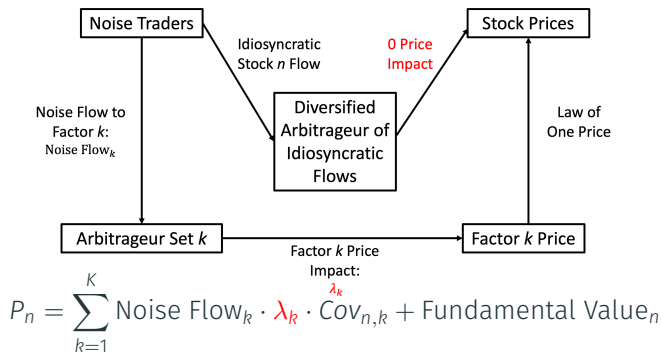
- By forcing arbitrageur to bear more/less systematic risk

Implication: Idiosyncratic flows have no price impact

- Empirics allows for idiosyncratic risk in fundamentals, flows

Comment: Price equation does not obtain with idiosyncratic risk

Law of One Price: Factor Structure of Price Impacts



Implication: Factor-driven flows impact stock price

- By forcing arbitrageur to bear more/less systematic risk

Implication: Idiosyncratic flows have no price impact

- Empirics allows for idiosyncratic risk in fundamentals, flows

Comment: Price equation does not obtain with idiosyncratic risk

- Solution: New arbitrageur who absorbs idiosyncratic flows

Comment: Empirically Idiosyncratic Flows do Impact Prices

Previous work: Demand shocks to individual stocks move prices

- Index inclusion
 - Shleifer (1986); Harris & Gurel (1986); Chang, Hong & Liskovich (2014); Pavlova & Sikorskaya (2023)

Comment: Empirically Idiosyncratic Flows do Impact Prices

Previous work: Demand shocks to individual stocks move prices

- Index inclusion
 - Shleifer (1986); Harris & Gurel (1986); Chang, Hong & Liskovich (2014); Pavlova & Sikorskaya (2023)
- Dividend payments:
 - Schmickler & Tremacoldi-Rossi (2022)

Comment: Empirically Idiosyncratic Flows do Impact Prices

Previous work: Demand shocks to individual stocks move prices

- Index inclusion
 - Shleifer (1986); Harris & Gurel (1986); Chang, Hong & Liskovich (2014); Pavlova & Sikorskaya (2023)
- Dividend payments:
 - Schmickler & Tremacoldi-Rossi (2022)
- Asset demand systems:
 - Koijen & Yogo (2019); Haddad, Huebner & Loualiche (2021)

Comment: Empirically Idiosyncratic Flows do Impact Prices

Previous work: Demand shocks to individual stocks move prices

- Index inclusion
 - Shleifer (1986); Harris & Gurel (1986); Chang, Hong & Liskovich (2014); Pavlova & Sikorskaya (2023)
- Dividend payments:
 - Schmickler & Tremacoldi-Rossi (2022)
- Asset demand systems:
 - Koijen & Yogo (2019); Haddad, Huebner & Loualiche (2021)

Suggests other mechanisms for why flows impact prices

- E.g. Benchmarking, adjustment costs, parameter uncertainty, learning from prices

Suggestion: Model Impact of Idiosyncratic & Systematic Flows

Systematic Flows

Idiosyncratic Flows

Systematic Risk

Other Mechanisms

```
graph TD; SR[Systematic Risk] --> PI[Price Impact]; OM[Other Mechanisms] --> PI;
```

