

Motivation and Introduction

- One long-standing anomaly in finance is the closed-end fund (CEF) discount puzzle: CEFs usually trade at lower prices (discounts) than their NAVs (Pratt 1966).
- No consensus yet regarding what drives CEF discounts (Cherkes 2012).
- It remains under debate whether and to what extent CEF discounts arise from investor sentiment (irrationality).
 - Behavioral explanation based on individual investor sentiment (De Long et al. 1990 and Lee et al. 1991) vs. Rational explanations (see Cherkes 2012 for a review).
 - Important for sentiment-related financial research in general: the CEF discount is one main component in the widely-used Baker-Wurgler index of investor sentiment (Baker and Wurgler 2006, 2007).
- Empirical evidence has been mixed. Most empirical tests rely on (potentially endogenous) proxies for different factors \Rightarrow hard to draw **causal** interpretations.
- This paper:
 - Exploits the negative exogenous shock to individual investor sentiment induced by the COVID-19 outbreak, which has the advantage of being a truly exogenous and fully unanticipated shock.
 - Shows the **causal** effect of individual investor sentiment on CEF discounts using the difference-in-differences (DiD) approach.

COVID-19: a Negative Shock to Sentiment

Figure 1 plots the weekly individual investor sentiment measure from the American Association of Individual Investors (AAII). The vertical line indicates February 24, 2020, the date of the COVID-19 outbreak.

