# Discussion of "Speculation and Liquidity in Stock and Corporate Bond Markets" by Pasquariello and Sandulescu

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EFA 2024

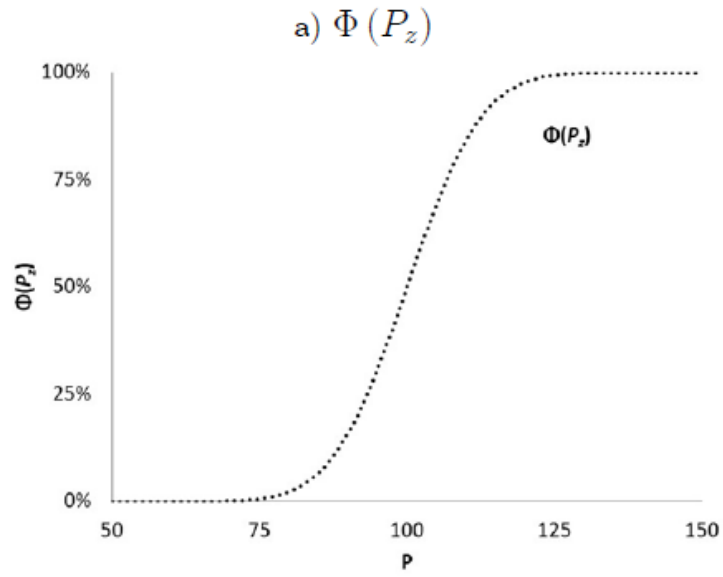
# Why we care

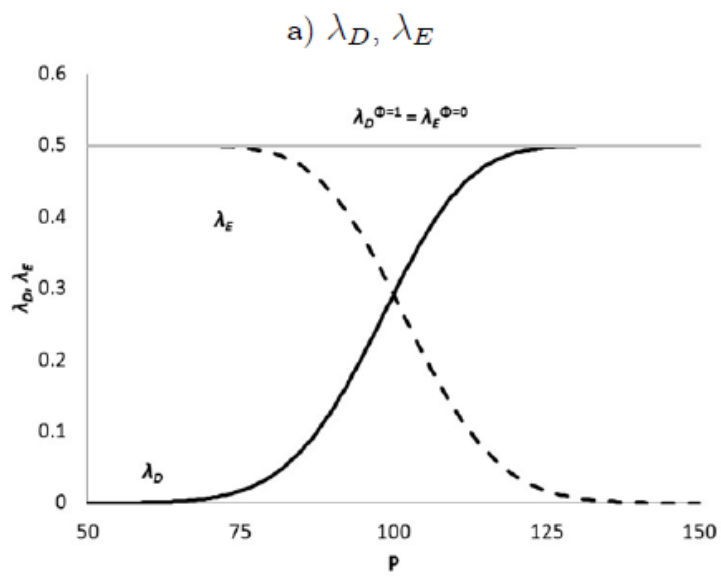
Study daily variations in bond and equity price impact and co-movement

- Important to disentangle among theories of illiquidity
- Important for large asset managers to manage their trades and the liquidity of their portfolio

# Theory

One-period Kyle model with segmented market making and nonlinear payoffs




- *x*-axis indicates debt principal *P*, fixing firm value
- Bond/stock become more or less informationally sensitive (because of nonlinear payoff)

# Empirical analysis

- Sample of 614 firms over 2010-2019
- Use Bharath and Shumway (2008) to estimate implied default probability (DEFPROB) at the *daily* level

$$\text{DEFPROB} = \Phi\left(-\frac{\log(1/L) + (\mu - \frac{1}{2}\sigma_F^2)T}{\sigma_F\sqrt{T}}\right)$$

- Estimate daily price impact
  - Daily average of firm *i*'s (5mn \$ price change $\times$ trade sign)
  - \$ daily price change per 1% of daily order imbalance

Main results:

1. Equity (bond) price impact is negatively (positively) related to DEFPROB
2. Bond-equity co-movement is non-monotonic in DEFPROB

