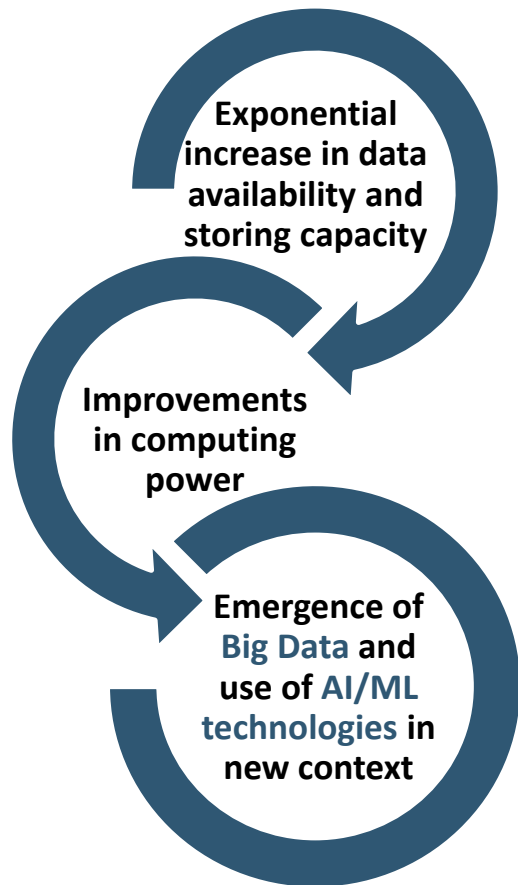




Discussion paper on machine learning for IRB models

Public hearing – 16 December 2021

Digital age supervisory challenges from AI/ML

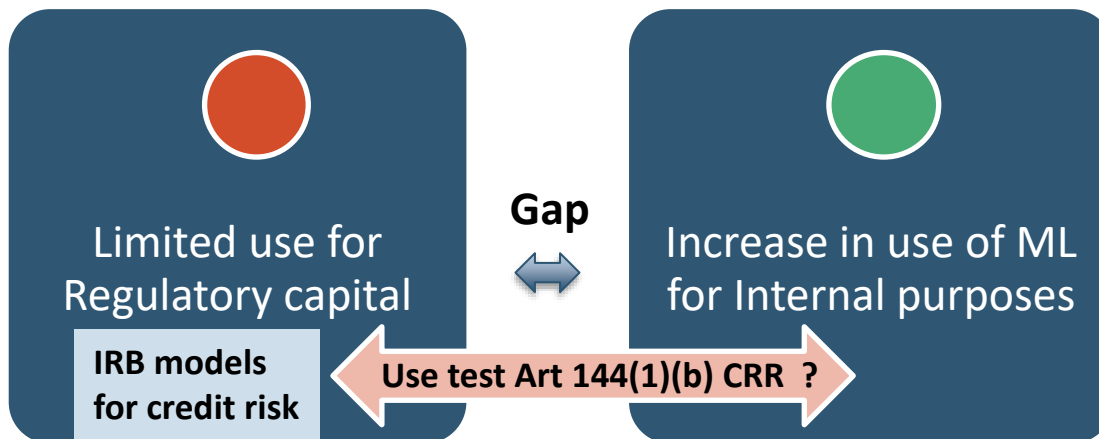


The EBA work identifies the supervisory challenges to adapt to the technological developments and provides related guidance:

- Jan 2020, EBA report on the recent trends of big data & advanced analytics (BD&AA) in the banking sector.
- April 2021, Commission legislative proposal on AI → AI used for evaluating the creditworthiness of natural persons among the high-risk use cases.
- June 2021, EBA report analysing the current RegTech landscape in EU.
- 11 Nov 2021, EBA published the **Discussion paper on ML for IRB model (DP)** for 3 months consultation.

Background

- Why we need this discussion paper?



