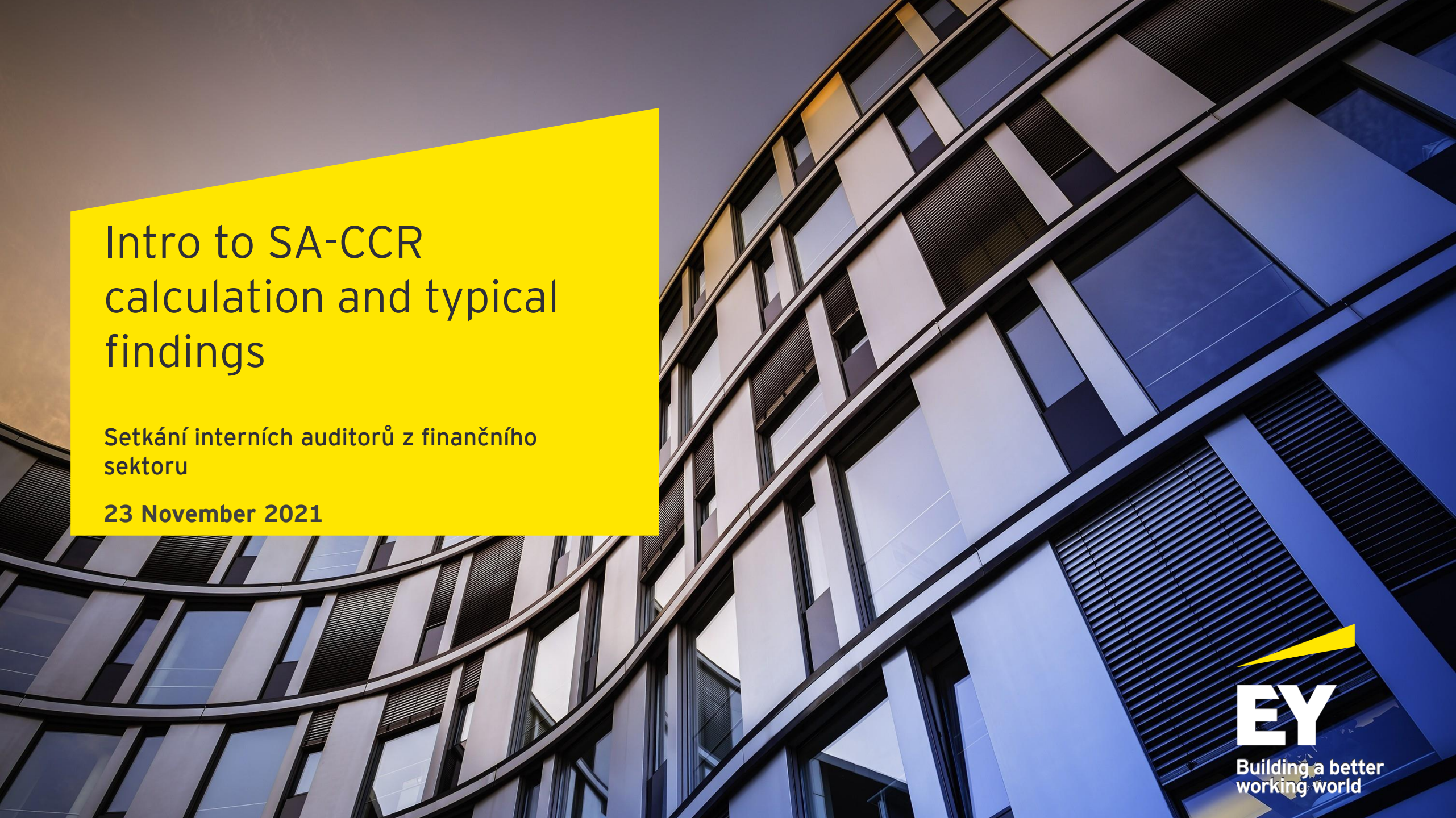


Intro to SA-CCR calculation and typical findings

Setkání interních auditorů z finančního sektoru

23 November 2021

Building a better working world

Agenda

1. Intro to SA-CCR calculation
2. Key implementation challenges
3. Typical findings
4. Q&A

SA-CCR basics I

Counter-party credit risk

- Risk that **counterparty in a financial contract may default on its obligations** during the term of the contract, i.e. before the final settlement of the transaction's cash flows
- Fundamental element of the CCR capital requirement calculation is determination of **Exposure at Default (EAD)**, which is then multiplied by corresponding risk weight according to the credit quality of a counterparty

