Gender Differences in Executives' Corporate Decisions in the Covid-19 Pandemic

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01 Introduction

Motivation ...

- How do female and male executives make decisions differently in response to COVID?
- Are existing gender differences exaggerated or diminished?
- How will these decisions impact firms' future performance?

Our research ...

How gender differences in executives influence corporate decision-making, especially those of American corporations during the COVID-19 pandemic?

02.1 Related Work Pandemic Impacts Global Economy

China ...

- A decline of 6.8% in GDP in the first quarter of 2020, compared to the same period in 2019 [1].
- Significant decrease in the investment scales and total revenue of Chinese firms → negative return rate [1].

Malaysia ...

- Negative impacts on governance structure, dividend, liquidity, leverage, and many other corporate characteristics [2].

→ Will there be gender differences in executives' decision-making during COVID-19?

02.2 Related Work Gender Differences in Executives

Risk-taking:
Female executives tend to prefer less risky decisions, leading to distorted capital allocation [1, 2].

Overconfidence:
Male executives tend to be overconfident when making significant corporate decisions [3].

Innovation:
Having female executives on board is associated with higher level of innovation [4].

→ **There do exist gender differences in corporate decisions.**

02.3 Related Work Measuring Corporate Decisions

Risk-taking [7, 8]

Cash Holdings [9]

$$\frac{Cash\ and\ Marketable\ Securities}{Net\ Assets}$$

Innovation [10]

- input: $\frac{Expenditures\ on\ R\&D}{Book\ Assets}$
- output: # *Patents granted in a given year*
- quality: # *Patent citations*

03.1 Data Executive Characteristics

Collection

- **Database:** ExecuComp
- **Information:** Executive names, age, gender, total compensation for each corporation
- **Time period:** 2016-2021
- **Dataset type:** Panel data
- **Size:** (69528, 10)

Processing

- **Drop** missing observations.
- Take **sum** (executive number), **average** (age, total compensation), **percentage** (female executives) for each company per year.
- Generate new variable *female_dom.*
- Size after processing: (13128, 9)

03.2 Data Corporate Data: dependent & control variables

Collection

- **Database:** Compustat, CRSP
- **Dependent:** Risk-taking (Leverage, Volatility), Cash Holdings, Innovation (R&D)
- **Control:** financial (total assets, sales, liquidity, etc), geographical (state, city), industry
- **Time period:** 2014-2021
- **Dataset type:** Panel data
- **Size:** (75551, 30)

Processing

- **Drop** missing observations
- **Compute** / **Generate** variables following formulas from literature review (02.3)
- **Manually recalculate** volatility on a daily basis by referring to CRSP database, **merge** the result to original dataset from Compustat
- **Winsorize** top and bottom 1% of the distribution for outliers
- **Merge** all sub-datasets by *GVKEY*, **plot** summary stats: (10381, 47)