Price Impact

Suggestion: Model Impact of Idiosyncratic & Systematic Flows

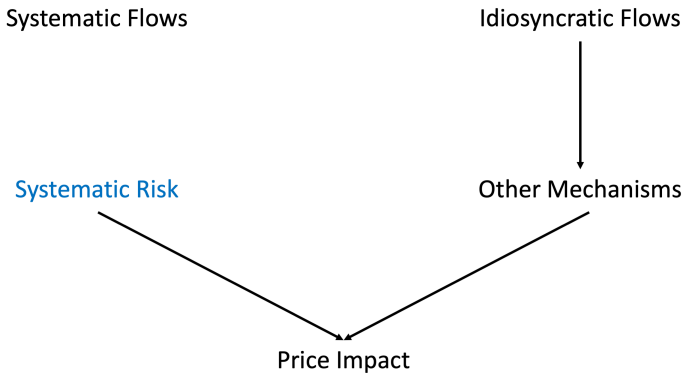
Systematic Flows

Idiosyncratic Flows

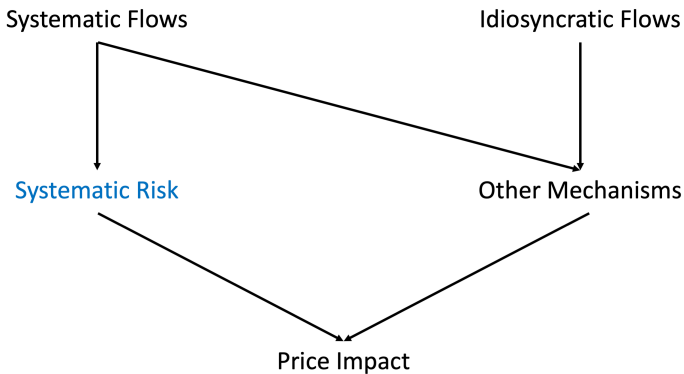
Systematic Risk

Other Mechanisms

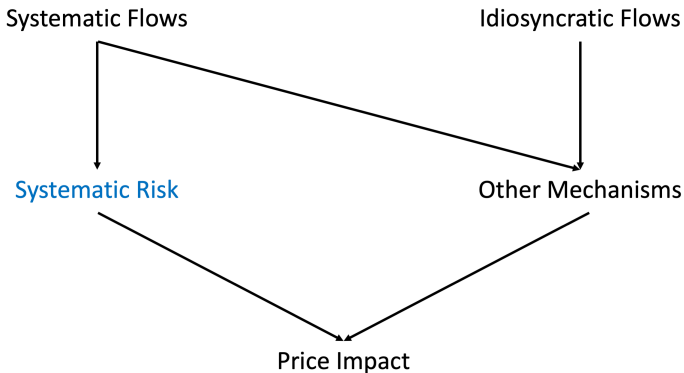
Price Impact



Suggestion: Model Impact of Idiosyncratic & Systematic Flows

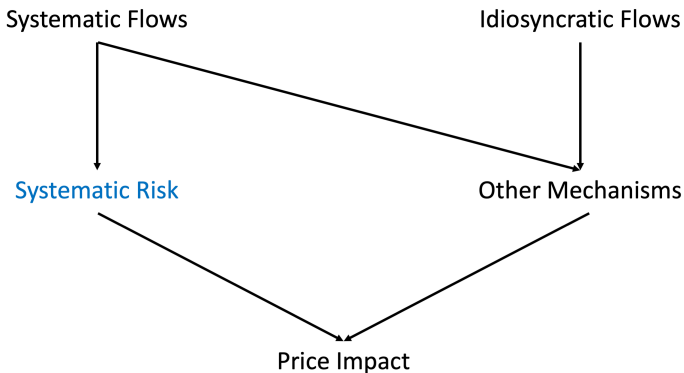


Suggestion: Model Impact of Idiosyncratic & Systematic Flows



Is there unique evidence of systematic risk mechanism?

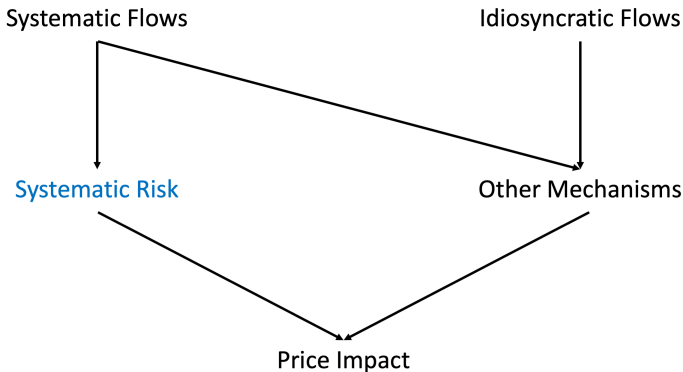
Suggestion: Model Impact of Idiosyncratic & Systematic Flows



Is there unique evidence of systematic risk mechanism?

How important is systematic risk mechanism quantitatively?

Suggestion: Model Impact of Idiosyncratic & Systematic Flows



Is there unique evidence of systematic risk mechanism?

How important is systematic risk mechanism quantitatively?

Systematic flow price impact $>$ idiosyncratic flow price impact?

Empirical Approach

Get stock flows from mutual-fund flows via approach of Lou (2012)

$$\text{Stock Flow}_{n,t} = \sum_{\text{Fund } i} \text{Shares Held}_{i,n,t} - 2 \text{Fund Flow}_{i,t}$$

Empirical Approach

Get stock flows from mutual-fund flows via approach of Lou (2012)

$$\text{Stock Flow}_{n,t} = \sum_{\text{Fund } i} \text{Shares Held}_{i,n,t} - 2 \text{Fund Flow}_{i,t}$$

Aggregate stock flows to new measure of factor flows: $q_{k,t}$

Empirical Approach

Get stock flows from mutual-fund flows via approach of Lou (2012)

$$\text{Stock Flow}_{n,t} = \sum_{\text{Fund } i} \text{Shares Held}_{i,n,t} - 2 \text{Fund Flow}_{i,t}$$

