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# **1FP571**

# **Special seminar – Advanced Corporate Finance**



EVROPSKÁ UNIE  
Evropské strukturální a investiční fondy  
Operační program Výzkum, vývoj a vzdělávání



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# Bankruptcy Prediction

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## Multiple Discriminant Analysis (MDA)

- identify the **sample of bankrupt firms**,
- identify the **matching sample of healthy firms** (controlling for the size and industry factors),
- calculate a group of **financial statement ratios** expected to be **linked with the likelihood of bankruptcy**

## Altman's Z- score model

popular MDA bankruptcy prediction model (developed on data for manufacturing firms)



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Z-score:

**bankruptcy**  $Z < 1.81$ ; **gray zone**  $Z \in < 1.81; 2.99 >$ ; **prosperity**  $Z > 2.99$

$$\begin{aligned} \mathbf{Z\text{-}score} = & 1.2x \text{ (Net Working Capital/Total Assets)} \\ & + \\ & 1.4x \text{ (Retained Earnings/Total Assets)} \\ & + \\ & 3.3x \text{ (EBIT/Total Assets)} \\ & + \\ & 0.6x \text{ (Market Value of Equity/Book Value of Liabilities)} \\ & + \\ & 1.0 \times \text{ (Sales/Total Assets)} \end{aligned}$$



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Z-score's ratios relate to different aspects of profitability & risk

**Net Working Capital/Total Assets:**

**Retained Earnings/Total Assets:**

**EBIT/Total Assets:**

**MV of Equity/BV of Liabilities:**

**Sales/Total Assets:**

short-term liquidity risk

accumulated profitability

and relative age of a firm

current profitability

debt/equity incorporating  
market's assessment of the  
equity value; long-term  
solvency risk and the market's  
overall assessment of the firm's  
profitability and risk

ability of a firm to use  
assets to generate sales



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## Real World Applications of Z-Score

- Models similar to the Z-Score are used by bond rating services (Moody's and Standard & Poor's) to rate corporate bonds



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## REFERENCES

Class #16 Ratio Analysis & Bankruptcy Detection Class #16 1,  
<http://docplayer.net/29943936-Class-16-ratio-analysis-bankruptcy-detection-class-16-1.html?>