04.1 Methodology

Regression

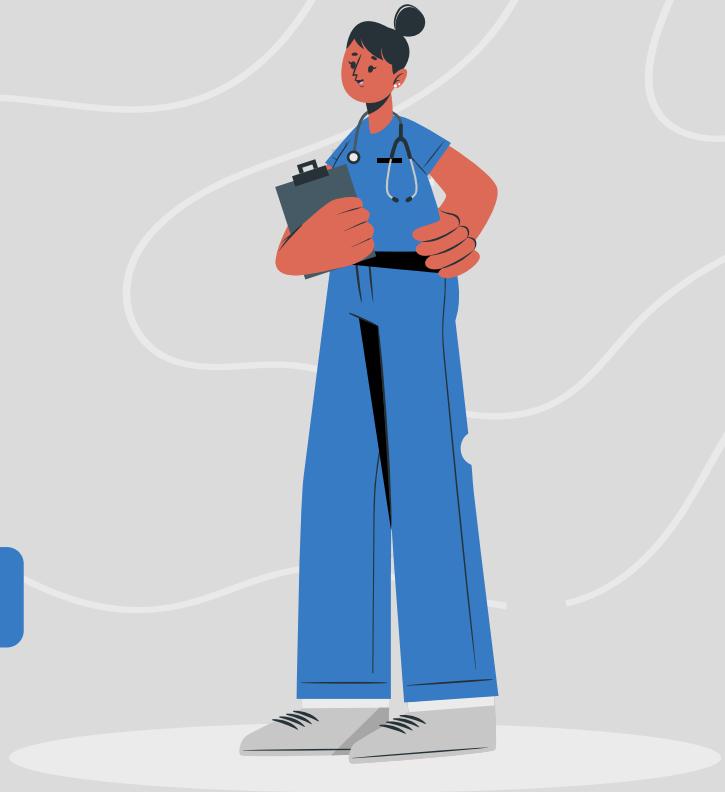
Panel Ordinary Least Squares

Fixed Effects

Fixed Effects: Industry, Year, Politics

Clustered Standard Errors

Year + Company, Year + Industry



04.2 Results Risk-taking

Table 2: Leverage

	Dependent variable:			
	Leverage			
	(1)	(2)	(3)	(4)
post_covid	2.947***	2.947**	3.034***	3.034**
	(0.283)	(1.082)	(0.370)	(1.115)
have_female	−2.644***	−2.644***		
	(0.738)	(0.609)		
pct_female			−10.980***	−10.980***
			(3.126)	(2.670)
log(at)	2.326**	2.326	2.278**	2.278
	(0.971)	(3.980)	(0.964)	(3.948)
log(sale)	1.096	1.096	1.108	1.108
	(0.749)	(3.149)	(0.746)	(3.125)
M&B	0.073	0.073	0.080	0.080
	(0.370)	(0.863)	(0.371)	(0.878)
ppent	−0.225***	−0.225	−0.223***	−0.223
	(0.069)	(0.169)	(0.068)	(0.173)
avg_TDC1	−0.087	−0.087	−0.079	−0.079
	(0.229)	(0.366)	(0.226)	(0.368)
Liquidity_lagged	−0.605***	−0.605***	−0.617***	−0.617**
	(0.213)	(0.124)	(0.211)	(0.178)
avg_age	−0.537***	−0.537***	−0.544***	−0.544***
	(0.099)	(0.136)	(0.099)	(0.142)
ROE	−1.891***	−1.891**	−1.897***	−1.897**
	(0.660)	(0.765)	(0.653)	(0.763)
post_covid * have_female	3.457***	3.457***		
	(0.449)	(0.863)		
post_covid * pct_female			13.540***	13.540***
			(2.396)	(2.900)
Industry Fixed Effects	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes
Politics Fixed Effects	Yes	Yes	Yes	Yes
Clustered Standard Errors	Company + Year	Industry + Year	Company + Year	Industry + Year
Observations	10,356	10,356	10,356	10,356
R^2	0.153	0.153	0.154	0.154
Adjusted R^2	0.151	0.151	0.152	0.152
Residual Std. Error (df = 10326)	19.927	19.927	19.913	19.913
Note:				*p<0.1; **p<0.05; ***p<0.01

Table 3: Stock price volatility

	Dependent variable:			
	prccd_var			
	(1)	(2)	(3)	(4)
post_covid	151.079***	151.079***	160.495***	160.495***
	(26.281)	(29.198)	(23.135)	(27.979)
have_female	−10.979	−10.979		
	(14.002)	(21.315)		
pct_female			−50.682	−50.682
			(40.554)	(55.593)
log(at)	53.026***	53.026**	52.841***	52.841**
	(17.258)	(18.021)	(17.277)	(18.069)
log(sale)	−6.714	−6.714	−6.490	−6.490
	(11.183)	(13.832)	(11.014)	(13.948)
M&B	114.256***	114.256***	114.371***	114.371***
	(30.908)	(27.549)	(30.995)	(27.617)
ppent	0.628	0.628	0.621	0.621
	(2.508)	(2.851)	(2.513)	(2.618)
avg_TDC1	6.965	6.965	6.962	6.962
	(7.326)	(6.358)	(7.345)	(6.392)
Liquidity_lagged	6.147	6.147	6.053	6.053
	(5.597)	(3.710)	(5.566)	(3.257)
avg_age	−4.357**	−4.357*	−4.483**	−4.483**
	(1.859)	(1.813)	(1.843)	(1.755)
ROE	−2.923	−2.923	−2.878	−2.878
	(14.371)	(12.967)	(14.245)	(13.306)
post_covid * have_female	6.845	6.845		
	(24.134)	(10.251)		
post_covid * pct_female			−32.919	−32.919*
			(33.179)	(14.859)
Industry Fixed Effects	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes
Politics Fixed Effects	Yes	Yes	Yes	Yes
Clustered Standard Errors	Company + Year	Industry + Year	Company + Year	Industry + Year
Observations	10,355	10,355	10,355	10,355
R^2	0.175	0.175	0.175	0.175
Adjusted R^2	0.173	0.173	0.173	0.173
Residual Std. Error (df = 10325)	473.928	473.928	473.868	473.868
Note:				*p<0.1; **p<0.05; ***p<0.01

