Bankruptcy

-Hriday Raj and Ghson Alotibi

Context

Private Equity

[ˈprī-vət ˈe-kwə-tē]

A type of alternative investment in which the investors purchase shares in privately-held businesses.

Investopedia

Agenda

1. Context/Key Definitions
2. Example
3. Metrics
4. Random Forest Model
5. Example Revisited
6. Conclusion/Takeaways

Key Definitions

Solvency

[ˈsäl-vən(t)-sē]

The ability of a company to meet its long-term debts and financial obligations.

Bankruptcy

[ˈbaŋk-(ˌ)rəp(t)-sē]

A legal proceeding initiated when a person or business is unable to repay outstanding debts or obligations.
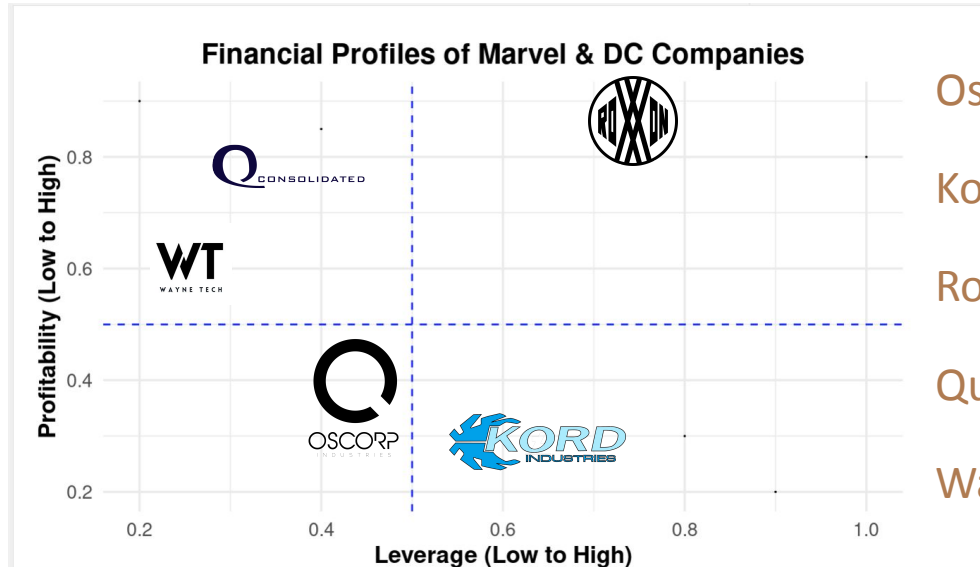
Net Worth

[ˈnet ˈwərth]

The value of the assets a person or corporation owns, minus the liabilities they owe.

