

Predicting Companies' Delisting to Improve Mutual Fund Performance



BADM Group 6

Ta-Wei Huang, Eugene Yang, Po-Wei Huang



BUSINESS GOAL

Preventing mutual funds managers from investing in those companies potentially–delisted in 1 years



ANALYTIC GOAL

- Predict companies' delisting in 1 years



DATA DESCRIPT.

- Resource: TEJ Database (Largest Financial Database in Taiwan)
- Columns: Delisted(Output) + 16 Financial Variables
- Records: Non-delisted 830 (2012) & Delisted 91 (2006–2012)

Company	Date	Delisted	EPS	ROE	GPM	...	TRGR
3651 F-天鵬	2011/12/30	1	0.39	3.13	9.85	...	-31.47
3033 威健	2011/12/30	0	2.73	17.18	7.24	...	0.76

MINING METHOD

Logistic Regression

Company	Prob. for 0	Prob. for 1
2509 全坤建	0	1
2528 皇普	0	1
2540 愛山林	0	1
5239 宏鈺	0	1
5467 聯福生	0	1
2348 海悅	6.57363E-12	1
1103 嘉泥	2.85603E-08	0.9999999971
2443 新利虹	8.522E-08	0.9999999915
2302 麗正	2.61693E-06	0.999997383

Confusion Matrix		
	Predicted Class	
Actual Class	1	0
1	11	23
0	2	331

Error Report			
Class	# Cases	# Errors	% Error
1	34	23	67.64705882
0	333	2	0.600600601
Overall	367	25	6.811989101

Performance	
Success Class	1
Precision	0.846154
Recall (Sensitivity)	0.323529
Specificity	0.993994
F1-Score	0.468085

Cutoff = 0.65

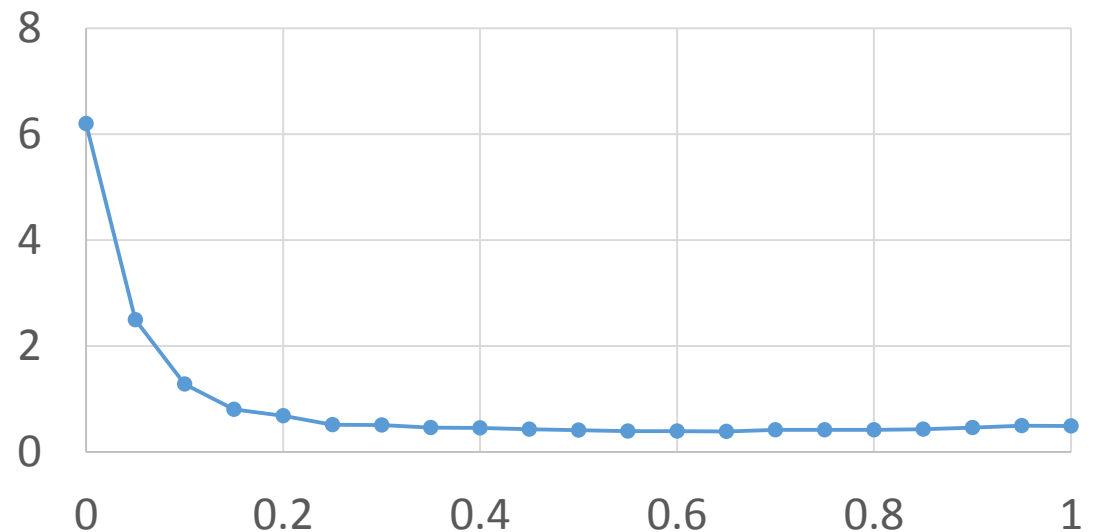
PERFORMANCE 1

Classification Performance

$$\min_{\text{cutoff prob}} 6.26\% \times P(C_0) \times \frac{n_{0,1}}{n_{0,0} + n_{0,1}} + 52.1\% \times P(C_1) \times \frac{n_{1,0}}{n_{1,0} + n_{1,1}}$$

Cutoff Prob	Cost Function (%)
0.45	0.430192512
0.5	0.411577539
0.55	0.392962566
0.6	0.392962566
0.65	0.389671122
0.7	0.420318181
0.75	0.417026738

Cost Function (%)



PERFORMANCE 2

Strategy: 130% long non-delisted and 30% short delisted

Total Cost =

$$6.26\% \times 30\% \times 67.64\% \\ + 52.1\% \times 130\% \times 0.60\% = 1.67\%$$

Total Revenue =

$$6.26\% \times 130\% + 52.1\% \times 30\% = 15.71\%$$

Benchmark: Market Portfolio

Error Report			
Class	# Cases	# Errors	% Error
1	34	23	67.64705882
0	333	2	0.600600601
Overall	367	25	6.811989101

PERFORMANCE 2

Classification Performance: Profit v.s. Market Portfolio

Portfolio	Long Position	Short Position	Misclass. Cost	Transaction Cost & Tax	Portfolio Return
Algorithm	6.26% (130%)	52.1% (30%)	1.67%	0.185%	$15.71\% - 1.67\% - 0.185\% = 13.855\%$
Market	11.85%	0%	--	0.02%	11.655%

SUGGESTION

- For implementation

1. Hard to classify 3 year before really delisted
2. Use the rank to find interesting companies
3. Unstable Short Selling Opportunities

- For model risk

1. Short Selling require margins
2. Fund managers will get fired if error rate is too large
2. Investor's psychology