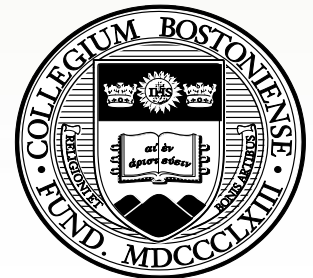# Resiliency of environmental and social stocks: An analysis of the exogenous COVID-19 market crash

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Introduction

- There is plenty of evidence that ESG policies are positively associated with firm financial performance.

- What is the direction of causality?

  - Do ESG activities create shareholder wealth?

  - Or, is it that well-performing firms engage in ESG activities? Perhaps even wasting resources?

- COVID-19 is the "acid test" (FT Alphaville, April 2)

  - We think that the pandemic represents an ideal opportunity to study this causal link.

S&P 500 Q1 2020 and YTD
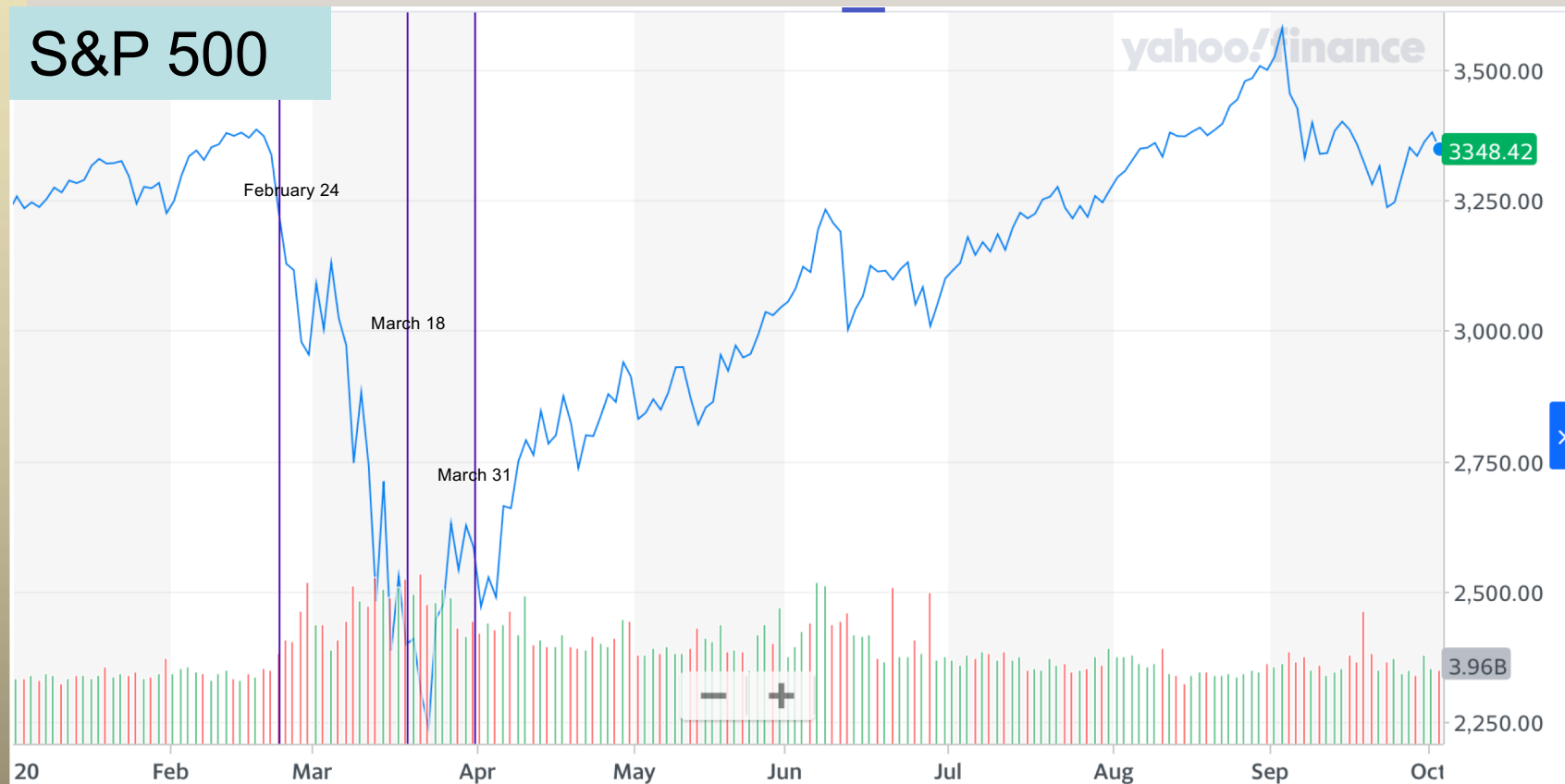
COVID-19 Shock

- 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.
- What is the performance of stocks with high Environmental and Social (ES) ratings relative to other stocks?
- Why do ES policies help firms to be resilient?

Findings

- We show that stocks with high ES ratings have significantly higher returns than other stocks.
  - In particular, firms with high ES ratings and high advertising expenditures do especially better.
- We show that stocks with high ES ratings have significantly lower return volatilities than other stocks.
  - In particular, firms with high ES ratings and ES-oriented investors experience even lower volatilities.
- We show that stocks with high ES ratings maintain higher profit margins, but no difference on return on assets.

Related Literature on COVID-19

- 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

Related Literature on ESG

- ESG in major crashes:
  - Lins, Servaes, and Tamayo (2017) - Great Recession of 2008-2009
  - Cornett, Erhemjamts, and Tehranian (2016) - U.S. banks' financial performance during the Great Recession

- Causal claims from ESG to financial performance
  - El Ghoul, Guedhami, Kwok, and Mishra (2011) – instrumental variables
  - Dimson, Karakas, and Li (2015) – event study
  - Krüger (2015) – event study
  - Flammer (2015) – regression discontinuity design
  - Albuquerque, Koskinen, and Zhang (2019) – instrumental variables

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 is obtained from Compustat.

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.
- We find that 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 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

