Does Absorptive Capacity Protect Shareholder Wealth in Times of Crisis? Evidence from the COVID-19 Pandemic

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ABSTRACT

R&D capital increases firms' ability to identify, absorb, and utilize new external information. Firms with absorptive capacity become resilient to external shocks while providing an opportunity to protect shareholder wealth during a crisis period. This study examines the role of firms' absorptive capacity in protecting shareholder wealth around the COVID-19-induced stock market crisis. Our findings report that firms' absorptive capacity is positively related to stock returns of US firms during the COVID-19 pandemic. This positive relationship exists irrespective of investor attention and is robust to the propensity-score-matching approach. Overall, the results imply that R&D capital makes firms resilient to external shocks.

KEYWORDS

Absorptive Capacity, COVID-19, Stock Returns

JEL Codes: G10, G32

INTRODUCTION

Investors prefer safer investment bets during crisis periods, especially that are resilient to external shocks (Coudert & Gex, 2008; Hirshleifer, 2008; Nofsinger & Varma, 2014; Lins et al., 2017; Pastor & Vorsatz, 2020; Singh, 2020). For instance, the COVID-19 pandemic led to an exogenous shift in the demand for firms with high ESG ratings (Albuquerque et al., 2020; Dantas, 2021). The whole idea of this switch is to invest in firms that are resilient to external developments and are sustainable in the long run. In this regard, the present study examines the role of firms' capacity to absorb external shocks in protecting shareholder wealth around the COVID-19-induced stock market crisis. R&D capital increases firms' ability to identify, absorb, and utilize new external information (Oh, 2017). Firms with absorptive capacity become resilient to external shocks while providing an opportunity to protect shareholder wealth during a crisis period (Evenson & Kislev, 1976; Henderson & Cockburn, 1996).

Since R&D capital increases firms' capacity to absorb external shocks, one can argue that it can also protect shareholder wealth during a crisis period, like the COVID-19 pandemic. In other words, we expect firms with absorptive capacity in the pre-crisis period to reflect a positive impact on stock returns around the COVID-19-induced stock market crisis. As an exogenous shock, the COVID-19 pandemic provides an opportunity to investigate this relationship between firms' pre-crisis absorptive capacity and crisis-induced stock returns while setting aside the potential endogeneity concerns. Unlike ESG ratings, we expect investors to exogenously increase demand for firms with absorptive capacity during the COVID-19 pandemic. Firms with an absorptive capacity in the pre-crisis period are expected to perform well during a crisis period, as firms' absorptive capacity reflects their resilience

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to external shocks.

To examine the role of absorptive capacity, we consider cumulative stock returns around the COVID-19-induced stock market crisis, i.e., the period from 18th February 2020 to 20th March 2020 (Bae et al., 2021). Both raw, as well as CAPM-adjusted abnormal stock returns, are considered as dependent variables. CAPM-adjusted abnormal stock returns are computed using CRSP value-weighted market returns in the year 2019. Absorptive capacity is measured using firm's R&D intensity (Oh, 2017). R&D intensity or absorptive capacity is defined as the ratio of R&D capital to sales. Our findings state that absorptive capacity and stock returns share a positive relationship in the context of both raw and abnormal stock returns.

Firms with absorptive capacity protect shareholder wealth to the tune of 9.3% (of its sample average raw returns) during times of uncertainty, i.e., the COVID-19 stock market crisis. This positive impact is robust to the inclusion of industry fixed effects and other control variables, such as the logarithm of market capitalization, Tobin's Q, firm leverage, capital expenditures (CAPEX), return on assets (ROA), cash holdings, momentum, idiosyncratic risk, and market beta. Firms with absorptive capacity may be different from firms without absorptive capacity. Therefore, the study also employs a propensity-score-matching approach. Our findings remain consistent even after the application of the propensity-score-matching approach.

