



Backward AND Forward

The inclusion of ESG Factors in Credit Risk Models

ABI - Supervision, Risks & Profitability

—

Milan, June 6-7 2023

Why is the **integration** of ESG factors into Credit Risk Models necessary?

Awareness in ESG topics and risks is growing

- Regulatory attention is high
- Public awareness / attention regarding ESG factors is high and still growing
- More data regarding ESG needs to be collected to link (past) defaults to ESG topics, otherwise investigation is not possible

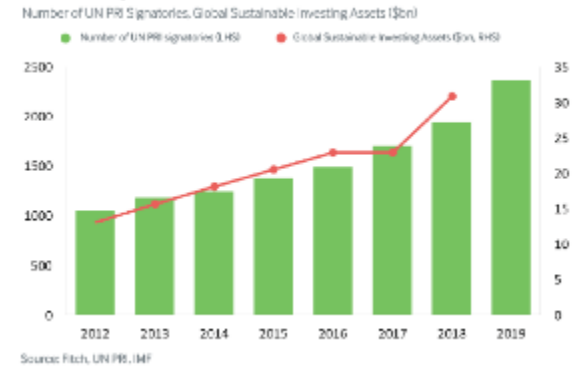
- As impact of ESG factors and respective ESG risks on companies activities is growing (e.g. transition risks), more and more defaults are expected due to realized ESG risks
- Models that do not consider ESG Risks in some way will not be able to predict these defaults
- In S&P research updates¹, environmental and climate factors were an important consideration in ~10% of the cases and triggered certain actions towards credit ratings (see pie chart on the right for breakdown of these actions)

Current models will not be representative in the future

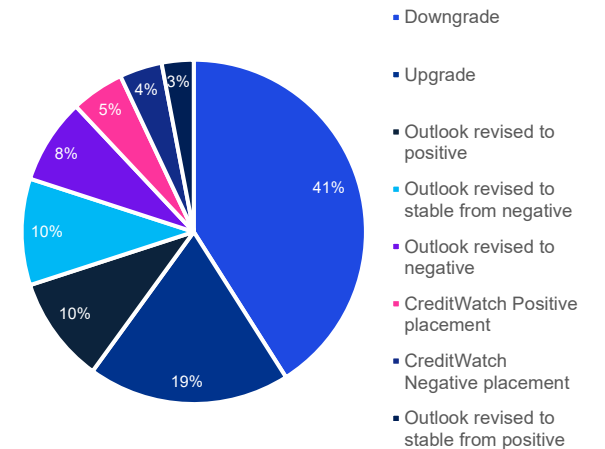
Integration in credit risk models becomes necessary for the broader assessment of ESG risks

- Credit processes are becoming sensitive to ESG risks and credit models need to provide necessary input to process decisions
- Link to creditworthiness, RWA calculation and Pricing is made by Credit risk models
- Allows regular and (ideally) automated estimation of ESG Risks

ESG Investing Becomes Mainstream



Rating Actions Related to E&C Risk



Source: S&P Global Ratings

Ok...As of now what **data tell** about ESG factors and Credit Risk?

A consensus on the existence of a relationship between ESG and Credit Risk is , but it has been proved mainly for Large Firms



- **Be good to be wise**, by M. Brogi, V. Lagasio, P. Porretta 2022. *High ESG awareness scores are strongly associated with a reduction in firm credit risk.*
- **2022 ECB WP “The low carbon transition, climate commitments and firm credit risk”**. *High emissions tend to be associated with higher credit risk. Disclosing emissions and setting a forward-looking target to cut emissions are both associated with lower credit risk*

Firms investigated

ECB

- The 859 firms belonging to the S&P 500 and the STOXX 600 stock indices (mostly American and European Large Firms)
- Firms are analyzed over a period spanning from 2010 to 2019

Brogi et al.

- 3000 ca Large listed companies from 79 countries, American firms represent half of the panel, European ones 20%,
- Firms have been analyzed over a period spanning from 2000 to 2016

Firms' Credit Risk metrics

ECB

- Credit Ratings assigned by S&P (Moody's ratings used for robustness checks)
- Market Implied Distance-To-Default measures retrieved from a Merton Model.

