ESG Stock Resilience During the COVID-19 Stock Market Crash

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COVID-19 crash of 2020



The COVID-19 shock and ESG stocks

- COVID-19 pandemic is an ideal shock for an event study analysis:
 - Very steep market crash of 30% in one month.
 - Unexpected, took everyone by surprise.
 - Exogenous, due to health reasons, unrelated to the economy.
 - Markets reacted to pre-determined firm conditions. Firms didn't have time to change policies until end of Q1 2020.
- Financial Times (April 2) called COVID-19 the "acid test" of ESG.

Today's presentation/The research agenda

- Paper #1: <u>Albuquerque, Koskinen, Yang and Zhang (RCFS, 2020)</u>
 - ESG stocks performed relatively better during the crash.
- We don't really understand why ESG policies helped firms be resilient:
 - Stable cash flows due to costumer loyalty;
 - Investor clientele of ESG stocks.
- Paper #2: <u>Albuquerque, Koskinen, and Santioni (2021)</u>
 - What's the role of mutual funds, if any, in stabilizing the market for ESG stocks?

Paper #1: The resiliency of ES stocks



Albuquerque, Koskinen, Yang and Zhang (2020)

Diff-in-Diff Analysis of Stock Returns

- We estimate a difference-in-difference regression of firm-level daily abnormal returns with two shock dates:
 - February 24, when the stock market decline started following several Northern Italian municipalities in lockdown;
 - March 18, when President Trump signed the second Coronavirus Emergency Aid Package (later the CARES Act); the Fed announces aggressive monetary policy on March 15.

Data: ES Ratings Measure

- Main data source on firms' ES performance is Thomson Reuters' Refinitiv ESG database.
- Refinitiv ESG evaluates firms' environmental (E) performance in three areas: resource use, emissions, and innovation.
- Social (S) commitments are measured in four areas: workplace, human rights, community, and product responsibility.
- Our main measure, ES, is the average of the environment and social scores in 2018:
 - ES-treatment dummy is 1 for top quartile firms.

Data: Financial

- Daily stock returns from Capital IQ North America Daily for the first quarter of 2020 and CRSP from 2017 to 2019.
- The CAPM beta is estimated by using daily returns from 2017 and 2019, where the market index is the S&P 500.
- Accounting data for 2019 and Q1 2020 are obtained from Compustat.

Diff-in-Diff Regressions for Daily Abnormal Returns

	(1)	(2)	
	(1)	(2)	
Dependent variable	Abnormal Return	Abnormal Return	
ES_Treatment*Post_COVID	0.453***	0.453***	
	(3.06)	(3.03)	
ES_Treatment*Post_Fiscal	-0.568	-0.567	
	(-0.94)	(-0.94)	
ES_Treatment	-0.000		
	(-0.00)		
Post_COVID	-1.095***		
	(-3.66)		
Post_Fiscal	1.280		
	(0.99)		
Firm FE	No	Yes	
Day FE	No	Yes	
Number of firm-days	134,689	134,689	
Adj. R ²	0.007	0.082	

Firms with high ES ratings earned an extra daily return of 45 b.p. between February 24 and March 18 relative to low ES firms, representing a cumulative effect of 8 percentage points.

Mechanisms of Resiliency (I)

1. <u>Resiliency through customer loyalty</u>

- Albuquerque, Koskinen, and Zhang (2019) present a model where firms invest in ESG policies as a product differentiation strategy. Firms with high ES have more loyal customer base and face less price-elastic demands for their products.
- e.g., Patagonia uses only organic cotton in its outdoor clothing and supports conservation efforts; Apple is switching to 100% renewable energy; and TOMS donates a pair of shoes for every pair bought.
- In the model, ES firms obtain higher profit margins; these higher profit margins lower operating leverage, reduce firms' systematic risk, and increase value.
- If the COVID-19 shock affects consumer demand, customer loyalty for ESG firms is hypothesized to benefit ESG firms' stock performance and resiliency.
- Use <u>advertising expenditures</u> as a signal of firms' ability to influence customer loyalty.

