Extract from

Age discrimination in financial services: final report of the Experts' Working Group

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EXPERIAN AND THE FINANCE AND LEASING ASSOCIATION JOINT PAPER ON CREDIT SCORING

What is credit scoring?

Scoring was introduced to the UK in the late1970s but really gained a foothold in the UK during the 1980s when more and more lending organisations sought ever more efficient ways to make decisions. The most advanced scoring systems operate in those countries of the world where there is access to the most data about the subject of the decision. In general, and particularly for application scoring, that means access to data from a credit reference agency. There are a wide variety of models around the world but the most comprehensive data is held in the UK and the USA.

Scoring estimates the probability that a given outcome will occur. It can be used to predict a wide variety of outcomes such as the responsiveness of an individual to a product offer, the likelihood that a credit application is fraudulent or the likelihood that an applicant will fall into serious arrears in the future. It is based on the assumption that the past predicts the future and that information held about the past performance of people with credit obligations can be used to predict the future behaviour of similar customers.

In the credit industry scoring is used by lenders to improve the speed and accuracy of lending decisions. The statistical analysis that underpins credit scoring helps the lender identify the true predictors of credit risk from among the information gathered about applicants and customers. These predictors are given a weight (positive or negative points) that reflects their relative importance in identifying credit risk and the predictors plus their weights make up the scorecard. The scorecard can then be programmed into an automated decision system (a computer) which can calculate the score very quickly and consistently: the same input data will always generate the same score. This provides the accuracy and efficiency which today's high volume lending businesses demand. The score will be supplemented with a number of rules based on the business policy of the organisation: no lending to people aged less than 18 because the contract is unenforceable, the business may not extend credit to the unemployed etc. Applicants that satisfy the lending criteria will then be offered a product under certain terms: credit amount, term and interest rate. The combination of the scorecard, policy rules and the terms of business constitute the lender's credit strategy.

Scoring has been proven to be more accurate than manual underwriting and is consistently fairer. As a result, lenders are able to provide more credit to a greater

proportion of applicants because of the understanding of risk that the scorecard gives them. It enables credit grantors to manage their business more effectively. It also enables lenders to make faster decisions based on reliable and consistent data from a range of other lenders and provided through a third party – the credit reference agency. As a result, consumers and businesses in the UK benefit from what the World Bank consistently terms as the best credit regime in the World[45].

45 The World Bank Doing Business Report chapter on "Getting Credit" has ranked the UK as number 1 in the world ever since the evaluation started. http://www.doingbusiness.org/ . The UK ranks considerably higher than the USA because wide data coverage is also coupled with balanced legislative protections for lenders and borrowers, resulting in UK ranking of 1 and USA ranking of 7.

Put simply, an effective and properly managed and monitored credit scoring system gives appropriate weight to different pieces of information (characteristics, in the jargon) by allocating points to each predictive characteristic and sums these up to produce a final score. The scorecard describes the relationship between score and risk. The score is divided into a number of ranges (typically 10) each containing an equal proportion of the development sample and the risk is calculated within each band. The risk is usually measured by the bad rate – the number of bad customers as a proportion of the total in the band or the good/bad odds – the ratio of the number of good customers to bad customers within the score band. The choice of cut-off score (the minimum score required by the organisation before it will do business with the individual concerned) will be set at the point at which the organisation considers to be right for its business model. As long as no policy rules are breached and an applicant's score reaches a certain level an application will generally be accepted. If a score does not reach this level then the application will be rejected or may be referred out for manual assessment.

Most lenders also use scoring to manage existing customer relationships. So called behavioural scores can be used to predict a number of outcomes: the likelihood of default if the customer is offered another product or the likelihood of default in the event that the customer's credit limit is increased. This will usually be managed through a behavioural scoring system. Other scoring models may predict the likelihood of the subject becoming over indebted, responding to collections or litigation activity or defaulting in the event that a particular transaction is authorised for payment.

Credit Scoring

"The Office of Fair Trading supports the principles of credit scoring and recognises its important contribution to responsible credit granting."

