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ESG scores and the response of the S&P 1500 to monetary and fiscal policy during the Covid-19 pandemic

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ABSTRACT

Examining the S&P 1500 stocks, the responses of the stocks to fiscal and monetary policy are found to differ due to E, S and G scores by the type of legislation. Non-Financial firms that manage environmental and governance risks better performed better over the pandemic. Part of this was due to their high environmental and governance scores allowing them to hedge the negative effects of the announcements of fiscal policies during the pandemic.

1. Introduction

The spread of COVID-19 has taken an enormous toll on people and economies around the globe. As shown by Fetzer et al. (2020), the advent of the virus exponentially increased economic angst and weakened economic outlook. Di Mauro (2020) pointed out that early on the pandemic had affected all major economies including the G7 countries, who jointly shared 60% of world supply and demand (GDP), 65% of world manufacturing, and 41% of world manufacturing exports; therefore, as these economies were severely affected the rest of the world followed suit. The changes in asset prices due to the economic disruption (Gormsen & Koijen, 2020) and expectations (Coibion et al., 2020; Hanspal et al., 2020) suggested that the effects of the pandemic were not to be regarded as transitional (Zechner et al., 2020). To counteract the pandemic and correct its effects on the economy, governments and central banks took strong measures. Albuquerque et al. (2020) shows that stocks with higher ESG ratings have significantly higher returns, lower return volatility, and higher operating profits during the first part of the Covid-19 crisis.

The rest of this paper is organized as follows: Section reviews the literature and develops hypothesis. Section 3 describes the data and underlying issues; Section 4 introduces the event studies and the regressions on underlying E, S, and G variables and other firm variables for the relevant policy actions; Section 5 concludes.

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2. Literature review and development of hypotheses

This work looks at the reaction of the stock market to the COVID-19 pandemic and finds that the financial market reacts negatively to the first death in a country. They also find that announcements of country-specific fiscal policy measures negatively affect stock returns, while monetary policy measures calm markets.

Loof et al. (2021) examine the risks of E, S & G stocks under Covid-19 and find that better ESG ratings are associated with lower downside risk, but also with lower upside return potential, thus maintaining the fundamental relationship between risk and reward. Ferriani and Natoli (2020) analyze whether investors take risks related to environmental, social, and governance factors into account during the pandemic and find that after the markets collapsed in late February 2020, investors preferred low-ESG-risk funds because these were seen as offering hedging against market downturns. Folger-Laronde et al. (2020) examine the relationship between the financial returns of ETFs and their ESG ratings during the COVID-19 pandemic and find higher levels of sustainability performance of ETFs do not prevent financial losses during a severe market downturn.

Huang et al. (2020) examine the response of Chinese firms to the Covid crisis and find that firms with higher CSR ratings experience less loss and take a shorter time to recover. Rubbanjani et al. (2021) apply a wavelet coherence approach to measure the co-movement between the daily global COVID-19 fear index (GFI) with ESG indices’ returns from February 5th, 2020 to January 18th, 2021. They find a strong and positive co-movement between GFI and ESG indices over the pandemic, confirming the safe-haven properties of ESG indices during the COVID-19 pandemic. Dölling and Sehoon (2021) on the other hand document fragile demand for socially responsible investments during the early part of the pandemic.

Demers et al. (2021) present evidence that, once industry affiliation, market-based measures of risk, and accounting-based measures of performance, financial position, and intangibles investments have been controlled for, ESG ratings didn’t positively affect returns during the COVID crisis during the first quarter of 2020. Huang et al. (2021) examine a set of European firms during the pandemic and find that high ESG ratings are associated with lower stock volatility though not higher returns. Chatjuthamard et al. (2021) find that an increase in the growth rate of the number of confirmed Covid cases increased stock volatility and jumps around the World while reducing returns. Engelhardt et al. (2021) find high ESG-rated European firms to be associated with higher excess returns and lower return volatility, with higher social scores driving the results during the Covid crisis.

Pham et al. (2021) examine responses to US state-level Covid data finding that the number of infected cases, hospitalized cases, and deaths in a state are negatively associated with next day stock returns of firms headquartered in the same state. The relation gets weaker in states with higher levels of medical resources. The negative effect is reduced for firms with strong corporate social responsibility practices.

Garel and Petit-Romec (2021) investigate investor returns over the Covid crisis, exploring investors’ views and expectations about environmental issues. They find that firms with responsible strategies on environmental issues experience higher stock returns, mainly driven by initiatives addressing climate change. The result is more pronounced for firms with larger ownership by long-term oriented investors and is not observed prior to the COVID-19 crisis.

Bae et al. (2021) on the other hand, find no evidence that CSR affected stock returns during the crash period, using a sample of 1750 U.S. firms and two major sources of CSR ratings. They find some weak supporting evidence that the relation between CSR and stock returns during the pandemic-related crisis is more positive when CSR is congruent with a firm’s institutional environment.

Akhtaruzzaman, Boubaker, Chiah, and Zhong (2021) find that oil supply industries benefit from positive shocks to oil price risk in general, whereas oil user industries and financial industries react negatively to positive oil price shocks. The COVID–19 outbreak appears to moderate the oil price risk exposure of both financial and non-financial firms.

Akhtaruzzaman, Boubaker, Lucey, and Sensoy (2021) examine whether gold was a safe-haven asset during different phases of the Covid crises using high-frequency data. Gold served as a safe-haven asset for stock markets during Phase I (December 31, 2019–March 16, 2020) of the pandemic. However, gold lost its safe-haven role during Phase II (March 17-April 24, 2020) when hedging costs significantly increased.

Akhtaruzzaman, Boubaker, and Sensoy (2021) examines how financial contagion happens through financial and nonfinancial firms between China and G7 countries during the COVID–19 period. Their results show that financial and non-financial firms experience
significant increases in their conditional correlations between their stock returns. However, the magnitudes of the increases in these correlations is higher for financial firms during the COVID-19 outbreak, probably due to the importance of financial firms in transmission of contagion.

Akhtaruzzaman, Boubaker, and Umar (2021) uses a TVP-VAR model to examine how the transmission of contagion is facilitated by media coverage. They find a pronounced connectedness between ESG leader indices and MCI that is evident around the pandemic’s peak in March and April, matching with the declaration of COVID–19 as a pandemic by the WHO and the massive global decline in stock indices. The US appears to be a net receiver across the network, reiterating that the US is the most affected country during the pandemic.

The results of the available studies on the effects of E, S and G indices on returns during the pandemic are mixed. Thus, the developed hypotheses are:

Hypothesis 1. The effect of the E index on returns will be insignificant.

Hypothesis 2. The effect of the S index on returns will be insignificant.

Hypothesis 3. The effect of the G index on returns will be insignificant.