Standardized approach

- Exposure value is calculated as:

$$\boldsymbol{EAD} = \alpha \times (RC + PFE)$$

$\alpha = 1.4$	supervisory alpha
RC	replacement costs
PFE	potential future exposure

- May be calculated at **netting set level** for all the transactions covered by a contractual netting agreement if particular conditions are met.
- When the conditions are not met, **each transaction shall be treated as it is its own netting set**

SA-CCR basics II

Calculation details

$$\boldsymbol{RC} = \begin{cases} \max\{CMV - NICA; 0\} \\ \max\{CMV - VM - NICA; TH + MTA - NICA; 0\} \end{cases}$$

CMV	value of derivatives in the netting set
NICA	net independent collateral amount
VM	net variation margin received/posted
TH	positive threshold to trigger collateral transfer
MTA	minimal transfer amount applicable to the counterparty

$$\boldsymbol{PFE} = \text{multiplier} * \text{Addon}^{\text{aggregate}}$$

$$\textbf{multiplier} = \begin{cases} 1 \text{ if } z \geq 0 \\ \min\left\{1; 5\% + 95\% * \exp\left(\frac{z}{2*95\%*\text{Addon}^{\text{aggregate}}}\right)\right\} \text{ if } z < 0 \end{cases}$$

$$\textbf{Addon}^{\textbf{aggregate}} = \sum_{i=1}^{6} \text{Addon}^{asset\ class_i}$$

$$z = \begin{cases} CMV - NICA \\ CMV - VM - NICA \end{cases}$$

$$Floor = 5\%$$

Interest rate derivatives
FX derivatives
Credit derivatives
Equity derivatives
Commodity derivatives
Other derivatives

1. Calculate the **effective notional** for each **trade**
2. Allocate the trades to **hedging sets** based on currency, maturity, commodity type, etc.
3. Calculate the **effective notional** of each **hedging set** using specified type of aggregation of the previous results
4. Calculate the **hedging set level add-on** using multiplication by **supervisory factor SF** (ranging from 0.5% to 40%)
5. Calculate the **asset class level add-on** using a specified type of aggregation of the previous results
6. **Sum up** all asset

SA-CCR key implementation challenges

1. Mapping of derivatives with multiple risk factors

CRR II – mapping to corresponding categories

- Only 1 material risk factor – map to corresponding risk category
- More material risk factors:
  - All in one risk category – map only once to that risk category
  - In different risk category – map once to each of these categories

RTS – identification of material risk drivers

- Purely qualitative approach
- Qualitative (identification of all risk drivers) and quantitative (assessment of their materiality) approach:
  - Sensitivities (i.e. delta risk sensitivities in FRTB SA framework)
  - SA-CCR add-ons for each risk category
  - Volatility of the underlying instruments (mentioned in BCBS)
- Fallback approach

2. Grey zones of SA-CCR

Delta for exotic option

- Option strategies should be transformed into particular call/put options. For digital (binary) options one should approximate the trade by collar strategy which is then decomposed into call / put options.

Supervisory duration for callable derivatives

- For IR, credit asset classes: $SD_i = \frac{exp(-5\% * S_i) - exp(-5\% * E_i)}{5\%}$
- S_i is time period between reporting date and start date of the deal if it is after
- Earliest possible termination date is considered to be the start date if it is before all dates at which a transaction starts fixing or making payments

Mapping to hedging sets for basis derivatives

- Art 277a (1) basic rule for mapping is clear – for IR risk category it is currency
- Art 277a (2) brings additional hedging sets for special derivatives like variance derivatives (2a) and basis swaps (2b) to be more prudent
- However, if the risk drivers of the basis swap are identical and positively correlated, they can be in the same hedging set
- 3M-1M Euribor vs. fix, 3M Euribor vs. 1M Euribor; 3M Euribor vs. fix

SA-CCR typical validation findings

Data quality

- Clients use quite a lot of manual inputs, data updates/changes
- Most of the data findings are explained by the clients