Mechanisms of Resiliency (II)

- 2. <u>Resiliency through investor loyalty</u>
 - Heinkel, Kraus, and Zechner (2001) present a model of segmented capital markets where polluting firms are only held by a subset of investors due to investors with exclusion restrictions.
 - Investors in ESG funds are less sensitive to performance (Renneboog, Ter Horst, and Zhang, 2011).
 - Long-term investors have a preference for ES stocks (Starks, Venkat, and Zhu, 2017).
 - If the COVID-19 shock led investors to flee the market, but less so for ESG investors, then the price of ESG stocks should not decline as much, relative to the price of other stocks.
 - For each firm, use their institutional investors' preference for ES stocks as a proxy for investor loyalty.

Diff-in-Diff Analysis of Daily Abnormal Returns

	(1)	(2)	(3)	(4)
Dependent variable	Abnormal return	Abnormal return	Abnormal return	Abnormal return
ES_treatment*Post_COVID*A dvertising_high	0.532**	0.533**		
	(2.35)	(2.33)		
ES_treatment*Post_fiscal* Advertising high	-1.018**	-1.019**		
0_ 0	(-2.47)	(-2.45)		
ES_treatment*Post_COVID*I nvestorES high			0.272	0.271
_ 0			(1.08)	(1.06)
ES_treatment*Post_fiscal* InvestorES_high			0.125	0.127
InvestorE5_mgn			(0.28)	(0.28)
ES_treatment*Post_COVID	0.302**	0.302**	0.283*	0.284*
	(2.07)	(2.05)	(1.77)	(1.74)
ES_treatment*Post_fiscal	-0.292	-0.292	-0.417	-0.418
	(-0.51)	(-0.51)	(-1.08)	(-1.06)
All dummies and other possible	8			
interactions included	Yes	Yes	Yes	Yes
Firm FE	No	Yes	No	Yes
Day FE	No	Yes	No	Yes
Number of firm-days	134,689	134,689	131,654	131,654
Adj. R ²	.007	.082	.007	.084

Resiliency is particularly stronger for high-ES firms with high advertising expenditures. Investor-ES preference does not affect the return resiliency of stocks.¹²

Related Literature on COVID-19 and ESG in crashes

- Other pre-existing conditions that helped firms endure the COVID-19 meltdown:
 - Acharya and Steffen (2020) access to liquidity
 - Ramelli and Wagner (2020) cash and leverage
 - Pagano, Wagner, and Zechner (2020) social distancing
 - Ding, Levine, Lin and Xie (2020) cross-country evidence, balance sheets, exposure, sustainability
- Firm financing during COVID-19 pandemic
 - Li, Strahan, and Zhang (2020) credit lines
 - Halling, Yu, and Zechner (2020) bond financing
- ESG in crashes:
 - Lins, Servaes, and Tamayo (2017) Great Recession of 2008-2009 and ESG as trust mechanism
 - Cornett, Erhemjamts, and Tehranian (2016) U.S. banks' financial performance during the Great Recession

Takeaways from paper #1

- Stock market crash associated with the COVID-19 pandemic is an ideal shock for identification of ESG effects.
- ES stocks are more resilient during the shock, demonstrating a performance about 8pp better than other firms.
- Customer loyalty is associated with better stock return performance.
- Investor loyalty is associated with lower volatility of returns (not shown here).
- Next step: who traded in support of ESG firms?

Paper #2 Mutual fund loyalty to ES stocks

- We study the trading behavior of <u>U.S. actively-managed equity</u> <u>mutual funds</u> during the market crash.
- Divide funds between ESG and non-ESG funds:
 - Based on prospectus, Morningstar Globe ratings, or Low-Carbon designation
- Study aggregate net sales, but also net sales of ES vs. non-ES stocks by each fund.
- We use proprietary monthly data from Morningstar.
 - Quarterly data common.