Investopedia

Investopedia

Investopedia

Consider~

Financial Profiles of Marvel & DC Companies

Oscorp: **High liquidity**
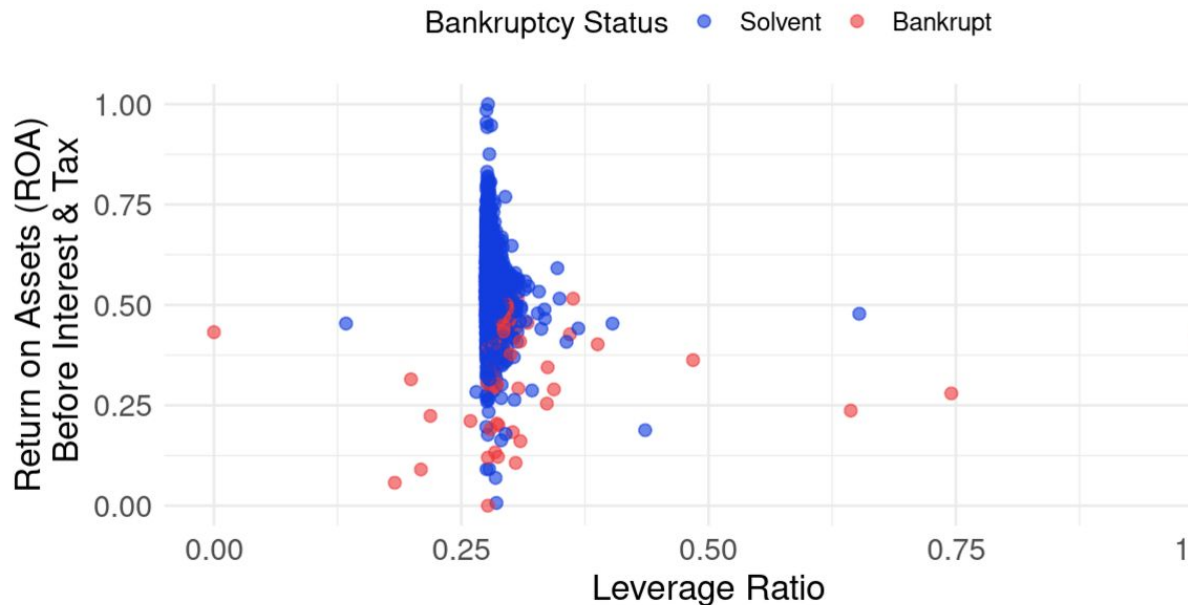
Kord Industries: **Low Liquidity**

Roxxon Energy: **Low Liquidity**

Queen Consolidated: **Medium Liquidity**

Waynetech: **High Liquidity**

Impact of ROAA and Leverage on Bankruptcy
Examining Operational Efficiency and Financial Leverage

Bankruptcy Status ● Solvent ● Bankrupt

Return on Assets (ROA) Before Interest & Tax

1.00
0.75
0.50
0.25
0.00

Leverage Ratio

0.00 0.25 0.50 0.75 1.

Data Source: Taiwan Economic Journal (1999-

Takeaways

Return On Assets
[ʳɪˈtɜːrn ɒn ˈæsets]

Low ROA stay away

High Leverage is ok

Not risky with High ROA

High leverage, Low ROA is a very bad idea

A financial ratio that indicates how profitable a company is in relation to its total assets.

Financial Leverage
[ˈle-və-rij]

Leverage is an investment strategy of using borrowed money—specifically, the use of various financial instruments or borrowed capital—to increase the potential return of an investment.

Investopedia

Do Higher Cash Reserves Lower Bankruptcy Risk?

Distribution of total assets among bankrupt and non-bankrupt firms

Source: Taiwan Economic Journal (1999)