Risk mapping

- The client decides the materiality of risk factors based on alphabetical sorting because SA-CCR addons used for quantitative mapping yield the same numbers
  - Artificially netting exposures that should not be netted out (based on arbitrary criteria)
- Inconsistencies in notional calculations for particular risk factors leading to incorrect selection of material risk factors

Other

- The basis / inflation flag is not considered for basis / inflation structured products resulting in wrong hedging set supervisory factor used (0.5 and 5 should be used instead of 1)

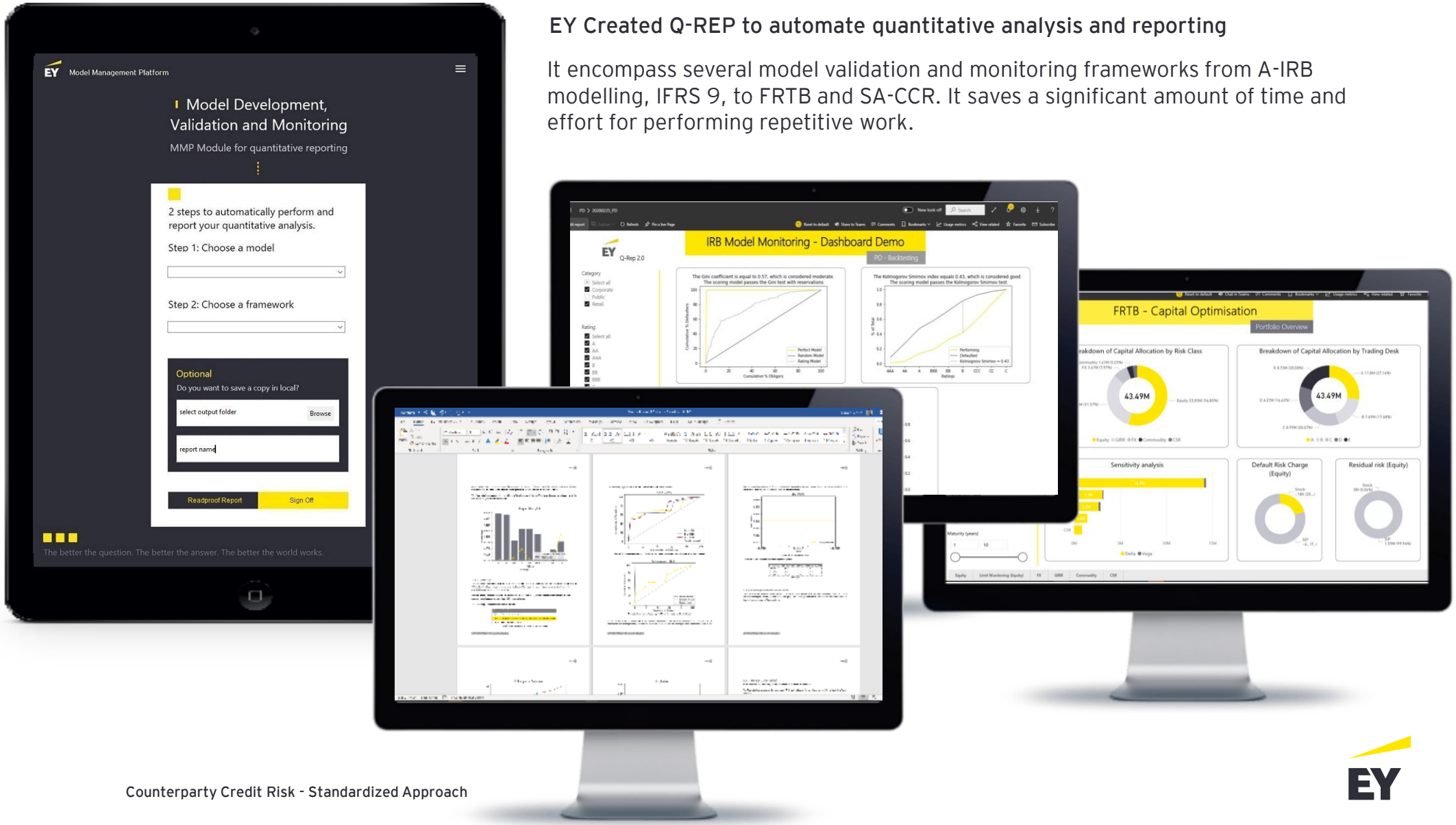
- The client did not apply time-bucketing for single trade netting set. It was considered to be applied only for netting set with more trades.