Exposure of returns to various firm characteristics Q1 2020

Evolution of Coefficients
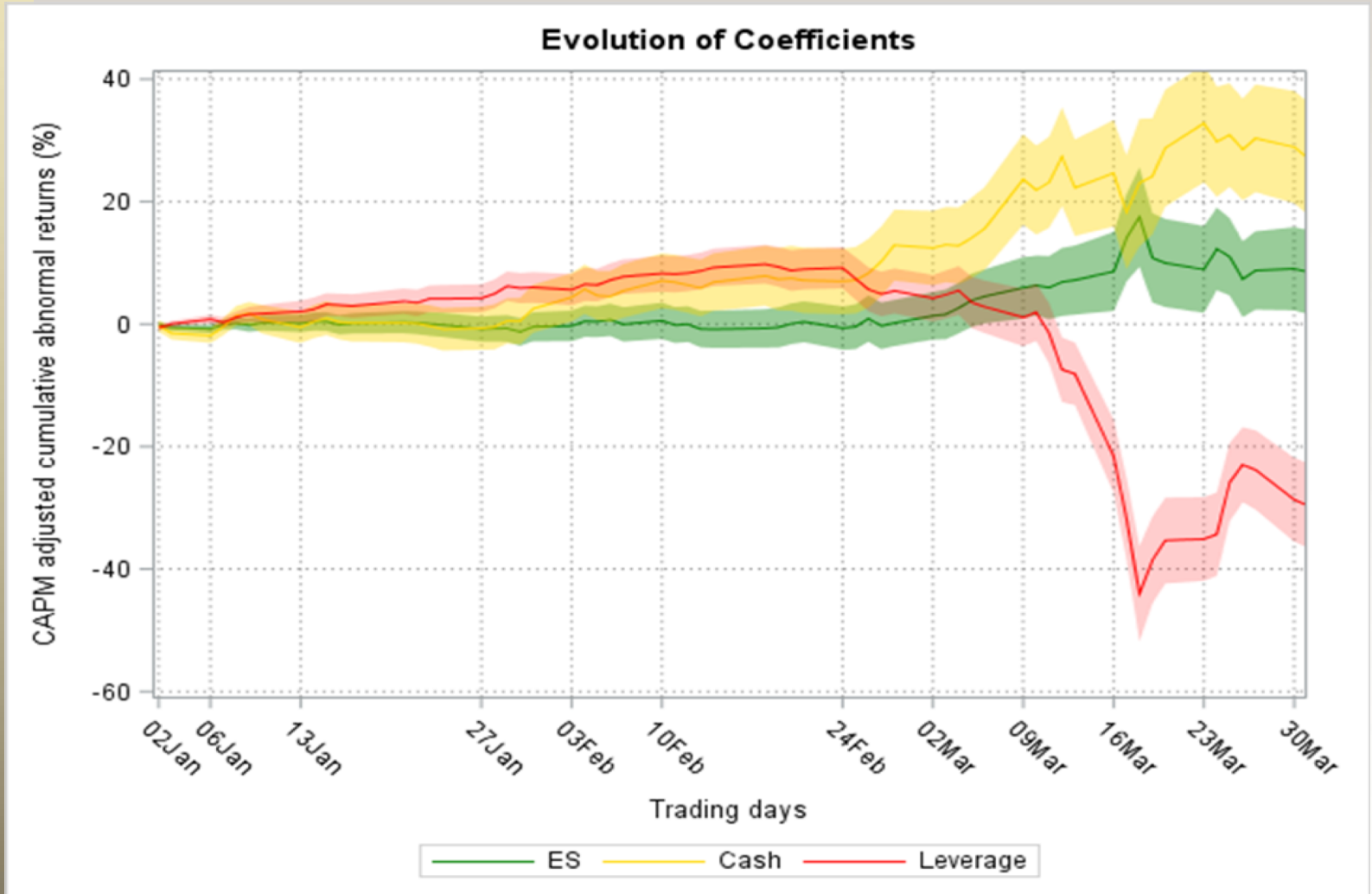
We also Run Cross-sectional Regressions:

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

- An increase in ES ratings equal to one standard deviation is associated with an increase in quarterly returns of 1.8%.
- Effect is smaller than in diff-in-diff because it contains the fiscal policy response.

ES and return volatility

- We compute the standard deviation of daily log raw returns and also for daily log CAPM adjusted returns for Q1 2020.

- We show that 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.

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. R²	0.324	0.622

Two Mechanisms of Resiliency

- 1 . Resiliency through 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.
  - Use <u>advertising expenditures</u> as a signal of the ability of firms to influence customer loyalty.

We show that
  - For firms with high ES ratings coupled with high advertising expenditures
    - Effect on returns is stronger;
    - Effect on volatility of returns is also stronger, but statistically insignificant.
  - Operating profit margin increases for ES firms during COVID-19 despite decrease in sales turnover.

Two Mechanisms of Resiliency

- **2 . Resiliency through 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 <u>institutional investors' preference for ES stocks</u> as a proxy for investor loyalty.

We show that

  - For firms with high ES ratings coupled with high ES-preference investors:
    - Effect on returns is stronger, but statistically insignificant;
    - Effect on volatility of returns is stronger.

Robustness

- Perhaps results are driven by poor performance of energy stocks who also rank badly in ES:
    - Results are actually stronger when energy sector is excluded.
- Results are similar for E and S scores, but not for G:
    - Our results are not explained by the 'G' rating in ESG.
- Results are similar when we use MSCI ES scores from 2016 (latest year available).
- Perhaps results are driven by stocks in industries considered 'essential':
    - Results are quite similar across all industries.

