AN OVERVIEW OF THE 5 MAIN MODELS THAT ARE RECOMMENDED FOR CECL

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CECL COUNTDOWN SERIES

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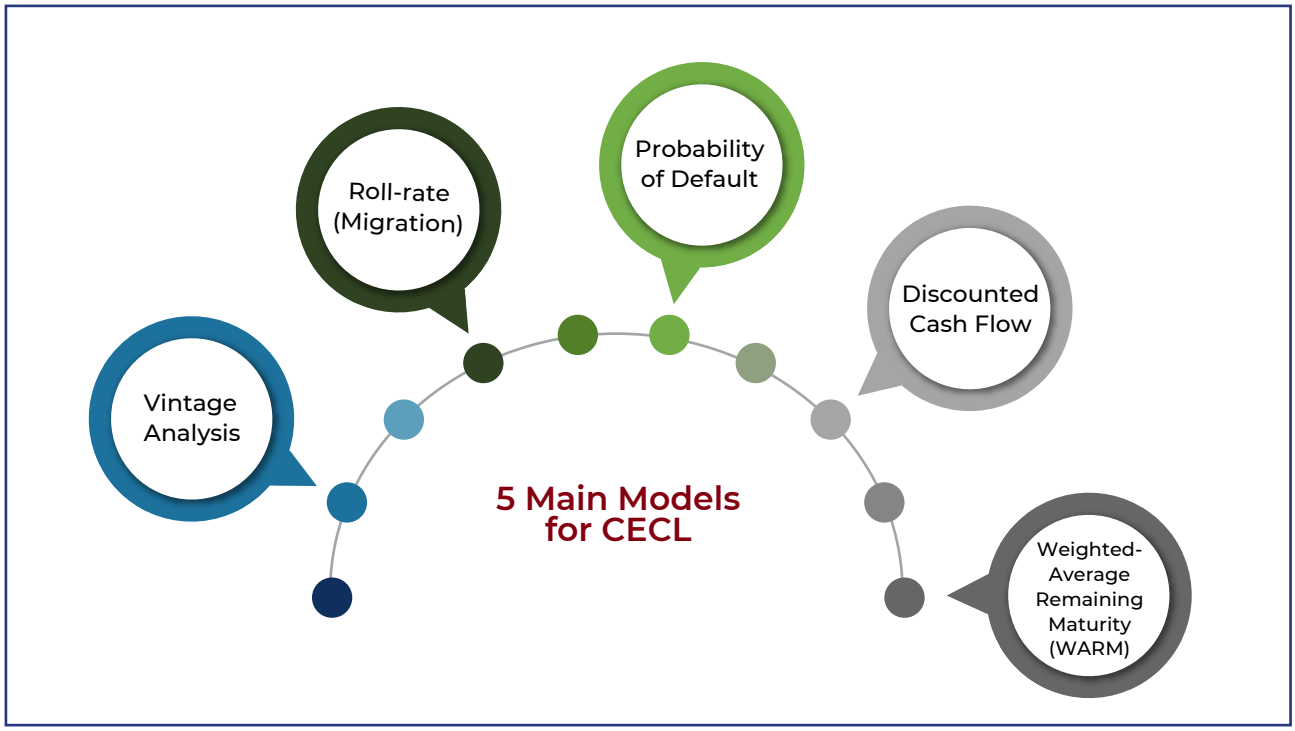
THE CECL METHODOLOGIES

The Current Expected Credit Losses (CECL) methodologyfor estimating allowances for credit losses came into existence on June 16, 2016, and was issued by the Financial Accounting Standards Board (FASB). CECL replaced the Allowance for Loan and Lease Losses (ALLL) accounting standard. ALLL relied on losses that were incurred but did not factor in future cash flows that would end up uncollected. The 2007-2008 financial crisis demonstrated the inadequacy of existing methods for setting reserve levels that reflected expectations of future market conditions.

The CECL standard will incorporate a change to the allowance methodology by asking financial institutions to move to an expected credit loss model, which is a lifetime estimate. Financial institutions such as banks will have to make this shift from the longstanding incurred loss model. This shift will force these institutions to develop estimates that are forward-looking in nature.

Entities will also need to consider being subject to internal control audits as they plan their shift to CECL. FASB did not include absolute limitations on the methods and models institutions could use when implementing CECL. Several models have risen in popularity within financial institutions, to estimate expected credit losses. Different models can be used for different asset types. The data collection and storage processes, needed to implement CECL, will undergo fundamental changes.

Below, we provide an overview of some of the main models that are used as part of CECL



Source: FASB

- **Discounted Cash Flow Analysis:**

Under CECL, there is a change to the Discounted Cash Flow Analysis method with a requirement to consider at least some risk of loss and removal of the best estimate notion. This method now incorporates relevant external factors that indicate a credit loss that is expected. Consequently, new data may have to be sourced, especially for individual assets, to support the cash flow expectations.

