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CEO GENDER AND FIRM PERFORMANCE: EVIDENCE FROM THE COVID-19 PANDEMIC

CHRISTOS I. GIANNIKOS[1], GEORGIOS KOIMISIS[2*], JUN LOU[3]

1. Baruch College, USA.
2. Manhattan College, USA.
3. University of Maine, USA

* Corresponding Author: Georgios Koimisis, Present address: Department of Economics & Finance, O' Malley School of Business, Manhattan College, 4513 Manhattan College Pkwy, Bronx, NY 10471, USA.
☎ +1 (718) 862 7220 ✉ gkoimisis02@manhattan.edu

Abstract

The COVID 19 pandemic precipitated an unprecedented deceleration of economic activities and a stock market crash. The unparalleled shock and the altered risk attitudes present a distinctive opportunity to examine whether the well-established concept of the "glass ceiling" is indicative of latent gender differentials in company performance. Utilising US financial data, the study employs a range of methodologies to examine whether firms led by female CEOs exhibited the same performance as firms led by male CEOs during 2020-2021. Our empirical results confirm previous findings from the finance literature, as we neither find a systematic difference in returns to holding stock in female-led firms, nor a difference in accounting returns between female-led and male-headed firms.

Keywords: Firm performance, gender diversity, pandemic, excess returns

1. Introduction

There has been a renewed emphasis on the representation of women in leadership positions, which can be attributed to the significant progress women have achieved in this domain. Several studies show that gender diversity in leadership roles can serve as an effective alternative mechanism for bolstering corporate governance control. Notably from literature, Adams and Ferreira (2009) find that women have a significant impact on board governance and that the CEOs' turnover is more sensitive to stock return performance in companies with a higher proportion of women on their boards. Melero (2011) finds that a higher proportion of female executives in a firm has beneficial effects in employee feedback and development. Jurkus et al. (2011) suggest that increasing diversity in management has positive impact on firms with absence of strong external governance and Upadhyay and Zeng (2014) show that gender diversity can lead to better strategic decisions. Furthermore, Iseke and Pull (2019) find that female job seekers tend to be more attracted to firms with female executives holding a non-stereotypical position.

However, a significant lack of representation of women in high-level managerial positions and as CEOs (Hillman et al., 2007), as well as pay gender gaps, continue to exist, despite advancements in overall employment trends. Blau and Kahn (2017) provide a comprehensive literature review on systematic gender differentials in the labour market, and particularly the decline of the pay gender gap from 1980 to 2010. Carter et al. (2017), using a large sample of S&P 1500 firms between 1996-2010, show that female risk aversion as well as the lack of gender diversity on corporate boards, can contribute significantly to the observed pay gender gap. Flabbi et al. (2019) complement the

findings by Carter al. (2017), showing a positive effect of female leadership on the top of the female wage distribution.

Vandegrift and Brown (2005) show that the differential risk attitude of gender may affect the financial decision-making process. Given that firm outcomes depend on executives' characteristics, such as risk attitude and management practices, there is research work focused on financial risk aversion of men and women. Specifically, evidence from the experimental economics literature suggests that women, on average, tend to be more financially risk averse than men (Eckel & Grossman, 2008; Croson & Gneezy, 2009; Charness & Gneezy, 2012). On the other hand, the findings by Doan and Iskandar-Datta (2020) support the notion that female top executives are as risk-averse as their male counterparts.

In terms of firm performance and the gender of senior leadership, the results are mixed. A few papers (Barua et al., 2010; Liu et al., 2016) focus on the earnings quality in relation to the gender of CFOs, showing significantly lower abnormal accruals. Huang and Kisgen (2013) document that firms with female executives are less likely to make acquisitions, but have higher announcement returns relatively to those by firms with male executives. Several studies examine the relationship of stock prices, stock market returns and market values as proxies of firm performance and the proportion of women among board members is used as a measure of female leadership (Wolfers, 2006; Gul et al., 2011; Khan & Vieito, 2013). Findings by Gul et al. (2011) suggest that board gender diversity improves stock price informativeness, with the relationship being stronger for firms with weak corporate governance. Wolfers (2006), analysing data from more than 3,000 publicly traded companies from the period 1992-2004, finds that the stock returns of companies with female CEOs are not statistically different from the stock returns of companies with male CEOs, implying that a CEO's gender may not have a significant impact on a company's stock performance. On the other hand, Kolev (2012) finds that female-led firms significantly underperform relative to male-led firms. The key methodological difference is that Kolev (2012) focuses on the return of a firm in a given month, instead of the average return of a portfolio of firms in the given month as in the paper of Wolfers (2006). Lastly, Khan and Vieito (2013), focusing on accounting returns, as measured by the return on assets (ROA), find that female-headed firms tend to perform better than male-led firms.

