White Paper on Artificial Intelligence: Equifax supplementary paper

Summary

This paper sets out how Equifax is:

- Using AI to improve the predictiveness of creditworthiness assessments.
- Achieving explainability in our credit risk models that use AI.

It also sets out Equifax's recommendations on how the use of AI in credit risk should be regulated:

- We strongly support the White Paper position that credit risk is not listed as a high risk application. No further legislation is needed to mitigate the risks of using AI in credit risk.
- Clear guidelines from financial regulators and supervisors, such as the European Banking Authority (EBA), can mitigate risks while setting clear standards for firms to develop and deploy trustworthy AI.
- Standards on the use of AI in credit risk should insist that consumers who are declined credit always get an accurate explanation they can reliably act upon to increase their chance of accessing credit in future.
- The trustworthy use of AI in credit risk models should be encouraged where it is more predictive than traditional techniques. More predictive credit risk models improve financial inclusion and the supply of the credit, while reducing the incidence of overindebtedness and non-performing loans.

NeuroDecision: using neural networks for more predictive creditworthiness assessments

Equifax's NeuroDecision® is the first patented credit scoring system to use explainable AI[1]. It uses a neural network algorithm to predict the probability that a consumer will default on a credit product. Creditworthiness assessment models that use NeuroDecision are more predictive than traditional models that use techniques such as logistic regression.

More predictive creditworthiness assessments support a number of European policy objectives. The Mortgage Credit Directive and Consumer Credit Directive both require lenders to carry out creditworthiness assessments. The EBA states that creditworthiness assessments are partly intended "to protect consumers against the risks of over-indebtedness and bankruptcy, and therefore ensure responsible lending". More predictive creditworthiness assessments also increase the supply of credit and financial inclusion and reduce the incidence of non-performing loans[2].

Equifax's clients have deployed NeuroDecision around the world in credit risk models for automobiles, communications, utilities, consumer credit and mortgages. A US lender, for example, was able to approve 92,000 more accounts while also realising $13.7 million in annual loss savings[3]. Within the EU, our clients are not yet deploying NeuroDecision but we are working with a number of them at the proof of concept stage to demonstrate the performance, safety and compliance of NeuroDecision.

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[1] Equifax (2018) Equifax Receives Utility Patent for Innovative NeuroDecision® Technology

[2] See, for example, CEPS, Centre for Credit Risk Studies, and European Credit Risk Institute (2019) Data sharing in credit markets: Does comprehensiveness matter?

[3] Equifax (2019) Innovation in credit decisions

NeuroDecision: explainable decisions with no trade off in performance

The algorithm in NeuroDecision is fully explainable – it can be explained in the same way and to the same degree as a traditional logistic regression algorithm. So NeuroDecision realises the benefits of AI without introducing a 'black box' algorithm. NeuroDecision achieves explainability partly by constraining the neural network so that the variables in the model only move in one direction (a monotonic constraint).

A common objection to constraining AI to produce more interpretable results is that an unconstrained, unexplainable model may be more predictive. Over time though, we have found it is the constrained, explainable model that is more predictive. This is because the unconstrained model 'overfits' to training data (the unconstrained model is more affected by temporal changes in consumer behaviour than the constrained model).

Regulating for trustworthy AI in credit risk

We strongly support the position in the White Paper that credit risk is not listed as a high risk application. Credit risk is a well regulated sector already. Financial services firms have considerable experience of using advanced algorithmic models safely and effectively to make accurate and trustworthy decisions. Firms are typically using AI within those proven control frameworks which remain fit for purpose; as we are with NeuroDecision.

Where new risks do emerge, financial regulators and supervisors at EU and member state level are tackling them skillfully through sandboxes, research and guidelines tailored to each use case. Taking the EBA as an example, among the actions it has taken are:

- Publishing *Guidelines on loan monitoring and origination* that "introduce requirements for assessing the borrowers' creditworthiness, together with the handling of information and data for the purposes of such assessments". This includes guidelines for institutions "using technology-enabled innovation for credit-granting purposes".
- Establishing a FinTech Knowledge Hub to bring together competent authorities and firms in a common setting to enhance the monitoring of financial innovation, knowledge sharing about FinTech and to foster technological neutrality in regulatory and supervisory approaches.
- Joining other European Supervisory Authorities on the European Forum for Innovation Facilitators, to share experiences of engaging with firms in sandboxes and innovation hubs.

