







How Did Small Business Respond to Unexpected Shocks? Evidence from a Natural Experiment in China

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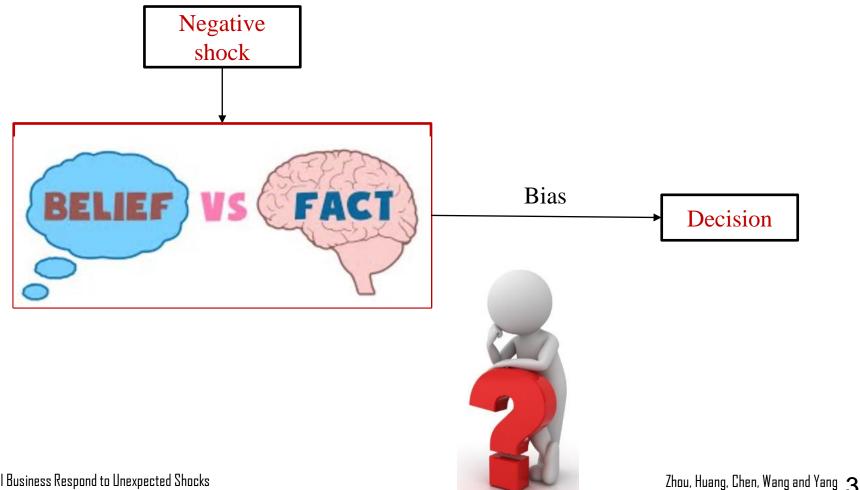
Bank of Finland/Renmin University of China Conference on "Chinese path to modernization"

Belief Update for Negative information

- For beliefs we self-identify with, belief updating is dictated by the a psychological immune system, where counter-attitudinal information is seen not just as any new evidence but as a deep psychological threat. (Gilbert, Pinel, Wilson, Blumberg, & Wheatley, 1998; Mandelbaum, 2019).
- The psychological immune system functions to protect our core beliefs, the ones that make up our sense of who we are (such as the belief that one is a good person, a smart person, and a dependable person).
- > The immune system also works proactively. When it comes to information gathering, people tend to engage in selective exposure to information. They seek out information that is concordant with their beliefs and avoid information that is discordant with them (Brock & Balloun, 1967).

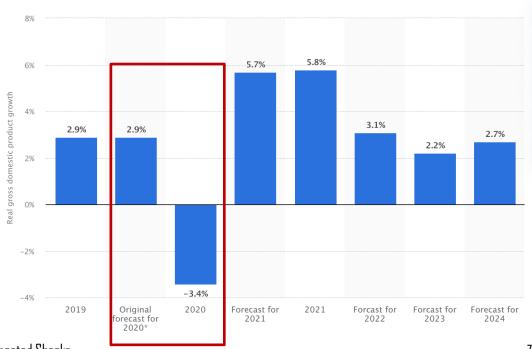
Research Question?

•**Do** managerial belief matter quantitatively during unexpected negative shock? And Do they create significant distortions in firm-level decisions that may further exacerbate and contribute to aggregate inefficiency?



Negative shock setting-Covid-19

- The COVID-19 pandemic has caused enormous damage to global economies and firm values (Bao and Huang, 2021; Bonaccorsi et al., 2020; Fisman et al., 2021; Miocevic, 2022; Montserin et al., 2021; Josephson et al., 2021; Pusceddu et al., 2021; Sheridan et al., 2020).
- In 2020, global Gross Domestic Product (GDP) decreased by 3.4 percent, while the forecast initially was 2.9 percent GDP growth.



Why SMEs?

■Important of SMEs

- ■SMEs represent over 90% of the business population, 60-70% of employment and 55% of GDP in developed economies. In emerging markets, most formal jobs are generated by SMEs, which create 7 out of 10 jobs. (World Trade Organization)
- ■The number of small and medium-sized enterprises nationwide reached 48 million, an increase of 2.7 times over the end of 2012. SMEs are the largest and most dynamic group of enterprises, becoming the main force of China's economic and social development. (人民日报,2022)

■Vulnerable to COVID-19

■SMEs are particularly vulnerable to the impact of the Covid-19 crisis. 1.4 million to 2.1 million of them (25 to 36 percent) could close permanently as a result of the disruption from just the first four months of the COVID-19 pandemic. (Mckinsey&Company)

