Resiliency of environmental and social stocks: An analysis of the exogenous COVID-19 market crash

Review of Corporate Finance Studies (Forthcoming)

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Introduction

- ESG initiatives are positively associated with firm financial performance
- Causation and mechnisms?
  - Do ESG activities create shareholder wealth?
  - Do well-performing firms engage in ESG activities? Perhaps even wasting resources?
- COVID-19 as the "acid test" (FT Alphaville, April 2)
  - Pandemic opportunity to study causal link

COVID-19 Shock

- Unparalleled shock
  - Unexpected, took everyone by surprise
  - Exogenous, not due to economic conditions
  - Unprecedented market crash - 30% in one month, deepest and fastest crash
  - Markets reacted to pre-determined firm conditions, firms didn't have time to change policies
  - Allows for event-study
- What is the relative performance of stocks with high Environmental and Social (ES) ratings to other stocks?
- Why do ES policies help firms to be resilient?

S&P 500 during 2020 Q1

Stock Market Path

Findings

- We show that stocks with high ES ratings have significantly higher returns than other stocks, based on cross-sectional and diff-in-diff regressions
  - Firms with high ES ratings and high advertising expenditures have especially high returns
- Stocks with high ES ratings have significantly lower return volatilities than other stocks
  - Firms with high ES ratings and ES-oriented investors experience even lower volatilities
- Stocks with high ES ratings maintain higher profit margins, no difference in operating profits

Related Literature

- Stock prices during COVID-19
    - 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
- Corporate financing during COVID-19
    - Li, Strahan, and Zhang (2020) – credit lines
    - Halling, Yu, and Zechner (2020) – bond financing

Related Literature

- Lins, Servaes, and Tamayo (2017) - Great Recession of 2008-2009

- Causal claims from ESG to financial performance
  - El Ghoul, Guedhami, Kwok, and Mishra (2011)
  - Dimson, Karakas, and Li (2015)
  - Krüger (2015)
  - Flammer (2015)
  - Albuquerque, Koskinen, and Zhang (2019)

ES 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: top quartile

Financial Data

- 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 S&P 500.

- Accounting data for 2019 is obtained from Compustat

- We winsorize all control variables at the 1% level in each tail

Average Return Effects

- First quarter abnormal returns significantly correlated with ES ratings in the cross-section,
    - Controlling for the usual firm characteristics size, cash to assets, Tobin's Q, and leverage
- An increase in ES ratings equal to one standard deviation is associated with an increase in quarterly returns of 1.8%.
- Effects get stronger, when we exclude energy companies from our sample

Cross-sectional regressions of CAR

Dependent variable	(1) Abnormal Return	(2) Abnormal Return	(3) Abnormal Return
ES	16.568***	19.500***	8.542**
	(4.30)	(5.56)	(2.05)
Tobin's Q			3.857***
			(8.25)
Size			3.179***
			(4.85)
Cash			27.209***
			(4.86)
Leverage			-29.584***
			(-7.05)
ROE			0.730
			(0.49)
Advertising			-9.797
			(-0.24)
Historical Volatility			-4.427***
			(-3.62)
Dividend			-2.378***
			(-4.93)
Industry FE	No	Yes	Yes
Number of firms	2,171	2,171	1,958
Adj. R^2	0.006	0.229	0.352

