INTELLIGENT RISK

knowledge for the PRMIA community

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Peter Plochan is Senior Risk & Finance Specialist at SAS Institute assisting institutions in dealing with their challenges around finance and risk regulations, enterprise risk management, risk governance, risk analysis and modelling. Peter has a finance background (Master's degree in Banking) and is a certified Financial Risk Manager (FRM) with 10 years of experience in risk management in the financial sector. He has assisted various banking and insurance institutions with large-scale risk management implementations (Basel II, Solvency II) while working internally and also externally as a risk management advisor (PwC).

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◪ managing preventable risks

by **Elias** Loki

the opportunity for machine learning in credit risk early warning systems

Since the financial crisis of 2008, both Global Systemically Important Banks (G-SIB) and Domestic Systemically Important Banks (D-SIB) have been affected by regulations published by the Bank for International Settlements (BIS). The regulatory efforts of BCBS 239, in which financial institutions need to demonstrate transparency, completeness, accuracy and timely provisioning of risk data has enabled banks to free up synergies and leverage the revised infrastructure to apply better controls and open the capability to introduce, in a cost-efficient way, improved models and frameworks for an early warning system (EWS) in the area of credit risk management.

The banking industry is still, however, lacking behind in terms of leveraging freed up synergies. The opportunity of a methodology and technology re-launch for early warning systems could be used to replace traditional human rule-based approach. But why is this important? The decrease in the credit worthiness of a client or the potential increase of default reduces the opportunity of the bank and the client to navigate through a potentially difficult situation. The bank's first priority would be to keep the expected loss at a minimum. There are various possibilities to hedge potential loss situations, for example, through the use of credit default swaps. However, where clients are characterized as 'not listed corporates' or 'private individuals' an EWS provides a mechanism to better manage potential losses and which can lead to reduced loan-loss provisions, higher risk-bearing capacity and optimized regulatory capital requirements.

BCBS 239 infrastructure as an enabler
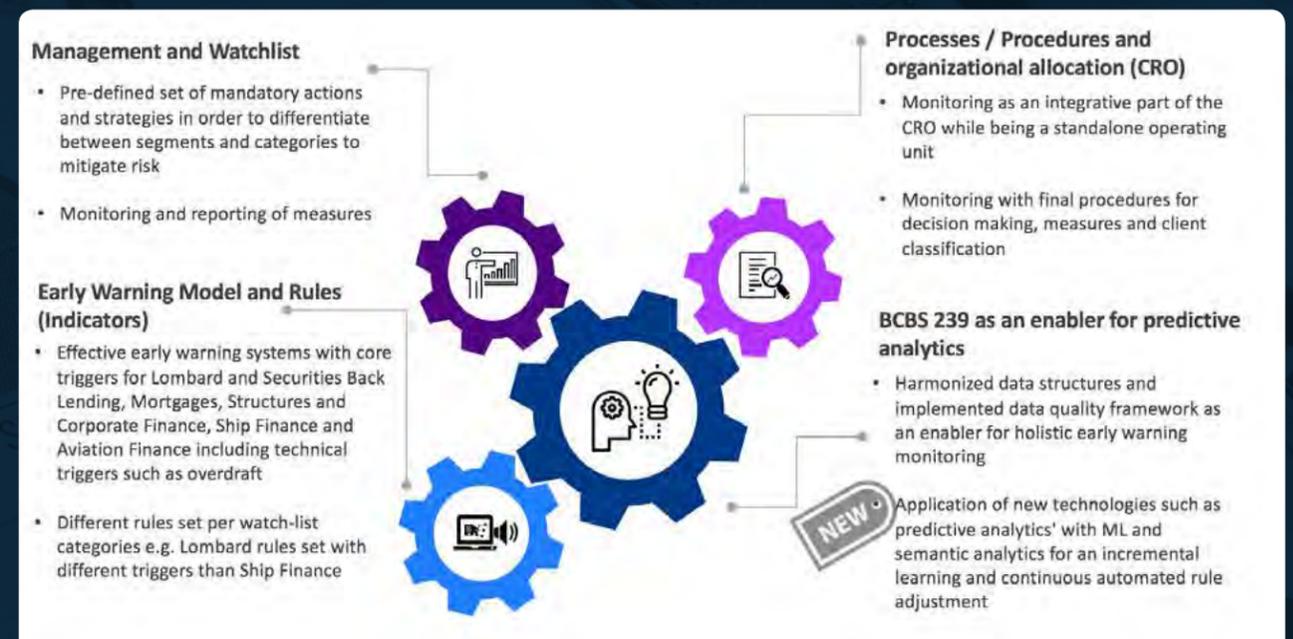
A mature EWS approach would consist of using statistical and qualitative indicators with a high predictive accuracy for default. Identifying these triggers, based on the released synergies raised from the Basel framework, provides Banks with an ideal opportunity to enhance their credit risk management (CRM) process. The relevant information technology infrastructure, human resources and data are available in such a highly sophisticated and educated manner than ever before. The question arises as to how to integrate these capabilities in order to manage preventable credit risk by a relaunch of methodology and technology. First, it is highly recommended to identify the relevant credit segments, which have a need for improvement and understand what governance processes are in place for an EWS and determine whether they are sufficiently robust and consider the data used in modelling.

Secondly, the questions of financial materiality and experienced shortcomings should be clarified. A strong alignment between the recovery team and portfolio management team would lead to expert and experience driven analysis. An analysis of defaults by credit volume and type, results in the assessment and re-calibration of given statistical and macro-economic triggers.

Thirdly, the validation of new technologies and methods needs to be considered. This includes the use of predictive analytics such as behavioral analytics, semantic analytics, and machine learning. The added value of behavioral analytics is characterized through data science and social network analysis combined with machine learning. Data feeds from external sources could be incorporated, in which major critical decisions are communicated earlier than in traditional news. Machine learning applies purely data driven rules for use in early warnings system based on various data sources (Big Data).

For example, the use of classical approaches e.g. Professor. Edward Altman Z-Score approach coupled with the use of more advanced mathematical algorithms e.g. in constructing Credit Risk Scorecard using the Mahalanobis-Distance approach to determine predictive clusters can be applied to identify the relevant clients in a shortfall position. This would help the first line of defense to proactively identify potential credit anomalies as opposed to reacting based on client-re-ratings as part of credit review process.

Data from the front-office can be integrated in the continuous improving machine learning algorithm. Further, a purely data driven rule-set generation enriched with the feedback of a risk manager incorporating the qualitative component, completes the full capability of a new auto-improved rule generation and indicator re-calibration. This supports the elimination of human error and increases the operational effectiveness.

Semantic analytics helps to transform unstructured data into actionable knowledge for a better comprehensive understanding and parameter calibration of the early warning models.

However, not every new technology or technical method is needed for every credit risk segment. More important would be the derived conclusions and benefit-based incorporation of new technologies and methods. The latest Basel frameworks have created added value and freed up new synergies in terms of data quality and re-calibration gains of existing credit risk systems.

references

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Elias Loki, Senior Business Consultant at BearingPoint, Switzerland, is a subject matter expert for BCBS239, market and credit risk management. He has been working with systemically important banks helping them in implementing regulatory change and giving them guidance and advise for several years. His educational background in business economics, mechanical engineering combined with an MBA has equipped him with a broad base from which to approach many topics in the area of Financial Risk Management.