Brogi et al.

- The original Altman's Z-score is used to rank firms according to their Credit Risk
- All firms are provided with a S&P rating, so a map between Z-score and external ratings exists

Firms' Climate-related transition risk metrics

ECB

- Firm-level Scope 1,2 3, GHG emissions (backward) and GHG commitments (forward)
- Data retrieved from Refinitiv, Urgentem, Bloomberg

Brogi et al.

- An ad-hoc ESG scoring model has been developed, where the three letters are separately assessed and then equally weighted in a single score
- The variables used to compute the E, S, G, scores are all retrieved from MSCI

Traditional Risk Drivers

ECB

- Firm-level variables include: RoE, leverage, liquidity, size, governance, debt service
- Control variables are considered including the state of the economy, country of incorporation and industrial sector.

Brogi et al.

- The original Z-score creditworthiness explores all the typical credit-related areas: liquidity, profitability, operating efficiency, size,

How ESG Factors can be included in real-world Banks' Credit Risk Models?

2-step overlay



Apply ESG overlay to classical credit models

- Requires traditional credit rating from PD/LGD models as well as macro **ESG assessment**
- Impacted ratings are notched based on **expert judgement**
- Override may be decided by credit officers or in credit committees
- Existing models need not be adjusted
- ESG assessment may come from exposure method analysis (i.e. results are refactored for the purpose of rating adjustments)
- **Overrides usually directly impact RWA calculation**

Direct integration



Integrate ESG risks directly in the models

- **ESG KRIs** are used as model parameters
- Requires **redevelopment** of existing models
- Alternatively, a **separate ESG risk score** is modelled and combined with the credit score
- Or use external ESG score / exposure Method score
- Provides a data driven link between E, S and G KRIs and the customers credit rating
- **ESG-adjusted credit scores impact RWA calculation**

Scenario Method



Use stressed input parameters

- Stressed input parameters (e.g. adjusted balance sheet data) are used in traditional PD/LGD models
- **Models themselves remain unchanged**
- Stressed parameters are derived based on **scenario analysis**
- Allows observing the reaction different scenarios

Backward-looking methodology

Forward-looking methodology

The two overarching methods are not alternative to each other as they pursue different aims

Scoring models: using ESG factors in a backward looking methodology

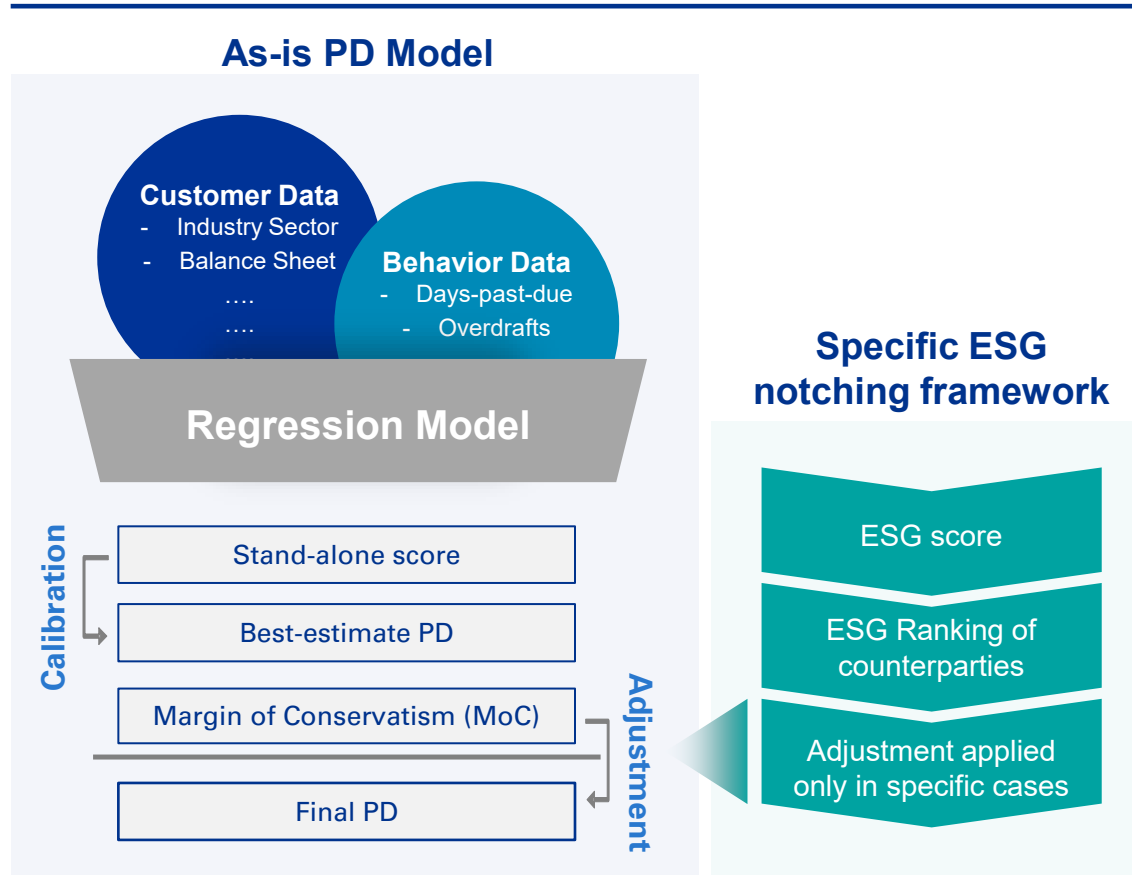
The two backward looking methodologies are hereby presented:

- **Overall overview of the 2-step Overlay process**, which is easy to implement, but directly impacts RWA of high-risk clients.
- **Direct Integration Framework**, where a separate ESG score is estimated from KRI input factors. This ESG score is then combined with the credit score of an existing PD model in an additional regression model;

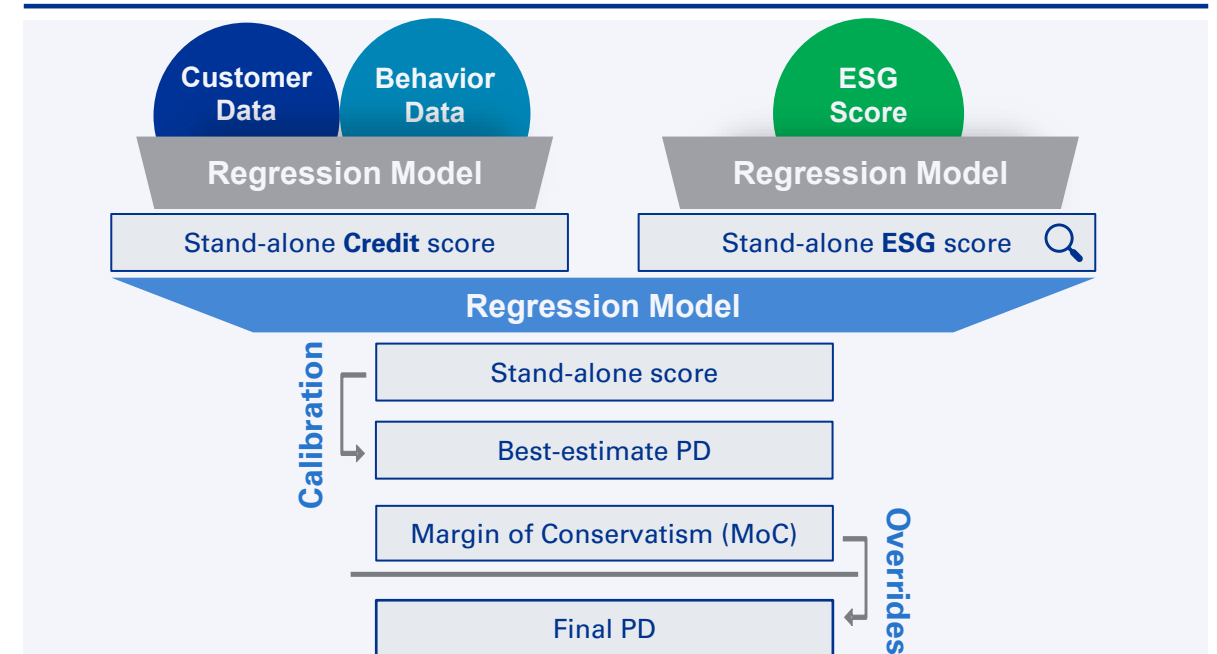


Use Cases #1, #2

2-Step Overlay

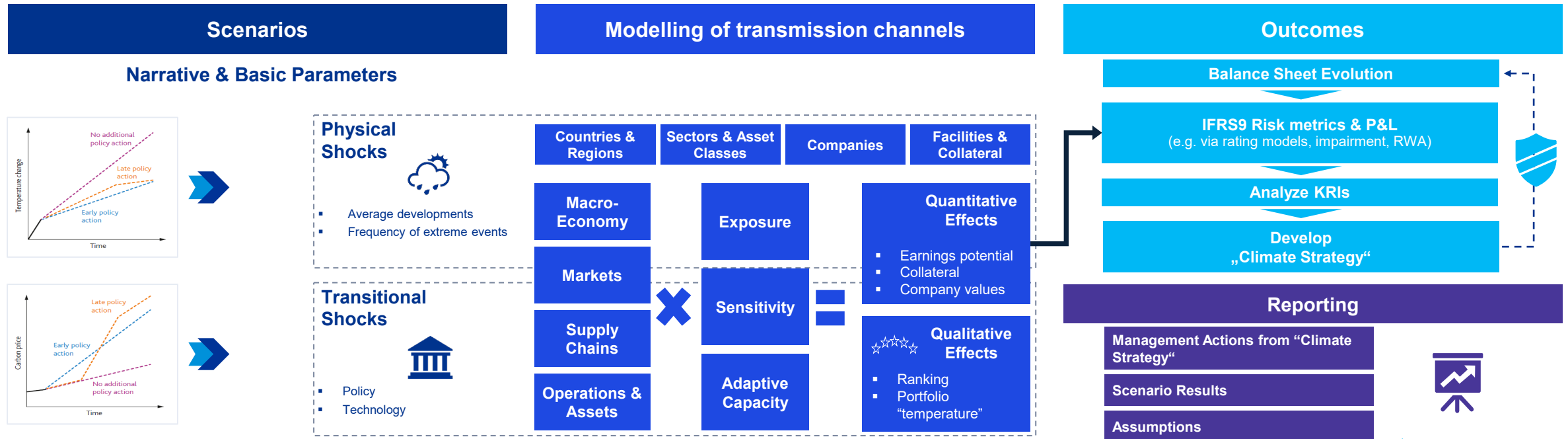


Direct Integration



Scores divided into **ESG categories** are assigned to each issuer through the use of questionnaires or publicly available information. Then, **3 specific models by area of analysis (E, S, G)** are developed to obtain an E, S or G Score. The **3 final models** are finally statistically integrated into an **overall ESG Score**.

Forward looking methodology: using ESG factors for Credit Risk projections



- Banks are expected to align with IPCC & IEA scenarios
- Based on IPCC, NGFS have defined a set of reference scenarios which have developed to be a market standard in the financial sector
- **IFRS9 LLP are going to include ESG elements**

Derive portfolio impact from scenario information

- Expansion of scenario parameters w.r.t. countries / sectors (transition risk) or regions / specific location of assets (physical risk)
- Many cause-effect-relationships to consider – necessary to prioritize based on the portfolio

