An innovative approach to transitional risk scenario modelling

Abstract

Lenders today are increasingly required to evaluate climate-related risks within their portfolios. Transitional risks stem from the economic and financial implications of transitioning to a low-carbon economy, which are influenced by government policies and advancements in technology.
However, the availability of macroeconomic transitional risk data is often constrained by several factors:

- Limited Scope – Existing data often lack granularity and comprehensive outputs.
- Lack of Customisation – Many models are not tailored to specific lender portfolios or risk exposures.
- Unstated Assumptions – Economic outputs are frequently driven by black-box macroeconomic assumptions.
- Longer term Focus – A predominant emphasis on long-term projections may obscure short-term portfolio shocks and losses.
- Time Sensitivity – Scenarios such as those used in the PRA CBES are outdated. and scenarios from institutions such NGFS have prescribed actions applied.

To address these limitations, 4most has developed an innovative transitional risk scenario model that enables bespoke transition scenarios. The underlying model is a structural economic model providing transparency and explainability on the macro impacts
The model is structured on the following economic principles:

- Investment and Business Contraction – Without sufficient investment, businesses contract. The failure to cover depreciation leads to a decline in capital stock, which reduces gross value added (GVA) and employment levels.
- Impact of Carbon Taxes – The introduction of carbon taxes affects energy-intensive industries by increasing operational costs, leading to a higher capital costs and reduced investment due to lower returns.
- Capital Depreciation and Business Viability – Businesses facing higher operational costs and reduced investment experience accelerated capital depreciation. In extreme cases, asset decommissioning (e.g., factory closures) results in a substantial decline in capital stock and business output, reducing employment further.
- Labor Market Adjustments – Sector-wide employment reductions contribute to increased national unemployment, exerting downward pressure on wages. This then enables businesses to rebuild their workforce and stimulate growth.
- Longer term energy costs – The increase of renewable energy technologies contributes to decreasing energy costs, mitigating some of economic impacts highlighted above.

The above theory is guided by bespoke scenarios that provide shocks in energy prices. Scenarios are bespoke and look to encapsulate known or potential government policy – such as carbon taxes, green investment and enhancements in technologies.
The model output is a delta to a base scenario (No Climate Impacts) at both sectoral and UK level and is intended to be used in conjunction with incumbent Macro Economic Forecasts and Models to understand the impact of transitional risks on lenders portfolios.

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