Conclusion

- Before the pandemic, the overall managerial beliefs are consistent with the actual business conditions. At the peak of the pandemic, managers are over-optimistic and tend to underestimate the negative impacts; during the weakened stage, they are over-pessimistic and underestimate the firms' growth after the operation and production resumption.
- The pandemic influences managerial biases temporarily, and managerial beliefs return to normal when the pandemic is under control.
- The existence of moderates, the anchoring effect, and government policy support may explain the alternations of managerial biases during the pandemic.
- Managerial biases may influence the managers' labor market and investment decisions, leading to aggregate economic inefficiency.

Contribution on literature

Belief bias

- Historical managerial expectations positively relate to forecasting errors in macroeconomics due to informational frictions.(Coibion and Gorodnichenko, 2015)-Extrapolate
- Overreaction in macro and financial variables at the individual level among professional forecasters (Bordalo et al., 2019, 2020a)
- We show significant underreaction to new information in managerial beliefs during unexpected negative shocks

Belief and decision

- The existence of managerial biases and quantified their impacts on corporate investment, capital structure, and firm value (Ben David et al., 2013; Hirshleifer et al., 2012; Landier and Thesmar, 2020; Gennaioli et al., 2016).
- We document how managerial biases matter quantitatively during an unexpected negative shock and what significant distortions may result in firm-level decisions.

SME

We provide a detailed understanding of subjective managerial beliefs, objective firm balance sheets, and income statements for small businesses in developing countries.

Our Survey Data

>	Our data on i the People's									Head Office of
>	It covers the China effecti fourth quarte	Survey a	8. For the cu	nalysis	r company		Statisti	ics and Analys	is Departmen	eriod when 2019 to the
	Over the surveurrent busin access to gov		2. Equipment c prises fill, %) 3. Operating in 4. Operating co	apacity utilization (c come (million yuan) ost (million yuan) ofit (million yuan)						n, belief in of loans, and
>	The survey d	*9. During the period of <u>Sep</u> estimate your company's fi	ember to Novembe		at would you	10. Looking <u>ahead</u> , what we next quarter?	ould you estimate y	our company's financ	ial performance in	spects: a focus
	on belief in c firm, a quarte broad covera	Operating profit (quarter on quarter) Number of employees (quarter on quarter) Labor cost per capita (quarter on quarter) Domestic order (quarter on quarter) Foreign order (quarter on quarter)	Better (increasing, rising)	Fair (flat, no change)	Poor(decrease)	Operating profit (quarter on quarter) Number of employees (quarter on quarter) Labor cost per capita (quarter on quarter) Domestic order (quarter on quarter) Foreign order (quarter on quarter)	Better (Increasing, rising)	Fair (flat, no change)	Poor(decrease)	dent's own period and

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Research Model

$$Bias_{i,t} = \delta_0 + \delta_1 Outbreak_t + \delta_2 Weaken_t + \delta_3 Controlled_t + \beta X_{i,t} + \theta_i + \varepsilon_{i,t}, \tag{1}$$

Dependent Variables:

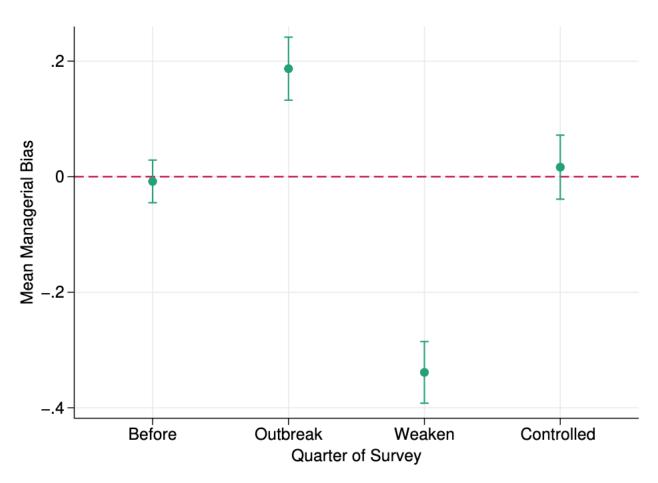
- ➤ Bias = Subjective Objective (Belief Fact)
- Subjective(Belief): manager's subjective belief on operating conditions.
- > Objective(Fact): objective operating conditions regarding the actual rate of change in firms' operating profits. Given that the respondent may not be able to perceive small changes in operating profit, we define an interval [-a%, a%], where a is the threshold value.