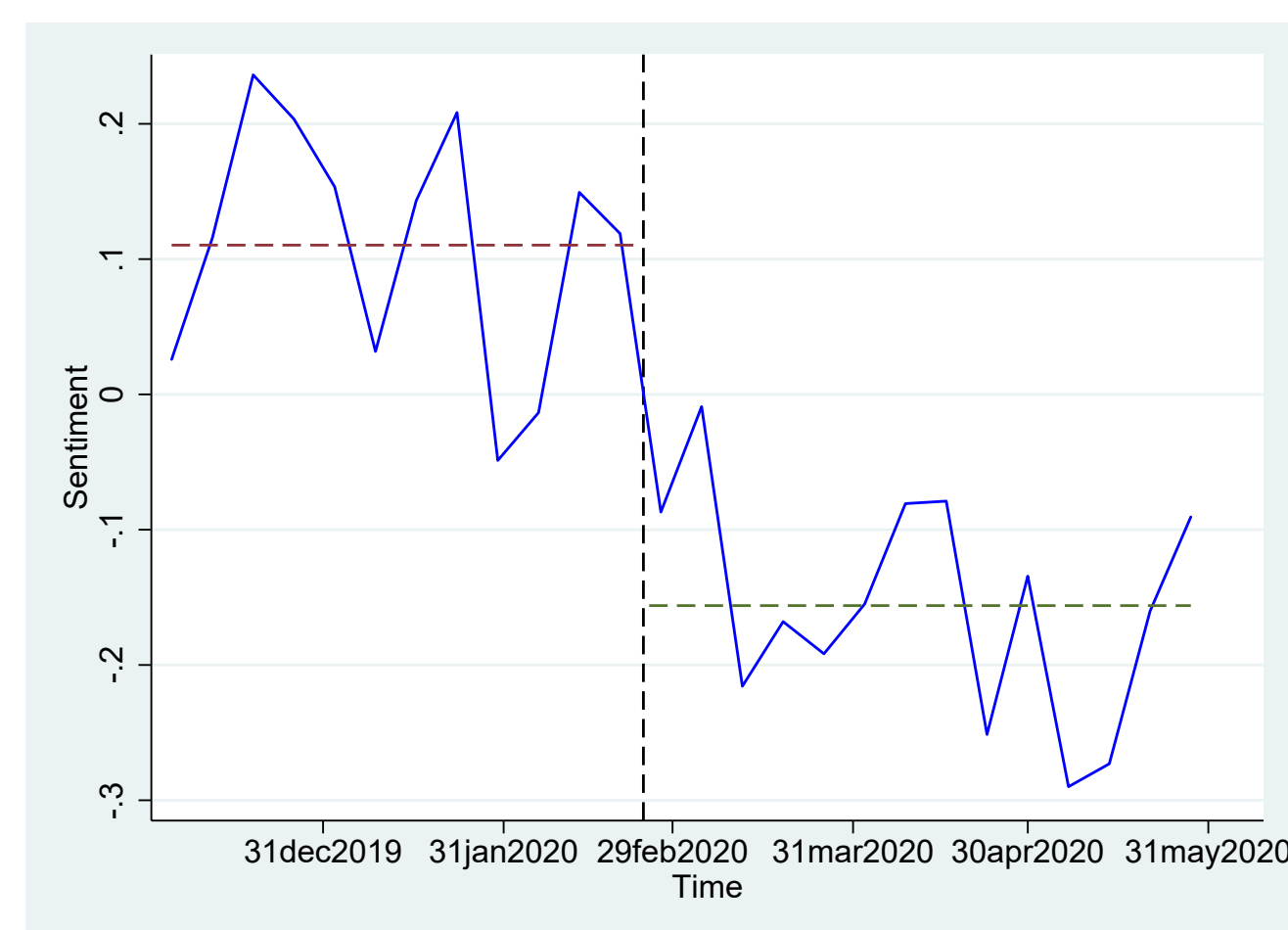


Fig. 1: Individual investor sentiment over time.

There was a large decline in individual investor sentiment after the COVID-19 outbreak.

Hypotheses

- Hypothesis 1: CEF discounts increase on average after the COVID-19 outbreak.
- Hypothesis 2: CEFs more subject to individual investor sentiment experience a larger increase in discounts after the COVID-19 outbreak.

Data, Sample, and Variables

- Sample construction starts with all CEFs (second digit of shrcd = 4) existing on CRSP at the end of 2019.
- Daily prices/NAV from Bloomberg; other data from CRSP, 13f, Capital IQ, and SEC filings.
- Exclude CEFs without valid prices/NAV at the end of 2019, delisted before 02/24/2020, or without at least 52 week data of valid prices/NAV during 2017:02-2020:01.
- Final sample: 485 CEFs. Sample period: 2019:12-2020:05.
- Main dependent variable: $Discount_{it} = 100 \times \frac{NAV_{it} - P_{it}}{NAV_{it}}$.
- Main measure of (ex-ante) exposure to individual investor sentiment: sentiment beta ($Beta_i^S$) calculated using weekly data over 2017:02-2020:01.
- Dummy $POST_t$ equals 1 if day t is on or after 02/24/2020 and zero otherwise.
- Control variables follow e.g., Pontiff (1996) and Bradley et al. (2010).