3. Data

The stock data used comes from the Center for Research in Security Prices (CRSP), and consists of the stocks of the S&P 1500 firms. The S&P1500 were chosen as Drempetic et al. (2019) show that there is a significant bias in ESG scores related to firm size that they believe is due to larger firms having more ability to transfer information about ESG activities. So to guard against this possible bias, the sample is restricted to large firms with ESG scores. The ESG scores are from Morgan Stanley Capital International and measure the firm’s exposure to environmental (E), social (S), and governance (G) risks. For Non-Financial Firms in the sample, the correlation between size (measured by market capitalization) and E, S, and G respectively are 0.19, −0.03, and −0.03, so there only seems to be a chance of bias with the environmental risk measure. For Financial firms, the correlation with E, S, and G respectively are 0.19, 0.02, and −0.09. Again, there only seems to be a chance of bias with the environmental risk measure. Firms are divided into Financial and Non-Financial based on Bloomberg Industry Classifications. The fiscal policy acts were chosen in consultation with the International Monetary Fund analysis of Key Policy Responses to Covid at https://www.imf.org/en/Topics/imf-and-covid19/Policy-Responses-to-COVID-19#U.

Table 1 displays the average returns for Non-Financial and Financial Firms first for the period from 1/19/2020–6/16/2021 which corresponds to the trading before the first reported coronavirus case in the United States and a date after the end of the third wave of deaths due to the original variant of the virus.

For Non-Financial firms the raw returns and the buy-and-hold market-adjusted returns (BHAR) over the entire period are 25% and 19% respectively. For Financial firms, they are 13% and 31% respectively, due to Financial firms’ lower systematic risk.

Also included in Table 1 are the average abnormal returns and Z-tests from the event studies for the relevant fiscal policy and monetary policy actions identified over the era. Unlike the results of Heyden and Heyden (2021), not all fiscal policies are found to have negative market reactions, with the Paycheck Protection Program and Health Care Enhancement Act of April 23, 2020, having an average positive gain of 1.6% that is statistically significant. Also unlike Heyden and Heyden, the monetary policy announcement is negative and significant, with the Paycheck Protection Program and Health Care Enhancement Act of April 23, 2020, having an average abnormal return of 1.6911, which is statistically significant.

The table displays the average raw returns for the S&P 1500 and the average buy and hold average returns adjusted for the market (BHAR) over the period 1/19/2020 to 6/16/2021. The average abnormal returns are from event studies estimated using a (1,-1) day window with a pre-estimation period starting on February 1, 2019 and ending 11 days prior to the event date. The Z-Test is the Parnell Z-Test.

### Table 1

| Policy Actions and Date | Average Abnormal Return (1,-1) | Z-Test |
|------------------------|-------------------------------|--------|
| Coronavirus Preparedness and Response Supplemental Appropriations Act - March 5, 2020 | −0.001825 | −4.4396 |
| Federal Reserve Response – March 16, 2020 | −0.021525 | −19.3987 |
| Families First Coronavirus Response Act – March 18, 2020 | −0.071875 | −75.885 |
| Coronavirus Aid, Relief and Economy Security Act – March 27, 2020 | −0.004875 | −1.6911 |
| Paycheck Protection Program and Health Care Enhancement Act – April 23, 2020 | 0.01565 | 7.1325 |
| President Trump Executive Order – August 8, 2020 | 0.011175 | 4.4974 |
| Consolidated Appropriations Act of 2021–December 28, 2021 | −0.00725 | −5.2194 |
| American Rescue Plan Act of 2021- March 11, 2021 | −0.004825 | −2.8662 |

The holding period for the raw returns and BHAR is from January 19, 2020 to June 16, 2021.
Note), a Sunday, to implement a change in monetary policy. The next trading day was March 16, the event date chosen here.

For regressions on the abnormal returns for each firm, a set of control variables are used in addition to the E, S, and G variables. Table 2 details the descriptive statistics.

DY is the dividend yield. Leverage is the market debt to equity ratio. Liquidity is the Bloomberg Liquidity measure. ROE is Return on Equity. Size is the market capitalization of the firm. Tangible is the book value of tangible assets. Volatility is the standard deviation of stock returns over the previous year. All variables are from Bloomberg as of January 2020.

4. Empirical results

First looked at is the effect of E, S, and G variables on the raw returns and BHAR over the extended holding period of 1/19/2020-6/16/2021. Table 3 details the coefficient estimates and standard errors of estimating the following regression:

\[ R_{it} = \alpha_1 + \alpha_E E_{it} + \alpha_S S_{it} + \alpha_G G_{it} + \alpha_{DY} DY_{it} + \alpha_{Leverage} Leverage_{it} + \alpha_{Liquidity} Liquidity_{it} + \alpha_{ROE} ROE_{it} + \alpha_{Size} Size_{it} + \alpha_{Tangible} Tangible_{it} + \varepsilon_{it} \]

Where \( R_{it} \) is alternatively the raw returns and the BHAR. \( \varepsilon_{it} \) is an error term. Industry-fixed effects are also controlled for but are suppressed.

For Non-Financial firms, firms that score higher in managing governance risk (high G) and environmental risk (High E) have significantly higher raw returns and BHAR. Of course, with the environmental risk measure being significantly related to firm size, this result must be treated carefully. But the significance of the size variable disappearing with the controlling for systemic risk with the BHAR and the environmental risk measure remaining positive and significant is a good sign. The coefficient on leverage is positive and significant for raw returns but switches sign when systemic risk is controlled for. Liquidity of firms leads to positive returns under raw returns and BHAR. Firms with higher stock volatility in the past earn higher returns.

For Financial firms, firms that score higher in managing governance and social risks have significantly higher raw returns, but there are no ESG effects when systemic risk and industry effects are controlled for. For financial firms, a high dividend yield translates into lower raw returns and BHAR. Higher liquidity and ROE leads to higher raw returns and BHAR.

Overall, contrary to the results of Demers et al. (2021) there is evidence that firms that score higher in E, S, and G are less penalized throughout the pandemic, though maybe not during the early stages. Management of governance risks seems to play a key role in creating value over the pandemic, indicating that leadership is viewed as important throughout the pandemic in maintaining value for Non-Financial firms. Managing environmental risks also played a key role in value creation over the pandemic for Non-Financial firms. However, for Financial firms, it is not clear that ESG risk management played a role in value creation.

The first of the individual events examined is the passage of the Coronavirus Preparedness and Response Supplemental Appropriations Act on March 5, 2020 (CPRSA(2020)). The bill provided $8.3 billion in emergency funding for federal agencies to respond to the coronavirus outbreak. The majority ($6.2 billion) was for the Department of Health and Human Services (HHS) including funding for the research and development of vaccines, therapeutics, and diagnostics. Additional funding went to the Centers for Disease Control and Prevention (CDC), which included funds for state and local response efforts.