Independent Variables:

Proxies for the peak (2020Q1), weakened (2020Q2), and controlled (2020Q3), stages of the COVID-19 pandemic: Outbreak, Weaken, Controlled

Baseline Results

Managerial biases across time



Baseline Results

- The coefficient of *Outbreak* is significantly positive, and the coefficient of *Weaken* is significantly negative, suggesting that managers may underreact when facing the pandemic and overreact to the negative sign of the pandemic on firm performance.
- Moreover, this shift is temporary; the impact of the pandemic on managerial biases disappears when the pandemic is under control.

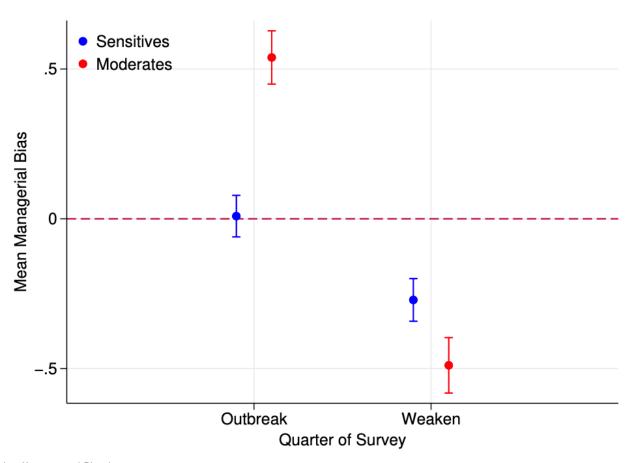
		$\begin{array}{c} \text{Dependent Variable:} \\ Bias \end{array}$							
	(1)	(2)	(3)	(4)	(5)	(6)	$ \begin{array}{c} (7) \\ a = 5 \text{ for} \end{array} $		
		a = 10		a = 20	a = 30	a = 40	above median $a = 10$ for above median		
Outbreak	0.183***	0.187***	0.182***	0.213***	0.216***	0.213***	0.180***		
Weaken	(2.659) -0.353***	(2.715) -0.351***	(2.614) -0.349***	(2.988) -0.333***	(2.945) -0.349***	(2.871) -0.355***	(2.591) $-0.34***$		
	(-4.848)	(-4.810)	(-4.759)	(-4.582)	(-4.804)	(-4.863)	(-4.633)		
Controlled	0.021	0.023	0.027	0.031	0.004	0.015	0.017		
	(0.301)	(0.333)	(0.391)	(0.466)	(0.065)	(0.221)	(0.248)		
Debts/Assets		0.136	0.128	0.120	0.109	0.109	0.121		
		(1.622)	(1.508)	(1.429)	(1.290)	(1.313)	(1.425)		
Revenues/Assets		0.013	0.012	0.012	0.014*	0.015**	0.013		
		(1.630)	(1.480)	(1.583)	(1.909)	(2.087)	(1.640)		
Loan			0.151**	0.148**	0.142**	0.160**	0.144**		
			(2.187)	(2.103)	(1.992)	(2.219)	(2.113)		
Policy			-0.064	-0.062	-0.066	-0.057	-0.049		
			(-1.247)	(-1.201)	(-1.283)	(-1.111)	(-0.935)		
Industry Dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes		
Firm Clustered	Yes	Yes	Yes	Yes	Yes	Yes	Yes		
Observations	1,776	1,776	1,776	1,776	1,776	1,776	1,776		
Pseudo \mathbb{R}^2	0.012	0.013	0.014	0.014	0.015	0.016	0.014		

How does COVID-19 affect managerial beliefs?-The

existence of moderates

Managers may differ in their ability to obtain and learn from new information (Ghaderi et al., 2022; M'obius et al., 2022; Zimmermann, 2020).