- **Vintage Analysis:**

Vintage analysis draws its data from loss curves. Loss curves incorporate expectations of losses at every point in the life of a financial asset. The main change to the vintage analysis method under CECL is that the allowance will be reflected in the remaining area under the loss curve (which is the expected credit losses on the remaining life of an asset) instead of being reflected by a single point on the loss curve.

- **Roll-rate Method (Migration Analysis):**

Roll-rate models based on risk ratings require regular and timely updates to credit risk ratings for all assets. As part of the roll-rate method, a financial institution will have to ascertain the primary attributes that predict loss most appropriately. Various economic cycles are reflected by assembling default or loss migrations. To improve precision, limitations on time series length, population sizes, and data integrity may need to be combined with judgments, and additionally calibrated over time.

- **Probability-of-default method:**

Institutions opting for a probability-of-default will have to check the reliability and accessibility of historical data sets. These data sets may be used to build the cumulative default probabilities and loss given default. A standard definition of default and paths to default that could occur within a product line will need to be assessed by the institution. To supplement the institution's own experience, various industry sources of data could be utilized to evaluate the probabilities of default over different economic cycles.

- **Weighted-Average Remaining Maturity method:**

One of the newest methods, the Weighted-Average Remaining Maturity (WARM) method, is a practical methodology to implement CECL. For institutions with less loan-level data, the WARM method is a good option. Institutions are able to use aggregated data from call reports since the WARM method uses an average annual charge-off rate.

Financial institutions can choose from these methods to comply with the CECL model. With adequate planning, they can develop their sources of data and subject their planned approach to relevant tests. This will ensure they calculate their losses and plan in advance to mitigate them.

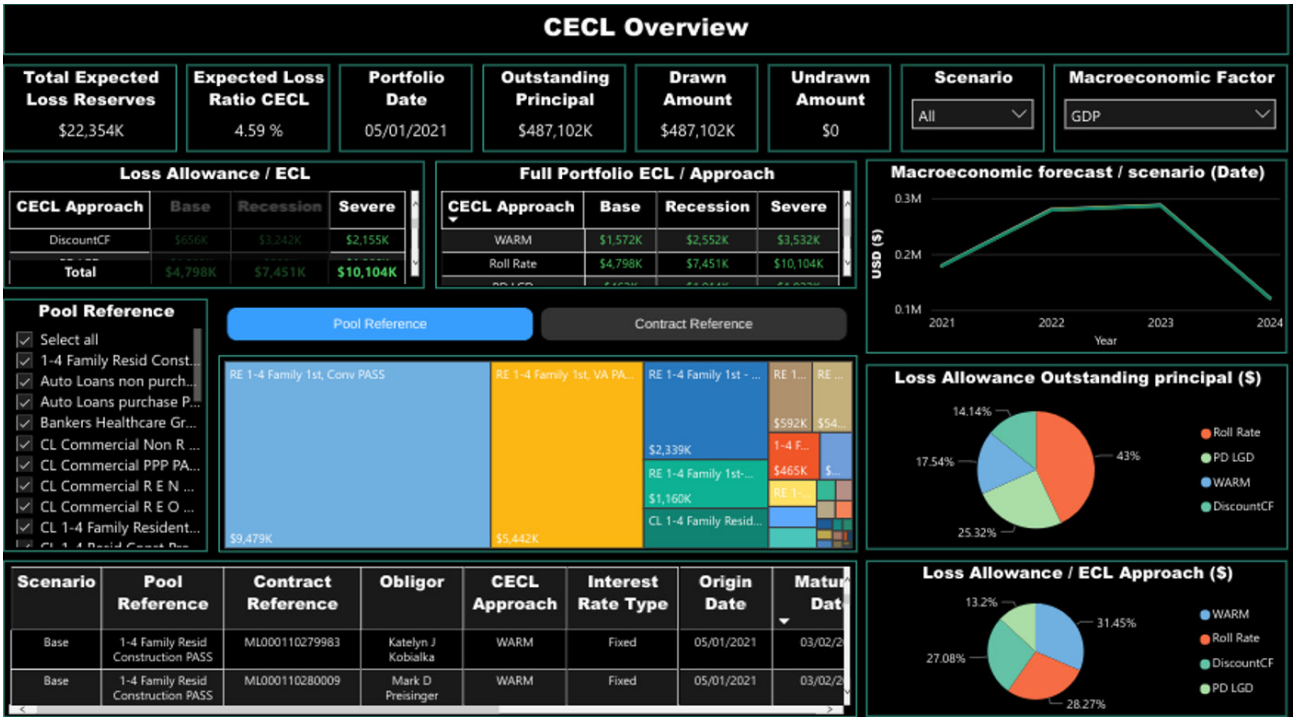
CECL Express can help...