Oh (2017) argue that investor attention plays an important moderating role in dissecting the impact of absorptive capacity on stock returns. The author argues that investors' limited attention contributes to high future abnormal stock returns for firms with high absorptive capacity. Therefore, we also consider the moderating role of investor attention in comprehending the relationship between absorptive capacity and stock returns. Following Oh (2017), we use firm size, analyst coverage, and institutional ownership as a proxy for investor attention. Our findings do not support a differential impact of absorptive capacity on stock returns based on firm size and institutional ownership. However, for analyst coverage, the findings suggest that firms with greater analyst coverage observe a larger positive impact on CAPM-adjusted abnormal stock returns.

This study adds to the growing literature on the capital market and real effects of the COVID-19 pandemic (e.g., Bretscher et al., 2020; Fahlenbrach et al., 2020; Davis et al., 2020; Baker et al., 2020; Bae et al., 2021). It also contributes to the literature that examines the role of a firm's resilience in protecting shareholder wealth during a crisis period (Nofsinger & Varma, 2014; Lins et al., 2017; Singh, 2020; Pastor & Vorsatz, 2020; Albuquerque et al., 2020). The rest of the paper is organized as follows: section 2 discusses data and sample overview, section 3 reports empirical findings, and lastly, section 4 concludes the paper.

DATA AND SAMPLE OVERVIEW

Data relating to firm's annual financial characteristics and stock returns are gathered from the COMPUSTAT and CRSP databases. Firm-level raw and CAPM-adjusted abnormal stock returns are considered as dependent variables, computed during the crisis period from 18th February 2020 to 20th March 2020. During this period, the US stock market (major stock indices) witnessed one of the severest falls since 1987 (i.e., from pre-crisis peak to the bottom) (Bae et al., 2021). CAPM-adjusted abnormal stock returns are computed using market returns in the year 2019. Following Oh (2017), absorptive capacity is defined as a ratio of R&D capital to sales. R&D capital is calculated as cumulative R&D expenditures for five years, assuming a depreciating rate of 20%. Therefore, firms with absorptive capacity, i.e., a positive value of R&D capital to sales ratio, are considered as firms that are resilient to external shocks. The regression model is specified as follows:

$$R_i = \alpha + \beta_1 AC_i + \sum \beta_k Control\ Variables + \sum \beta_n Industry\ Fixed\ Effects + \varepsilon_i \quad (1)$$

Where, R_i is the dependent variable, i.e., raw and CAPM-adjusted cumulative abnormal stock returns, during the COVID-19-induced stock market crisis from 18th February 2020 to 20th March 2020. AC_i is an indicator variable, equal to 1 for firms with a positive R&D capital to sales ratio, and 0 otherwise. We consider all firms in the CRSP database; however, following Bae et al. (2021), micro-cap firms with a market capitalisation of less than $250 million (as of the last quarter of 2019) are excluded from the sample. To account for unobserved factors related to industry variations and other omitted variables, the study also considers industry fixed effects, and append the logarithm of market capitalization, Tobin's Q, firm leverage, CAPEX, ROA, cash holdings, momentum, idiosyncratic risk, and market beta as important control variables, existing in the year 2019. All the variables are winsorized at 1% and 99% levels.

FINDINGS

Table 1 provides descriptive statistics of all the variables undertaken for the study. We manage to gather data relating to 2,805 firms after excluding missing observations. On average, firms witnessed a negative return during the COVID-19-induced stock market crisis period. Both raw and CAPM-adjusted abnormal stock returns are negative to the tune of -39.46% and -4.21%, respectively – consistent with Bae et al. (2021). Around 45% of firms have a positive R&D capital to sales ratio, i.e., firms with absorptive capacity. Table 2 provides baseline regression results related to the impact of firms' pre-crisis absorptive capacity on stock returns of US firms. The findings report that absorptive capacity protected shareholder wealth to the tune of 9.3% [(0.0367/|0.3946|)*100] of its sample average raw returns during the COVID-19 stock market crisis. The coefficient for AC is positive and statistically significant for both raw and CAPM-adjusted abnormal stock returns[1]. Consistent with Bae et al. (2021), our results suggest that firm leverage and momentum are negatively associated with crisis period returns, while the logarithm of market capitalization, ROA, Tobin's Q, and cash holdings are positively associated with crisis period returns.