- **All companies increase their leverage, but companies with more female executives increase more.**
- **Stock price volatility increases for all companies, but companies with more female executives increase less.**

04.3 Results Cash Holdings & Innovation

Table 4: Cash Holdings

	Dependent variable:			
	CashHolding			
	(1)	(2)	(3)	(4)
post_covid	−0.005**	−0.005	−0.006***	−0.006
	(0.002)	(0.010)	(0.002)	(0.011)
have_female	0.009**	0.009*		
	(0.004)	(0.004)		
pct_female			0.037**	0.037*
			(0.016)	(0.019)
log(at)	−0.030***	−0.030**	−0.030***	−0.030**
	(0.004)	(0.012)	(0.004)	(0.012)
log(sale)	−0.011**	−0.011	−0.012**	−0.012
	(0.005)	(0.018)	(0.005)	(0.018)
M&B	0.023***	0.023***	0.023***	0.023***
	(0.003)	(0.004)	(0.003)	(0.004)
ppent	0.002***	0.002**	0.002***	0.002**
	(0.0003)	(0.001)	(0.0003)	(0.001)
avg_TDC1	0.010***	0.010***	0.010***	0.010***
	(0.001)	(0.002)	(0.001)	(0.002)
Liquidity_lagged	−0.004**	−0.004	−0.004**	−0.004
	(0.002)	(0.003)	(0.002)	(0.003)
avg_age	0.001	0.001	0.001	0.001
	(0.001)	(0.001)	(0.001)	(0.001)
ROE	−0.001	−0.001	−0.001	−0.001
	(0.003)	(0.003)	(0.003)	(0.003)
post_covid * have_female	−0.008***	−0.008*		
	(0.003)	(0.003)		
post_covid * pct_female			−0.029***	−0.029**
			(0.009)	(0.012)
Industry Fixed Effects	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes
Politics Fixed Effects	Yes	Yes	Yes	Yes
Clustered Standard Errors	Company + Year	Industry + Year	Company + Year	Industry + Year
Observations	10,356	10,356	10,356	10,356
R^2	0.377	0.377	0.377	0.377
Adjusted R^2	0.375	0.375	0.376	0.376
Residual Std. Error (df = 10326)	0.121	0.121	0.121	0.121
Note:				*p<0.1; **p<0.05; ***p<0.01

Table 5: R&D Expenditure

	Dependent variable:			
	R_D			
	(1)	(2)	(3)	(4)
post_covid	−0.011***	−0.011***	−0.011***	−0.011***
	(0.001)	(0.003)	(0.0004)	(0.002)
have_female	−0.003	−0.003		
	(0.002)	(0.002)		
pct_female			−0.012**	−0.012
			(0.006)	(0.008)
log(at)	−0.00000	−0.00000	−0.0001	−0.0001
	(0.001)	(0.003)	(0.001)	(0.003)
log(sale)	−0.009***	−0.009*	−0.009***	−0.009*
	(0.001)	(0.004)	(0.001)	(0.004)
M&B	0.005***	0.005**	0.005***	0.005**
	(0.001)	(0.002)	(0.001)	(0.002)
ppent	0.0004***	0.0004**	0.0004***	0.0004**
	(0.0001)	(0.0001)	(0.0001)	(0.0001)
avg_TDC1	0.002***	0.002	0.002***	0.002
	(0.0004)	(0.001)	(0.0004)	(0.001)
Liquidity_lagged	−0.004***	−0.004*	−0.004***	−0.004*
	(0.001)	(0.002)	(0.001)	(0.002)
avg_age	0.0003	0.0003	0.0002	0.0002
	(0.0002)	(0.0004)	(0.0002)	(0.0004)
ROE	−0.003**	−0.003	−0.003**	−0.003
	(0.001)	(0.002)	(0.001)	(0.002)
post_covid * have_female	0.004***	0.004***		
	(0.001)	(0.001)		
post_covid * pct_female			0.012***	0.012***
			(0.003)	(0.002)
Industry Fixed Effects	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes
Politics Fixed Effects	Yes	Yes	Yes	Yes
Clustered Standard Errors	Company + Year	Industry + Year	Company + Year	Industry + Year
Observations	10,356	10,356	10,356	10,356
R^2	0.317	0.317	0.318	0.318
Adjusted R^2	0.315	0.315	0.316	0.316
Residual Std. Error (df = 10326)	0.038	0.038	0.038	0.038
Note:				*p<0.1; **p<0.05; ***p<0.01

All companies decrease their cash holdings, but companies with more female executives decrease more.

All companies decrease their spendings on Research and Development, but companies with more female executives decrease less.