CECL Express is a turnkey solution that fully satisfies all elements of the new CECL accounting standard. The system provides all non-loan data, including:

- Yield curves and Fed data
- Linked reports on losses from the FFIEC and NCUA
- PD and LGD curves
- Macroeconomic data

Banks and credit unions need to only provide the underlying loan details for the system to provide fully auditable ECL results for multiple calculation methods, including:

- Vintage
- Roll Rate
- Discounted Cashflow
- WARM
- PD/LGD



CECL Express provides more than valid ECL results. The system computes results for all methods and all loan pools, allowing the bank to optimize its CECL configuration and avoid the worst impacts of the new standard.

Visit ceclexpress.com for more information about the most efficient route to optimal CECL compliance.

CECL COUNTDOWN SERIES

ABOUT
CECL EXPRESS

- CECL Express is a turnkey, cloud-based solution, designed to provide banks and credit unions with optimized results and reporting that fully meet the 'Current Expected Credit Loss' accounting standards.
- CECL represents a major change in what is expected from financial institutions in their reporting of, and provisioning against potential credit losses.
- Smaller financial institutions are expected to implement forward-looking credit models to estimate losses they may experience.
- Selecting inappropriate 'Expected Credit Loss' (ECL) models will create a need to hold far more capital than is required, directly causing a loss of Profit and Loss (P&L). Data used within these models must also be reported for audit purposes.
- January 2023 will see the first official reporting period for the beginning of CECL. Banks and credit unions must have a framework in place, which is fully tested and reports results based on that data. In practice, this means selecting, implementing, and testing the system in the first half of 2022.
- For Finastra core systems, the integration has already been built. For customers with these systems, their CECL results are ready to be calculated and reported.

GreenPoint> Financial

ABOUT
GREENPOINT FINANCIAL

- GreenPoint Financial is a division of GreenPoint Global, which provides software-enabled services, content, process and technology services, to financial institutions and related industry segments.
- GreenPoint is partnering with Finastra across multiple technology and services platforms.
- Founded in 2006, GreenPoint has grown to over 500 employees with a global footprint. Our production and management teams are in the US, India, and Israel with access to subject matter experts.
- GreenPoint has a stable client base that ranges from small and medium-sized organizations to Fortune 1000 companies worldwide. We serve our clients through our deep resource pool of subject matter experts and process specialists across several domains.
- As an ISO certified by TUV SUD South Asia, GreenPoint rigorously complies with ISO 9001:2015 and ISO 27001:2013 standards.

Marcus Cree

MANAGING DIRECTOR AND
CO-HEAD OF FINANCIAL TECHNOLOGY AND SERVICES

Marcus has spent 25 years in financial risk management, working on both the buy and sell side of the industry. He has also worked on risk management projects in over 50 countries, gaining a unique perspective on the nuances and differences across regulatory regimes around the world.

As Managing Director, Marcus co-heads GreenPoint Financial Technology and Services and has been central in the initial design of GreenPoint products in the loan book risk area, including CECL and sustainability risk. This follows his extensive experience in the Finastra Risk Practice and as US Head of Risk Solutions for FIS. Marcus has also been a prolific conference speaker and writer on risk management, principally market, credit and liquidity risk. More recently, he has written and published papers on sustainability and green finance.

Marcus graduated from Leicester University in the UK, after studing Pure Mathematics, Phycology and Astronomy. Since graduation, Marcus has continually gained risk specific qualifications including the FRM (GARP's Financial Risk Manager) and the SCR(GARP's Sustainability and Climate Risk). Marcus's latest academic initiative is creating and teaching a course on Green Finance and Risk Management at NYU Tandon School of Engineering.

Sanjay Sharma, PhD

FOUNDER AND CHAIRMAN

Sanjay provides strategic and tactical guidance to GreenPoint senior management and serves as client ombudsman. His career in the financial services industry spans three decades during which he has held investment banking and C-level risk management positions at Royal Bank of Canada (RBC) Goldman Sachs, Merrill Lynch, Citigroup, Moody's, and Natixis. Sanjay is the author of "Risk Transparency" (Risk Books, 2013), Data Privacy and GDPR Handbook (Wiley, 2019), and co-author of "The Fundamental Review of Trading Book (or FRTB) - Impact and Implementation" (Risk Books, 2018).

Sanjay was the Founding Director of the RBC/Hass Fellowship Program at the University of California at Berkeley and has served as an advisor and a member of the Board of Directors of UPS Capital (a Division of UPS). He has also served on the Global Board of Directors for Professional Risk International Association (PRMIA).

Sanjay holds a PhD in Finance and International Business from New York University and an MBA from the Wharton School of Business and has undergraduate degrees in Physics and Marine Engineering. As well as being a regular speaker at conferences, Sanjay actively teaches postgraduate level courses in business and quantitative finance at EDHEC (NICE, France), Fordham, and Columbia Universities.