Table 1. Descriptive Statistics

This table provides descriptive statistics of all the variables undertaken for the study. Firm-level raw and CAPM-adjusted abnormal stock returns are considered as dependent variables, computed during the crisis period from 18th February 2020 to 20th March 2020. All the variable definitions are provided in the appendix.

Variables	N	Mean	S.D.	p25	p50	p75
Raw Returns	*2,805*	*-0.3946*	*0.1733*	*-0.5018*	*-0.3910*	*-0.2886*
Abnormal Returns	*2,805*	*-0.0421*	*0.3032*	*-0.2369*	*-0.0644*	*0.1234*
AC	*2,805*	*0.4456*	*0.4971*	*0.0000*	*0.0000*	*1.0000*
Log (MC)	*2,805*	*7.9803*	*1.6002*	*6.6936*	*7.7772*	*9.0345*
Tobin's Q	*2,805*	*2.3089*	*1.9477*	*1.0914*	*1.5606*	*2.7216*
Leverage	*2,805*	*0.3004*	*0.2262*	*0.1018*	*0.2760*	*0.4464*
CAPEX	*2,805*	*0.0337*	*0.0388*	*0.0067*	*0.0209*	*0.0459*
ROA	*2,805*	*0.0658*	*0.1383*	*0.0276*	*0.0856*	*0.1348*
Cash Holdings	*2,805*	*0.1739*	*0.2141*	*0.0312*	*0.0816*	*0.2238*
Momentum	*2,805*	*0.2887*	*0.4275*	*0.0426*	*0.2411*	*0.4570*
Idiosyncratic Risk	*2,805*	*0.0006*	*0.0007*	*0.0002*	*0.0003*	*0.0007*
Beta	*2,805*	*1.0322*	*0.4398*	*0.7672*	*1.0606*	*1.3048*

[1] Our findings remain consistent and statistically significant even after considering the absolute values of R&D capital to sales ratio. Since absorptive capacity is either zero or positive; we, therefore, consider a logarithmic version of the same, i.e., log(1+actual values).

Table 2. Baseline Regression

This table provides baseline regression results related to absorptive capacity and stock returns of US during the crisis period. Firm-level raw and CAPM-adjusted abnormal stock returns are considered as dependent variables, computed during the crisis period from 18th February 2020 to 20th March 2020. All the variable definitions are provided in the appendix. t-statistics based on robust standard errors are reported in the parentheses. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively.

Variables	Raw Returns		Abnormal Returns	
AC	0.0621***	0.0367***	0.139***	0.0743***
	(6.10)	(3.85)	(7.90)	(4.87)
Log (MC)		0.00984***		0.0110***
		(4.83)		(3.63)
Tobin's Q		0.0125***		0.0130***
		(5.73)		(3.86)
Leverage		-0.138***		-0.182***
		(-7.64)		(-6.46)
CAPEX		-0.164		-0.119
		(-1.50)		(-0.68)
ROA		0.148***		0.145**
		(4.55)		(2.50)
Cash Holdings		0.0877***		0.199***
		(3.98)		(5.33)
Momentum		-0.0223***		-0.0550***
		(-2.67)		(-3.88)
Idiosyncratic Risk		-5.226		40.71***
		(-0.67)		(3.26)
Beta		-0.0552***		0.273***
		(-6.01)		(18.34)
Constant	-0.2384***	-0.2316***	0.0752***	-0.2204***
	(-5.27)	(-4.85)	(2.97)	(-5.34)
Observations	2,804	2,804	2,804	2,804
Industry FEs	Yes	Yes	Yes	Yes
Adjusted R^2	0.19	0.28	0.23	0.40

To further examine the moderating role of investor attention in explaining the relationship between absorptive capacity and stock returns, the study also considers three different measures of investor attention, i.e., firm size (logarithm of total assets), analyst coverage and institutional ownership. Large firms, and firms with high analyst coverage and high institutional ownership reflect greater investor attention. Table 3 provides regression results after considering the moderating role of investor attention via the interaction terms. We interact our variable *AC* with the respective low and high groups. These groups are determined based on the median values of investor attention measures. One can argue that the positive relationship between absorptive capacity and stock returns exists for firms with high investor attention. However, the findings suggest that absorptive capacity protects shareholder wealth irrespective of investor attention. Particularly, firms with high analyst coverage observe a larger positive impact on CAPM-adjusted abnormal stock returns.