Introduction to the Guide to Credit Scoring.[46]

Building of scorecards

Effective scorecards depend on access to large amounts of historical data, usually from the last two to three years but possibly more. It has now become common practice for lenders to use information from other sources such as credit reference agencies in their application and behavioural scorecards. Indeed, the latest iteration of the Banking Code makes it clear the credit reference data should normally be used to make decisions about new customers and whether they should be granted credit http://www.bba.org.uk/bba/jsp/polopoly.jsp?d=140&a=13131.

Shared data are generally provided by one or more credit reference agencies. Where credit reference agency data are used, the development of the scorecards must comply with the Principles of Reciprocity and the Guide to Credit Scoring. Data supplied to the user will comply with the Data Protection Act 1998. Also decision systems will comply with antidiscrimination law and, of course, any relevant principles contained within the Consumer Credit Act 1974 (as amended) and the Data Protection Act 1998 provisions on, for example, automated processing.

Scorecards may be developed in house by lenders or by third parties such as the credit reference agencies or other specialist providers. Most agencies also have a range of generic

46 A copy has not been appended to this report in the interests of space. The OFT Guide to Credit Scoring can be accessed at: http://www.experian.co.uk/www/pages/responsibilities/compliance/credit_scoring.html

scorecards which may be used "off the shelf" and are particularly useful for new start ups that will not have any data of their own.
Scorecards are developed using large samples of data[47] *which comprises a selection of previous applications or customers with good, bad and indeterminate outcomes after a given outcome period together with a representative sample of rejected applications in the case of an application scorecard. The outcome period will typically be 12 months for an application credit risk scorecard but can vary according to the product in question and the business situation: scorecards used in debt collection can have outcome periods as short as three months.*
Credit scorecards are typically developed to predict the likelihood of serious arrears or default: typically the likelihood of an account going 3 months in arrears within the first , say, 1-2 years.
A proportion of the scorecard development sample (typically 10-20 per cent) will be held out of the development process to validate the results of the development.
After implementation regular monitoring is necessary to ensure that the scorecard is working as predicted and that the customer profile is in line with that observed during the development. Significant changes in the applicant or customer profile can have a detrimental impact on the performance of the scorecard.

Components of a scorecard

A well constructed scorecard will use applicant or customer characteristics from a variety of sources. These will include demographic information submitted on the application form, information about existing relationships held by the customer with that organisation and information held by a credit reference agency. A robust development will establish which are the truly predictive characteristics for the portfolio in question and ensure that where pieces of information overlap (correlation in the jargon) that there is no double counting. As an example of this there are a number of pieces of information which are related to the customer or applicant's age: age, time at address, time in employment, time with bank. All of these characteristics are saying something similar about the applicant or customer – it is difficult to have been in employment for 20 years at the age of 20.
There can be as many as 400 characteristics analysed in a scorecard development by the time credit bureau data is added to the sample but this is usually whittled down to 20 or so by a combination of subjective and statistical means by the time the final model is built. Age is included as a component where there is a robust statistical basis for this.
Typical application scorecards will include demographic information (time at address; time in employment; marital status; age; number of children; income), past performance of other credit accounts with the lender (arrears history, the amount of credit outstanding and the amount of available credit) and credit bureau data (number, value and recency of previous County Court Judgments or defaults, number and value of current active credit accounts, arrears history of previous accounts, the amount of credit outstanding and available credit and details of previous credit enquiries).
Credit scorecards must be compliant with relevant anti-discrimination legislation and do not discriminate on the grounds of sex, race, religion, disability or ethnic origin.

47 The sample should reflect a cross section that will correlate to the organisation's expected applicant population.

Each characteristic is assigned a positive or negative score on the basis of its ability to predict credit risk. The scoring process is a reflection of the behaviour of the underlying population: stability is rewarded and instability is penalised. The scorecard will allocate positive points to older people who are more likely to be home owners, married, in stable employment and who have a good track record of using credit products in the past.
Younger people, who are more likely to be single, probably in rented accommodation and

with little or no track record of good credit usage tend to be penalised. This weighting process is not arbitrary but is a reflection of the past behaviour of the lender's customers. Some organisations will not lend if the applicant has a recent CCJ or default. If this policy is to persist in future then these people should be excluded from the development sample because no matter what their score they will be declined and their presence in the sample would have a misleading effect on the final model. Indeed current bankruptcy has to be a decline rule for most credit grantors as undischarged bankrupts may not borrow > £250.