- **What is the aim?**
 - Investigate the sources of this gap and
 - discuss how ML models can coexist and adhere to the CRR requirements for IRB models for credit risk
- **Scope/definition:** more complex ML models that are difficult to interpret
- **Why stakeholder feedback is important?** Strengthening supervisory experience on ML models used in IRB

Structure of the discussion paper

Section 2

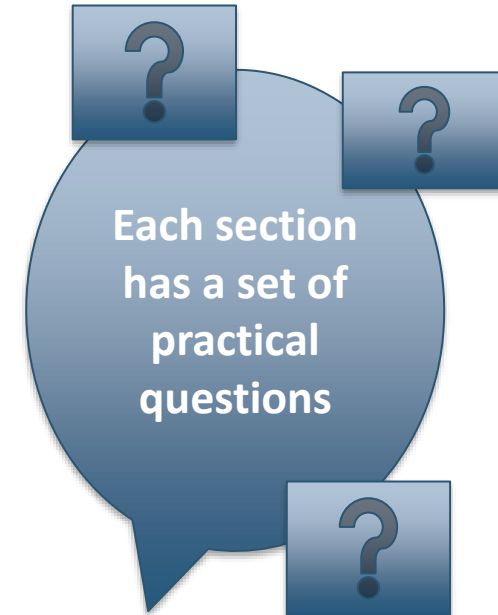
- Set the scope (complex models)
- Current use

Section 3

- Challenges and potential benefits of using ML in developing CRR compliant IRB Models