- The exposure value of margined netting set shall be capped at the exposure value of the same netting set which unmargined. This is for EAD, not only RC or PFE.

EY Q-Rep

EY Q-REP addresses:

- High standard validation
- Resourcing
- Changing modelling techniques
- **Validation velocity**
- Standardization / Automation



EY Created Q-REP to automate quantitative analysis and reporting

It encompass several model validation and monitoring frameworks from A-IRB modelling, IFRS 9, to FRTB and SA-CCR. It saves a significant amount of time and effort for performing repetitive work.

Counterparty Credit Risk - Standardized Approach

How can EY Q-Rep solution help you?

Validation of your own calculation

EY can help you even if you have already implemented SA-CCR calculation:

- EY Q-Rep solution can validate your calculation, incl. data quality checks
- There is no need to on-board Q-Rep at your side
- It is able to run validation exercise on a large sample of your portfolio to ensure implementation correctness

Implementation of EY Q-Rep solution for SA-CCR

EY Q-Rep on-boarding to get all benefits of the SA-CCR solution

- End-to-end calculation of SA-CCR capital requirements and reporting items
- Analytical layer implemented within interactive dashboard
- Automated internal / regulatory reporting layer
- Reduces manual effort drastically with high quality reports
- Is flexible and user friendly
- Delivers audit trail and replicability and facilitates tracking of validation findings

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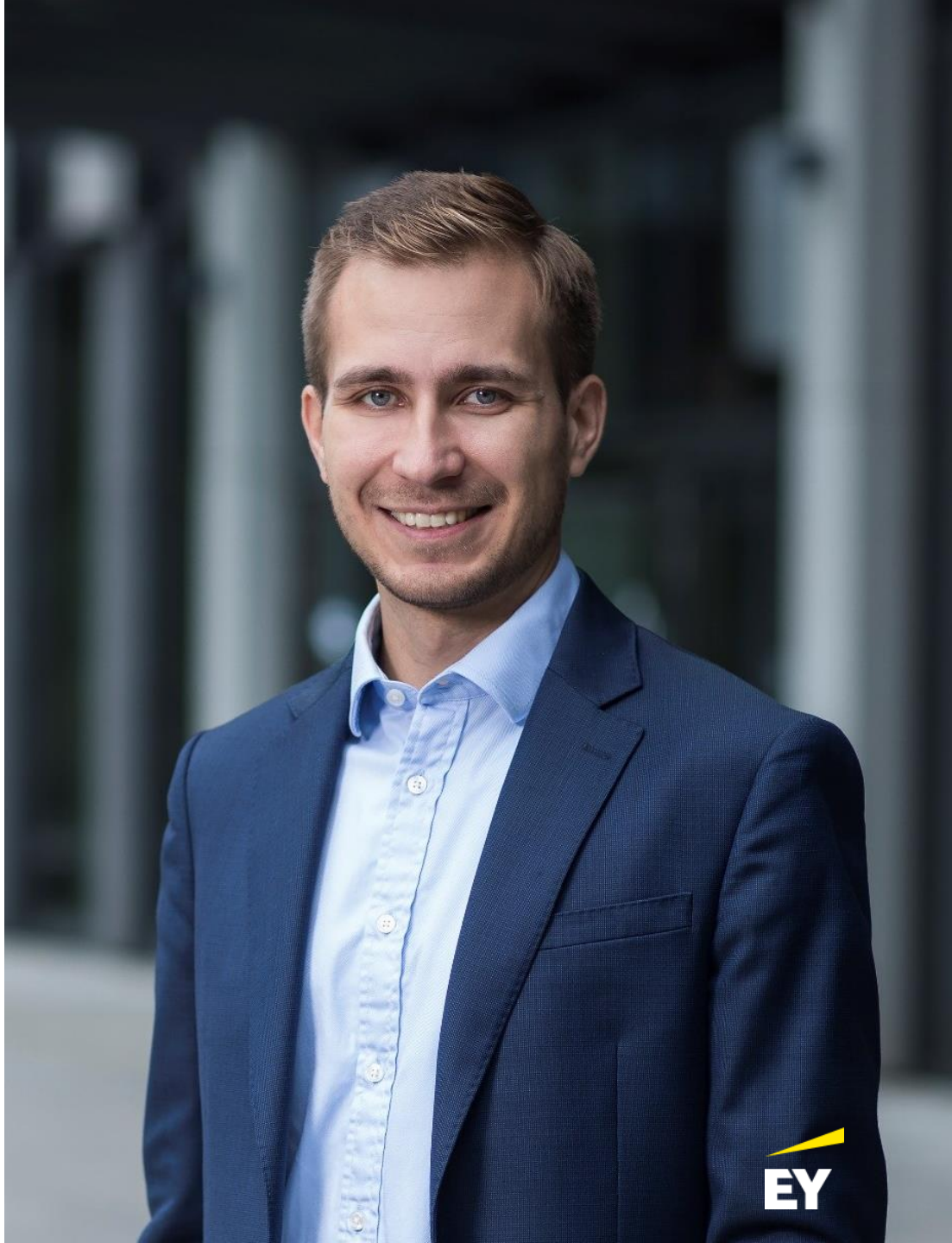