Furthermore, evidence regarding female leadership during disruptive times is scarce (Wu et al., 2021). In one of the few studies examining female leadership and firm performance during a crisis period, Palvia et al. (2015) document that smaller banks with female CEOs and board chairs were less likely to fail during the 2007–2010 subprime crisis. Another study by Tiscini et al. (2023), investigating Italian-listed firms during the COVID-19 pandemic, finds a positive effect of female leadership on firm performance, as measured by the return on assets (ROA).

Drawing upon past empirical evidence, our paper seeks to investigate disparities in the financial performance between companies led by female and male CEOs, during the COVID-19 pandemic. The implementation of economic lockdown measures, during this period, presented an unforeseen shock to global financial markets which experienced a significant decline. Specifically in the U.S., the stock market reached its highest point in mid-February of 2020, followed by a significant decrease of about 30% within a span of just one month. This unparalleled shock has likely altered the risk attitude of financial decision makers (Heo et al., 2021). Consequently, the pandemic years present a unique crisis period prompting for a reassessment of the CEO gender gap in firm returns.

The objective of our paper is threefold: first, we contribute to the existing body of literature on gender and firm performance; second, we try to expand upon the recent literature on COVID-19 and its impact on businesses; third, we present new evidence related to the role of female leadership in times of crisis. We accomplish this by analysing the performance of female and male-led 1500 S&P firms during the COVID-19 pandemic. Our results reveal that female-headed firms did not outperform male-led firms during the pandemic and are robust in terms of stock market returns (stock market performance) and in terms of operating performance (Return on Assets, Gross Profit Margin and Growth of Sales), in both time series and in the cross-section.

The paper is organised as follows: Section 2 describes the data and explains the empirical methodology. Section 3 presents and analyses the results. Section 4 concludes.

2. Data and Methodology

2.1 Data

Table 1 presents the Summary Statistics of the variables in our study. The methodologies utilised are described in detail in the rest of this section.

Table 1: Summary statistics

	Obs.	Mean	SD	25%	Median	75%
Panel A: Variables 2020						
Daily excess return of zero-investment portfolio	253	0.12%	2.80%	-0.91%	0.12%	1.33%
Mean daily excess return	1314	0.10%	0.19%	0.01%	0.07%	0.17%
Annual abnormal return	1314	8.52%	49.42%	-15.16%	4.88%	27.33%
ROA	1316	0.092	0.104	0.036	0.09	0.139
Gross Profit Margin	1316	0.392	0.389	0.226	0.379	0.599
Growth of Sales	1317	-0.011	0.261	-0.11	-0.022	0.08
CEO_Gender	1317	0.944	0.233	1	1	1
Profitability	1316	0.009	0.365	-0.007	0.056	0.129
ROE	1259	0.019	1.307	-0.011	0.079	0.159
Leverage	1316	0.644	0.261	0.479	0.649	0.813
Cash Ratio	1092	1.112	3.382	0.257	0.532	1.073
Size	1317	3.397	0.699	2.926	3.358	3.858
Advertising	1316	0.013	0.035	0	0	0.011
Panel B: Variables 2021						
Daily excess return of zero-investment portfolio	252	-0.02%	0.46%	-0.29%	-0.05%	0.26%
Mean daily excess return	1451	0.12%	0.24%	0.04%	0.11%	0.18%
Annual abnormal return	1451	-1.77%	60.91%	-24.89%	-7.86%	14.85%
ROA	1355	0.122	0.114	0.06	0.11	0.168
Gross Profit Margin	1351	0.427	0.429	0.252	0.397	0.601
Growth of Sales	1216	0.243	0.837	0.04	0.138	0.266
CEO_Gender	1451	0.934	0.248	1	1	1
Profitability	1356	0.066	0.543	0.033	0.088	0.168
ROE	1307	0.19	0.657	0.06	0.131	0.235
Leverage	1356	0.63	0.235	0.46	0.635	0.793
Cash Ratio	1139	1.046	1.864	0.241	0.579	1.154
Size	1357	3.37	0.708	2.889	3.328	3.849
Advertising	1356	0.012	0.033	0	0	0.01