Since firms with absorptive capacity could be fundamentally different from firms without absorptive capacity, therefore, the study also employs a propensity-score-matching (PSM) approach. Matched control firms are determined from the same 2-digit SIC codes by using the logarithm

of market capitalization, Tobin's Q, firm leverage, CAPEX, ROA, and cash holdings as matching factors. Table 4 provides the PSM model results. Panel A of table 4 supports that treatment (with absorptive capacity) and control firms (without absorptive capacity) are statistically indistinguishable from each other in terms of market capitalization, Tobin's Q, firm leverage, CAPEX, ROA, and cash holdings. Further, Panel B of Table 4 depicts that the positive relationship persists even after considering matched control firms. Firms with absorptive capacity witnessed a lower negative reaction of shareholders during the COVID-19-induced stock market crisis.

In our un-tabulated findings, we also append MSCI-CSR scores in the regression specifications. Our findings remain consistent registering a positive relationship between firms' pre-crisis absorptive capacity and stock returns during the COVID-19-induced stock market crisis.

Table 3. Investor Attention and Absorptive Capacity

This table provides regression results after considering investor attention. Firm size, analyst coverage, and institutional ownership are considered as a proxy for investor attention. Firm-level raw and CAPM-adjusted abnormal stock returns are taken as dependent variables, computed during the crisis period from 18th February 2020 to 20th March 2020. All the variable definitions are provided in the appendix. t-statistics based on robust standard errors are reported in the parentheses. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively.

Variables	Firm Size		Analyst Coverage		Institutional Ownership	
	Raw Returns	Abnormal Returns	Raw Returns	Abnormal Returns	Raw Returns	Abnormal Returns
AC*Low	*0.0340***	*0.0744***	*0.0358***	*0.0505***	*0.0412***	*0.0759***
	(3.04)	*(4.05)*	*(3.14)*	*(2.68)*	*(3.64)*	*(4.07)*
AC*High	*0.0396***	*0.0743***	*0.0387***	*0.0940***	*0.0391***	*0.0829***
	(3.85)	*(4.61)*	*(3.57)*	*(5.40)*	*(3.57)*	*(4.70)*
Controls + Constant	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*
Observations	*2,804*	*2,804*	*2,637*	*2,637*	*2,532*	*2,532*
Industry FEs	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*
Adjusted R^2	*0.28*	*0.40*	*0.27*	*0.39*	*0.27*	*0.38*
AC*Low *minus* AC*High						
F-stat	*0.31*	*0.00*	*0.09*	*7.20*	*0.06*	*0.23*
(p-value)	*(0.5773)*	*(0.9966)*	*(0.7593)*	*(0.0073)*	*(0.8134)*	*(0.6344)*

Table 4. Propensity-Score-Matching

This table provides regression results after considering the propensity-score-matching approach. Panel A reports average differences between treatment and control firms. Panel B reports regression results for the matched sample. Control firms (firms with no absorptive capacity) are determined from the same 2-digit SIC codes. Firm-level raw and CAPM-adjusted abnormal stock returns are taken as dependent variables, computed during the crisis period from 18th February 2020 to 20th March 2020. All the variable definitions are provided in the appendix. t-statistics based on robust standard errors are reported in the parentheses. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively.