Aggregate stock flows to new measure of factor flows: $q_{k,t}$

Fama-McBeth style two-stage regression

- Time series regression: Get stock flow betas on factor flows

$$\text{Stock Flow}_{n,t} = \sum_{\text{Factor } k} b_{n,k} \cdot q_{k,t} + \underbrace{e_{n,t}}_{\text{Idiosyncratic Flow}}$$

Empirical Approach

Get stock flows from mutual-fund flows via approach of Lou (2012)

$$\text{Stock Flow}_{n,t} = \sum_{\text{Fund } i} \text{Shares Held}_{i,n,t} - 2 \text{Fund Flow}_{i,t}$$

Aggregate stock flows to new measure of factor flows: $q_{k,t}$

Fama-McBeth style two-stage regression

- Time series regression: Get stock flow betas on factor flows

$$\text{Stock Flow}_{n,t} = \sum_{\text{Factor } k} b_{n,k} \cdot q_{k,t} + \underbrace{e_{n,t}}_{\text{Idiosyncratic Flow}}$$

- Panel regression: Get stock factor flow price impacts

$$r_{n,t} = \sum_{\text{Factor } k} \underbrace{\lambda_k}_{\text{Empirically Big}} \cdot q_{k,t} \cdot \text{COV} \left(\xi_{n,t}, \underbrace{b'_k \xi_t}_{\text{Factor Fundamental Return}} \right) + \underbrace{\xi_{n,t}}_{\text{Fundamental Return}}$$

Identification

$$r_{n,t} = \sum_{\text{Factor } k} \lambda_k \cdot q_{k,t} \cdot \text{COV} \left(\xi_{n,t}, \underbrace{b'_k \xi_t}_{\text{Factor Fundamental Return}} \right) + \underbrace{\xi_{n,t}}_{\text{Fundamental Return}}$$

Issues addressed:

- Mutual funds trading on private information
 - Use predicted flows based on lagged holdings
- Return-chasing flows
 - Separate intraday from overnight returns

Identification

$$r_{n,t} = \sum_{\text{Factor } k} \lambda_k \cdot q_{k,t} \cdot \text{COV} \left(\xi_{n,t}, \underbrace{b'_k \xi_t}_{\text{Factor Fundamental Return}} \right) + \underbrace{\xi_{n,t}}_{\text{Fundamental Return}}$$

Issues addressed:

- Mutual funds trading on private information
 - Use predicted flows based on lagged holdings
- Return-chasing flows
 - Separate intraday from overnight returns

Concern: Factor flows correlate with fundamental returns

- Positive omitted variable bias
- E.g. Government cuts taxes on small firms:
 - Positive fundamental return for small stocks
 - Retail investors allocate more to small-cap mutual funds

Identification

Solutions used for *stock-level* flows that do not apply here

- Strip out common factors from flows, use idiosyncratic variation
 - Gabaix & Koijen (2023)
- Use exogenous variation in mutual fund ownership shares
 - Goldsmith-Pinkham, Sorkin & Swift (2020); Chaudhry (2023); Chaudhary, Fu & Li (2023)

Identification

Solutions used for *stock-level* flows that do not apply here

- Strip out common factors from flows, use idiosyncratic variation
 - Gabaix & Koijen (2023)
- Use exogenous variation in mutual fund ownership shares
 - Goldsmith-Pinkham, Sorkin & Swift (2020); Chaudhry (2023); Chaudhary, Fu & Li (2023)

Suggestion: Possible solution for *factor-level* flows

- Natural experiment from Ben-David, Li, Rossi & Song (2022)
 - Exogenous Morningstar ratings methodology change induced reallocation across style funds

Minor Comments

How to reconcile larger price impacts for SMB, HML than market?

- Previous work finds larger price impacts at higher levels of aggregation (e.g. Table 1 in Gabaix & Koijen (2023))

What happens if different factors drive factors versus cash flows?

- Interesting theoretical extension

Does iterative procedure finds fixed point in simulations?

- Validate procedure for recovering fundamental returns in Section 5.3

Standard errors in Table 2 are very small

- Suggestion: Fama-McBeth standard errors or cluster by month

Weak instruments problem in Section 5.3 ($F = 6 < 10$)

Positive omitted variable bias in “raw” (cross-)multiplier estimates

- In section 5.4: Regressions of returns on flows
- Due to common shocks to flows and returns (e.g. information)
- Stock-level multipliers difficult to measure non-parametrically (no-previous estimates)

Much of out-of-sample return comes in GFC

- How much from just absorbing market outflows in 2008-2009?

Conclusion

Factor-driven flows impact asset prices

- New theoretical framework & elegant theoretical mechanism
- New (better) measures of factor flows and factor price impact

Conclusion

Factor-driven flows impact asset prices

- New theoretical framework & elegant theoretical mechanism
- New (better) measures of factor flows and factor price impact

Main comments

- Generalize theory to allow price impact of idiosyncratic flows
- Use exogenous variation in factor flows