Note: Table 1 reports the summary statistics for the variables utilised in the study.

Due to their significant role in the organisation, we concentrate on CEOs. Data on CEO gender is available from the EXECUCOMP database. We gather information on CEO gender from 2020 and 2021, applying the following restrictions: we sort firms based on CEO gender in December 2019 (December 2020) for the next 12 months and exclude firms where the CEO gender changed during 2020 (2021); we remove observations of CEOs not receiving any compensation; we do not include CEOs who did not receive salary or bonus during these years. Women hold 5.6% - 6.6% of CEO positions in the sample years.

We retrieve daily and annual stock data from Capital IQ North America Daily (Compustat/CRSP, WRDS), for the years 2020 and 2021. To calculate stock returns, we adjust prices for dividends through the price adjustment factor (AJEXDI) and the daily multiplication factor (TRFD). In the case of dual listed firms, we keep only the security of the firm with the highest market capitalisation. A key variable of interest in firm-level analysis is leverage, which is difficult to compare between non-financial and financial firms (Fama & French, 1992). Therefore, and in accordance with standard practice in finance research, for our firm-level study, we exclude financial companies. Next, we estimate each firm's Betas (βs) on daily market excess return, size, value, and momentum factor returns. We then calculate each firm's annual abnormal return, i.e., the Fama-French-adjusted return which is the excess return of the stock minus its Betas times the annual factor returns. We obtain Fama-French four factor returns and the risk-free rates from Kenneth French's database.

2.2 Empirical Methodology

We first assess whether individuals could gain excess returns by holding stocks in female-led firms relative to holding stocks in male-led firms. Therefore, we consider the following time-series specification (Wolfers, 2006):

$$Portfolio\ Excess\ Return_t = \alpha + \beta_1^*\left(Market_t - R_t^f\right) + \beta_2^* SMB_t + \beta_3^* HML_t + \beta_4^* UMD_t + \varepsilon_t \quad (1)$$

where the dependent variable is the daily excess return of a zero-investment portfolio (i.e., long male-headed firms and short female-headed firms). Market Excess Return is measured as return of the CRSP-weighted index minus the Treasury-Bill rate, SMB (Small Minus Big) is the Size factor, HML (High Minus Low) is the Value factor and UMD (Up minus Down) is the Momentum factor. The ε represents the disturbance term.

We also consider the following cross-sectional specification (Fama & MacBeth, 1973):

$$Mean\ Daily\ Excess\ Return_i = \alpha_0 + \alpha_1 CEO\_Gender_i + \gamma_1\beta_{i,1}^* + \gamma_2\beta_{i,2}^* + \gamma_3\beta_{i,3}^* + \gamma_4\beta_{i,4}^* + \varepsilon_i \quad (2)$$

which regresses the mean daily excess return of firm i on that firm's estimated Betas (βs) and CEO gender, a dummy variable assuming value equal to 1 when the CEO is male and zero otherwise.

Beyond expected returns, we also examine the effect of CEO gender on firm's abnormal returns as well as on the operating performance of female-led firms relative to male-led firms. The specification of this model is:

$$Performance_i = \beta_0 + \beta_1 CEO\_Gender_i + \beta_2 FirmControls_i + \beta_3 IndustryFE_i + \varepsilon_i \quad (3)$$

where the dependent variable corresponds respectively to the firm's yearly abnormal stock returns or to the firm's accounting performance, measured either by the return on assets (ROA) or by the Gross Profit Margin (GPM), or lastly by the Growth of Sales (GSA). The unit of observation is firm i during the year t, where year t is either 2020 or 2021. In terms of firm-specific characteristics, for abnormal stock returns, we control for Profitability, Return on Assets (ROE), Leverage, Cash Ratio, Size and Advertising of firm i. For operating performance, we control for Profitability, Leverage, Cash Ratio, Size and Advertising. We run regression specifications with industry fixed effects.

