Assessing Bankruptcy Risk for Business Loan Applicants

Uyen Pham, Ryan Dunn, Aaron Carr

Problem Statement

- Budget constraints dictate:
  - Limited # of applications given elevated review by management
  - Need for accurate ID of high-risk applicants
- Business Credit Lending Department + Data Science Team tasked to develop automatic ID of high-risk applicants
- System will aid junior analysts in their initial credit evaluation of business lending applications → Limit the number of reviews required by senior analysts/management

Solutions Explored

- Historical 10K and 10Q. Contains key ratios.
- Ratios were assessed to find the optimal data points that can be modeled to identify future a bankruptcy
- Identify maximum number of bankruptcies, and limit false positive
- Change the current workflow
- Provide a risk score recommendation that will identify the type of review required to approve an application

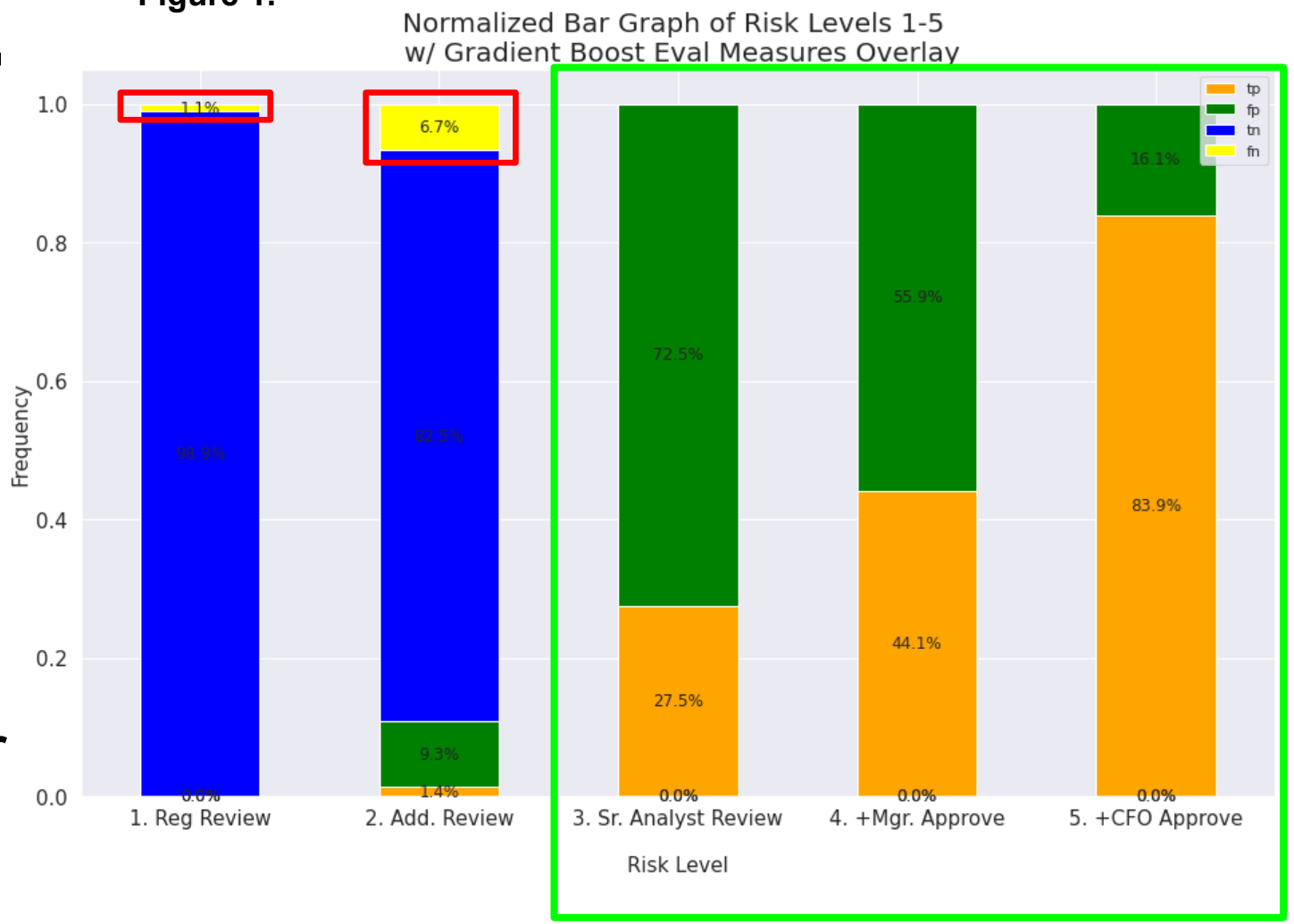
Data Analysis Conclusion

- A model was developed that has targeted applications to:
  - Reduce missing majority of companies at-risk
  - Assign risk levels based on probability of bankruptcy
  - Pool needing additional review and approval decreases as risk levels increase

Recommendation

- Divide customers into risk groups based on probability of bankruptcy
- A few customers in riskiest tiers require additional reviews
- Increased automation → Decreased review for senior analysts + Decreased loss from bad loans

Figure 1.



References

Analyst Prep (2021, April 15). *cfa-level-2-oversampling-and-undersampling*. https://analystprep.com/study-notes/cfa-level-2/quantitative-method/model-training/attachment/cfa-level-2-oversampling-and-undersampling/

Bayirli, A. (2020, June 29). *Gunden geri kalanlar - 17*. https://blog.arifbayirli.com/post/2020-06-29-gunden-geri-kalanlar-17/

Zięba, M., Tomczak, S. K., & Tomczak, J. M. (2016). Ensemble boosted trees with synthetic features generation in application to bankruptcy prediction [Data set]. *UCI Machine Learning Repository*.