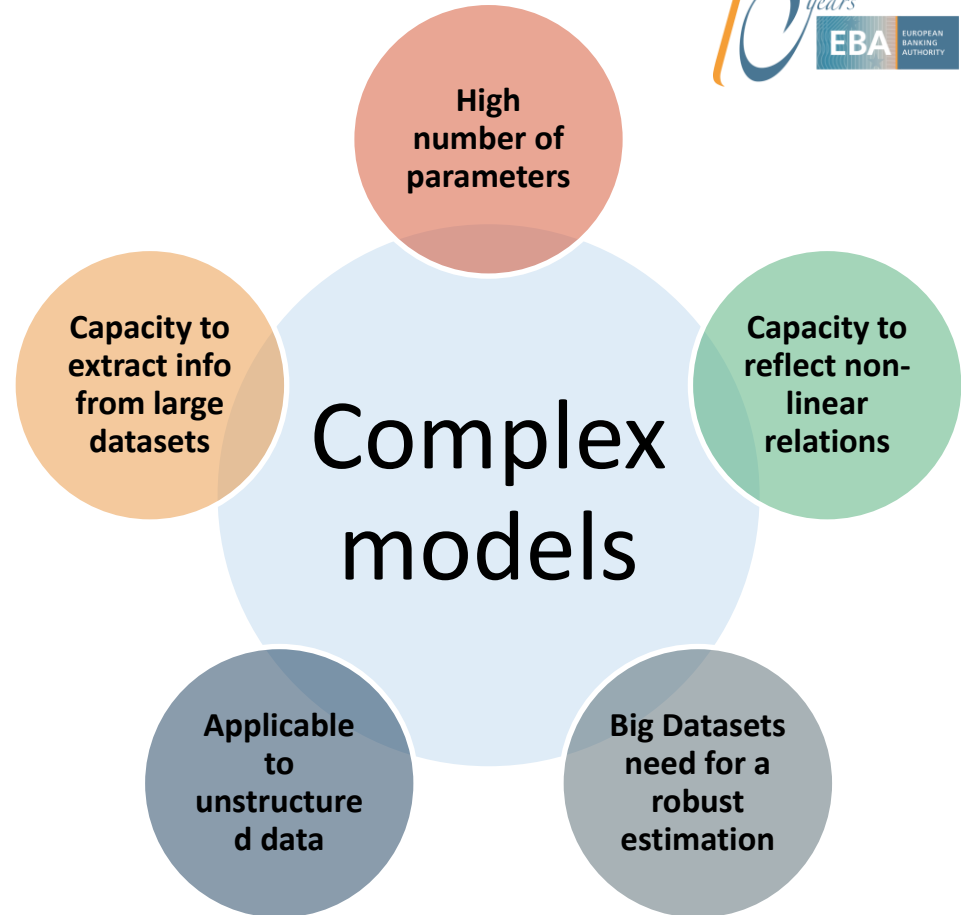
Section 4

- Main concerns
- Principle-based recommendations



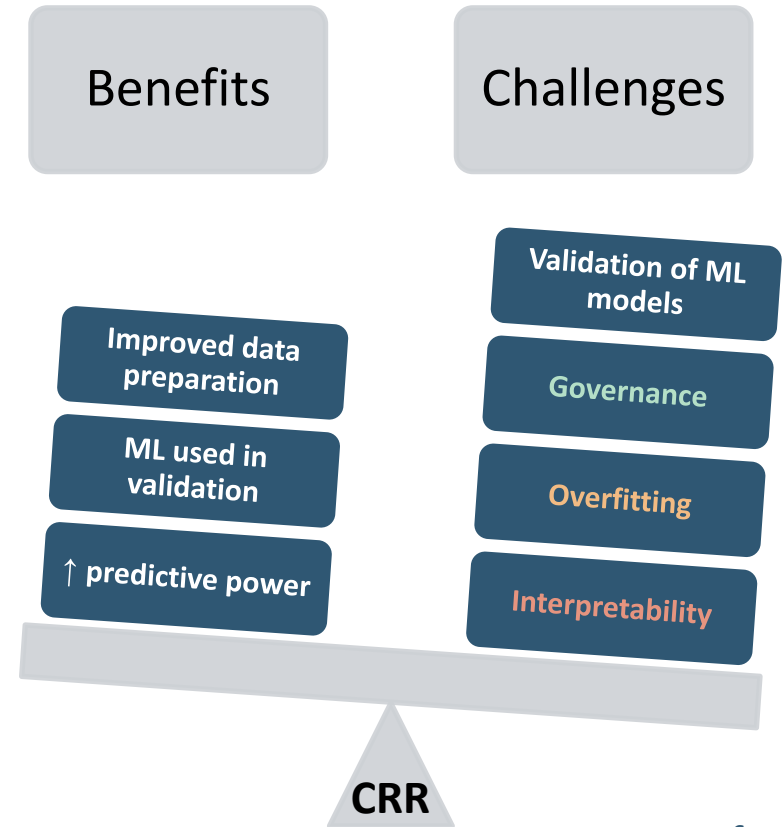
Setting the scope

- ML covers a wide range of models with different level of complexity (from linear regression to deep neural network)
- The discussion paper refers only to the more complex that are difficult to interpret and justify to supervisors
- No clear-cut distinction between simple and complex models
- The DP provides **characteristics to consider to evaluate the complexity of a model**



Main challenges and benefits from using ML in IRB

- The DP analyses CRR provisions to identify **challenges** and **benefits in using ML to develop IRB compliant models**
- These are **specific to the context** in which ML may be used (e.g. risk differentiation or validation) and depends on whether ML does the prediction in full or it is used as a supporting tool (e.g. data cleansing)
- **Main concerns:**
 1. **Interpretability of results**
 2. The governance with particular reference to **ensuring adequate understanding by their users including management functions**
 3. **The difficulty in evaluating the generalisation capacity of a the models**



Principle-based recommendations

The DP stresses economic and supervisory principles that banks should consider when seeking approval to apply ML for regulatory purposes, these are aimed at:

- **Ensure that ML models are properly understood by their users** (CRCU, validation unit and management functions)
- **Avoid unnecessary complexity** (excessive number of parameters and reliance on unstructured data) if not justified by a significant improvement in predictive power
- **Ensure model can be interpreted and documented properly** (assess statistical and economic relations of risk drivers with model predictions)
- **Enhancing** the understanding of assumptions and behaviour of the model on specific predictions when using **human judgement** in model development and application respectively.
- **Justify and monitor frequent updates** of a model
- Focus on **validation** which may require **increased depth/frequency**

Industry feedback is sought with a set of 17 questions

Q 1-2

- Explore current use of ML in IRB

Q 3-12

- Explore specific challenges related to internal user acceptance, human judgement, overfitting, frequency of model updates.
- Challenges in using ML for IRB models stemming from the AI act

Q 13-14

- Explore potential benefits of using ML in IRB and,
- In particular, the use of ML for collateral valuation

Q 15-17

- Explore the use of explainability techniques and, the strategy to ensure understanding by the ML models users
- Investigate industry concerns around the recommendations given

Conclusions and next steps

- ML models can provide added value in the IRB context provided that they ensure acceptable monitoring, validation and explainability of methodology and model outcomes.
- The need for competence in ML is becoming increasingly important.
- Decision to go forward with ML in IRB should be based on prudential terms but also considering other relevant aspects (e.g. Ethical or consumer protection considerations)
- The discussion paper seeks stakeholders' feedback on many practical aspects related to the use of machine learning in the context of IRB (deadline 11 February 2022)
- Need to provide further guidance will be assessed based on the feedback received
- Potential developments in relations with the Commission AI act



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