05 Discussion

Implications ...

- Policymaking → tailored policy
- Management → gender diversity
- Social → anti-discrimination

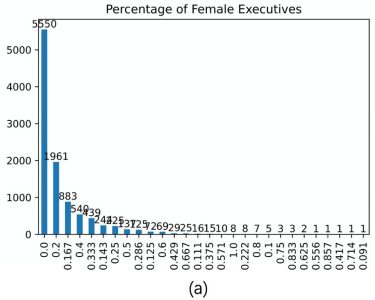
Future work ...

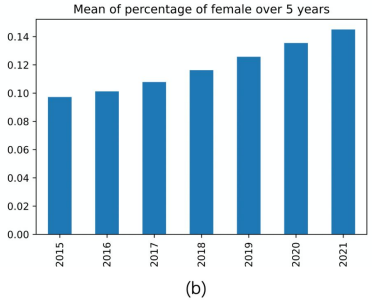
- Mechanism: reasons behind patterns?
- Hypothesis testing
- Causal inference

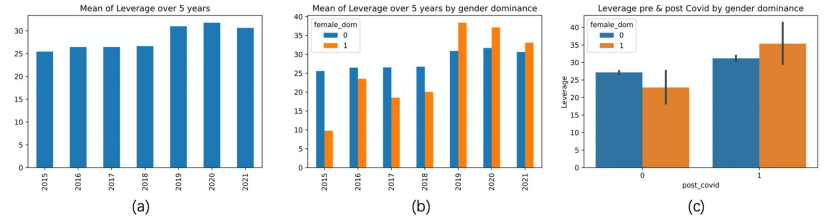
Appendix Tables, Figures

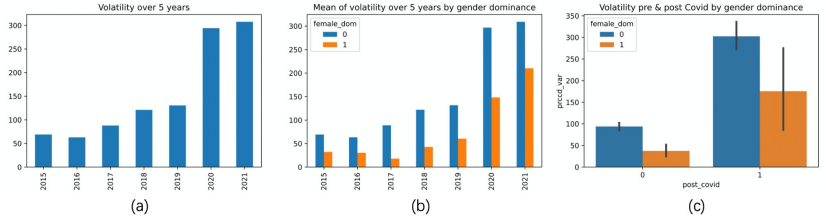
Table 1: Summary Statistics after Winsorizing

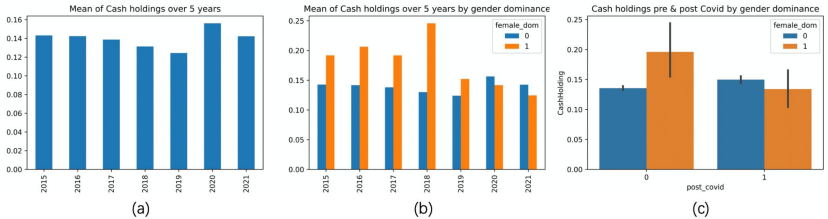
Statistic	N	Mean	St. Dev.	Min	Max
at	10,381	14,066.830	33,459.050	65.422	237,532.600
sale	10,381	8,046.880	24,592.940	0.000	556,933.000
M&B	10,381	2.135	1.616	0.658	9.982
ppent	10,381	3.209	8.224	0.0004	53.918
avg_TDC1	10,381	3.423	2.910	0.305	16.687
liquidity	10,315	4.490	239.198	−465.200	22,155.250
avg_age	10,381	54.435	3.983	44	65
ROE	10,381	0.076	0.615	−3.331	3.121
xrd	10,381	382.434	1,227.858	0.000	31,562.000
CashHolding	10,381	0.140	0.155	0.001	0.729
Leverage	10,381	28.160	21.642	0	101
prccd_var	10,380	145.453	520.497	0.147	4,250.613
R&D	10,381	0.047	0.046	0.000	0.291
politics	10,381	0.816	0.687	0	2
have_fem	10,381	0.465	0.499	0	1
pct_female	10,381	0.117	0.148	0	1

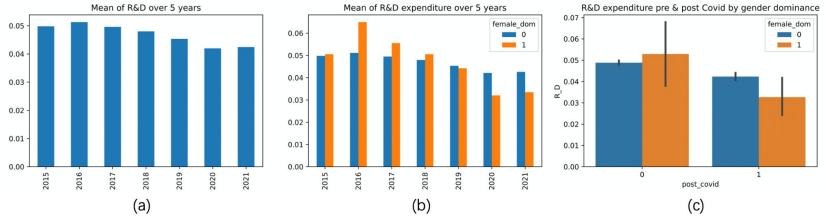












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