Managerial biases for sensitives and moderates groups



How does COVID-19 affect managerial beliefs?-The

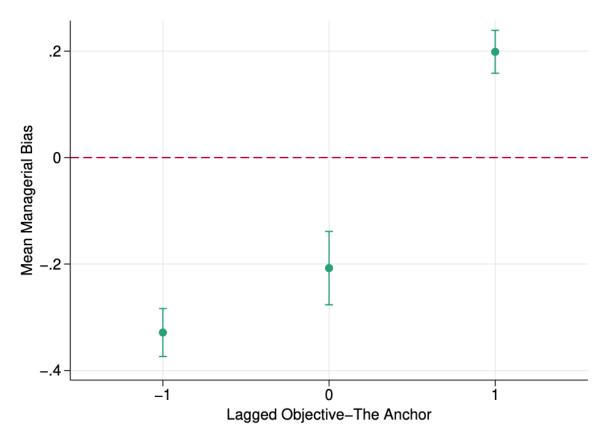
existence of moderates

- Moderates may not promptly adjust to the large fluctuations in the actual operating conditions driven by the pandemic, while sensitives may alter their beliefs about firms' performance based on new information.
- > Therefore, the shift in managerial biases should be larger for the moderates compared to the sensitives after the pandemic.

	Dependent Variable: $Bias$					
	(1)	(2)	(3)	(4)		
Outbreak	0.218***	0.026	0.046	0.922***		
	(2.619)	(0.280)	(0.476)	(4.879)		
Weaken	-0.276***	-0.248**	-0.234**	-0.498**		
	(-3.133)	(-2.376)	(-2.212)	(-2.547)		
Controlled	0.049	0.060	0.079	0.088		
	(0.604)	(0.736)	(0.777)	(0.512)		
$Mid \times Outbreak$		0.662***				
		(4.903)				
$Mid \times Weaken$		-0.106				
		(-0.741)				
Mid		-0.130				
		(-1.548)				
Debts/Assets	0.083	0.080	0.022	0.229		
	(0.829)	(0.796)	(0.193)	(0.969)		
Revenues/Assets	0.022**	0.022**	0.028**	0.017		
	(2.355)	(2.366)	(2.109)	(0.847)		
Loan	0.105	0.121	0.138	0.079		
	(1.274)	(1.467)	(1.328)	(0.449)		
Policy	-0.022	-0.029	0.025	-0.207		
	(-0.361)	(-0.456)	(0.336)	(-1.476)		
Industry Dummies	Yes	Yes	Yes	Yes		
Firm Clustered	Yes	Yes	Yes	Yes		
Observations	1.289	1.289	883	406		
Sample	All saı	mples	Sensitives	Moderate		
Pseudo R^2	0.016	0.022	0.015	0.120		

How does COVID-19 affect managerial beliefs?-The anchoring effect under imperfect information

- > Based on current and past information, managers update their beliefs on firms' operating conditions and may extrapolate beliefs formed in the past (Charness et al., 2021; Gennaioli et al., 2016; Bordalo et al., 2019).
- ➤ However, such updating often leads to biases in managerial beliefs if the information is imperfect (Bordalo et al., 2020b; Barrero, 2022)



How does COVID-19 affect managerial beliefs?-The

anchoring effect under imperfect information

- Our results indicate that for firms with good (poor) objective operating conditions in the previous period, their managers tend to be more optimistic (pessimistic).
- The coefficients of *Outbreak*. and Weaken are insignificant for sensitives samples, implying that the effect of anchoring on managerial biases is more salient for sensitives.

	Dependent Variable: $Bias$						
	(1)	(2)	(3)	(4)			
Outbreak	0.162*	0.232***	0.195**	0.000			
	(1.862)	(2.808)	(2.359)	(0.004)			
Weaken	-0.108	-0.270***	-0.127	-0.109			
	(-1.138)	(-3.083)	(-1.411)	(-0.985)			
Controlled	-0.016	0.051	-0.042	-0.010			
	(-0.195)	(0.627)	(-0.512)	(-0.093)			
$Objective_{i,t-1}$	0.186***		0.259^{***}	0.252***			
	(3.693)		(7.322)	(5.682)			
$Objective_{i,t-1} \times Outbreak$	0.169*						
	(1.937)						
$Objective_{i,t-1} \times Weaken$	0.134						
	(1.554)						
Debts/Assets	0.096	0.083	0.105	0.034			
	(0.981)	(0.853)	(1.077)	(0.288)			
Revenues/Assets	0.020**	0.022**	0.021**	0.026*			
	(1.990)	(2.330)	(2.022)	(1.799)			
Loan	0.095	0.101	0.096	0.127			
	(1.131)	(1.227)	(1.153)	(1.225)			
Policy	-0.020	-0.023	-0.027	0.021			
	(-0.324)	(-0.377)	(-0.436)	(0.279)			
Industry Dummies	Yes	Yes	Yes	Yes			
Firm Clustered	Yes	Yes	Yes	Yes			
Observations	1,301	1,301	1,301	883			
Sample		All samples		Sensitives			
Pseudo R^2	0.033	0.017	0.032	0.028			

