



UNIVERSITY OF EDINBURGH  
Business School



## Corporate governance measures and financial distress

Zhiyong Li, Jonathan Crook & Galina Andreeva

Credit Research Centre, Business School, University of Edinburgh

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## Credit scoring

- **Credit scoring: consumer & corporate**
- **Corporate credit modelling:**
- **To predict default such as bankruptcy, financial distress, late payment**
- **Listed companies, SMEs,...**
- **Variables: financial ratios, market prices, corporate performance measures, **corporate governance measures**, etc.**



**Campbell et al. (2008): financial distress is stronger among stocks with lower analyst coverage and institutional ownership.**

**Mann (2005): there's connection between CEO compensation and overall credit risk. Higher CEO pays has higher default and downgrade rate than the other.**

**Ashbaugh-Skaife et al. (2006): credit ratings are negatively associated with the number of block holders and CEO power, and positively related to board independence, board stock ownership, and board expertise.**

**Lee and Yeh (2004): the more directors and supervisors controlled by the largest shareholder, the greater the likelihood the firm would get into financial distress in the following year.**

## **What I find:**

- Generally corporate governance measures are associated with financial performance/bankruptcy. But different studies have different results.**
- Many of them study it from the corporate governance perspective (hypothesis testing) but not from default prediction.**
- The research on corporate governance measure in credit risk modelling is far from enough.**
- My research will use panel regression to give a more robust result over time on the effect of various corporate governance measure.**



# Corporate governance measures

## board composition:

**Number of independent directors, number of female directors, size of board, duality of the chair and CEO, etc.**

## ownership structure:

**Concentration ratio, proportion of institutional holding shares, proportion of state-owned shares, number of shareholders, etc.**

## management compensation:

**Senior managers' payoff (salary, bonus, options/shares)**

## directors' characteristics

**Gender, education, age, nationality, experiences, etc.**



**Data is sourced from Wind database which contains information of all Chinese listed companies (over 2,000) since the beginning 1991 to present.**

**Original sample is 2104 listed companies in China between 1998 and 2010. A few cases, years and variables are dropped due to missing values, correlations, outlying observations.**

**Final panel dataset contains 1,881 listed companies over the period of 2003 to 2010 (covariates over 2005 to 2010, six years), lagged 2 years.**

**Randomly select training and test cases by ratio training : test = 2 : 1**



**Financial distress indicator: Special Treatment (ST)  
Which is defined by the China Securities Regulatory Commission (CSRC).**

	Non-ST (Good)	ST (Bad)	Total	Bad rate
2003	1123	39	1162	3.36%
2004	1189	35	1224	2.86%
2005	1177	26	1203	2.16%
2006	1177	58	1235	4.70%
2007	1234	55	1289	4.27%
2008	1291	22	1313	1.68%
2009	1359	27	1386	1.95%
2010	1369	39	1408	2.77%
Total	12608	334	12942	2.58%



## Share capital structure in Chinese listed companies:

	in which has issued	number of listed companies	% in all listed companies	in which has issued	number of listed companies	% in all
<b>Total shares (2472)</b>	restricted shares	1808	73.10%	state owned shares	481	19.50%
				sponsor legal person shares	929	37.6%
				private placement of legal person shares	9	0.40%
				senior management shares	1232	49.80%
				others	654	26.50%
	tradable shares	2472	100%	A shares	2472	100%
				B shares	86	3.50%
				H shares	81	3.30%
				Overseas shares	2	0.10%



## Type of corporation

Type	No.	Percentage
Private	917	45%
SOE	1003	49%
Collective	32	2%
Overseas	70	3%
total	2022	100%



## Board Composition (6)

name	definition	Expected sign
board size	number of total directors	-
independent director	number of independent director to board size	-
number supervisors to total directors	number of supervisors to board size	-
senior managers to total directors	number of senior managers to board size	+
duality of Chair and CEO	1 if the chair and ceo is the same person	+
independent director working location	1 if independent directors working office is the same as registered office	-