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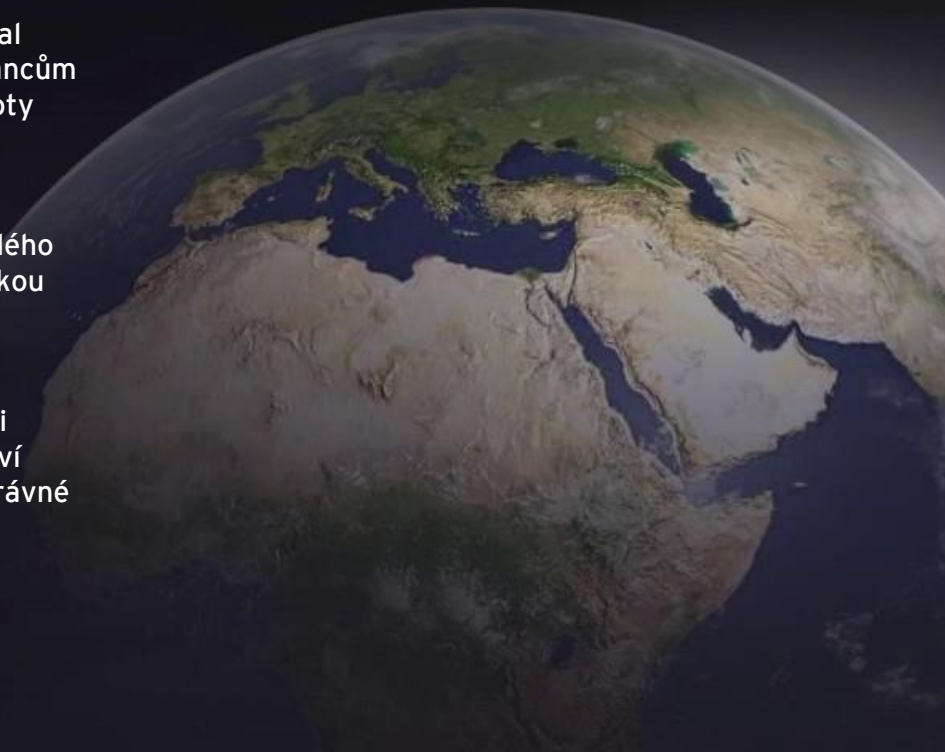
Smyslem EY je přispívat k tomu, aby svět fungoval lépe. Proto pomáháme klientům, našim zaměstnancům i širšímu společenství vytvářet dlouhodobé hodnoty a posilovat důvěru v kapitálové trhy.

Týmy odborníků EY, vybavené nejmodernějšími technologiemi, působí ve více než 150 zemích celého světa – provádějí audity a poskytují klientům širokou poradenskou podporu, která jim umožňuje růst, transformovat se a efektivně fungovat.

Naši auditoři, konzultanti, právní a daňoví poradci i odborníci na strategické a transakční poradenství si kladou ty správné otázky a dokážou najít ty správné odpovědi na složité problémy dnešního světa.



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