As a final robustness test to our results, we employ the specification by Kolev (2012). The corresponding model is as follows:

$$r_{it} = \alpha + \delta CEO_{Gender\,it} + \beta_1\left(Market_t - R_t^f\right) + \beta_2 CEO\_Gender_{it} * \left(Market_t - R_t^f\right) + \zeta_1 SMB_t + \zeta_2 CEO\_Gender_{it} * SMB_t + \eta_1 HML_t + \eta_2 CEO\_Gender_{it} * HML_t + \tau_1 UMD_t + \tau_2 CEO\_Gender_{it} * UMD_t + \varepsilon_{it} \quad (4)$$

where the r_{it} is the net return on firm i in period t (day). Relevant regressors are described and denoted as in Models (1) to (3).

3. Analysis of Results

In this section we present and analyse our empirical findings. Table 2 presents results based on Model (1), for the years 2020 (Panel A) and 2021 (Panel B). We examine whether holding the portfolio of female-led firms yields higher $alpha$ (or α) than holding the portfolio of male-led firms. The portfolio maintains zero investment by employing the strategy of investing in the male portfolio and selling off the female portfolio. These strategies yield daily returns that are then regressed on standard factor return series. A significant α of this zero-investment portfolio conditional on risk factors will signal whether CEO gender has an influence on firm stock return. We present the results of the zero-investment portfolio in Col. 3 accompanied by the portfolio of male-headed firms and the portfolio of female-headed firms in Col. 1 and Col. 2, respectively. Despite the low R-square in Col. 3 of Panel A, attributed to the striking similarity in year 2020 between portfolios of male- and female-headed firms in their exposure to the risk factors (i.e., their βs), the time series regression of the zero-investment portfolio identifies insignificant difference between the alphas of the two portfolios (female outperformance 0.0045% daily). Hence, these results provide support for the insignificant effect of the CEO gender on stock returns. In Panel B, the 2021 evidence consistently supports the insignificant effect of the CEO gender, although the zero-investment portfolio is somewhat exposed to the size and value factors.

Table 2: Time-series regressions of daily returns (%) in zero-investment portfolio (long male-headed firms; short female-headed firms)

Panel A	(1) Portfolio of male-headed firms Jan-Dec, 2020	(2) Portfolio of female-headed firms Jan-Dec, 2020	(3) Zero-Investment Portfolio Jan-Dec, 2020
Alpha	0.034194*	0.03868	-0.004482
	(0.019782)	(0.02998)	(0.021299)
Market-Rf	1.03188***	1.03724***	-0.005359
(VWRF)	(0.009633)	(0.0146)	(0.010372)
Size	0.646344***	0.63937***	0.006969
(SMB)	(0.022808)	(0.03456)	(0.024557)
Value	0.468773***	0.45725***	0.011524
(HML)	(0.025511)	(0.03866)	(0.027468)
Momentum	-0.066409***	-0.08663***	0.020225
(UMD)	(0.019089)	(0.02893)	(0.020553)
Sample size	253	253	253
Adj R-sq	0.988	0.9731	0.0081
Panel B	**(1) Portfolio of male-headed firms Jan-Dec, 2021**	**(2) Portfolio of female-headed firms Jan-Dec, 2021**	**(3) Zero-Investment Portfolio Jan-Dec, 2021**
Alpha	-0.009336	0.02584	-0.03518
	(0.015859)	(0.02616)	(0.02779)
Market-Rf	1.106132***	1.07078***	0.03535
(VWRF)	(0.021581)	(0.03559)	(0.03781)
Size	0.572316***	0.46198***	0.11033***
(SMB)	(0.021708)	(0.0358)	(0.03803)
Value	0.412217***	0.30008***	0.11213***
(HML)	(0.014501)	(0.02392)	(0.02541)
Momentum	-0.092049*	-0.11347***	0.02143
(UMD)	(0.018834)	(0.03106)	(0.033)
Sample size	252	252	252
Adj R-sq	0.9592	0.8739	0.1196

Note: Market return is measured as an excess return of CRSP-weighted index minus the one-tenth Treasury rate. Size, Value, Momentum are factor returns extracted from Kenneth French's website. Standard errors in parentheses. Statistical Significance: *p<10%; **p<5%; ***p<1%.