Table 4 exhibits the regressions on the abnormal returns from the event study on the event date for the Coronavirus Preparedness

### Table 2
Descriptive statistics.

|          | Non-Financial | Financial |
|----------|---------------|-----------|
|          | Mean          | Std.Dev.  | Mean          | Std.Dev.  |
| E        | 4.973602      | 2.173478  | 4.588724      | 2.616544  |
| S        | 4.652502      | 1.366970  | 3.728190      | 1.202406  |
| G        | 5.576153      | 1.241312  | 6.055193      | 1.241703  |
| DY       | 0.015659      | 0.035916  | 0.029761      | 0.025629  |
| Leverage | 0.649727      | 1.717207  | 0.910740      | 1.615681  |
| Liquidity| 2.494117      | 1.926339  | 1.713018      | 1.018073  |
| ROE      | 0.189892      | 0.735845  | 0.122045      | 0.184637  |
| Size     | 20567.00      | 67511.05  | 13770.12      | 42249.88  |
| Tangible | 8926.074      | 24339.15  | 18138.75      | 77364.80  |
| Volatility| 0.277746     | 0.112499  | 0.201919      | 0.063492  |

The table displays descriptive statistics for the variables used in the paper. E, S, and G are respectively the environmental, social, and governance scores of MSCI. DY is the dividend yield. Leverage is the market debt to equity ratio. Liquidity is the Bloomberg Liquidity measure. ROE is Return on Equity. Size is the market capitalization of the firm. Tangible is the book value of tangible assets. Volatility is the standard deviation of stock returns over the previous year.
Table 3

|                      | Non-Financial |                      | Financial |                      |
|----------------------|--------------|----------------------|-----------|----------------------|
|                      | Raw          | BHAR                 | Raw       | BHAR                 |
| Constant             | −0.216015 (0.159785) | −0.003626 (0.122219) | −0.040686 (0.131154) | −0.104794 (0.291916) |
| E                    | 0.011906** (0.006074) | 0.008392* (0.004864) | −0.002771 (0.006967) | −0.011303 (0.021583) |
| S                    | −0.000337 (0.007789) | 0.000896 (0.005957) | 0.026155** (0.011880) | 0.036483 (0.026441) |
| G                    | 0.029043*** (0.008359) | 0.024078*** (0.006394) | 0.025588* (0.013987) | 0.043409 (0.031131) |
| Leverage             | 0.859523 (0.548279) | −0.300993 (0.419377) | −4.770381*** (0.805227) | −7.052919*** (1.791793) |
| Liquidity            | 0.058378*** (0.014200) | −0.025466** (0.010862) | −0.024457*** (0.009033) | −0.013292 (0.020105) |
| ROE                  | 0.072242*** (0.006587) | 0.029378*** (0.005038) | 0.065805*** (0.017943) | 0.154983*** (0.039937) |
| Size                 | 0.017332 (0.012530) | 0.010313 (0.009584) | 0.165965** (0.074048) | 0.409536** (0.164812) |
| Tangible             | 3.95E-07** (1.88E-07) | 1.91E-07 (1.43E-07) | 4.25E-07 (8.55E-07) | 2.89E-06 (1.90E-06) |
| Volatility           | −2.95E-07 (5.56E-07) | −2.85E-08 (4.25E-07) | 9.10E-08 (4.28E-07) | −1.25E-06 (9.52E-07) |
| Adjusted R-squared   | 0.356744 (0.126297) | 0.370221*** (0.096604) | −0.219145 (0.337818) | −0.389942 (0.751900) |

The table exhibits the estimation results from estimating the equation: $R_i = α + β_1E + β_2S + β_3G + β_4DY + α_1Leverage + α_2Liquidity + α_3ROE + α_4Size + γ_1Tangible + γ_2Volatility + ε_i$. The dependent variables are the average raw returns for the S&P 1500 and the average buy and hold average returns adjusted for the market (BHAR) over the period 1/1/2020 to 6/16/2021. E, S, and G are respectively the environmental, social, and governance scores of MSCI. DY is the dividend yield. Leverage is the market debt to equity ratio. Liquidity is the Bloomberg Liquidity measure. ROE is Return on Equity. Size is the market capitalization of the firm. Tangible is the book value of tangible assets. Volatility is the standard deviation of stock returns over the previous year. Standard errors are in parentheses. *,**, and *** indicate significance at the 10%, 5% and 1% level respectively. Industry fixed effects are controlled for but suppressed.

Table 4

|                      | Non-Financial |                      | Financial |                      |
|----------------------|--------------|----------------------|-----------|----------------------|
|                      | Raw          | BHAR                 | Raw       | BHAR                 |
| Constant             | −0.209285* (0.016718) | −0.027744*** (0.010523) | −0.000120 (0.000781) | −0.000800 (0.000957) |
| E                    | 0.000215 (0.000635) | 0.000080 (0.000985) | −0.000534 (0.001125) | −0.000420 (0.001125) |
| S                    | 0.000108 (0.000808) | 0.000800 (0.000957) | 0.0001284 (0.001480) | 0.000120 (0.000729) |
| G                    | 0.001769** (0.000869) | −0.000534 (0.001125) | 0.000654 (0.000688) | −0.000177*** (0.001427) |
| Leverage             | −0.0001284 (0.001480) | −0.0001284 (0.001480) | 0.0002749*** (0.001312) | 0.000140 (0.000975) |
| ROE                  | 3.95E-07 (1.88E-07) | 1.91E-07 (1.43E-07) | 4.25E-07 (8.55E-07) | −1.30E-07 (6.91E-08) |
| Size                 | 0.056921 (0.057230) | 0.056921 (0.057230) | 0.084519 (0.064457) | 0.084519 (0.064457) |
| Tangible             | 0.000564 (0.000688) | −0.000534 (0.001125) | 0.000377** (0.001427) | 0.000000 (0.000000) |
| Volatility           | 3.95E-07 (1.88E-07) | 1.91E-07 (1.43E-07) | 4.25E-07 (8.55E-07) | −1.30E-07 (6.91E-08) |
| Adjusted R-squared   | 0.038332*** (0.013082) | 0.127236*** (0.026821) | 0.127236*** (0.026821) | 0.127236*** (0.026821) |

The table exhibits the estimation results from estimating the equation: $R_i = α + β_1E + β_2S + α_3G + δ_0DY + α_1Leverage + α_2Liquidity + α_3ROE + α_4Size + γ_1Tangible + γ_2Volatility + ε_i$. The dependent variable is the average abnormal returns for the set of firms described in the text for the event in the heading. Also controlled for are industry fixed effects. E, S, and G are respectively the environmental, social, and governance scores of MSCI. DY is the dividend yield. Leverage is the market debt to equity ratio. Liquidity is the Bloomberg Liquidity measure. ROE is Return on Equity. Size is the market capitalization of the firm. Tangible is the book value of tangible assets. Volatility is the standard deviation of stock returns over the previous year. Standard errors are in parentheses. *,**, and *** indicate significance at the 10%, 5% and 1% level respectively. Industry fixed effects are controlled for but suppressed.

and Response Supplemental Appropriations Act.