Empirical Strategy

- Regressions use as dependent variables either:
 - Monthly fund-level aggregate net sales
 - Monthly fund-level ES and non-ES stock net sales
- Independent variables:
 - Fund inflows and outflows
 - ESG-fund designation dummy
 - Crash-dummy (Feb+Mar)
 - Fund size
 - Interactions with ESG-fund designation and crash dummies
 - Market return and volatility
- Quarter and fund fixed effects

Data

- Monthly holdings data from Morningstar's proprietary database
 - January to June 2020
 - Robustness January 2019 to June 2020
- Fund information from Morningstar Direct
 - US domicile: 6,989 unique US funds representing \$29.2 trillion total net assets with at least 80% of portfolio disclosed
 - Fund type: Sample 1,699 actively-managed equity mutual funds with \$3.1 trillion TNA
 - Globe classifications, prospectus information
- Stock-level ES ratings from Refinitiv

Cumulative Net Fund Flows



Figure 1: Fund flows and sustainability rating. This figure plots aggregate cumulative net fund flows from January 1 to June 30, 2020, using monthly fund flows, for two fund categories, those that receive by Morningstar 4 or 5 Globes (ESG funds) and those with less than 4 Globes (non-ESG funds).





Figure 2: Inflows and Outflows and sustainability rating. Panel A (Panel B) plots the weighted average of monthly Inflows (Outflows), weighted by lagged fund total net assets, from January 1 to June 30, 2020, for two categories of funds, those that receive by Morningstar 4 or 5 Globes (ESG funds) and those with less than 4 Globes (non-ESG funds).

ESG and non-ESG funds' net sales: main mechanism

- When the market loses value quickly, a fund manager sells her holdings in order to meet current withdrawals, but also to partially meet expected withdrawals as selling later may obtain even lower prices.
- Argue that this is less relevant if manager knows that investors are not as sensitive to fund performance.
 - Recent evidence suggests that ESG fund investors demonstrate less sensitivity to fund performance (Renneboog et al. 2008, and Bollen 2007).
- ESG-fund manager displays loyalty towards her holdings and avoids fire sales in her portfolio stocks.
- Expect the resiliency of ESG stocks to be due to the fund managers' response to fund flows.

Sensitivity of fund net sales to inflows and outflows

Panel B: t-tests on linear combinations of parameters					
	ESG (prospectus)		ESG (Globe ratings)		
	(1)	(2)	(3)	(4)	
Sensitivity of net sales by non-ESG funds to:					
Inflows/Normal	-0.0052	-0.0052	-0.0028	-0.0028	
Inflows/Crash	-0.9513***	-0.9609***	-0.9757***	-0.9941***	
Outflows/Normal	1.0176***	1.0224***	0.972***	0.9794***	
Outflows/Crash	1.1652***	1.1479***	1.257***	1.2342***	
Sensitivity of net sales by ESG funds to:					
Inflows/Normal	-0.7972***	-0.7771***	-0.8802***	-0.8808***	
Inflows/Crash	-1.4213***	-1.4281***	-1.2083***	-1.2095***	
Outflows/Normal	0.9828***	1.0006***	1.0048***	1.0081***	
Outflows/Crash	1.1638***	1.1387***	0.8738***	0.8586***	

Results: Aggregate net sales

- In response to inflows, ESG funds are more aggressive net-buyers than non-ESG funds, including during the crash.
- In response to outflows, net sales increase for non-ESG funds, but decrease for ESG funds, during the crash.

Net sales of ES versus non-ES stocks: main mechanism

- We further look into the trading patterns across ES and non-ES stocks—since ESG and non-ESG funds hold both stock types.
- When faced with inflows:
 - Increase purchases of both or favor the 'good buys' that are most undervalued.
- When facing fund outflows:
 - Fund managers may choose to sell ES stocks, whose price had fallen the least, in order to minimize their realized losses.
 - Alternatively, fund managers may choose to sell non-ES stocks in anticipation of even further price declines.
 - Only the latter is consistent with the resiliency of ES stocks.

