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Simulation For Risk Management

A powerful new way of managing risk in times of uncertainty

Simudyne ———— Reality, re–engineered

Run multiple what-if scenarios to proactively revise your strategy, mitigate potential risk and optimize bad debt provisioning in order to make better informed, forward-looking decisions.

Traditional 'top-down' risk models don't capture the subtleties of the entities and the interactions that are involved in the risk system. Whilst conventional models enable you to correlate variables in historical data, you can't always identify causal relationships. This makes it difficult to extrapolate and predict future outcomes.

With agent-based modeling (ABM), you can simulate multiple scenarios for better decision making in mortgage analytics, stress testing, contagion risk and credit risk.

Agent-based modeling: new way to mitigate risk

Agent-based modeling is a technique for modeling complex systems to gain a deeper understanding of system behaviors. ABMs simulate how all kinds of people, regulators, corporations, banks or investors interact with one another, and how that interaction can affect financial markets.

In an ABM framework, banks can:

- Explicitly account for the heterogeneity of financial market participants and embrace a view of financial markets as complex adaptive systems.

- Capture non-linear dynamics, like knife-edges of risk and tail risk.

- Incorporate dynamic responses of market participants and recognize that the future won't look like the past.

- Model impact of behavioural changes of market participants.

- Identify, quantify and manage contagion risk.

Simudyne's solution

Simudyne provides a robust library of code and examples for frequently used and specialized functions that reduce the time and resources required to build even the most complex agent-based models. What normally requires several months of engineering and thousands of lines of code can be delivered in weeks and at a fraction of the cost.

Risk management applications

1. Comply with regulatory metrics like IFRS9

Simudyne offers a better tool for understanding sensitivity within a portfolio and how changes in accounting regulations effect provisioning.

ABMs are rich enough to capture key concepts embedded in IFRS9. For example, you can simulate agents that depict borrowers and banks and encode them with existing data and known behaviors; you might give your 'borrower' agents income and wealth that reflects the distribution of real-world borrowers. By simulating real incidents like an income shock, you can:

- Explore how people might react by repaying early, forbearing or defaulting.

- Compute expected credit loss of loan contracts by running a simulation forward in time to study the behavior of each borrower out to maturity.

- Run each simulation millions of times to obtain probability distributions and times at which the borrower defaults.

2. Balance sheet testing and lending

Simudyne already has a balance sheet lending module that you can use to easily build balance sheet models. The model highlights agents that require stress testing, such as borrowers and lenders who have a balance sheet and income statement.

These agents can be extended to fit your purpose: borrowers could represent SMEs, households, a certain person, or any other agent that should request or pay loans. Lenders represent anyone you want to model as a provider of loans, such as your bank and your competitors.

3. Capture causative relationships

You can use Simudyne to simulate network analysis to capture causative relationships, i.e. funding providers pulling funds from banks, CDS contracts linking financial institutions to failing insurers, or suppliers losing out on contracts from failed construction companies. Essentially, simulating scenarios that have the potential to do significant harm.

"Simudyne is ground breaking technology that is currently being leveraged across Barclays and enables us to model multiple scenarios on huge data sets, so we can understand our risk, exposure and options."

– Jes Staley, Group CEO at Barclays

Want to know more? Request a demo at simudyne.com.

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Simudyne is a simulation technology company based in the City of London. It uses advanced analytics and applied AI alongside agent-based modeling and simulation to help organizations solve complex problems and make better decisions. With Simudyne, you will be better able to attract clients, investors and assets while reducing and often eliminating costs.

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