Panel A: Treatment versus Control Firms

Variable	Treatment	Control	Difference	t-stat	p-value
Log (MC)	*8.1221*	*8.1468*	*-0.0247*	*-0.1400*	*0.8850*
Tobin's Q	*2.1393*	*2.2508*	*-0.1115*	*-0.6600*	*0.5080*
Leverage	*0.3186*	*0.2896*	*0.0290*	*1.3100*	*0.1920*
CAPEX	*0.0350*	*0.0310*	*0.0041*	*1.2200*	*0.2230*
ROA	*0.1116*	*0.1100*	*0.0016*	*0.1900*	*0.8490*
Cash Holdings	*0.1425*	*0.1620*	*-0.0195*	*-1.1400*	*0.2530*

Panel B: Regression Results

Variables	Raw Returns	Abnormal Returns
AC	*0.0490****	*0.100****
	(3.33)	*(4.17)*
Log (MC)	*0.0232****	*0.0308****
	(3.54)	*(3.07)*
Tobin's Q	*0.00815*	*0.0141*
	(1.15)	*(1.09)*
Leverage	*-0.186****	*-0.232****
	(-4.25)	*(-3.34)*
CAPEX	*0.0689*	*0.448*
	(0.21)	*(0.77)*
ROA	*0.0972*	*-0.135*
	(0.63)	*(-0.44)*
Cash Holdings	*0.141***	*0.233***
	(2.47)	*(2.26)*
Momentum	*-0.0248*	*-0.0635*
	(-1.05)	*(-1.52)*
Idiosyncratic Risk	*6.692*	*64.95*
	(0.22)	*(1.33)*
Beta	*-0.0851****	*0.224****
	(-3.43)	*(5.37)*
Constant	*-0.6056****	*-0.6798****
	(-6.95)	*(-5.05)*
Observations	*372*	*372*
Industry FEs	*Yes*	*Yes*
Adjusted R^2	*0.29*	*0.32*

CONCLUSION

It is well recognized that R&D investments increase a firm's ability to absorb external information. Firms with absorptive capacity become more resilient to external shocks while providing an opportunity to protect shareholder wealth during a crisis period. This study, therefore, examines the role of firms' pre-crisis absorptive capacity in protecting shareholder wealth around the COVID-19-induced stock market crisis period from 18th February 2020 to 20th March 2020. The findings report that absorptive capacity is positively related to stock returns of US firms during the COVID-19 pandemic. This positive relationship exists irrespective of investor attention (measured through firm size, analyst coverage, and institutional ownership) and is robust to the propensity-score-matching approach. Overall, the results imply that R&D capital makes firms resilient to external shocks, thereby protecting shareholder wealth during a crisis period.

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APPENDIX

Variable	Definition
Raw Returns – Crisis	*Cumulative daily raw stock returns over the period from 18th February 2020 to 20th March 2020.*
Abnormal Returns – Crisis	*Cumulative daily CAPM-adjusted abnormal returns over the period from 18th February 2020 to 20th March 2020. The CAPM-adjusted abnormal returns are estimated as the difference between raw returns of a stock and the CAPM beta times the market returns (Albuquerque et al., 2020; Bae et al., 2021). The CAPM beta is estimated using the daily stock returns data for the year 2019, and by using CRSP value-weighted index as the market return.*
AC	*Indicator variable equal to 1, when R&D capital to sales ratio is positive in the year 2019, and 0 otherwise. R&D capital is calculated as cumulative R&D expenditures for five years, assuming a depreciating rate of 20%.*
Log (MC)	*Logarithm of the market value of firm, calculated at the end of the year 2019.*
Tobin's Q	*Market value of assets divided by total assets. Market value of assets is defined as total assets plus the market value of common stock less the book value of common stock.*
Leverage	*Total debt (long-term plus short-term debt) divided by total assets.*
CAPEX	*Capital expenditures divided by total assets.*
ROA	*Earnings before interest, taxes, depreciation and amortization divided by total assets.*
Cash Holdings	*Cash and short-term investments divided by total assets.*
Momentum	*Daily cumulative raw stock return in 2019.*
Idiosyncratic Risk	*Variance of the CAPM-adjusted returns in 2019.*
Institutional Ownership	*Institutional ownership as a percentage of market capitalization in the last quarter of 2019.*
Analyst Coverage	*Number of analysts following a firm in the month of January 2020.*