Editorial overview

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Credit scoring is one of the earliest financial risk management tools developed and is one of the most successful applications of statistical and Operational Research modelling in finance and banking. Its use by US retailers and mail order firms in the 1950s is contemporary with the early applications of portfolio analysis and financial derivatives to manage and diversify the risk inherent in their investment portfolios. However, credit scoring has far less glamour than its financial cousins, so that the literature on the subject is much more limited. Nevertheless, credit scoring has been vital in supporting the phenomenal growth in consumer credit over the last forty years. Credit scoring is also fairly widespread. For example, almost everyone in the US or UK who is financially active could be credit scored every month. Without an accurate, objective, and controllable risk assessment tool, lenders of consumer credit could not have expanded their loan books in the way they have.

Credit scoring is also an area where there are many quantitative techniques that can be used and where even a small improvement in performance can mean a tremendous increase in profit to the lender because of the sheer volume of lending made using scoring. Relevant, ubiquitous, profitable—credit scoring is all these.

Another reason for the aforementioned paucity of credit scoring research in the academic literature is the commercial sensitivity and financial value of any improvement in techniques. It is true that there have been credit scoring conferences since at least as far back as the mid-1980s both in the UK and the USA and more recently in other western economies. However, the vast majority of these conferences are organised by credit scoring vendors who use the conferences as vehicles to enhance their corporate image, sell their software products, or promote their consultancy services.

There are some rare exceptions to this rule, one of which is the series of conferences on Credit Scoring and Credit Control, run under the auspices of the University of Edinburgh's Credit Research Centre. The first of these took place in 1989 and its proceedings were published in their entirety.¹ The conference has been held biennially ever since and selected papers from some of the later conferences have appeared in print, either in regular issues or in special issues of journals.

The passage of time from the first of these conferences to the sixth in 1999 has led to a deepening of knowledge of the techniques of model-building that are used in credit scoring.

It has also led to a widening of the remit of the papers at the conference series and, therefore, published afterwards in journals.

Turning now to data mining, we consider it to be the exploration and analysis of data in order to discover meaningful patterns and relationships. Over the last decade, organisations, especially retailers and banks, have recognised the importance of the information they have on their customers. They are able to gather information on all their customers' transactions, for example, through the use of loyalty cards and eftpos (electronic funds transfer at point-of-sale). Moreover, the growth in computer power makes it feasible to analyse the large numbers of transaction data collected. Therefore, credit scoring could also claim to be a predecessor of data mining, in that it is one of the earliest uses of data on consumers' behaviour.

When one looks at the main techniques of data mining, not surprisingly one finds that they are the ones that have proved so successful in credit scoring—data summary, variable reduction, observation segmentation and clustering, and prediction and propensity modelling and explanation.

Thus, we can see that data mining has at its heart the techniques and methodologies of credit scoring but applied in a wider context. It is to be hoped that those who use and advocate data mining study the successes and developments of credit scoring, since the latter provides a useful guide to the pitfalls to be avoided and the ideas that will work in these other application areas.

This special issue on Credit Scoring and Data Mining is the first to appear in *JORS* and all of the papers were originally presented at Credit Scoring and Credit Control VI in September 1999. The papers are, therefore, a subset of the papers from the conference, which are also suitable for inclusion in *JORS*. Other papers may appear in subsequent *JORS* issues or elsewhere. However, the combined effect is the continued development of a published body of knowledge and ideas in credit scoring and data mining—and this special issue makes a significant contribution.

It should be recognised that the papers in this special issue do not present a rounded view of the current issues in credit scoring. Rather, they display some state-of-the-art thinking on some specific topics. Five of them look at particular aspects of scorecard development and application. Zhu *et al.*² look at some of the issues arising when considering the combination of two credit scores, one

based on applicant data and the other based on credit reference data. Thomas *et al*³ look at how scorecard development can incorporate some of the extraneous requirements that might meet internal constraints or objectives. Hand and Kelly⁴ develop a framework for a scoring model to evolve in the scenario where we might have a new lending product and, therefore, no historical data. Banasik *et al*⁵ investigate the possibility of increasing the predictive accuracy of an application scorecard for a credit card product by developing separate scoring models for applicants predicted to be high or low volume users of the product. Stepanova and Thomas⁶ develop the use of survival analysis tools from reliability and maintenance modelling to produce behavioural scoring models and also show that this approach supports the estimation of expected profit.

In one of the other four papers, Adams *et al*⁷ look at the techniques generated by data mining and compare and contrast them with traditional scoring/statistical techniques, showing that data mining may be better for identifying small pockets of distinctive behaviour. We also have Oliver and Wells⁸ discussing efficient frontiers for cut-off policies in credit portfolios, and Neri⁹ looking at the application of graphical chain models to define marketing strategies for consumer credit. Completing the special issue is the paper by Maznevski *et al*.¹⁰ This is quite different from the others as it starts from some business lending decisions that are being made by human sanctioners rather than by the output from a model. The authors of this paper argue that the social contextual aspects of the lending decision add rational value to the process and, therefore, that there is a place for behavioural science theory and methods within credit scoring research.

In aggregate, therefore, this is certainly not a rounded view of the current state of research in the field, but rather a

selection of some topics of current interest. Together, however, the reader should gain some view of the research areas that have been pursued and of the possibilities there are for future research.

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References

- 1 Thomas LC, Crook JN and Edelman DB (1992). *Credit Scoring and Credit Control*. Oxford University Press: Oxford.
- 2 Zhu H, Beling PA and Overstreet GA (2001). A study of the combination of two consumer credit scores. *J Opl Res Soc* **52**: 974–980.
- 3 Thomas LC, Banasik J and Crook JN (2001). Recalibrating scorecards. *J Opl Res Soc* **52**: 981–988.
- 4 Hand DJ and Kelley MG (2001). Lookahead scorecards for new fixed term credit products. *J Opl Res Soc* **52**: 989–996.
- 5 Banasik J, Crook J and Thomas LC (2001). Scoring by usage. *J Opl Res Soc* **52**: 997–1006.
- 6 Stepanova M and Thomas LC (2001). PHAB scores: proportional hazards analysis behavioural scores. *J Opl Res Soc* **52**: 1007–1016.
- 7 Adams NM, Hand DJ and Till RJ (2001). Mining for classes and patterns in behavioural data. *J Opl Res Soc* **52**: 1017–1024.
- 8 Oliver RM and Wells E (2001). Efficient frontier cutoff policies in credit portfolios. *J Opl Res Soc* **52**: 1025–1033.
- 9 Neri A (2001). The planning of marketing strategies in consumer credit: an approach based on graphical chain models for ordinal variables. *J Opl Res Soc* **52**: 1034–1044.
- 10 Maznevski ML, Kemp RS, Overstreet GA and Crook JN (2001). The power to borrow and led: investigating the cultural context as part of the lending decision. *J Opl Res Soc* **52**: 1045–1056.