How does COVID-19 affect managerial beliefs?-The

anchoring effect under imperfect information

The gap between anchor and target is associated with the change in managerial biases during

the pandemic.

	Dependent Variable: $Bias$						
	(1)	(2)	$\frac{aas}{(3)}$	(4)			
$Objective_{i,t-1}$	0.122**	0.161**	0.015	0.040			
0 0,0 1	(2.397)	(2.489)	(0.191)	(0.386)			
$Objective_{i,t-1} \times Above$	0.260***	0.180**	,	, ,			
, , , , , , , , , , , , , , , , , , ,	(4.023)	(2.167)					
Above	-0.006	-0.022					
	(-0.089)	(-0.257)					
$Objective_{i,t-1} \times Decrease$			0.323***	0.299**			
			(2.712)	(2.072)			
$Objective_{i,t-1} \times Increase$			0.288***	0.239*			
			(2.778)	(1.792)			
Outbreak	0.204**	0.003	0.207**	0.014			
	(2.443)	(0.034)	(2.492)	(0.144)			
Weaken	-0.128	-0.105	-0.130	-0.108			
	(-1.394)	(-0.931)	(-1.427)	(-0.957)			
Controlled	-0.033	-0.006	-0.026	0.002			
	(-0.400)	(-0.057)	(-0.315)	(0.022)			
Debts/Assets	0.112	0.040	0.106	0.042			
	(1.084)	(0.327)	(1.031)	(0.340)			
Revenues/Assets	0.019*	0.023	0.021**	0.025*			
	(1.925)	(1.631)	(2.077)	(1.811)			
Loan	0.097	0.124	0.102	0.126			
	(1.162)	(1.200)	(1.224)	(1.221)			
Policy	-0.021	0.031	-0.025	0.029			
	(-0.326)	(0.400)	(-0.396)	(0.371)			
Industry Dummies	Yes	Yes	Yes	Yes			
Firm Clustered	Yes	Yes	Yes	Yes			
Observations	1,301	883	1,301	883			
Sample	All samples	Sensitives	All samples	Sensitives			
Pseudo R^2	0.036	0.030	0.036	0.031			

How does COVID-19 affect managerial beliefs?-The role of policy and loan support.

The vital role of policy intervention and support during the pandemic or other external shocks.

	$\begin{array}{c} \text{Dependent Variable:} \\ Negative \end{array}$					
	(1)	(2)	(3)	(4)		
$\overline{Policy \times Outbreak}$	0.320	-0.437*				
	(0.925)	(-1.886)				
$Policy \times Weaken$	-0.196	-0.317				
	(-0.560)	(-1.429)				
$Loan \times Outbreak$			-0.483	-0.176		
			(-0.948)	(-0.586)		
$Loan \times Weaken$			-0.441	-0.008		
			(-0.946)	(-0.026)		
Outbreak	-1.073***	-0.052	-0.853***	-0.236*		
	(-4.165)	(-0.305)	(-4.104)	(-1.688)		
Weaken	0.566**	0.352**	0.565***	0.185		
	(2.375)	(2.018)	(2.696)	(1.401)		
Controlled	-0.088	-0.150	-0.098	-0.118		
	(-0.501)	(-1.146)	(-0.559)	(-0.911)		
Loan	-0.064	-0.073	0.087	-0.038		
	(-0.347)	(-0.576)	(0.376)	(-0.209)		
Policy	0.177	0.302**	0.211	0.116		
	(0.998)	(2.250)	(1.491)	(1.204)		
Debts/Assets	-0.225	-0.030	-0.225	-0.017		
	(-0.935)	(-0.202)	(-0.934)	(-0.115)		
Revenues/Assets	-0.017	-0.020	-0.017	-0.020		
	(-0.788)	(-0.990)	(-0.817)	(-0.959)		
Industry Dummies	Yes	Yes	Yes	Yes		
Firm Clustered	Yes	Yes	Yes	Yes		
Observations	406	883	406	883		
Sample	Moderates	Sensitives	Moderates	Sensitives		
Pseudo R^2	0.122	0.031	0.122	0.027		