Sensitivity of net sales of ES and non-ES stocks to inflows and outflows

Panel B: *t*-tests on linear combinations of parameters

	Sensitivity of Net Sales of			
	non-ES stocks	ES stocks	non-ES stocks	ES stocks
	ESG (prospectus)		ESG (Globe ratings)	
by non-ESG funds to:				
Inflows/Normal	-0.0032	0.002	-0.0016	0.003
Inflows/Crash	-0.9346***	-0.8346***	-0.954***	-0.8852***
Outflows/Normal	1.032***	0.8614***	1.007***	0.8204***
Outflows/Crash	1.1547***	0.8415***	1.2397***	0.895***
by ESG funds to:				
Inflows/Normal	-0.7313***	-0.7101***	-0.8918***	-0.6564***
Inflows/Crash	-1.6848***	-1.0216***	-1.3393***	-1.0022***
Outflows/Normal	1.4039***	0.6664***	0.9992***	0.887***
Outflows/Crash	1.5415***	0.7231***	0.9882***	0.7485***

Results: ES and non-ES stocks net sales

- In response to inflows, ESG and non-ESG funds both decrease their net sales for ES and non-ES stocks,
 - If anything ESG funds increased their willingness to buy non-ES stocks relative to ES stocks during the crash.
- In response to outflows, net sales for non-ES stocks increase for non-ESG funds, during the crash, compared to their net sales of ES stocks.
- ESG funds display loyalty to ES stocks (and to non-ES stocks).
- Non-ESG funds display loyalty to ES stocks:
 - The preferential treatment of non-ESG funds experiencing outflows to ES stocks is an unexpected source of resilience.

Low-Carbon Designation funds

- Increased investor focus on climate change and the role of corporations.
- Also, Ceccarelli et al. (2021) show that these funds experienced significantly large inflows.
- Only 17% of fund-month observations have both Low-carbon designation and high Globe ratings.
- Disparities between Low-carbon funds and others even bigger than between high Globe ratings funds and others:
 - For non-ESG funds, those experiencing outflows sold more aggressively, especially their non-ES stocks.

Alternative mechanism for resiliency

- Investors with longer trading horizons prefer ES stocks (Starks et al. 2020).
- Cella et al. (2013) show that during market turmoil, long-term investors churn their portfolios less than other investors.
- Hypothesis that resilience of ES stocks is due to greater presence of longer term investors (not necessarily due to ESG nature of the fund).
- We don't find any evidence that investor trading horizon affects our results.

Monthly vs quarterly data

- Glossner et al. (2021) find that institutional investors (including mutual funds) did not change their holdings of ES stocks. They use quarterly data.
- When we use quarterly holdings data, our results disappear, consistent with their evidence.
- Evidence points to the importance of using monthly data to capture the variations in fund flows and net sales inside the first quarter of 2020.

Takeaways from paper #2

- We examine the mutual fund trading behavior during the COVID-19 market crash.
- ESG funds helped to stabilize stocks:
 - When experiencing inflows, ESG funds bought stocks more aggressively, especially during the crash, and especially non-ES stocks.
 - When experiencing outflows, ESG funds reduced their sensitivity to outflows for both ES and non-ES stocks.
- Unexpected role for non-ESG funds:
 - More likely to sell their non-ES stocks when experiencing outflows.

Some open questions

- The return response during the crash was due to changes in discount rates or changes in expected cash flows?
 - The clientele of mutual funds seems to indicate discount rates.
- How has the value of flows into corporate debt responded across ES and non-ES stocks and across debt maturities for these types of stocks?
- How does the market coordinate in herding in non-ES stocks but not in ES stocks?
- What happened in Europe where the demand for ESG is older and larger than in the US?