# Big picture

- Paper is at an advanced stage, I enjoyed reading it
- The theory and results make sense to me
- I won't comment on the theory
  - It would be nice to see a more thorough comparison to the model of Back and Crotty (2015)
  - No cross impact here, even though it seems important for the co-movement results
- I will focus on the tests of the equity price impact implications
  - Informed speculation is an important cross-sectional and time-series determinant of firm-level illiquidity due to "default-driven sensitivity to adverse selection" (p.27)

# Adverse selection risk vs. inventory risk

The argument is that the relation between DEFPROB and price impact is hard to explain with inventory risk

- This is not easy because everything is endogenous (the authors are careful!)
- Let's look at the components of DEFPROB

$$\text{DEFPROB} = \Phi\left(-\frac{\log(1/L) + (\mu - \frac{1}{2}\sigma_F^2)T}{\sigma_F\sqrt{T}}\right)$$

  - $L$: leverage
  - $\sigma_F$: firm volatility

# Firm volatility

- Volatility is also positively associated with price impact / spread in inventory models (Grossman and Miller, 1988)
  - Thus, it cannot differentiate between the theories
- The authors find a "surprisingly" weak relation between price impact and volatility

| | $_PRICEIMPACT_ID | | | | $_PRICEIMPACT_D | | | |
|---|---|---|---|---|---|---|---|---|
| | Panel A: Stocks | | | | | | | |
| | I | II | III | IV | I | II | III | IV |
| FIRMVOL | -0.096* | 0.020 | -0.066* | 0.072 | 0.336 | 1.95*** | 0.971*** | 1.80*** |
| | [0.056] | [0.049] | [0.039] | [0.050] | [0.493] | [0.464] | [0.274] | [0.468] |

- Stock volatility is the (rolling) standard deviation of daily returns over the past year (following Bharath and Shumway, 2008)
  - It's very "slow-moving"
  - High-frequency variation in DEFPROB, high-frequ. inputs?

# Firm volatility: high-frequency measures

Stronger link between realized volatility and spread measures (e.g., Bogousslavsky and Collin-Dufresne, 2023)

| | $Price Impact (dollar-weighted) | | | | |
|---|---|---|---|---|---|
| constant | 0.035 | 0.024 | 0.021 | 0.020 | 0.017 |
| | (28.44) | (70.00) | (51.63) | (44.17) | (36.35) |
| rolling $\sigma$ | -0.617 | | | | |
| | (-7.69) | | | | |
| avg$\|r\|$ | | 0.173 | | | |
| | | (7.92) | | | |
| RVol30mn | | | 0.500 | | |
| | | | (16.06) | | |
| RVol15mn | | | | 0.638 | |
| | | | | (18.73) | |
| RVol5mn | | | | | 0.842 |
| | | | | | (22.68) |
| Adj. $R^2$ | 0.0026 | 0.0017 | 0.0133 | 0.0175 | 0.0254 |
| Obs. (stock-day) | 115,400 | 115,400 | 115,400 | 115,400 | 115,400 |

Sample: top size quintile U.S. stocks in 2017

- Also, interesting to compare DEFPROB to volatility and leverage since DEFPROB is a nonlinear function of both variables, as predicted by theory

# Leverage

Can inventory models explain the relation between leverage and price impact? It seems harder (I'd emphasize that)

- Daily variation in Leverage is coming from MKTCAP since DEBT is updated quarterly
  - With slow-moving volatility, daily variation in DEFPROB is likely coming from variation in market capitalization
- Does it survive controlling for volatility and volume?
- One concern is that the paper uses $ price impact
  - As the firm price goes down, it might be mechanical that $ price impact declines
  - (Also, for the 2nd measure, $ daily price change will incorporate the overnight period and might be biased by dividends, splits, etc.)
  - Report results with % price impact

# Additional suggestions

1. Examine effective spread and realized spread
   - Realized spread associated with compensation for liquidity provision
2. Test implications for trading volume
   - There could be an increase in noise trading for stocks close to default
   - Use realized informed trading measures?
     - Duarte, Hu, and Young (2020); Bogousslavsky, Fos, and Muravyev (2024)

# Conclusions

- Nice paper with a strong theory
- It might help to emphasize more clearly the main message
- Also, adjust the empirical tests to allow for better measures of volatility and more robustness relative to price impact measures and controls