Takeaways

- Solvent firms have broad and high total asset range
- Bankrupt firms have moderate cash reserves
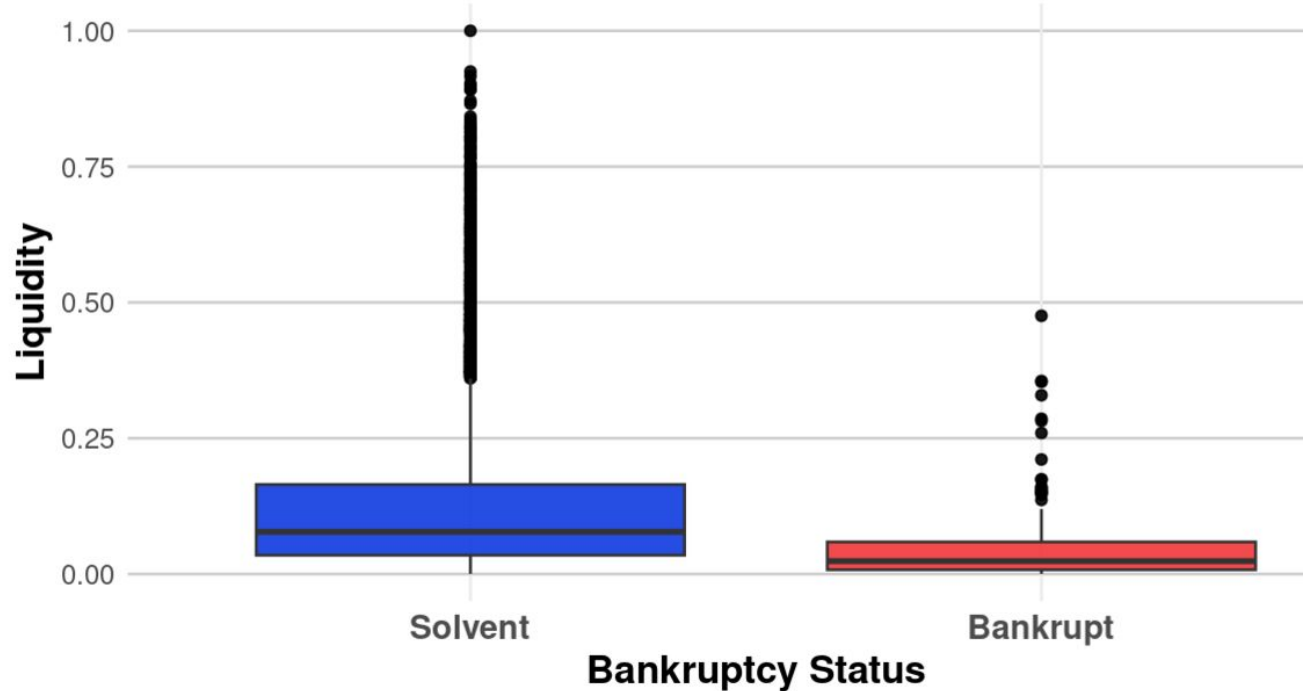
Liquid Asset
['li-kwad 'a-,set]

An asset that can easily be converted into cash, such as heavily-traded shares, money market instruments, and funds held in checking accounts.

Investopedia

Cash Asset Ratio

One of several metrics used by analysts and investors to determine a company's liquidity by assessing its ability to pay off its short-term obligations with cash and cash equivalents.