In Table 3, based on Model (2), we report regressions in the cross-section for the firms' mean daily excess returns on firms' betas for a given year. The betas of firm i are estimated from daily returns of the same year. The coefficient of the CEO_Gender in Table 3 is statistically insignificant to explain the cross-sectional variation in mean daily returns during the pandemic. It must be noted, that in terms of the other coefficients, by looking at the 2020 returns (Col. 1), we observe a significantly positive market risk premium, while for 2021 a significantly negative market risk premium (-45.67%). The positive and negative signs of the market risk premia in the two years are robust to regressions using either the betas estimated in daily or in weekly frequency (not reported). While the actual market risk

premium in 2021 is positive, the negative value we estimate implies an empirical rejection of the Fama-French model in 2021.

Table 3: Cross-sectional regressions of firm mean daily excess returns on firm betas

	(1) 2020 mean returns (on 2020 Betas)	(2) 2021 mean returns (on 2021 Betas)
Alpha	-0.03879 (0.06579)	0.65372*** (0.06329)
CEO_Gender	-0.03281 (0.05050)	-0.01089 (0.05327)
Beta-Market (VWRF)	0.36221*** (0.04666)	-0.45665*** (0.03262)
Beta-Size (SMB)	0.12323*** (0.01763)	0.18343*** (0.02093)
Beta-Value (HML)	-0.21760*** (0.02163)	0.28383*** (0.02611)
Beta- Momentum (UMD)	0.34763*** (0.02748)	0.68206*** (0.05169)
Sample size	1314	1451
Adj R-sq	0.1726	0.2905

Note: The dependent variable is the mean daily excess returns. CEO_gender is a dummy variable that assumes the value of 1 when the CEO is a male and 0 otherwise. The cross-sectional regressions of firms' mean daily excess returns on firm betas generate coefficients representing daily risk premiums. For presentational purposes, the coefficients are then multiplied by 252 for conversion into yearly risk premia. Standard errors in parentheses. Statistical significance: *p<10%; **p<5%; ***p<1%.

Overall, when the four-factor model adequately accounts for the cross-sectional variations in mean returns, the estimated (market, size, value, and momentum) risk premia should be quite close to the actual. That is not the case in our Table 3, particularly for the year 2021. Nevertheless, the Fama-French model focuses on explaining variations in long-term expected returns rather than variations in short-term mean returns (Roll & Ross, 1994; Blitz & Hanauer, 2023). It should be of no surprise that the multifactor model fails for a duration as short as one year. Yet, since the betas are correctly estimated, the outcomes in Table 3 are still valid for identifying insignificant effects of CEO gender on firm return in 2020 and 2021.

The output of Table 4 is based on Model (3) and shows results of regressing yearly Fama-French-adjusted (abnormal) returns on firms' CEO_gender and other firm characteristics. Col. (1) and (2) refer to the year 2020 and Col. (3) and (4) refer to the year 2021. Col. (1) and (3) use CEO_gender as the only independent variable, while in Col. (2) and (4) we add firm controls as independent variables. All specifications include industry fixed effects. Standard errors are robust to heteroscedasticity. According to our results, the gender of the CEO is not significant to explain abnormal stock returns, and this continues to be the case after including firm controls.