Use of "age" within a scorecard

As a predictive variable, age is often a strong enough predictor to be included in many scorecards. Age is never normally used in decision systems as a decline rule at the upper limit. All lenders will have a lower limit, usually 18, being the age below which a credit agreement is not enforceable. Some lenders will refer out older applicants or, in the case of mortgages, those that will be in retirement towards the end of the term sought. This is in order that the lender may check affordability post retirement when income is likely to have fallen. Some lenders have found, for example, that applicants under 21 have a greater propensity to default, so this leads to declined credit or a parental guarantee being sought. Older applicants are generally found to be more stable and are likely to benefit from age being used in decision systems.

FLA members report that age is rarely used in isolation as predictive of the risk of default. It would include other factors such as length of time at address, employment, bank, Income and debt to income, loan to value, location, employment status etc.

Experian, along with the other credit reference agencies, builds a number of scorecards for lenders and also generic credit bureau scores for use across a variety of lending products. Experience in the UK and abroad shows age continues to be a strong predictor of credit risk and continues to appear in scorecards built by Experian.

Implementation and Operation of scorecards

Several principles dictate the implementation and operation of scorecards within automated lending systems.

As previously stated, the scorecard and system must be tested. Data must be captured and coded correctly. Reasons for override of the scorecard system by underwriters must be clearly defined. Operating procedures must be kept under review and all relevant staff must receive adequate training in order that they can deal with customer enquiries.

Many lenders also have a section of applicant types that are likely to be subject to manual review, either because they are an existing customer and the lender would not want to automatically decline applications or perhaps because they are high net worth individuals and the system cannot handle such a small and distinct group. Also all lenders need to operate an appeals procedure and be able to offer manual assessment if so required by the applicant.

Importantly, access to the content of all scorecards should be strictly controlled to retain their integrity.

Decisions

Creditors may take account of factors other than the credit score when making a decision. These other factors may include:

- Verification of identity
- Verification of application details
- Applicants' income and existing commitments to determine affordability
- Credit reference agency information
- The creditors own prior experiences relevant to that application or applicant
- Any security taken
- Other commercial policy rules

Cut-off credit scores will be established on the basis of overall financial considerations and will not discriminate against individual applicants.

When creditors tell applicants that their credit application has been declined they will

provide a clear explanation of the principal reasons why the applicant has not met the lending criteria. Creditors are not expected to give details of actual attributes or weightings used within the scorecards but they must disclose if data from a credit reference agency contributed to that decision and advise the applicant how to check their credit report.
Appeals procedures must be in place when credit applications are rejected. Creditors may also grant credit on terms different from those originally proposed.

Data used in credit scoring

- *Application information on income, commitments etc*
- *Credit Reference Agencies (Experian, Equifax, CallCredit)*
- *Public data – county court judgements, bankruptcy and Individual Voluntary Arrangements, Voters' data*
- *Closed user group shared credit databases (CAIS, Insight and Share)*
- *Search footprints*
- *Derived data such as links to other persons, names or addresses*
- *Generic scores*
- *Fraud databases (e.g. CIFAS)*
- *Details of current and past credit agreements with the lender*

Conclusion

Credit scoring is an effective and fair method of assessing the likelihood of a consumer getting into difficulties. It is an integral part of the decisioning process of just about every lender in the UK. For scoring to be effective the model should be developed according to rigorous rules which will ensure that data is used in the most effective way possible. Leaving aside any lender policies, this should ensure that any use of a characteristic, such as age, is based on robust statistical analysis that will evidence that the characteristic is predictive and does make an important contribution to the overall decision.