Investopedia

Total Assets

Current Assets
+
Non-Current Assets
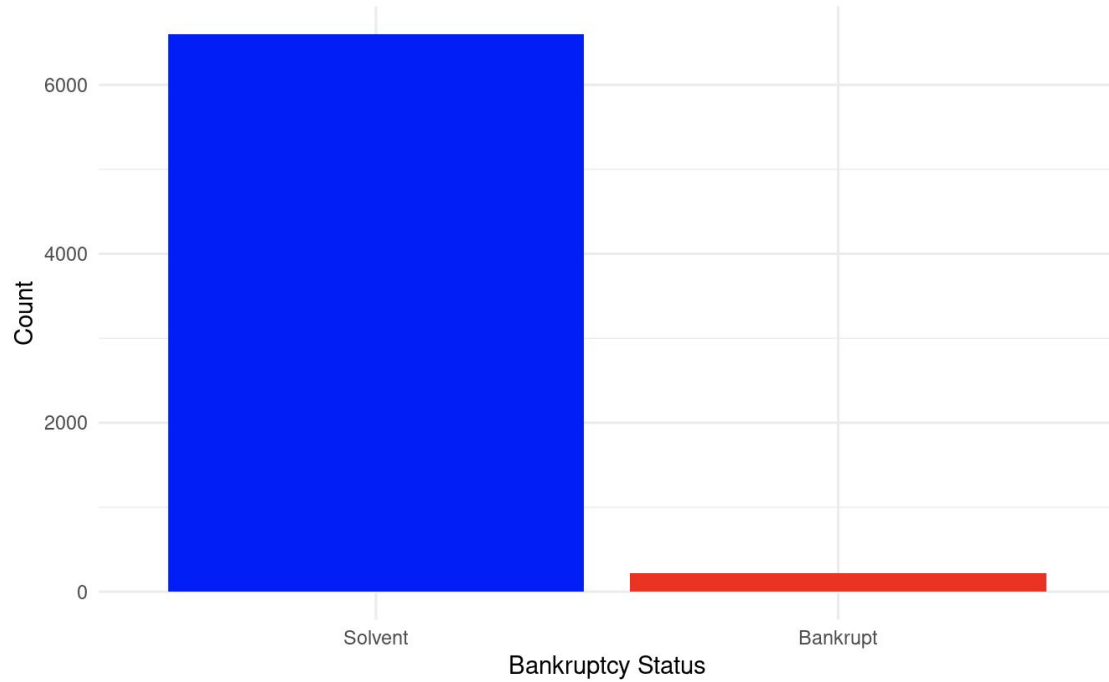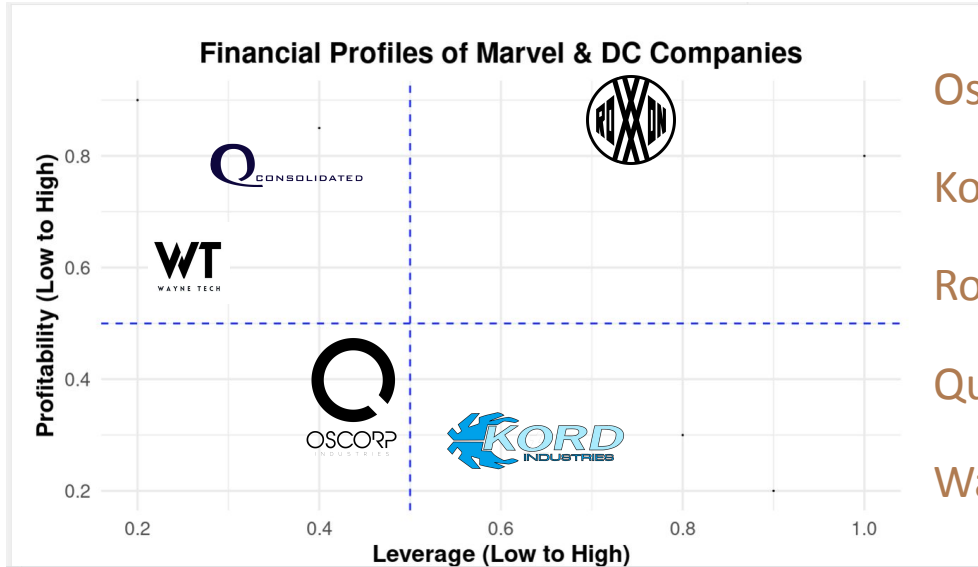
Yeah there's a reason our model didn't work

Number of companies that went bankrupt vs. those that didn't

Source: Taiwan Economic Journal (1999-2009)

Revisitation

Financial Profiles of Marvel & DC Companies

Oscorp: **Bankrupt**

Kord Industries: **Bankrupt**

Roxxon Energy: **Solvent**

Queen Consolidated: **Solvent**

Waynetech: **Bankrupt**

Conclusion and Future Work

Takeaways:

- Financial ratios like leverage, profitability, and cash reserves are critical in assessing bankruptcy risk.
- Whilst these metrics protect us from bankruptcy risk they are not always fool proof
- While machine learning models like Random Forest can offer valuable insights, their effectiveness depends on data quality and balance.

Looking Ahead:

- Future improvements in model accuracy and handling of data imbalance will lead to better prediction capabilities.
- For investors, combining analytical tools with experienced judgment remains key to minimizing risk.

Questions?

Thanks for listening!

Huh what is Random Forest?

What it is: An ensemble method combining multiple decision trees.

How it works:

- Uses **random subsets** of data (bagging) to train each tree.
- Combines predictions via **majority vote** (classification) or **averaging** (regression).

Key Benefits:

- Reduces overfitting.
- Handles non-linear relationships.
- Robust to noise and complex interactions.

Challenges: Needs tuning; struggles with **imbalanced datasets**.