## Ownership structure (14)

Name	definition
state ownership	proportion of state owned shares to total shares
state control	1 if the ultimate controller is the government
board shares	shares held by the board to total shares
supervisor shares	shares held by the supervision board to total shares
top 10 shareholders	percentage of top 10 shareholders to total shares
institutional shares	percentage of institutional shares to total shares
average share holding percentage	total shares to total number of shareholders
listing somewhere else	1 if it issues B, H or overseas shares
share capital change?	1 if it changes from previous year
connected top 10 shareholders	1 if any two top 10 year are related



## Management Compensation (6)

name	definition	Expected sign
salary of directors, supervisors and senior managers	salary of directors, supervisors and senior managers to total salary cost	+
salary of top 3 directors	salary of top 3 directors to total salary cost	+
salary of top 3 independent directors	salary of top 3 independent directors to total salary cost	+
salary of top 3 senior managers	salary of top 3 senior managers to total salary cost	+
number of non-paid directors, supervisors and senior managers	number of non-paid directors, supervisors and senior managers	-



## Director Characteristics (14)

Name	definition
chair age	age in the year
chair gender	1 if it is female
chair education	dummies
chair professional qualification	1 if it has professional qualification
chair nationality	1 if it is not Chinese
chair get paid	1 if it is get paid
chair concurrent position	1 if it has another position in other companies
ceo age	age in the year
ceo gender	1 if it is female
ceo education	dummies
ceo professional qualification	1 if it has professional qualification
ceo nationality	1 if it is not Chinese
ceo get paid	1 if it is get paid
ceo concurrent position	1 if it has another position in other companies



## Financial ratios

Group	ratio
Profitability	return on assets (ROA)
Composition	tangible assets / total assets
Liability	current liabilities / total liabilities
Cash flow	net cash flow from operating / total liabilities
Operation	receivables turnover
Growth	total assets growth



## A discrete simple hazard model introduced by Shumway (2001):

$$\text{logit}(h_{\text{ST}=1}(t)) = \alpha + \beta_0 h_0(D_t) + \beta_1 x_{i,t-2}^g + \beta_2 x_{i,t-2}^r$$

$h_0$  is the baseline of hazard over time,  $\ln(D_t)$

$x_{i,t-2}^g$  is corporate governance measures for company  $i$  at year  $t - 1$

$x_{i,t-2}^r$  is financial ratios for company  $i$  at year  $t - 2$

**Four types of duration  $D$  have been tried: year since the first observation (2003), age since foundation, age since listing and age since IPO. Age since IPO is the most significant one.**



**Model 1: Corporate governance measures only**

**Model 2: Financial ratios only**

**Model 3: Significant corporate governance measures and financial ratios in 1 & 2**



# Results

board composition			ownership structure			management compensation			director characteristics		
board size	-0.114	**	state ownership	-1.338	**	salary of directors, supervisors and senior managers	0.736		chair_gender	-0.623	
number of independent director	-1.894		state control	0.039		salary of top 3 directors	0.411		chair_age	-0.033	**
number of supervisors	-0.025		board shares	-0.528		salary of top 3 independent directors	7.929	**	chair_edu_highsch_d	-0.238	
number of senior managers	-0.136	**	supervisor shares	-1243.555		salary of top 3 senior managers	1.334		chair_edu_undergra_d	0.594	
duality of Chair and CEO	0.216		top 10 shareholders	-0.289		number of non-paid directors, supervisors and senior managers	-0.063	**	chair_edu_master_d	0.426	
independent director working location	-0.687	**	institutional shares	-7.011	**				chair_education_doc_d	0.641	
			average share holding percentage	1.493					chair_proqualification_d	-0.434	
			listing somewhere	-0.268					chair_nationality_d	0.193	
			share capital change?	-0.298					chair_getpaid_d	0.294	
			connected top 10 shareholders	-0.298					chair_concurrentpost_d	-0.026	
									ceo_gender	0.211	
									ceo_age	-0.016	
									ceo_edu_highsch_d	0.148	
									ceo_edu_undergra_d	-0.275	
									ceo_edu_master_d	-0.837	**
									ceo_education_doc_d	-0.249	
									ceo_proqualification_d	0.057	
									ceo_nationality_d	-0.016	
									ceo_getpaid_d	-0.204	
									ceo_concurrentpost_d	-0.655	**