For Non-Financial forms, firms that scored high in governance risk management (High G) were seen as benefiting from the announcement. This may be due to Firms having more diverse and independent boards being able to better take advantage of access to external resources complementary to funded research from the act as per Pfeffer and Salancik (1978). For Financial firms, there is no such effect. Due to the more freelance nature of employment in Financial firms, they may not have been unable to leverage such returns.

The Board of Governors of the Federal Reserve, as discussed above, held an emergency meeting on March 15, 2020. At the meeting, the Federal Open Market Committee (FOMC) reduced the target range for the federal funds rate to near zero. The FOMC also discussed other types of interventions that could be done, including emergency lending and purchases of different kinds of assets. These interventions were subsequently undertaken by the Board of Governors and the Treasury Secretary (Board of Governors of the Federal Reserve System (2020)). Table 5 shows the regressions on the abnormal returns from the event study.

For Non-Financial, firms that manage governance risks well (high G) are seen as benefiting from the Federal Reserve’s actions more, because independent diverse boards are seen as being able to manage the risks of lower interest rates and looser liquidity better (Papangkorn et al. (2019)). On the other hand for Non-Financial Firms, firms that better manage environmental risks are found to earn
emissions, benefitting firms with more carbon exposure who are assumedly also those firms with better environmental risk management (MSCI (2020)). Extending unemployment benefits, expanding food assistance for vulnerable children and families, and protecting measurement of the absolute number of index constituents in the S score involved in social violations. Social violations are defined as sequences of the pandemic.

higher returns. Given that there is nothing in the bill or the literature that addresses this, this is most likely due to the size-E relationship.

The Families First Coronavirus Response Act of March 18, 2020, came hard on the heels of the Federal Reserve’s policy actions. The act provided funding for free coronavirus testing, 14-day paid leave for American workers affected by the pandemic, and increased funding for food stamps (FFCR(2020)). It also provided extended unemployment benefits, expanded food assistance for vulnerable children and families, protected front-line health workers, and provided additional funding to states for the ongoing economic consequences of the pandemic.

Table 6 exhibits the coefficient estimates and standard errors of the regressions on the abnormal returns.

The Environmental risk management scores of both Non-Financial Firms and Financial firms have a positive and significant relationship.

Table 5
Regressions on abnormal returns for the federal reserve response – March 16, 2020.

|               | Non-Financial | Financial |
|---------------|---------------|-----------|
| Constant      | −0.183900***  (0.047179) | −0.246598*** (0.044523) |
| E             | 0.002233 (0.001796) | 0.008500*** (0.003303) |
| S             | 0.003056 (0.002280) | 0.002720 (0.004051) |
| G             | 0.007857*** (0.002456) | −0.004469 (0.004758) |
| DY            | 0.032384 (0.161482) | 0.444965 (0.272718) |
| Leverage      | 0.008032* (0.004204) | 0.000136 (0.003084) |
| Liquidity     | 0.001386 (0.001943) | −0.020690*** (0.006038) |
| ROE           | 0.000500 (0.003704) | −0.030381 (0.025282) |
| Size          | 1.47E-07*** (5.80E-08) | 1.73E-07 (2.92E-07) |
| Tangible      | −3.66E-07** (1.80E-07) | −1.90E-07 (1.46E-07) |
| Volatility    | 0.094928** (0.036931) | 0.531209*** (0.113480) |
| Adjusted R-squared | 0.181765 | 0.411573 |

The table exhibits the estimation results from estimating the equation: \( R_{it} = \alpha_i + \alpha_E E_{it} + \alpha_S S_{it} + \alpha_G G_{it} + \alpha_DY_{it} + \alpha_{\text{Leverage}} \text{Leverage}_{it} + \alpha_{\text{Liquidity}} \text{Liquidity}_{it} + \alpha_{\text{ROE}} \text{ROE}_{it} + \alpha_{\text{Size}} \text{Size}_{it} + \alpha_{\text{Tangible}} \text{Tangible}_{it} + \alpha_{\text{Volatility}} \text{Volatility}_{it} + \epsilon_{it} \). The dependent variable is the average abnormal returns for the set of firms described in the text for the event in the heading. Also controlled for are industry fixed effects. E, S, and G are respectively the environmental, social, and governance scores of MSCI. DY is the dividend yield. Leverage is the market debt to equity ratio. Liquidity is the Bloomberg Liquidity measure. ROE is Return on Equity. Size is the market capitalization of the firm. Tangible is the book value of tangible assets. Volatility is the standard deviation of stock returns over the previous year. Standard errors are in parentheses. *,**,and*** indicate significance at the 10%, 5% and 1% level respectively. Industry fixed effects are controlled for but suppressed.

Table 6
Regressions on abnormal returns for the families first coronavirus response Act – March 18, 2020.

|               | Non-Financial | Financial |
|---------------|---------------|-----------|
| Constant      | −0.093721 (0.057646) | −0.121758** (0.057617) |
| E             | 0.007971*** (0.002189) | 0.016698*** (0.004274) |
| S             | 0.002989 (0.002787) | 0.016366*** (0.005243) |
| G             | 0.003112 (0.002997) | −0.000407 (0.006157) |
| DY            | 0.528652 (0.197337) | −1.338986*** (0.352922) |
| Leverage      | −0.018102*** (0.005102) | −0.025852*** (0.003990) |
| Liquidity     | 0.000407 (0.002374) | 0.002062 (0.007814) |
| ROE           | 0.004039 (0.004524) | −0.041041 (0.032717) |
| Size          | 1.05E-07 (6.77E-08) | −2.95E-07 (3.78E-07) |
| Tangible      | −8.47E-08 (2.01E-07) | −2.37E-08 (1.89E-07) |
| Volatility    | −0.078279* (0.045110) | −0.528842*** (0.146854) |
| Adjusted R-squared | 0.149252 | 0.341711 |

The table exhibits the estimation results from estimating the equation: \( R_{it} = \alpha_i + \alpha_E E_{it} + \alpha_S S_{it} + \alpha_G G_{it} + \alpha_DY_{it} + \alpha_{\text{Leverage}} \text{Leverage}_{it} + \alpha_{\text{Liquidity}} \text{Liquidity}_{it} + \alpha_{\text{ROE}} \text{ROE}_{it} + \alpha_{\text{Size}} \text{Size}_{it} + \alpha_{\text{Tangible}} \text{Tangible}_{it} + \alpha_{\text{Volatility}} \text{Volatility}_{it} + \epsilon_{it} \). The dependent variable is the average abnormal returns for the set of firms described in the text for the event in the heading. Also controlled for are industry fixed effects. E, S, and G are respectively the environmental, social, and governance scores of MSCI. DY is the dividend yield. Leverage is the market debt to equity ratio. Liquidity is the Bloomberg Liquidity measure. ROE is Return on Equity. Size is the market capitalization of the firm. Tangible is the book value of tangible assets. Volatility is the standard deviation of stock returns over the previous year. Standard errors are in parentheses. *,**,and*** indicate significance at the 10%, 5% and 1% level respectively. Industry fixed effects are controlled for but suppressed.
front-line health workers probably lowered risks for Financial firms, particularly insurers.

