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ANALYSIS OF FINANCIAL STATUS AND DETERMINANTS WITH ALTMAN`S Z-SCORE MODEL: A PANEL DATA INVESTIGATION FROM TRADITIONAL CHINESE MEDICINE LIST COMPANY IN CHINA

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Objective

This study aimed to evaluate the current situation of financial risk in traditional Chinese medicine(TCM) listed companies, and analyze the influencing factors of financial risk.

Methodology

- A retrospective study using the data of A-share TCM listed companies in both Shanghai and Shenzhen Stock Exchange in China from 2007 to 2018. A total of 38 companies were included.
- Altman Z-Score model was used to evaluate the financial status of TCM listed companies.
- Stata 13.0 was used to established panel model which dependent variable was Z-Score.Then uesd Firm's age, Cash holdings ratio, Firm's size, Debt-to-assets ratio, Tangibility, Debt to income ratio, Book to market ratio, Return on assets, Operating income-sales ratio and Liquidity as explanatory variable indicators to analyse their relationship with financial status.Lastly we used the system-GMM was used to test the robustness of the mode.

Results

- According to the calculation method of Altman Z-Score model(Table 1),most of the time,there are more than 70% of companies in healthy situation, especially in 2015-2016 when no company has a Z-Score below 1.81. However in 2008, 10 companies were in the financial gray state (10/38), and 4 companies were in financially dangerous state,as showed in Figure 1.

- From the result of panel regression, we saw that the Firm's age (β=0.249 P<0.001), Tangibility (β=6.32 P<0.05), and Return on assets (β=10.34 P<0.001) had positive effects on the listed company's financial position, while the Firm's size (β=-1.680 P<0.001), Book to market ratio (β=-1.728 P<0.001), and Debt-to -assets ratio (β=-13.14 P<0.001) had negative impacts on financial conditions,as showed in Table 2.

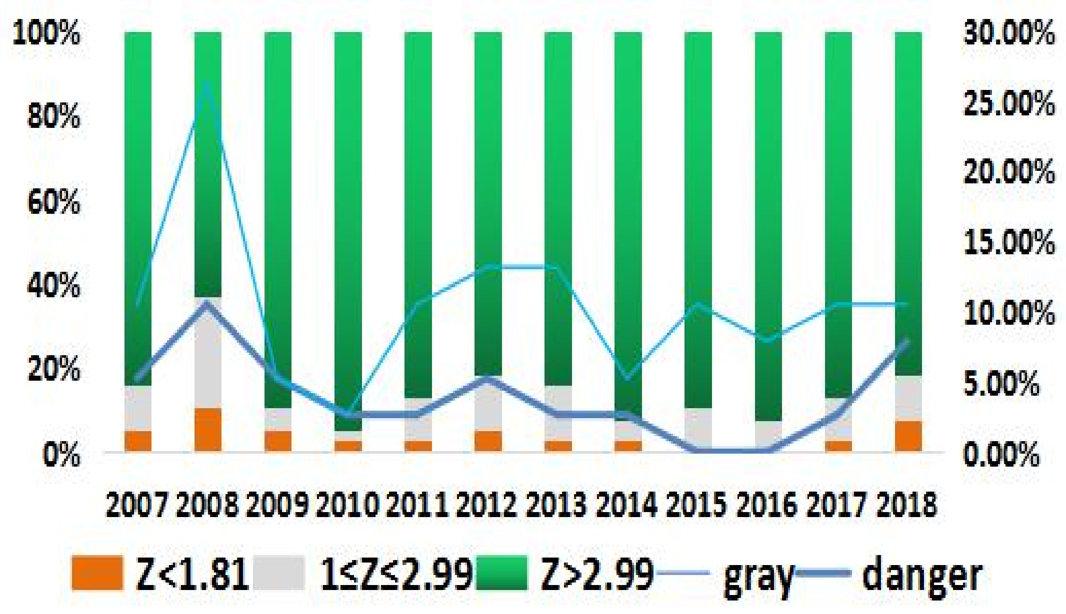

Figure 1: The Z-score from difference companies between 2007 and 2018

Table 1: Dedinition of independent variable in Altman`s model

Factor	Measure
X1	$X1 = \frac{\text{Working capital}}{\text{Total assets}}$
X2	$X2 = \frac{\text{Retained earnings}}{\text{Total assets}}$
X3	$X3 = \frac{\text{Earnings before interest and taxes}}{\text{Total assets}}$
X4	$X4 = \frac{\text{Market value + Net assets}}{\text{Total debts}}$
X5	$X5 = \frac{\text{Sales}}{\text{Total assets}}$
Z-Score	1.2*X1+1.4*X2+3.3*X3+0.6*X4+0.99*X5

Table 2: The result of regression analysis

Variable	POSL	FE	RE	SYS GMM
Firm's age	0.193*(0.0899)	0.375***(0.099)	**0.249*****(0.0701)	0.333* (0.147)
Firm's size	-1.587**(0.459)	-2.322***(0.549)	**-1.68*****(0.374)	-4.145***(0.868)
Book to market ratio	-1.229(0.791)	-1.686***(0.436)	**-1.728*****(0.425)	-4.451***(0.976)
Tangibility	4.624(4.687)	6.836*(3.176)	**6.320***(2.941)	9.654 (5.146)
Return on assets	14.41**(4.168)	8.894**(2.881)	**10.34*****(2.804)	4.711 (3.805)
Operating income-sales ratio	-1.37(1.262)	-1.117(1.321)	-1.698(1.242)	-0.907 (1.908)
Debt-to-assets ratio	-14.53***(3.779)	-12.01***(2.066)	**-13.14*****(1.873)	-23.06***(3.01)
Debt to income ratio	0.626(0.719)	0.832*(0.402)	0.827(0.384)	0.458 (0.5)
Cash holdings ratio	6.624(4.062)	3.643(2.337)	4.268(2.228)	5.372 (3.293)
Liquidity	0.566(0.494)	1.134(0.634)	1.073(0.595)	0.194 (1.027)
Constant	42.74***(10.15)	55.10***(10.89)	43.77***(7.801)	104.2***(17.58)
Observes	456	456	456	380
R-squared	0.4167	0.339	0.3958	
F-stat/Wald chi2(10)	7.31***	14.67***	108.03***	
F test		8.29***		
LR test			260.06***	
Hausman test		14.89(0.1875)		
Sargan-Hansen stat		15.248(0.1233)		

Standard errors in parentheses

* p<0.05, ** p<0.01, *** p<0.001

Conclusions

The total financial situation of traditional Chinese medicine listed companies in recent years is generally normal, yet some companies still have the possibility of financial crisis.

For policy makers of companies, increasing the proportion of fixed assets,using the company's assets reasonably, increasing the market value of the company and reducing the accumulation of unnecessary debt would be conducive to maintaining a healthy financial position.

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