Table 4: Cross-sectional regressions of yearly 2020-2021 Abnormal Returns (%)

	(1) Abnormal Returns 2020	(2) Abnormal Returns 2020	(3) Abnormal Returns 2021	(4) Abnormal Returns 2021
CEO_gender	0.211 (5.675)	-1.223 (6.510)	3.495 (6.619)	1.4666 (8.0895)
Profitability		14.213*** (4.730)		-0.1512 (3.5207)
ROE		-0.035 (1.090)		1.7670 (2.9525)
Leverage		38.017*** (8.795)		-21.5571* (12.6474)
Cash Ratio		-1.295*** (0.465))		-1.3610 (1.2020)
Size		-11.201*** (2.605)		-4,1673 (3.2352)
Advertising		21.474 (40.612)		-48.0324 (62.4336)
Constant	27.492*** (10.550)	27.383 (16.995)	28.432*** (9.708)	52.0550*** (15.9752)
Industry FE	Yes	Yes	Yes	Yes
Obs.	1314	1037	1357	1089
Adj R-square	0.068	0.081	0.04329	0.03445
Residual Std. Error	47.728 (df = 1304)	49.19 (df = 1021)	59.59 (df = 1331)	65.02 (df = 1058)
F-Stat	11.657*** (df = 9; 1304)	7.09*** (df = 15; 1021)	3.454*** (df = 25; 1331)	2.294*** (df = 30; 1058)

Note: Data is from COMPUSTAT (CAPITAL IQ) and EXECUCOMP databases. We use OLS regressions. The dependent variable is the yearly abnormal returns. CEO_gender is a dummy variable that assumes the value of 1 when the CEO is a male and 0 otherwise. Control characteristics include Profitability, ROE, Leverage, Cash Ratio, Size and Advertising. We control for industry fixed effects. Standard errors in parentheses. Statistical Significance: *p<10%; **p<5%; ***p<1%.

Next, we examine if the CEO's gender is effective to explain the firm's operating performance. Our cross-sectional regressions are presented in Table 5 and are based on Model (3). Operating performance is measured by ROA in Col. (1) and (2), by the Gross Profit Margin (GPM) in Col. (3) and (4) and by the Growth of Sales (GSA) in Col. (5) and (6). Holding all other variables constant, operating performance does not increase significantly if the company is led by a female CEO as opposed to a male CEO, according to the insignificant coefficient of CEO_Gender in all specifications. These results contradict with the findings by Khan and Vieito (2013), according to which female CEOs impact positively firm performance. However, in the paper of Khan and Vieito (2013) a Size component is included, specified using principal component analysis and is a function of three factors (Assets, Sales, and Firm Market Value).

Table 5: Cross-sectional regressions of accounting performance

	(1) ROA 2020	(2) ROA 2021	(3) GPM 2020	(4) GPM 2021	(5) GSA 2020	(6) GSA 2021
CEO_gender	-0.004806 (0.01036)	-0.0068043 (0.0121049)	0.041486 (0.028501)	0.013653 (0.037099)	0.013214 (0.033426)	0.10122 (0.12257)
Profitability	0.1778*** (0.007315)	0.064875*** (0.0052818)	0.912689*** (0.020118)	0.489678*** (0.016318)	0.041006* (0.023594)	0.02024 (0.04791)
Debt-to-Asset	0.03632*** (0.01012)	0.041127*** (0.01462)	0.028861 (0.027820)	0.032445 (0.044911)	-0.091588*** (0.032628)	-0.16855 (0.13771)
Cash ratio	0.001917** (0.0007468)	0.0019171 (0.001828)	0.002434 (0.002054)	-0.002221 (0.005602)	0.005600** (0.002409)	-0.02833 (0.01750)
Size	0.01231*** (0.003897)	0.025593*** (0.0046943)	-0.084487*** (0.010717)	-0.029786** (0.014386)	-0.048333*** (0.012569)	-0.11197** (0.04502)
Advertising	0.08868 (0.06441)	-0.1360997 (0.0935359)	1.701436*** (0.177159)	1.455337*** (0.287357)	-0.070557 (0.207774)	-0.21490 (0.87933)
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes
Obs.	1092	1135	1092	1135	1080	997
Adj R-square	0.4361	0.2032	0.6922	0.4842	0.0801	0.0316

Note: Data is from COMPUSTAT CAPITAL IQ and EXECUCOMP databases. OLS regressions. The dependent variable ROA is the Net Income before Extraordinary and Discontinued Items. The dependent variable GPM is the Gross Profit Margin, defined as the Gross Profit per Sales. The dependent variable GSA is the Growth of Sales, where Sales (scaled in millions) is defined as gross sales reduced by cash discounts, trade discounts, returned sales, excise taxes, and value-added taxes and allowances for which credit is given to customers. CEO_Gender is a dummy variable that assumes the value of 1 when the CEO is a male and 0 otherwise. We control for industry fixed effects. Standard errors in parentheses. Statistical Significance: *p<10%; **p<5%; ***p<1%.