The Coronavirus Aid, Relief and Economy Security Act of March 27, 2020, contained several health-related provisions focused on the outbreak in the United States, including paid sick leave, insurance coverage of coronavirus testing, nutrition assistance, and other programs and efforts. It also included support for the global response. It was much larger than the previous bills. It included provisions to address issues that related to drug, device, equipment, and supply shortages/stockpiles; an amendment to the Families First Coronavirus Response Act to clarify that tests for the detection of SARS-CoV-2 or the diagnosis of the virus that causes COVID-19 are to be covered without cost-sharing by private insurance and Medicare even if that test has not yet received FDA emergency use authorization; provisions to expand coverage of and offer grants to support broader use of telehealth services including in private insurance; provisions to address potential workforce issues, increasing flexibility for certain federal employee deployments, increasing training opportunities, and adding reporting requirements on workforce issues; increases certain Medicare payments for the treatment of patients with COVID-19, permits 90-day supply of prescription drugs during the COVID-19 emergency, and requires coverage of any COVID-19 vaccine without cost-sharing. More than $25 billion for domestic food assistance programs, including the school breakfast and lunch programs, the supplemental nutrition assistance program (SNAP), and the emergency food assistance program; and Billions in disaster relief and research (Coronavirus Aid, Relief and Economy Security Act (2020)).

Table 7 shows the regression results on the abnormal returns.

For Non-Financial Firms, none of the E, S, and G variables are significant. The provisions of the bill did not contain any undue risks that affected such firms. For Financial firms, firms that better managed environmental risks exhibit a significant positive coefficient, while firms that are better-governed exhibit a negative significant coefficient. There does not seem to be an economic rationale for the Environmental score result and it seems likely to be a size-interaction effect. The governance result may be due to insurers of better-governed firms having to take on more risk due to the provisions of the act regarding Covid-19 coverage. As shown by Ho et al. (2012), better-governed insurers have lower risk.

The passage of the Paycheck Protection Program and Health Care Enhancement Act on April 23, 2020, was the only legislation that resulted in a positive average abnormal return for the S&P1500 firms. The act appropriated an additional $321 billion in funding, with $60 billion set aside for small, midsize, and community lenders (including minority lenders). Among the areas addressed were $100 billion for the Public Health and Social Services Emergency Fund at the Department of Health and Human Services (HHS), including $75 billion for additional funding to reimburse hospitals and other health care entities for health care related-expenses or lost revenues attributable to coronavirus (referred to as the CARES Act Provider Relief Fund, which now totals $175 billion overall) and $25 billion for necessary expenses related to COVID-19 testing (Paycheck Protection Program and Health Care Enhancement Act (2020)). Table 8 displays the results of the regression.

For both Financial and Non-Financial Firms, firms better able to manage social risks are seen as being negatively affected by the legislation. This may be due to that larger, better-managed firms lost some competitive ability for female employees in the marketplace due to the funding of the Paycheck Protection Program thus enlarging the Pay Gap as part of the Social Measure (MSCI (2020)). For Non-Financial Firms, firms that better managed governance risks earn loader returns due to the passage of the legislation. A possible explanation is that better-governed firms are also more liquid firms and as the coefficient on liquidity was also negative and significant, the provisions of the act giving small businesses loans, but not the S&P1500, meant that more liquid firms were going to have to draw on their resources.

On August 8, 2020, President Trump issued an Executive Order and associated memorandum that addressed the pandemic. Under the CARES Act, passed into law earlier in the year, unemployed workers received an additional $600 in weekly benefits from the

| Table 7 | Regressions on abnormal returns for the coronavirus aid, relief and economy security Act – March 27, 2020. |
|---------|----------------------------------------------------------------------------------------------------------|
|         | Non-Financial                                                                                            | Financial                                                                 |
| Constant| 0.028543 (0.021321)                                                                                       | 0.075971*** (0.020898)                                                    |
| E       | −0.000470 (0.000809)                                                                                     | 0.003573* (0.001550)                                                      |
| S       | 0.000413 (0.001031)                                                                                      | −0.001455 (0.001902)                                                      |
| G       | −0.001063 (0.001109)                                                                                     | −0.004277* (0.002233)                                                     |
| DY      | 0.006633 (0.072988)                                                                                      | −0.514733*** (0.128010)                                                   |
| Leverage| −0.005766*** (0.001887)                                                                                  | −0.000309 (0.001447)                                                      |
| Liquidity| 0.001579* (0.000878)                                                                                    | 0.004330 (0.002834)                                                      |
| ROE     | −0.001401 (0.001673)                                                                                     | −0.010493 (0.011867)                                                      |
| Size    | −1.01E-08 (2.50E-08)                                                                                     | −7.86E-08 (1.37E-07)                                                      |
| Tangible| 9.97E-08 (7.42E-08)                                                                                      | −7.84E-08 (6.87E-08)                                                      |
| Volatility| −0.016605 (0.016685)                                                                                   | −0.187792*** (0.053266)                                                   |
| Adjusted R-squared| 0.135071                                                      | 0.075676                                                                  |