Evolution of Coefficients During 2020 Q1
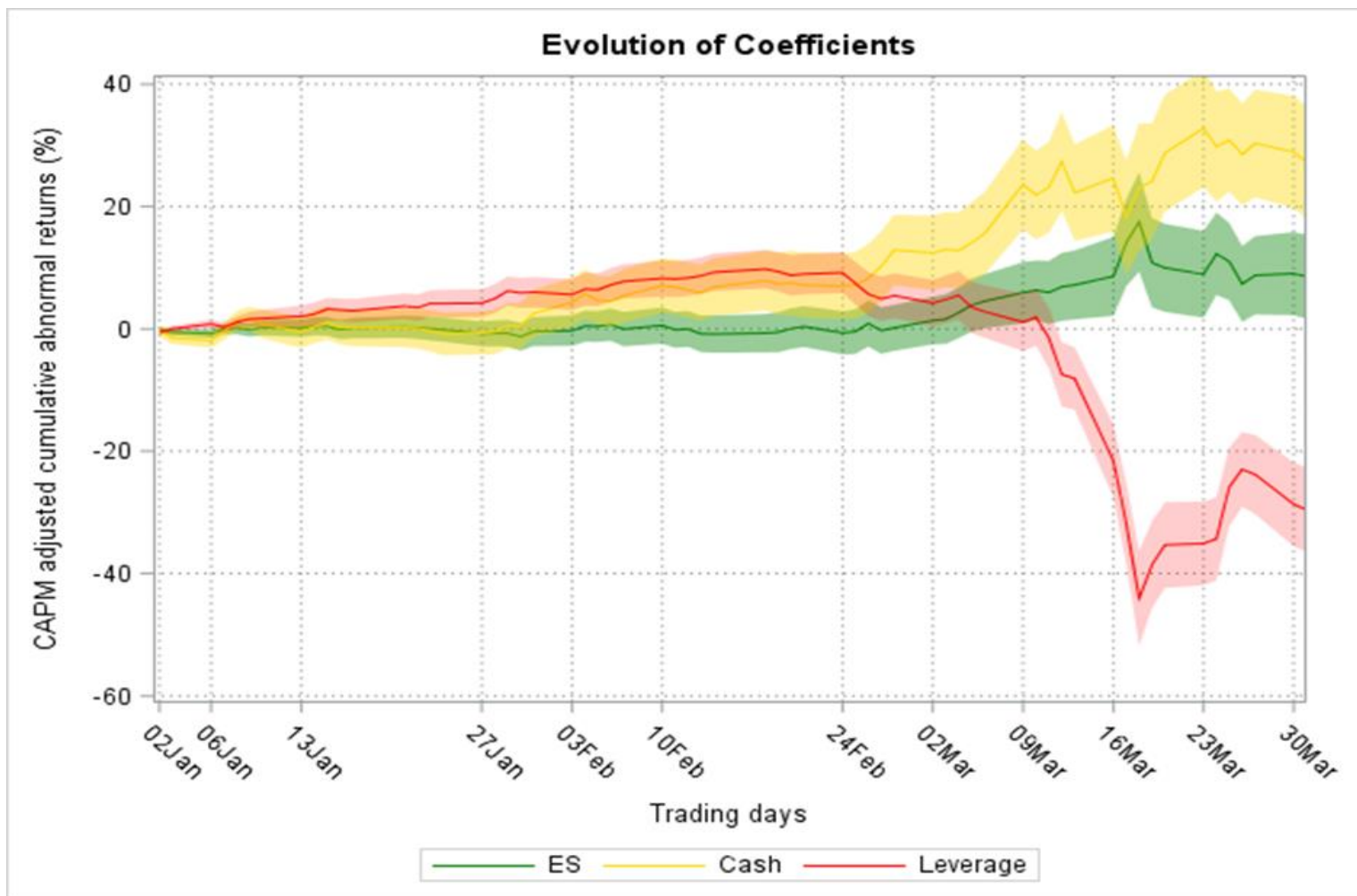
Diff-in-Diff Analysis of Stock Returns

- We estimate a difference-in-difference regression of firm-level daily abnormal returns with two treatment 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
  - S.E. are clustered by firm and day, with or without fixed effects.
- We find that firms with high ES ratings earned an extra daily return of 0.45% for the main treatment
  - Cumulative effect of 7.2%

Diff-in-Diff Regressions for Daily Abnormal Returns

Dependent variable	(1) Abnormal Return	(2) 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

ES and return volatility

- We compute the standard deviation of daily log returns, raw and CAPM adjusted, for 2020 Q1.
- High ES rated firms display lower volatility of stock returns
  - One standard deviation increase in ES score is associated with 5% decrease in volatility
- Also, range based volatility of stock returns (daily high price minus the daily low price divided by the average price) declines for high rated ES firms
  - 10% decrease in volatility from February 24 to March 17