Results

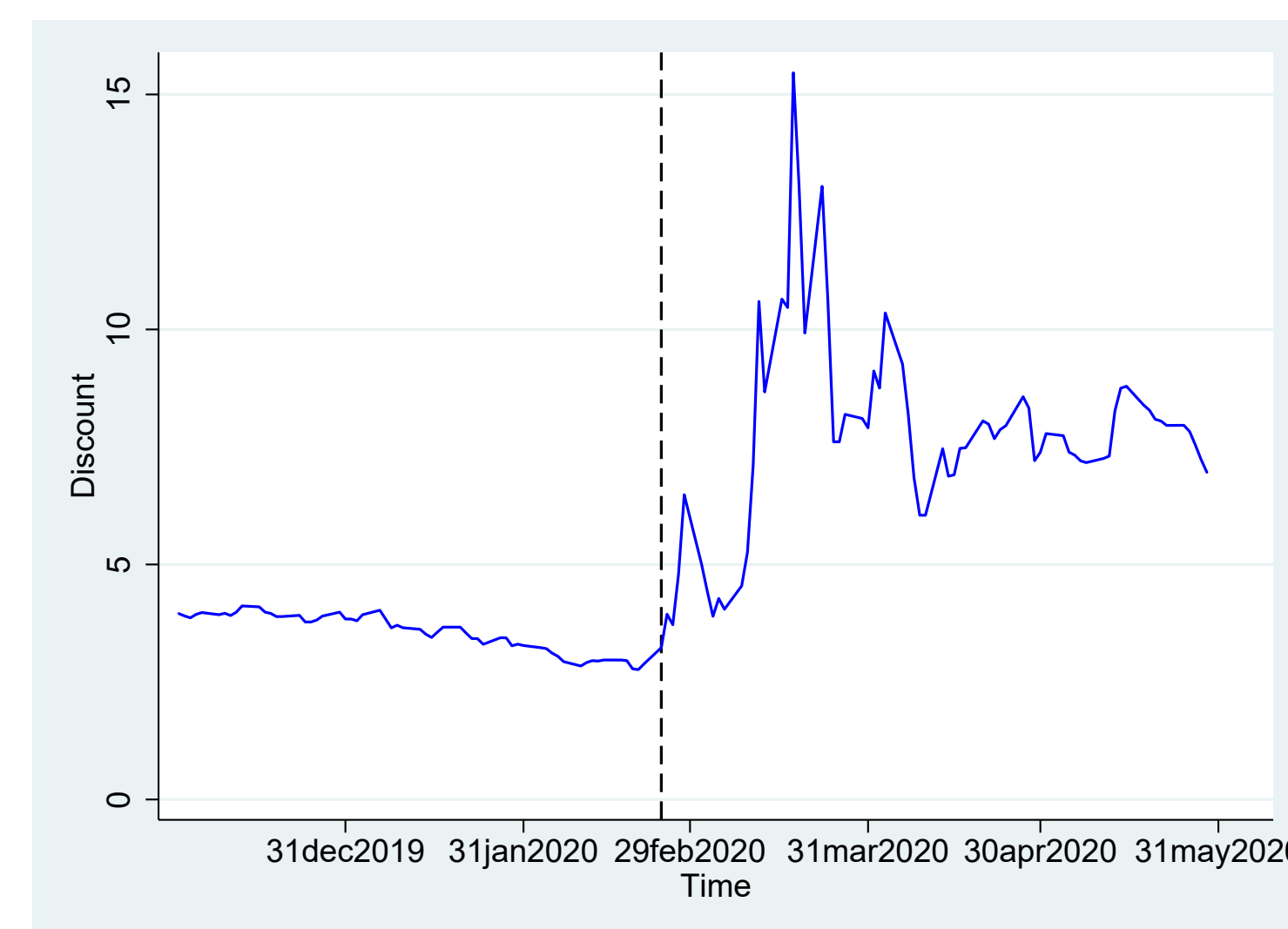


Fig. 2: The average CEF discount over time.

	Discount	Discount	Discount	Discount
<i>POST</i>	4.33*** (13.25)	3.63*** (7.58)	3.99*** (4.82)	4.03*** (4.73)
Controls	No	Yes	Yes	Yes
Fund Fixed Effects	Yes	Yes	Yes	Yes

Tab. 1: Effect of COVID-19 on CEF Discounts.

Figure 2 and Table 1 show that the average CEF discount increased substantially after the COVID-19 outbreak, which supports Hypothesis 1.

To test Hypothesis 2, the following DiD specification is used:

$$Discount_{it} = b_0 Beta_i^S \times POST_t + b_1 X_{it} + \gamma_i + \gamma_t + \epsilon_{it}. \quad (1)$$

	Discount	Discount	Discount	Discount
$Beta^S \times POST$	0.82*** (4.15)	0.77*** (3.98)	0.77*** (3.96)	0.72*** (3.50)
Controls	No	Yes	Yes	Yes
Fund Fixed Effects	Yes	Yes	Yes	Yes
Time Fixed Effects	Yes	Yes	Yes	Yes

Tab. 2: Main Difference-in-Differences (DiD) Results.

Results Cont.

- Table 2 shows that CEFs with higher $Beta_i^S$ experienced a larger increase in discounts after the COVID-19 outbreak, which supports Hypothesis 2.
- Parallel trends assumption satisfied:

