

Credit Scoring models, used to quantify the creditworthiness of an individual, have been developed using the same methodological approach for many years. Recent developments in technology such as computational processing power and the availability of advanced analytics tooling in SAS, have enabled Machine Learning to be evaluated as a viable challenger to conventional scoring methods.

In the last year the Retail Modelling team at Nationwide Building Society have conducted pioneering work into the application of Machine Learning in Credit Scoring for Personal Loans Applications. Through exploiting the power of SAS Enterprise Miner, the team have developed a Credit Score that provides ~10% uplift on an industry standard regression-based Credit Score on equivalent data.

Due to Credit Scoring being used in the highly governed and regulated world of credit risk, in conjunction with Nationwide's desire to ensure that their members are at the heart of decisions, the need to address the following challenges was more pertinent than ever:

- **Unlocking the black box** – ensuring that the key model drivers are understood, and variable behaviours are intuitive,
- **Model robustness** – ensuring that the improved member outcomes evidenced are robust over time and not subject to volatility due to over-fitting,
- **Data ethics** – ensuring the model was not inadvertently identifying trends that would result in adverse outcomes for specific member groups,
- **Implementable solution** – ensuring the Machine Learning model was not a theoretical exercise but a practical solution which could translate into tangible benefits for Nationwide members in real life.

To resolve these issues, the Modelling team developed a bespoke SAS-based “Decision Toolkit” that generated 1,000's of informative and innovative model diagnostics that give a deeper understanding of how the model works. The Toolkit was used as a supplementary to standard diagnostics such as ICE and LIME, which were found to be limited in their insight. Furthermore, the team leaned on their deep understanding of Credit Risk to ensure that the proposed solution complemented existing implementation and underwriting processes ensuring the members continued to have a great customer experience.

The future of Credit Scoring has arrived.