The table exhibits the estimation results from estimating the equation: \[ R_t = \alpha_1 + \alpha_2 E_t + \alpha_3 S_t + \alpha_4 G_t + \alpha_{Leverage} \times \text{Leverage}_t + \alpha_{Liquidity} \times \text{Liquidity}_t + \alpha_{ROE} \times \text{ROE}_t + \alpha_{Size} \times \text{Size}_t + \alpha_{Tangible} \times \text{Tangible}_t + \alpha_{Volatility} \times \text{Volatility}_t + \epsilon_t \] The dependent variable is the average abnormal returns for the set of firms described in the text for the event in the heading. Also controlled for are Industry fixed effects. E, S, and G are respectively the environmental, social, and governance scores of MSCI. DY is the dividend yield. Leverage is the market debt to equity ratio. Liquidity is the Bloomberg Liquidity measure. ROE is Return on Equity. Size is the market capitalization of the firm. Tangible is the book value of tangible assets. Volatility is the standard deviation of stock returns over the previous year. Standard errors are in parentheses. *, **, and *** indicate significance at the 10%, 5% and 1% level respectively. Industry fixed effects are controlled for but suppressed.
forgivable loans via the Paycheck Protection Program (Consolidated Appropriations Act of 2021 (2020)). It expanded the employee EITC from 25 to 19 and eliminates the upper age limit of 65. It extended the Employee Retention Tax Credit and the Paid Sick and Family Leave Tax Credits. Finally, President Trump also issued a memorandum on student loans. President Trump’s memorandum instructed the Education Department to temporarily suspend payments and interest on student loans held by the Department of Education until December 31, 2020 (Federal Register EO 13945 (2020)). The results of regressions on the abnormal returns after the issuance of the executive order and memorandums are given in Table 9. For Non-Financial firms, the firms that better managed social risks experienced more negative returns with the announcement of the executive order and memorandums. The concern here seemed to be that the provisions regarding the tax deferral would cause labor violations that would hurt the ratings of high-ranked firms. None of the E, S, and G variables are significant for the Financial firms.

The Consolidated Appropriations Act of 2021 passed on December 28, 2020, including a huge section devoted to coronavirus response (Consolidated Appropriations Act of 2021 (2020)). The act included $325 billion for small businesses with $284 billion in forgivable loans via the Paycheck Protection Program (Consolidated Appropriations Act of 2021 (2020)). It expanded the employee retention tax credit, $166 billion for a $600 stimulus check, for most Americans with an adjusted gross income lower than $75,000, and $120 billion for an extension of increased federal unemployment benefits ($300 per week until March 14, 2021(Consolidated Appropriations Act of 2021 (2020)). It also included $134 Billion for health services including testing and vaccine procurement and $82 Billion for schools and universities.

Table 8 shows the regression results for the normal returns.

For Non-Financial firms, the coefficient on the E score is negative and significant. There is no economic rationale for this, In fact, given the provisions of the act, an opposite reaction would be expected. The most likely explanation is the size-interaction. American Rescue Plan Act of 2021 was passed on March 11, 2021. The act extended expanded unemployment benefits with a $300 per week supplement through September 6, 2021. The act made the first $10,200 in unemployment benefits for 2020 not taxable for households with incomes below $150,000, thus avoiding the risk of many workers incurring a surprise federal tax liability. The act made provisions for $1,400 direct payments to individuals. The act offered emergency paid leave for over 100 million Americans. The act provided a tax credit, through October 1, 2021, to employers who choose to offer paid sick leave and paid family leave.

The American Rescue Plan Act allocated $39 billion in dedicated child care relief funding to states. The act increases the maximum Earned Income Tax Credit (EITC) for adults without children from $543 to $1,502 and lowers age eligibility for childless EITC from 25 to 19 and eliminates the upper age limit of 65. It extended the Employee Retention Tax Credit and the Paid Sick and Family Leave Tax Credits. The act included approximately $7.3 billion of supplemental funding for Paycheck Protection Program forgivable loans and $28.6 billion for the Restaurant Revitalization Fund. It included over $325 Billion in State and Local Recovery funds.

The regression results on the abnormal returns upon the announcement of the passage of the act are in Table 11. For both Non-Financial and Financial firms, there are significant positive coefficients on the E variables, indicating that firms that had high environmental ratings were expected to earn higher returns due to the passage of the act, probably due mostly to the recovery act State and Local spending going to renewable energy and environmental projects. Amongst Financial firms, firms with high

### Table 8: Regressions on abnormal returns for the paycheck protection program and health care enhancement Act – April 23, 2020.

| Variable       | Non-Financial | Financial |
|----------------|---------------|-----------|
| Constant       | 0.009498 (0.016792) | 0.008253 (0.016004) |
| E              | -0.000196 (0.000038) | -0.000216 (0.000118) |
| S              | -0.002117** (0.000812) | -0.002453* (0.001545) |
| G              | -0.002102* (0.000874) | -0.001708 (0.001710) |
| DY             | -0.063475 (0.057544) | -0.136855 (0.997950) |
| Leverage       | 0.004953*** (0.001485) | 0.000909 (0.001107) |
| Liquidity      | -0.001713** (0.000691) | 0.000927 (0.001267) |
| ROE            | -0.804E-05 (0.001317) | 0.025292*** (0.009074) |
| Size           | -4.56E-09 (1.97E-08) | -1.23E-07 (1.05E-07) |
| Tangible       | -8.10E-08 (5.84E-08) | 3.47E-08 (5.25E-08) |
| Volatility     | 0.045739*** (0.013133) | 0.105291*** (0.040767) |
| Adjusted R-squared | 0.184833 | 0.205398 |

The table exhibits the estimation results from estimating the equation: $R_t = \alpha + \alpha_E E_t + \alpha_S S_t + \alpha_G G_t + \alpha_DY DY_t + \alpha_Leverage_t + \alpha_Liquidity_t + \alpha_ROE_t + \alpha_Size_t + \alpha_Tangible_t + \alpha_Volatility_t + \epsilon_t$. The dependent variable is the average abnormal returns for the set of firms described in the text in the heading. Also controlled for are industry fixed effects. E, S, and G are respectively the environmental, social, and governance scores of MSCI. DY is the dividend yield. Leverage is the market debt to equity ratio. Liquidity is the Bloomberg Liquidity measure. ROE is Return on Equity. Size is the market capitalization of the firm. Tangible is the book value of tangible assets. Volatility is the standard deviation of stock returns over the previous year. Standard errors are in parentheses. *, **, and *** indicate significance at the 10%, 5% and 1% level respectively. Industry fixed effects are controlled for but suppressed.

federal government. The $600 in aid expired at the end of July, leaving workers to rely on often meager state benefits. President Trump’s executive order cut aid by $200, to $400 per week. However, the order required state governments to pay 25 percent ($100) of the $400 Unemployment Insurance (UI) benefit. President Trump also issued a memorandum on payroll taxes that stopped the collection of worker payroll taxes for Social Security from Sept 1 to Dec 31 for workers making under $104,000 per year. The proposal was a tax deferral, not a permanent tax cut. These taxes would ultimately have to be paid back by workers. President Trump’s executive order also addressed eviction moratoriums issued under the CARES act. President Trump’s executive order calls on federal agencies to consider whether eviction moratoriums are necessary and to identify ways to help renters and homeowners who are struggling to meet their financial obligations. Finally, President Trump also issued a memorandum on student loans. President Trump’s memorandum instructed the Education Department to temporarily suspend payments and interest on student loans held by the Department of Education until December 31, 2020 (Federal Register EO 13945 (2020)). The results of regressions on the abnormal returns after the issuance of the executive order and memorandums are given in Table 9.