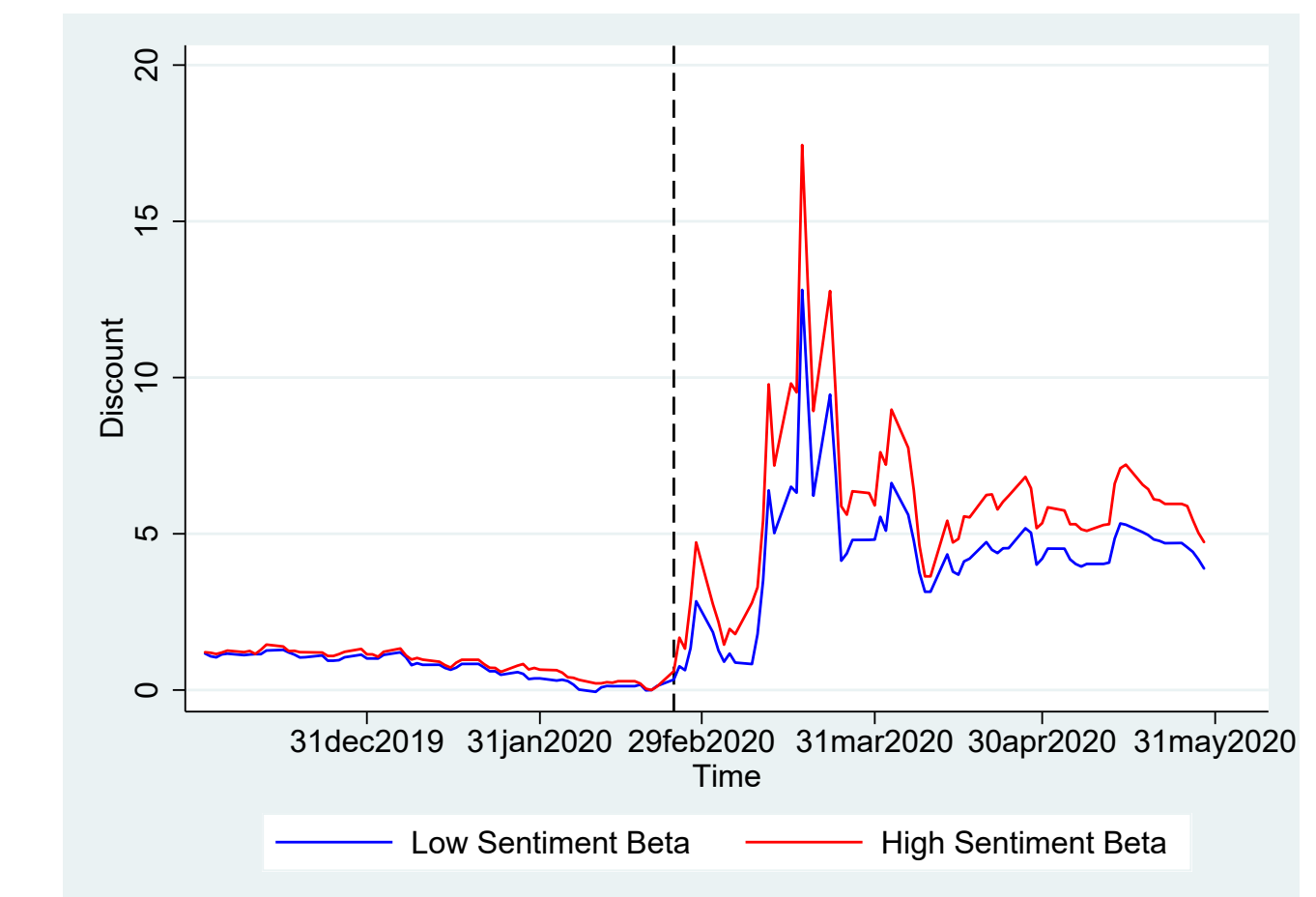


Fig. 3: Trends in discounts for high sentiment beta and low sentiment beta CEFs.

• Main DiD results are:

- Robust to using retail ownership as an alternative measure of exposure to individual investor sentiment.
- Robust to using March 11, 2020 (when the WHO announced COVID-19 as a pandemic) as an alternative date of the COVID-19 outbreak.
- Unlikely to be driven by alternative channels such as the liquidity, expense, payout, and leverage channels.

Conclusion

- Using the novel setting of COVID-19, this paper shows the causal effect of individual investor sentiment on CEF discounts.
- Results also support the use of the CEF discount as a measure of investor sentiment (Baker and Wurgler 2006, 2007).

References

- Bradley, M., Brav, A., Goldstein, I., Jiang, W., 2010. Activist arbitrage: A study of open-ending attempts of closed-end funds. *Journal of Financial Economics* 95, 1–19.
- Baker, M., Wurgler, J., 2006. Investor sentiment and the cross-section of stock returns. *Journal of Finance* 61, 1645–1680.
- Baker, M., Wurgler, J., 2007. Investor sentiment in the stock market. *Journal of Economic Perspectives* 21, 129–152.
- Cherkes, M., 2012. Closed-end funds: A survey. *Annual Review of Financial Economics* 4, 431–445.
- De Long, J. B., Shleifer, A., Summers, L. H., Waldmann, R. J., 1990. Noise trader risk in financial markets. *Journal of Political Economy* 98, 703–738.
- Lee, C., Shleifer, A., Thaler, R. H., 1991. Investor sentiment and the closed-end fund puzzle. *Journal of Finance* 46, 75–109.
- Pratt, E. J., 1966. Myths associated with closed-end investment company discounts. *Financial Analysts Journal* 22, 79–82.
- Pontiff, J., 1996. Costly arbitrage: Evidence from closed-end funds. *Quarterly Journal of Economics* 111, 1135–1151.