Cross-sectional Volatility Regressions

Dependent variable	(1) Volatility	(2) Volatility	(3) Volatility	(4) Idio. Volatility	(5) Idio. Volatility	(6) Idio. Volatility
ES	-2.409***	-2.315***	-1.374***	-2.830***	-2.740***	-1.568***
	(-9.54)	(-9.66)	(-5.10)	(-11.06)	(-11.31)	(-5.79)
Tobin's Q			-0.158***			-0.165***
			(-6.22)			(-6.58)
Size			-0.105**			-0.157***
			(-2.14)			(-3.15)
Cash			-0.821**			-0.622*
			(-2.46)			(-1.95)
Leverage			2.648***			2.856***
			(9.49)			(10.08)
ROE			-0.017			-0.083
			(-0.22)			(-1.09)
Advertising			-1.814			1.434
			(-0.94)			(0.82)
Historical Volatility			0.747***			0.786***
			(11.36)			(12.24)
Dividend			0.058			0.094**
			(1.55)			(2.39)
Industry FE	No	Yes	Yes	No	Yes	Yes
Number of firms	2,171	2,171	1,958	2,171	2,171	1,958
Adj. R^2	0.030	0.140	0.282	0.038	0.143	0.301

Diff-in-Diff Analysis of Daily Price Range

Dependent variable	(1) Daily Price Range	(2) Daily Price Range
ES_Treatment*Post_COVID	-0.628***	-0.630***
	(-3.61)	(-3.45)
ES_Treatment*Post_Fiscal	-0.613*	-0.614*
	(-1.95)	(-1.88)
ES_Treatment	-0.958***	
	(-11.30)	
Post_COVID	5.507***	
	(5.86)	
Post_Fiscal	4.505***	
	(2.79)	
Firm FE	No	Yes
Day FE	No	Yes
Number of firm-days	134,689	134,689
Adj. R^2	0.324	0.622

Two Mechanisms of Resiliency

- Customer loyalty
  - Albuquerque, Koskinen, and Zhang (2019) present a model where firms with credible ES policies have more loyal customer base and face less price-elastic demands for their products
  - Operating profit margin increases for ES firms during COVID-19
  - Use advertising expenditures as a proxy for customer loyalty
  - Effect on returns is stronger for firms with high ES ratings coupled with high advertising expenditures

Two Mechanisms of Resiliency

- Investor loyalty
  - Investors in ESG funds are less sensitive to performance (Renneboog, Ter Horst, and Zhang, 2011)
  - Long-term investors have preference for ES stocks (Starks, Venkat, and Zhu, 2017)
  - For each firm, use their institutional investors' preference for ES stocks as a proxy for investor loyalty
  - Effect on volatility is stronger for high ES firms coupled with ES-oriented institutional investors

Investor-ES

- Investors' ES preference is estimated using institutional investors' equity holdings

- We measure institutional ownership using Thomson Reuters' 13F database

- We first measure an investor's ES preference as the value-weighted average Refinitiv ES score of its portfolio holdings for each quarter in 2018 and then average across the four quarters

- Investor-based ES score of a firm is the weighted average of its investors' ES preference based on holdings in the first quarter of 2019

Discussion on Stock Return Resiliency

- Our results on stock returns and operating profit margins show strong support for the customer loyalty mechanism for resiliency

- The two mechanisms discussed predict that high ES firms have lower market beta

  – Our results suggest that ES firms appear more resilient during the COVID-19 crisis than what investors expected before the crisis (as reflected by the pre-crisis firm beta).

  – Still, it is also possible that the better performance of CAPM-adjusted returns is due to a decline in betas.

  – Declining betas of ES stocks may be due to expectations that firm cash flows become less risky than low-ES stocks after the crisis.