How does COVID-19 affect managerial beliefs?-The role of policy and loan support.

- > Government financial relief may effectively change managerial belief during the weakened period of the pandemic.
- > Government direct fund support is more effective in adjusting managerial beliefs at the start of the pandemic

		Dependent Variable: $Negative$					
	(1)	(2)	(3)	(4)			
$Policy_Financial \times Outbreak$	-0.333						
	(-1.494)						
$Policy_Financial \times Weaken$	-0.395*						
	(-1.853)						
$Policy_Government \times Outbreak$	k	-0.770*					
		(-1.658)					
$Policy_Government \times Weaken$		-0.354					
		(-1.002)					
$Policy_Loan \times Outbreak$			-0.220				
			(-0.600)				
$Policy_Loan \times Weaken$			-0.001				
			(-0.003)				
$Policy_Other \times Outbreak$				0.354			
				(0.667)			
$Policy_Other \times Weaken$				0.310			
				(0.737)			
Outbreak	-0.132	-0.219	-0.251*	-0.294*			
	(-0.817)	(-1.627)	(-1.875)	(-2.251)			
Weaken	0.377**	0.214	0.185	0.165			
	(2.290)	(1.642)	(1.384)	(1.254)			
Controlled	-0.132	-0.135	-0.116	-0.115			
	(-1.010)	(-1.024)	(-0.879)	(-0.877)			
Policy Financial	0.255*	0.076	0.070	0.072			

Real effects of managerial biases on firm-level outcomes

Quantitatively document how much managerial biases may contribute to the distortions in firm-level decisions and aggregate inefficiency during COVID-19.

	Dependent Variable:						
	Lay	yoff	Investment	t $Reduction$			
	(1)	(2)	(3)	(4)			
Bias	-0.193*		-0.378***				
	(-1.866)		(-4.106)				
Negative		0.545**		0.708***			
		(2.358)		(3.267)			
Debts/Assets	-0.351	-0.347	-0.455	-0.475			
	(-0.982)	(-0.970)	(-1.316)	(-1.370)			
Revenues/Assets	0.002	0.002	0.000	-0.008			
	(0.038)	(0.056)	(0.004)	(-0.226)			
Loan	-0.033	0.013	0.215	0.123			
	(-0.129)	(0.050)	(0.845)	(0.501)			
Policy	0.047	0.036	-0.924***	-1.007***			
	(0.236)	(0.179)	(-4.181)	(-4.564)			
Industry Dummies	Yes	Yes	Yes	Yes			
Firm Clustered	Yes	Yes	Yes	Yes			
Observations	249	249	204	204			
Pseudo \mathbb{R}^2	0.074	0.085	0.209	0.188			