For Non-Financial firms, the firms that better managed social risks experienced more negative returns with the announcement of the executive order and memorandums. The concern here seemed to be that the provisions regarding the tax deferral would cause labor violations that would hurt the ratings of high-ranked firms. None of the E, S, and G variables are significant for the Financial firms.

The regression results on the abnormal returns for the paycheck protection program and health care enhancement Act – April 23, 2020.

| Variable | Non-Financial | Financial |
|----------|---------------|-----------|
| Constant | 0.009498 (0.016792) | 0.008253 (0.016004) |
| E | -0.000196 (0.000038) | -0.000216 (0.000118) |
| S | -0.002117** (0.000812) | -0.002453* (0.001545) |
| G | -0.002102* (0.000874) | -0.001708 (0.001710) |
| DY | -0.063475 (0.057544) | -0.136855 (0.997950) |
| Leverage | 0.004953*** (0.001485) | 0.000909 (0.001107) |
| Liquidity | -0.001713** (0.000691) | 0.000927 (0.001267) |
| ROE | -0.804E-05 (0.001317) | 0.025292*** (0.009074) |
| Size | -4.56E-09 (1.97E-08) | -1.23E-07 (1.05E-07) |
| Tangible | -8.10E-08 (5.84E-08) | 3.47E-08 (5.25E-08) |
| Volatility | 0.045739*** (0.013133) | 0.105291*** (0.040767) |
| Adjusted R-squared | 0.184833 | 0.205398 |
Table 9
Regressions on abnormal returns for the president trump executive order – August 8, 2020.

|                  | Non-Financial        | Financial          |
|------------------|----------------------|--------------------|
| Constant         | 0.006037 (0.012667)  | -0.012946 (0.01957) |
| E                | 0.000258 (0.000481)  | -0.000757 (0.000813) |
| S                | -0.001321*** (0.000612) | 0.001268 (0.000997) |
| G                | -0.000645 (0.000659) | 0.000690 (0.001171) |
| DY               | 0.122791*** (0.043361) | 0.282027*** (0.067114) |
| Leverage         | 0.004649*** (0.001121) | 0.001402* (0.000759) |
| Liquidity        | -0.000771 (0.000522)  | -0.005846*** (0.001486) |
| ROE              | -0.000954 (0.000994)  | 0.005304 (0.006222) |
| Size             | -1.61E-08 (1.49E-08)  | -1.07E-07 (7.19E-08) |
| Tangible         | 4.67E-08 (4.41E-08)   | 6.53E-08* (3.60E-08) |
| Volatility       | 0.007383 (0.009912)   | 0.121149*** (0.027927) |
| Adjusted R-squared | 0.346511           | 0.161110            |

The table exhibits the estimation results from estimating the equation: $R_t = \alpha_1 + \alpha_2 E_2 + \alpha_3 S_3 + \alpha_4 G_4 + \alpha_5 DY_5 + \alpha_{\text{Leverage}} \cdot \text{Leverage}_t + \alpha_{\text{Liquidity}} \cdot \text{Liquidity}_t + \alpha_{\text{ROE}} \cdot \text{ROE}_t + \alpha_{\text{Size}} \cdot \text{Size}_t + \alpha_{\text{Tangible}} \cdot \text{Tangible}_t + \alpha_{\text{Volatility}} \cdot \text{Volatility}_t + \epsilon_t$. The dependent variable is the average abnormal returns for the set of firms described in the text for the event in the heading. Also controlled for are industry fixed effects. E, S, and G are respectively the environmental, social, and governance scores of MSCI. DY is the dividend yield. Leverage is the market debt to equity ratio. Liquidity is the Bloomberg Liquidity measure. ROE is Return on Equity. Size is the market capitalization of the firm. Tangible is the book value of tangible assets. Volatility is the standard deviation of stock returns over the previous year. Standard errors are in parentheses. *, **, and *** indicate significance at the 10%, 5% and 1% level respectively. Industry fixed effects are controlled for but suppressed.

Table 10
Regressions on abnormal returns for the consolidated appropriations Act of 2021–December 28, 2020.

|                  | Non-Financial        | Financial          |
|------------------|----------------------|--------------------|
| Constant         | 0.005623 (0.010064)  | 0.017331*** (0.006137) |
| E                | -0.001426*** (0.000382) | 0.000479 (0.000455) |
| S                | 0.000202 (0.000488)   | -0.000000 (0.000558) |
| G                | 9.1E-06 (0.000524)    | -0.000797 (0.000565) |
| DY               | 0.040385 (0.034427)   | -0.004723 (0.037590) |
| Leverage         | -0.000648 (0.000890)  | -0.000752* (0.000425) |
| Liquidity        | -0.000563 (0.000414)  | -0.001515* (0.000832) |
| ROE              | -0.001869** (0.000789) | 0.001161 (0.003485) |
| Size             | 3.32E-08** (1.18E-08) | 5.30E-09 (4.03E-08) |
| Tangible         | -1.27E-08 (3.50E-08)  | -3.03E-09 (2.02E-08) |
| Volatility       | -0.015603** (0.007879) | -0.073305*** (0.015641) |
| Adjusted R-squared | 0.216133           | 0.280422            |

The table exhibits the estimation results from estimating the equation: $R_t = \alpha_1 + \alpha_2 E_2 + \alpha_3 S_3 + \alpha_4 G_4 + \alpha_5 DY_5 + \alpha_{\text{Leverage}} \cdot \text{Leverage}_t + \alpha_{\text{Liquidity}} \cdot \text{Liquidity}_t + \alpha_{\text{ROE}} \cdot \text{ROE}_t + \alpha_{\text{Size}} \cdot \text{Size}_t + \alpha_{\text{Tangible}} \cdot \text{Tangible}_t + \alpha_{\text{Volatility}} \cdot \text{Volatility}_t + \epsilon_t$. The dependent variable is the average abnormal returns for the set of firms described in the text for the event in the heading. Also controlled for are industry fixed effects. E, S, and G are respectively the environmental, social, and governance scores of MSCI. DY is the dividend yield. Leverage is the market debt to equity ratio. Liquidity is the Bloomberg Liquidity measure. ROE is Return on Equity. Size is the market capitalization of the firm. Tangible is the book value of tangible assets. Volatility is the standard deviation of stock returns over the previous year. Standard errors are in parentheses. *, **, and *** indicate significance at the 10%, 5% and 1% level respectively. Industry fixed effects are controlled for but suppressed.

Social scores also did well as attested by the positive and significant coefficient on the S variable.