Effects cannot be derived from the past

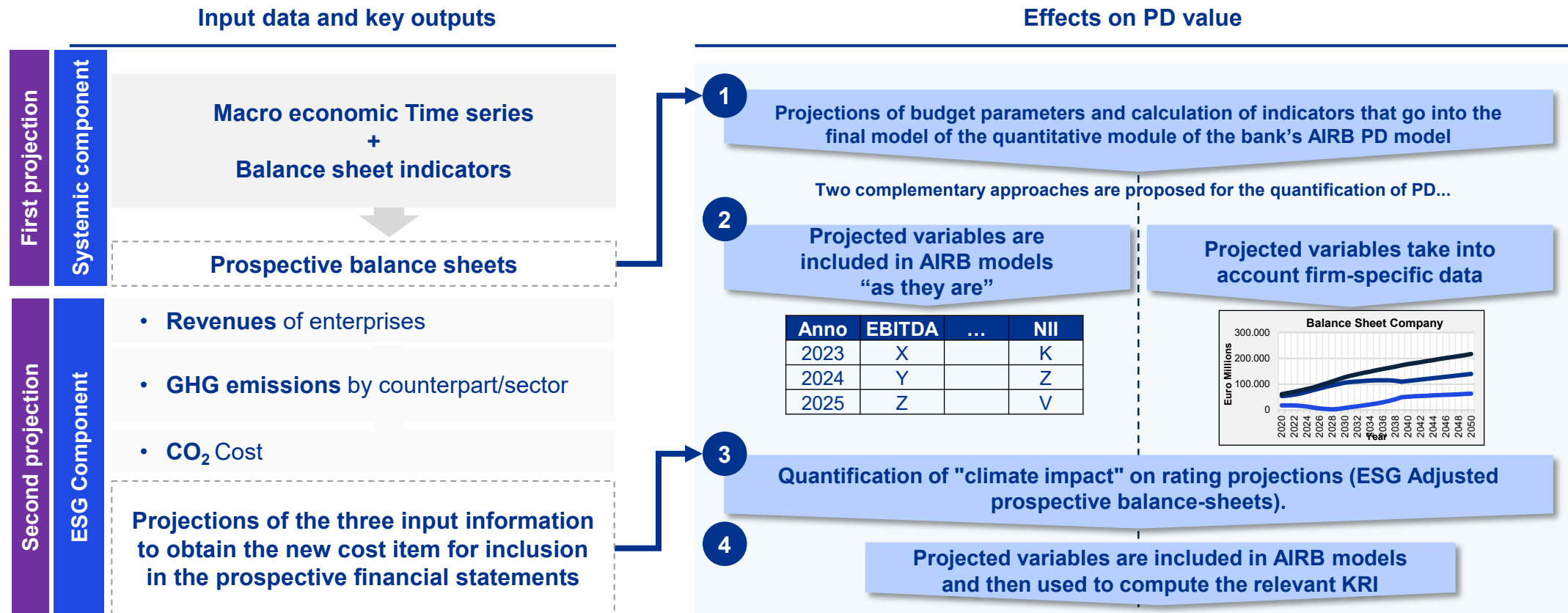
- The exercise's time-frame is typically twofold:
 - Short-term (as per IFRS9)
 - Long-term, extending until 2050
- In the Long-term change of portfolio as a response to changes is part of the exercise
- Reporting to focus on measures and strategy

Many assumptions to be fine-tuned

Case study: transition risk integrated in firms' balance sheets

The proposed framework is based on two consecutive streams:

- **First projection:** the “**prospective balance sheets**” and, thus, the **prospective ratings** are obtained through the construction of **satellite models** that project the financial ratios relevant in the balance sheet module of the bank’s AIRB PD model
- **Second projection:** starting from the previous projection, the “**climate**” **impact** is included in the projections of the balance sheet indicators and the **adjusted ESG rating** is calculated



Contacts

Giovanni Pepe

Partner, Risk & Regulatory Leader

KPMG Advisory

T +39 348 3080842

giovannipepe@kpmg.it



kpmg.com

The information contained herein is of a general nature and is not intended to address the circumstances of any particular individual or entity. Although we endeavour to provide accurate and timely information, there can be no guarantee that such information is accurate as of the date it is received or that it will continue to be accurate in the future. No one should act on such information without appropriate professional advice after a thorough examination of the particular situation.

© 2023 KPMG Advisory S.p.A., an Italian limited liability share capital company and a member firm of the KPMG global organization of independent member firms affiliated with KPMG International Limited, a private English company limited by guarantee. All rights reserved.

Document Classification: KPMG Confidential