Thank You

Temporary Effect-Data Extension

		Dependent Variable: $Bias$								
	(1)	(2)	(3)	(4)	(5)	(6)	a = 5 for			
		a = 10		a = 20	a = 30	a = 40	above median $a = 10$ for above median			
$\overline{Outbreak}$	0.179***	0.182***	0.177**	0.206***	0.208***	0.204***	0.176**			
	(2.592)	(2.631)	(2.535)	(2.900)	(2.854)	(2.781)	(2.511)			
Weaken	-0.356***	-0.355***	-0.357***	-0.339***	-0.355***	-0.359***	-0.351***			
	(-4.886)	(-4.862)	(-4.865)	(-4.690)	(-4.925)	(-4.988)	(-4.773)			
Controlled	0.019	0.021	0.019	0.023	-0.004	0.006	0.009			
	(0.279)	(0.297)	(0.277)	(0.347)	(-0.060)	(0.092)	(0.137)			
After	0.040	0.036	0.030	0.061	0.069	0.077	0.029			
	(0.586)	(0.532)	(0.435)	(0.895)	(0.990)	(1.092)	(0.420)			
Debts/Assets		0.116	0.100	0.093	0.091	0.091	0.093			
		(1.515)	(1.303)	(1.213)	(1.186)	(1.193)	(1.223)			
Revenues/Assets		0.006	0.006	0.007	0.008	0.008	0.007			
		(0.881)	(0.797)	(0.930)	(1.180)	(1.185)	(0.945)			
Loan			0.131**	0.122*	0.122*	0.129**	0.128**			
			(2.116)	(1.940)	(1.924)	(2.031)	(2.081)			
Policy			-0.005	-0.002	-0.003	0.005	0.011			
			(-0.099)	(-0.047)	(-0.070)	(0.112)	(0.228)			
Industry Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes			
Firm Clustered	Yes	Yes	Yes	Yes	Yes	Yes	Yes			
Observations	$2{,}132$	$2{,}132$	$2{,}132$	$2{,}132$	$2{,}132$	$2{,}132$	$2{,}132$			
Pseudo \mathbb{R}^2	0.012	0.013	0.014	0.014	0.014	0.015	0.013			

Nature of Moderate and Sensitive

Firm-level characteristics and industry composition of moderates and sensitives groups

Panel A: Firm-level characteristic of moderates and sensitives groups								
Variables	Sen	sitives	Mod	lerates	Difference			
variables	Obs.	Mean	Obs.	Mean	Mean			
Debts/Assets	883	0.483	406	0.452	0.03			
Revenues/Assets	883	1.931	406	2.169	-0.238			
Objective	883	0.102	406	0.054	0.048			
Asset	883	3453	406	3426	27.72			

Panel B: Industry composition of moderates and sensitives groups

Industry	Sen	sitives	Moderates		Difference
Industry	Freq.	Pct (%)	Freq.	Pct (%)	Mean
Agriculture, forestry and fishing	10	1.133	4	0.985	0.147
Real estate	13	1.472	6	1.478	-0.006
Leasing and commercial service	97	10.98	57	14.04	-3.054
Scientific research and technical service	48	5.436	9	2.217	3.219***
Water conservation, environment, and public facilities management	5	0.566	1	0.246	0.32
Public facilities management	25	2.831	13	3.202	-0.371
Services and repairs for residents and other services	0	0	4	0.985	0.985***
Cultural, sports and recreational	8	0.906	9	2.217	-1.311*
Manufacturing	188	21.29	84	20.69	0.601
Electricity, heat, gas, water production and supply	4	0.453	0	0	0.453
Construction	34	3.851	20	4.926	-1.076
Wholesale and retailing	337	38.16	148	36.45	1.712
Transport, warehousing, and postal	29	3.284	14	3.448	-0.164
Board and lodging	35	3.964	12	2.956	1.008
Information transfer, and software and information technology service	50	5.663	25	6.158	-0.495

Strategic behaviors of survey respondents

Whether the survey respondents strategically report the operating conditions to obtain bank loans or policy support using the following regression?

	Dependent Variable:						
	Loa	n_{t+1}	Polis	cy_{t+1}			
	(1)	(2)	(3)	(4)			
Bias	0.012		-0.017				
	(0.296)		(-0.415)				
Negative		-0.029		0.045			
		(-0.312)		(0.537)			
Debts/Assets	0.343***	0.343***	0.094	0.094			
	(2.723)	(2.724)	(0.731)	(0.730)			
Revenues/Assets	0.013	0.013	-0.026*	-0.026*			
	(0.890)	(0.897)	(-1.715)	(-1.724)			
Loan	0.556***	0.556***	0.084	0.084			
	(5.355)	(5.351)	(0.743)	(0.747)			
Policy	0.432***	0.432***	1.877***	1.877***			
	(4.629)	(4.624)	(21.693)	(21.693)			
Industry Dummies	Yes	Yes	Yes	Yes			
Firm Clustered	Yes	Yes	Yes	Yes			
Observations	1,284	1,284	1,280	1,280			
Pseudo \mathbb{R}^2	0.085	0.085	0.351	0.351			