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FICO Scores and the Economic Sensitivity Index

Credit scoring refers to the statistical methods of assessing a loan applicant's credit risk, which is the probability that an applicant will default on a loan. These methods are used to classify applicants into "good" and "bad" risk classes based on information, or predictor variables in statistical nomenclature, provided during the application. The probability that an applicant will default is estimated from these variables such as the applicant's repayment history and income.

Accurate classification is of interest to financial institutions, retailers, and other companies since it increases profit or reduces loss. Applicants who consistently pay off their loan have very low default risk and are not profitable since they are not charged interest. On the other hand, applicants who have very high default risk can be profitable if a high rate of interest is charged, but if the applicant does default, this can incur a loss for the lender. Thus, the lender must be careful in choosing who to accept or reject for credit in order to maximize profit.

Through statistical methods such as linear regression and discriminant analysis, credit applicants are assigned a credit score. Those with credit scores above the chosen threshold are predicted to be good risks, while those below are predicted to be bad risks. These statistical methods use information from applications and other sources as predictor variables, or characteristics, to build statistical models, or classifiers.

FICO (Fair Isaac Corporation) introduced the first credit score in 1989. The FICO Score is used by many banks and creditors to assess the credit risk of an applicant and determine rates and terms. It is based on the consumer credit reports generated by the national credit bureaus and is a number that ranges from 300 to 850. Higher scores are an indication of lower credit risk, and applicants with higher scores are more likely to be approved for a loan with competitive rates and terms.

FICO Scores are calculated based on the following components with their importance in parentheses: payment history (35%), amounts owed (30%), length of credit history (15%), credit mix (10%), and new credit (10%). [1]

- Payment history: This is the most important factor in determining an applicant’s FICO Score. The lender looks at an applicant’s payment history for any late payments on credit accounts. Paying bills on time is essential to maintaining a healthy credit history.

- Amounts owed: The amount owed on credit accounts and the portion of the available credit being used are worth about 30% of FICO Scores. Owing a large amount on credit accounts and using a large portion of the available credit increase the risk of defaulting.
- Length of credit history: A longer credit history generally results in higher FICO Scores. The ages of all of an applicant's credit accounts, including the oldest and youngest accounts and the average age of all accounts are taken into consideration.
- Credit mix: The types of accounts an applicant has such as credit cards, retail accounts, and mortgage loans are taken into consideration.
- New credit: Opening several credit accounts in a short period of time is a red flag and represents a greater risk.

FICO Scores are calculated assuming that future economic conditions are similar to the past. Additionally, individuals with the same FICO Scores are assumed to have the same risks of defaulting. Under changing economic conditions such as a recession, credit scores do not give us the full picture. Thus, a different approach is needed to take into account potential changes to the economy since financial stress affects everyone (even individuals with the same scores) differently: the Economic Sensitivity Index (ESI) is such an approach. [2]

The ESI rank-orders consumers with respect to their sensitivity to the economic cycle. In times of economic uncertainty, consumers who are less sensitive to the economy are at less risk of defaulting even if they have marginally lower credit scores than consumers who are more sensitive to the economy. Consumers with low economic sensitivity have more stable probabilities of defaulting during a recession, while for the consumers with high economic sensitivity, the probabilities of defaulting noticeably increase. Thus, during times of economic uncertainty, banks and creditors prefer lending to consumers with low economic sensitivity over those with high economic sensitivity at similar risk scores. [2]

The main challenge in identifying high sensitive individuals is the fact that only an individual's financial performance under "normal" economic conditions can be observed. How an individual would perform under counterfactual conditions, or conditions that cannot be observed or have not happened yet, can be predicted by what is called counterfactual analysis. For an individual, sensitivity is defined as the difference between potential payment performance under unstressed and stressed conditions. The idea of counterfactual analysis is to match an individual with people whose performances under stressed conditions have been observed. This matching is based on similarities in characteristics (predictor variables). Then, it is possible to estimate that individual's performance under counterfactual conditions based on people with similar characteristics. [2]

Through stochastic gradient boosting, it was found that in each FICO Score band, there is substantial variation in the estimated sensitivities; two consumers with the same FICO Score

can have very different sensitivities. Higher FICO Scores tend to correspond to less sensitive individuals; however, the association between FICO Score and sensitivity is not very strong. Among consumers with the same FICO Scores, sensitive consumers more actively search for credit, have higher total balances, more recently opened a new trade line, and have experienced fewer delinquencies. Consumers with the same score respond differently to stresses such as balance increases and downturns. [2]

Through these methodologies, consumers who are sensitive or not sensitive to changing economic conditions can be identified. Banks and lenders can use this information to make better decisions on who to accept for a loan during different stages of the economic cycle. By taking the Economic Sensitivity Index into account, banks and lenders can fine-tune their marketing and lending policies.

References

[1] How are my FICO® Scores calculated? (n.d.). Retrieved from https://www.myfico.com/credit-education/whats-in-your-credit-score

[2] Fahner, G. (2017). *Estimating Consumer Default Sensitivities to Financial Stress Factors Through Counterfactual Analysis*. Fair Isaac Corporation.