Altogether, out of the 60 ESG coefficients estimated, 23 were significant. At a level of significance of 10%, 6 significant results would be expected. Based on a binomial distribution, the probability of 23 significant results is 0.0000000096%, a 6-sigma level result. Based on the Bonferroni method, a significant result of 10%/60 = 0.17% is required for the results not to be due to chance. The G coefficient on the Non-Financials on Table 5 is significant at the 0.14% level, the E variable coefficient in Table 10 on the Non-Financials is significant at the 0.02% level, the E variable coefficient on Table 11 is significant at the 0.03% level on the Non-Financials and the E variable coefficient on Table 11 on the Financials is significant at the 0.01% level. I therefore conclude the results are not due to chance. All told, the Hypotheses are rejected.

5. Conclusion

The policy responses to COVID-19 were some of the largest and most expansive in US economic history. For the most part, the initial responses of the market to the policy announcements were negative and significant.

Over the entire period, it is found that for Non-financial firms, firms with higher Environmental and Governance scores had higher raw returns and higher risk-adjusted returns. For Financial firms, firms with higher Social and Governance scores had higher raw returns and higher risk-adjusted returns. For Financial firms, firms with higher Social and Governance scores had higher raw returns and higher risk-adjusted returns.
returns. Examining monetary policy announcements during the Covid crisis, Non-Financial Firms with higher Governance scores were less negatively affected by the monetary policy announcement. Financial firms with higher Environmental scores were also less negatively affected by the monetary policy announcement. Financial firms with higher Governance scores were also less negatively affected by the fiscal policy announcement. Financial firms with higher Environmental scores were also less negatively affected by the fiscal policy announcement. 

The effects of fiscal policy announcements during the Covid crisis are much more complicated and depend upon the details of the policy response. Generally, both Non-Financial and Financial firms with higher Environmental scores reacted less negatively and more positively to fiscal policy announcements. Firms with higher Governance scores also performed better under most fiscal policy announcements, the major exception being the Paycheck Protection Program and Health Care Enhancement Act where the extension gave small businesses access to loans that were not available to larger S&P 1500 firms with higher Governance scores.

The policy implications are that it makes sense for the government to encourage firms to adopt more progressive Environmental, Social and Governance policies as hedges against the effects of monetary and fiscal policy announcements during crises. As the results show here, they provide a very effective means of protecting firm returns against the negative effects of policy announcements and against the negative overall effects of the crisis.

Future research is needed on exactly which specific Environmental, Social and Governance policies of firms act as hedges. In terms of Environmental, is it commitment to climate change policies, commitment to natural resource efficiency or developing new environmentally friendly products that acts as hedges? This is a burning question.

**CRediT authorship contribution statement**

Richard Paul Gregory: Conceptualization, Data curation, Formal analysis, Funding acquisition, Investigation, Methodology, Project administration, Resources, Software, Supervision, Validation, Visualization, Writing – original draft, Writing – review & editing.

**Data availability**

Data will be made available on request.

**References**

Akhtaruzzaman, M., Boubaker, S., Chiah, M., & Zhong, A. (2021a). COVID – 19 and oil price risk exposure. *Finance Research Letters*, 42, Article 101882.

Akhtaruzzaman, M., Boubaker, S., Lucey, B. M., & Sensoy, A. (2021b). Is gold a hedge or a safe-haven asset in the COVID-19 crisis? *Economic Modelling*, 102, Article 105588.

Akhtaruzzaman, M., Boubaker, S., & Sensoy, A. (2021c). Financial contagion during COVID-19 crisis. *Finance Research Letters*, 38, Article 101604.

Akhtaruzzaman, M., Boubaker, S., & Umar, Z. (2021d). COVID-19 media coverage and ESG leader indices. *Finance Research Letters*, Article 102170.

Albuquerquoise, R., Koskinen, Y., Yang, S., & Zhang, C. (2020). Resiliency of environmental and social stocks: An analysis of the exogenous COVID-19 market crash. The *Review of Corporate Finance Studies*, 9(3), 593–621.

Alfaro, L., Chari, A., Greenland, A. N., & Schott, P. K. (2020). Aggregate and firm-level stock returns during pandemics. In *Real time. Working Paper*. National Bureau of Economic Research.

American Rescue plan Act of 2021. Retrieved June 25, 2021 [https://www.congress.gov/bill/117th-congress/house-bill/1319/text](https://www.congress.gov/bill/117th-congress/house-bill/1319/text), (2021).

Bae, K. H., El Ghoul, S., Gong, Z. J., & Guedhami, O. (2021). Does CSR matter in times of crisis? Evidence from the COVID-19 pandemic. *Journal of Corporate Finance*, 67, Article 101876.

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**Table 11**

Regressions on abnormal returns for the American rescue plan Act of 2021–March 11, 2021.

| Variable                  | Non-Financial       | Financial          |
|---------------------------|---------------------|--------------------|
| Constant                  | -0.093721 (0.057646)| -0.121758** (0.057617) |
| E                         | 0.007971*** (0.002189) | 0.016698*** (0.004274) |
| S                         | 0.002899 (0.0022787)  | 0.016366*** (0.005243) |
| G                         | 0.003112 (0.002997)  | 0.000407 (0.006157)  |
| DY                       | 0.528652*** (0.197337) | -1.338989*** (0.352922) |
| Leverage                  | -0.018102*** (0.005102) | -0.025852*** (0.003990) |
| Liquidity                 | 0.000407 (0.002374)  | 0.002062 (0.007814)  |
| ROE                       | 0.004039 (0.004524)  | -0.041041 (0.032717) |
| Size                      | 1.05E-07 (6.77E-08)  | -2.95E-07 (3.76E-07) |
| Tangible                  | -8.47E-08 (2.01E-07) | -2.37E-08 (1.89E-07) |
| Volatility                | -0.078279* (0.045110) | -0.528842*** (0.146854) |
| Adjusted R-squared        | 0.149252            | 0.341711           |

The table exhibits the estimation results from estimating the equation: $R_t = \alpha_1 + \alpha_2E_t + \alpha_3S_t + \alpha_4G_t + \alpha_5DY_t + \alpha_{\text{Leverage}}L_t + \alpha_{\text{Liquidity}}L_t + \alpha_{\text{ROE}}\text{ROE}_t + \alpha_{\text{Size}}\text{Size}_t + \alpha_{\text{Tangible}}\text{Tangible}_t + \alpha_{\text{Volatility}}\text{Volatility}_t + \epsilon_t$. The dependent variable is the average abnormal returns for the set of firms described in the text for the event in the heading. Also controlled for are industry fixed effects. E, S, and G are respectively the environmental, social, and governance scores of MSCI. DY is the dividend yield. Leverage is the market debt to equity ratio. Liquidity is the Bloomberg Liquidity measure. ROE is Return on Equity. Size is the market capitalization of the firm. Tangible is the book value of tangible assets. Volatility is the standard deviation of stock returns over the previous year. Standard errors are in parentheses. *, **, and *** indicate significance at the 10%, 5% and 1% level respectively. Industry fixed effects are controlled for but suppressed.