## Predictive accuracy: Gini coefficient

		overall	2005	2006	2007	2008	2009	2010
Training	model 1	0.500	0.364	0.562	0.420	0.345	0.662	0.540
	model 2	0.770	0.896	0.912	0.607	0.755	0.783	0.658
	model 3	0.790	0.886	0.917	0.644	0.770	0.820	0.716
Test	model 1	0.444	0.415	0.478	0.404	0.395	0.208	0.504
	model 2	0.762	0.716	0.842	0.769	0.791	0.654	0.739
	model 3	0.787	0.774	0.857	0.797	0.823	0.623	0.796



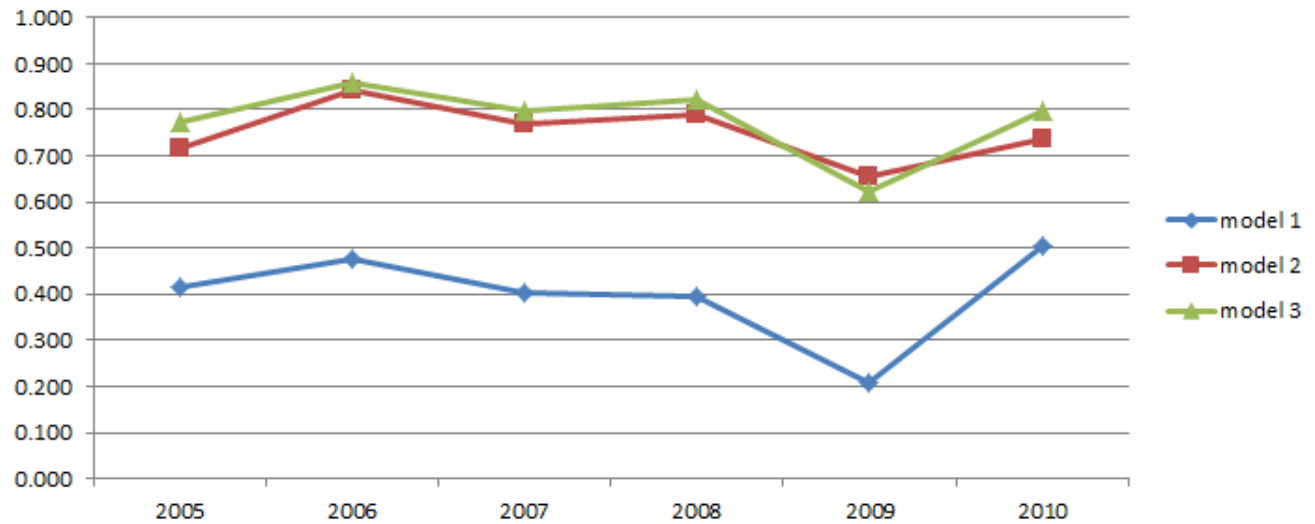
# Results

## Gini

### Training set



### Test set





# Conclusion

**The significant corporate governance measures are Board size (-), number of senior managers (-), state shares (-), institutional shares (-), salary of top 3 independent directors (+), number of non-paid directors, supervisors, senior managers (-), chair age (-), CEO concurrent position (-);**

**Corporate governance measures cannot be used to predict financial distress alone. But financial ratios assisted by governance measures give better prediction.**

**SEOs or state owned shares seem to be negatively associated with the probability of financial distress.**