As an additional robustness check, we use Kolev's (2012) approach. The panel regressions are presented in Table 6 and are based on Model (4). The differential return seems to be insignificant, as reported by the coefficient on CEO_Gender, although female CEOs outperform male CEOs in both years. In Model (4), β_1 measures the market risk of female-led firms, and $(\beta_1 + \beta_2)$ measures the market risk of male-headed firms. The same is true for other risk factors. In Col. (2) and (4), female- and male-led firms' exposure to each risk factor is almost identical to Table 2, a result not surprising given the linear nature of the regressions. Nevertheless, Table 6 accounts for information of individual firms unavailable when returns are averaged across firms, which is the case in Table 2, hence the non-identical standard errors in Tables 2 and 6. The cluster-robust standard errors in Table 6 turn out to be not significantly different from the standard errors in Table 2, suggesting that our findings from Table 2 are reinforced by the findings from Table 6. It becomes evident that Wolfers' (2006) and Kolev's (2012) methodologies produce contrasting findings in long-term data but consistent findings in the short-term period we examine.

Table 6: Panel regressions of daily Stock Returns (%)

	2020		2021	
	(1)	(2)	(3)	(4)
CEO_Gender	-0.0066 (0.0203)	-0.0044 (0.0198)	-0.0296 (0.0291)	-0.0352 (0.0270)
MktRf	1.1718*** (0.0446)	1.0374*** (0.0267)	1.0747*** (0.0465)	1.0708*** (0.0346)
CEO_Gender*MktRf	-0.0058 (0.0151)	-0.0055 (0.0156)	0.0582* (0.0327)	0.0353 (0.0395)
SMB		0.6388*** (0.0416)		0.4620*** (0.0374)
CEO_Gender*SMB		0.0075 (0.0475)		0.1105*** (0.0417)
HML		0.4568*** (0.0470)		0.3001*** (0.0271)
CEO_Gender*HML		0.0120 (0.0298)		0.1122*** (0.0275)
UMD		-0.0871*** (0.0289)		-0.1135*** (0.0330)
CEO_Gender*UMD		0.0206 (0.0214)		0.0214 (0.0356)
Sample size	385184	385184	394666	394666

Note: Cluster-robust standard errors in parentheses. The numbers of clusters (days) are 253 and 252. Statistical Significance: *p<10%; **p<5%; ***p<1%.

4. Conclusion

The impact of COVID-19 on the U.S. stock market was historically unprecedented. Based on a panel of US firms during the pandemic period of 2020-2021, we examine whether firms led by female CEOs exhibited comparable performance relative to firms led by male CEOs. According to our results, during the coronavirus pandemic, firms led by female CEOs are not associated with greater performance than businesses led by male CEOs. Our findings are robust in terms of stock market performance and operating performance.

It is worth mentioning that differences in firm performance between female and male-headed firms may be attributed to the disparity in risk attitudes between female and male CEOs, particularly during the highly disruptive period of the COVID-19 pandemic. The empirical evidence is inconclusive regarding the discrepancy in risk preferences between female and male executives. Some papers support the notion that female executives exhibit more risk aversion than male executives (Barua et al., 2010; Huang and Kisgen, 2013; Liu et al., 2016). Other papers suggest that females and males at top management positions are either similar in terms of risk preferences (Atkinson et al., 2003), or more generally, that there is no support that female executives are more risk-averse than their male counterparts (Doan and Iskandar-Datta, 2020). Given that we do not find substantial variation in performance between female and male-headed firms, the focus now is transferred to how the introduction of a highly disruptive period would affect the risk attitudes between female and male executives. This question is left for future research.

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