Explainability: credit risk models that use AI should give the right explanation to every consumer, every time

For AI to be trustworthy when it is used in creditworthiness assessments, it must be explainable and consumers must get the right kind of explanation. Equifax **recommends** that European regulators set the following standard when AI is used in creditworthiness assessments:

- The explanation should explain what action the consumer can take to increase their credit score and their chance of being granted credit in future. That explanation should be accurate for every consumer, every time.

NeuroDecision demonstrates it is possible to meet the standard - the model generates an explanation and every consumer can be certain that if they act rationally on it, then their credit score will improve.

Our recommended standard would not only empower consumers, it would also give confidence and clarity to firms developing and deploying AI solutions. Equifax developed NeuroDecision in the US to comply with a similar standard there, clarified by the Federal Trade Commission[4].

As credit risk models become more complex, those that do not meet this standard risk undermining the ecosystem of trust, social fairness and prosperity that the Commission has identified as its priorities. A misleading explanation could mean, for example, a consumer pays down debt but finds their credit score gets worse instead of improving.

AI and data: adding the right data improves the predictiveness of all credit risk models

NeuroDecision uses the same data as our traditional credit risk models; it does not require new types of data. It is more predictive because it analyses that data more effectively than traditional models do.

Like all credit risk models, however, NeuroDecision would be more predictive if Equifax and our clients had access to more comprehensive, timely and accurate data. A recent report by the European Credit Research Institute and the Centre for European Policy Studies highlighted how more comprehensive credit data has improved the predictiveness of creditworthiness assessments in Europe[5]. That in turn increased the supply of credit and financial inclusion and reduced the incidence of non-performing loans. The World Bank has highlighted how increasing the supply of data to credit reference agencies would support the economic recovery from Covid-19[6].

We support the Commission's work on a data strategy and a digital finance strategy to increase the supply and trustworthy use of data. In particular, increasing the supply of credit data held by the following groups would improve the predictiveness of creditworthiness assessments, regardless of whether they use AI or traditional techniques:

- **Private creditors** - some creditors do not supply any data to the credit information system, and some do not supply all the data that would improve credit risk models. For instance, Spanish creditors typically only supply data on defaults (negative data) whereas in the majority of member states, creditors provide positive data too[7]. Positive data may include, for example, balances, loan amounts, payments made on time and credit limits .
- **Public bodies** - governments and other public bodies hold data that consumers could use to prove their identity, their income and their positive payment history. Governments already supply credit data in a number of member states, including Belgium, Finland, Germany and Greece[8].
- **Consumers** - open banking and open finance allow consumers to share data used in creditworthiness assessments to prove their identity and evidence their ability to repay credit.

Equifax does not use social media data in our models.

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[4] Federal Trade Commission (2020) Using artificial intelligence and algorithms

[5] CEPS, Centre for Credit Risk Studies, and European Credit Risk Institute (2019) Data sharing in credit markets: Does comprehensiveness matter?

[6] World Bank (2020) COVID 19 Emergency Policy Responses: Why Credit Reporting Matters in the Stabilization and Recovery Phases?

[7] ACCIS (2017) ACCIS 2017 survey of members: analysis of credit reporting in Europe

[8] ACCIS (2017) ACCIS 2017 survey of members: analysis of credit reporting in Europe

About Equifax

Equifax Inc., “Equifax” is a global information solutions company that uses unique data, innovative analytics, technology and industry expertise to power organisations and individuals around the world by transforming knowledge into insights that help make more informed business and personal decisions.

Headquartered in Atlanta, Ga., Equifax operates or has investments in 24 countries in North America, Central and South America, Europe and the Asia Pacific region. It is a member of Standard & Poor's (S&P) 500® Index, and its common stock is traded on the New York Stock Exchange (NYSE) under the symbol EFX. Equifax employs approximately 11,000 employees worldwide. In Europe, Equifax operates in Spain, Portugal, Ireland and the UK. In the UK, Equifax is authorised and regulated by the Financial Conduct Authority.

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