ES Coefficients by Industry from Triple-Diff Regressions
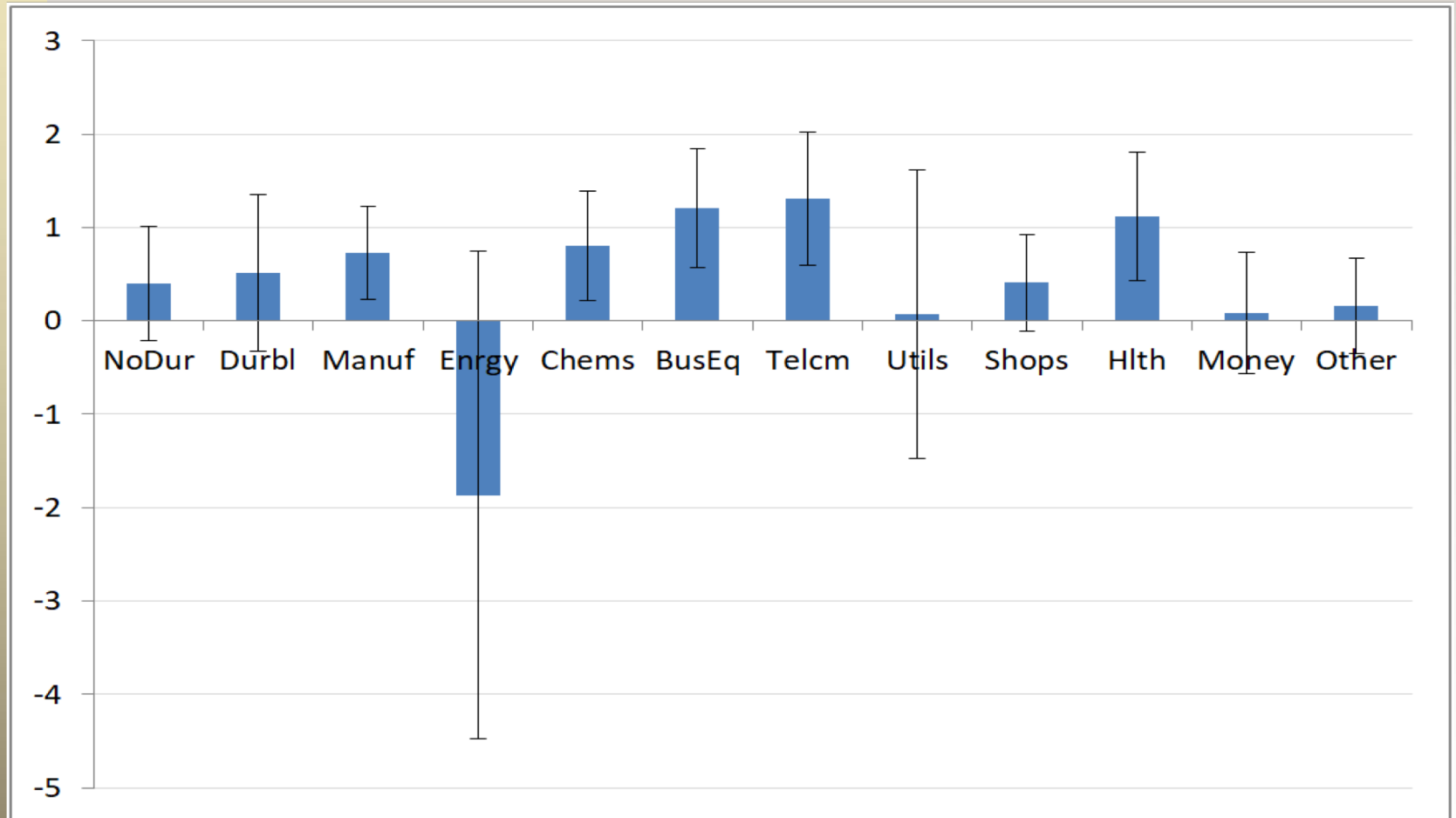
Conclusion

- 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.

- Customer loyalty is associated with better stock return performance; investor loyalty is associated with better volatility of returns performance.

- ES policies are important in increasing corporate resiliency:
  - Good risk management tool via both customers and investors.