Robustness

- Results are stronger when energy is excluded
- Results are not driven by any particular industry
- Results are similar for E and S scores, but not for G
  - Our results are not explained by ES firms' good corporate governance
- Results similar when we use MSCI ES scores from 2016

ES Coefficients by Industry from Triple-Diff Regressions
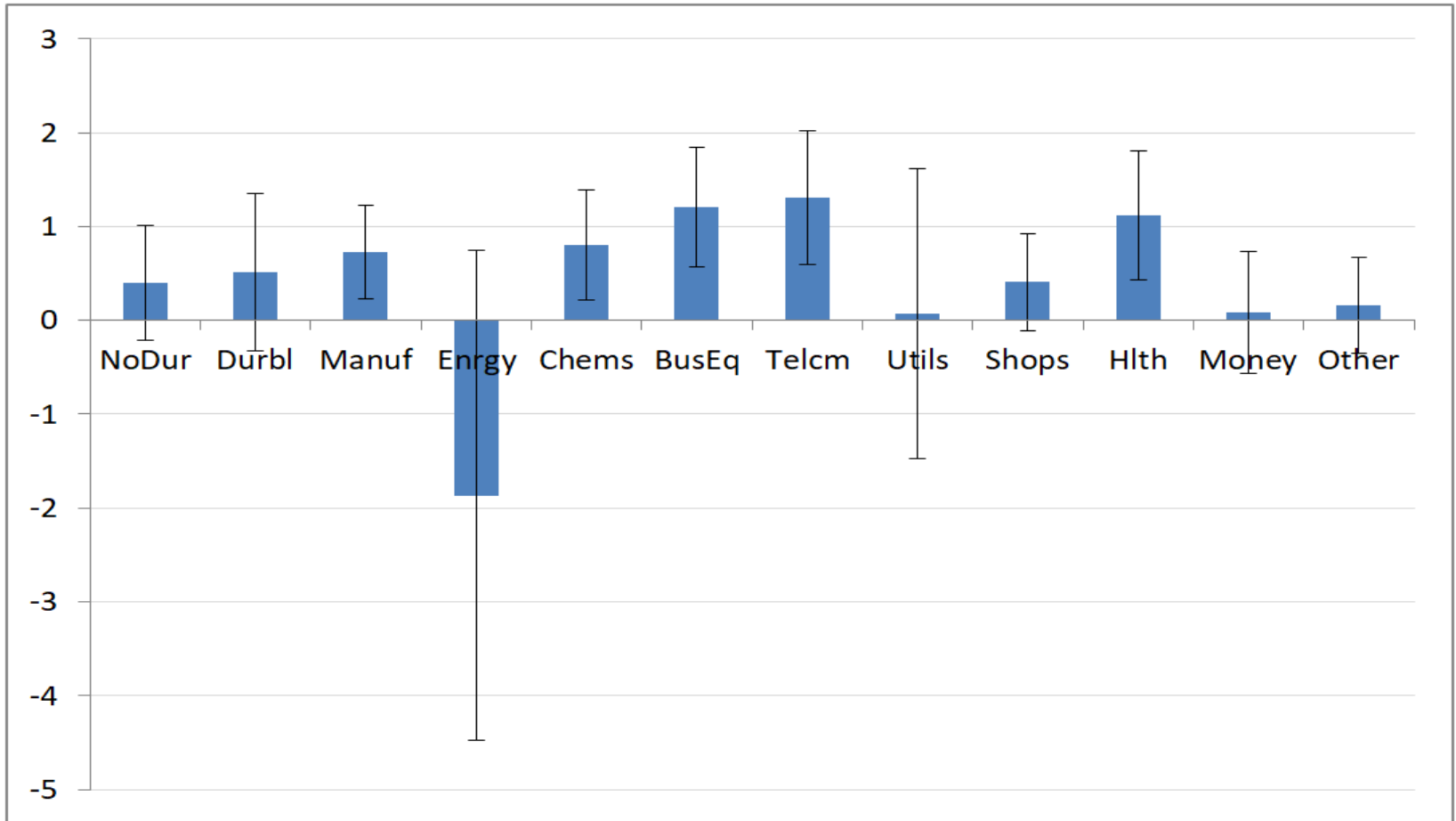
Conclusion

- COVID-19 an ideal shock for identification
- ES stocks perform better during 2020 Q1, especially when markets were collapsing
- Customer loyalty increases stock returns, investor loyalty decreases volatility
- ES important in increasing corporate resiliency
- ES firms may have a more long-term focus (Benabou and Tirole, 2010)