WHITEPAPER

CECL Methodology Overview - Discounted Cash Flow

- ✓ *Contractual vs. Expected Cash Flows*
- ✓ *A Bottom-Up Approach*
- ✓ *The PD/LGD Input*
- ✓ *Benefits & Challenges*

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CECL Methodology Overview

Discounted Cash Flow

Table of Contents

Executive Summary

As financial institutions develop and execute plans for implementing ASU 2016-13 (Topic 326/CECL), a critical component of the decision-making process will be selecting the appropriate methodology for calculating life-of-loan loss experience and estimating future losses. Institutions are discovering Discounted Cash Flow modeling to be an effective method of measurement for a variety of reasons, namely when historical loan data is insufficient and/or application toward longer-term assets.

The calculation of bottom-up cash flow expectations can require enhanced internal controls surrounding data and demand too much for some current, spreadsheet-based models.

The following pages will cover the basics of this measurement methodology, a high-level discussion on the inputs and assumptions used to perform the calculation, and the benefits and challenges of its deployment.

AN OVERVIEW OF CECL

One of the main impetuses for changing the prevailing model for estimation of the allowance for loan and lease losses (ALLL) was the FASB's view that reliance on historic information to determine "incurred-but-not-realized" losses in reserve calculations did not allow institutions to adjust reserve levels given a reasonable and supportable expectation of future events. Thus, a new standard requiring institutions to "... estimate expected credit losses over the contractual term of the financial asset(s)..." and "...consider available information relevant to assessing the collectability of cash flows. This information may include internal information, external information, or a combination of both relating to past events, current conditions, and reasonable and supportable forecasts."[1]

When discussing forward-looking factors, it is important to note that CECL is not an attempt to capture unexpected or remote catastrophic events; rather, the focus is on expected losses incorporating sensible information about the future. Put another way, we are not being asked to predict the next recession; we are being asked to recognize in a rigorous way the existence of that recession, when it is occurring.

The CECL standard explicitly notes that an institution is not required to conduct a DCF analysis, but as this paper will discuss, the use of such analysis is a logical methodology that maps cleanly and unambiguously to the guidance's requirements.

CECL Methodology Webinar Series

Sageworks offers a complimentary, on-demand webinar series taking CECL from theory into practice.

In an 8-part series, on-demand sessions cover:

- Commercial Real Estate (CRE) CECL Methodologies
- Commercial and Industrial (C&I) CECL Methodologies
- CECL Methodology Overview: A look at available methods

http://web.sageworks.com/cecl-methodology-webinar-series/

CONTRACTUAL V. EXPECTED CASH FLOWS

Expected Cash Flow models are different and more complex than Contractual Cash Flow models. When estimating losses using a Discounted Cash Flow approach, Expected Cash Flow models are appropriate for reserve calculation under the new standard. Many institutions have historically used Discounted Contractual Cash Flows for analysis of impaired assets or Troubled Debt Restructurings (TDR) under ASC 310-10-35. A few material differences between the two calculations are modeling factors such as prepayment, default estimates, loss estimates, and recovery activities that otherwise would not be used in a contractual cash flow calculation.

A BOTTOM-UP APPROACH

Our software as well as other analogous DCF tools utilize a bottom-up approach—meaning it models expected cash flows on a loan-level basis and aggregates results at the pool-level. Proper expected cash flow models will calculate and apply a statistical tendency to default some portion a loan balance over time. Loan losses as they pertain to DCF should not be thought of as a binary event resulting in total loss—they are incremental, compounding, and based on historical loss tendencies. The calculation can therefore take into account the seasoning and blend of loan maturities, their structures, any adjustments for current/future conditions, and any expected prepayments. To calculate and apply these tendencies, the following inputs are critical to the calculation of DCF:

This use of a contractual cash flow, modified by modeling parameters to an 'expected' cash flow, is a new technique for most allowance practices; however, this estimation tool is well established in current fair value adjacent practices for valuation / exit price calculation, purchased credit (impaired) re-estimation, and other areas. (ASC 820 and 310-30 respectively)

Loan Level Calculation Inputs // Stored Data

Input	Definition/Purpose
Payment Type	Required to determine whether to apply a statistical curtailment tendency, a P&I model, or a custom cash flow for baseline (contract) cash flow expectations.
Maturity Date	Used to determine the number of periods against which to generate cashflows / balloon expectations.
Payment Amount	The true principal and interest payment for amortizing loans exclusive of late fees, escrow, etc.
Interest Rate	Either effective yield or coupon rate.
Payment Frequency	The frequency with which a payment will be made. (e.g., monthly, annually)
Amortization	The "day count" of a loan. (e.g., Actual 365, 30/360, Actual 360)

Portfolio Level Calculation Inputs // Assumptions

Input	Definition/Purpose
Curtailment Rate	Periodic tendency of an extended **principal** dollar to return to the institution. This is the dominant behavior for non-amortizing loans.
Funding Rate	Periodic tendency of an undrawn dollar to be drawn. Only applicable to loans with available credit. Calculated separately from curtailment, not blended.
Prepayment Rate (CPR/SMM)	Periodic tendency to receive unexpected principal payments. Only applicable to amortizing loans.
PD (Probability of Default)	Periodic tendency of a loan or dollar to enter default state.
LGD (Loss Given Default)	Static loss on a loan, conditional to default event.
Recovery Delay	Static time between default event and resolution (recovery or loss).

Based on the required inputs above, most banks will find themselves focusing on the portfolio assumptions. For prepayment rate, a bank could look toward assumptions built into their Asset Liability Management (ALM) activities as a starting point. Other assumptions, such as curtailment, can be determined with observations going back in time. It is important to note that assumptions for DCF can be adjusted if the roll-forward indicates consistent over or under estimation compared to actual experience.

Of all the portfolio assumptions noted above, perhaps the most important to calculate are the Probability of Default (PD) and Loss Given Default (LGD).

THE PD AND LGD INPUT

PD (Probability of Default) and LGD (Loss Given Default) are parameters that can be leveraged by institutions in a standalone measurement. Institutions currently using a PD & LGD approach for current GAAP, may make an effort to calculate a lifetime PD and a symmetrical LGD to determine a rate for loss in an attempt to accomplish life-of-loan requirements as part of the new standard. However, the calculation of a lifetime PD contain the same inherent flaws as other life-of-loan historical observation methodologies. Understanding the time horizon of each underlying observation period utilized in the calculation of Probability of Default is the responsibility of management; often this is either unknown or misunderstood.

BENEFITS

The benefits of leveraging a discounted cash flow methodology for life-of-loan estimates are numerous and significant. Below are a few benefits to consider when electing a methodology for many of their loan pools:

1. **Long-Term Assets** – Calculating and understanding the average life and/or prepayment rate of a loan/loan type (e.g., CRE, Mortgages, C&I) is mandatory when calculating the expected credit losses. An institution calculating its life-of-loan loss experience utilizing methodologies such as Vintage Analysis, Migration, PD & LGD, and/or Static Pool analysis will require look-back periods sufficient to cover the expected life of the pool; for example:

   When modeling life-of-loan losses, the look back period for many methodologies must be long enough to be representative a lifetime loss experience for each respective loan/loan pool. For example, if a loan pool has an average life of 4 years, an institution would need 4 years of data to conduct a single 4-year observation of losses, and such a data set would only be inclusive of loans that were on balance sheet 4 years prior. This may not be an issue for pools of loans with a shorter life, but for longer-lived loan pools loan-level data in excess of the expected life is required to support adequate observations for loss estimation.

   In contrast, a DCF approach can employ recent shorter-term observations for deployment in a forward-looking amortization schedule. DCF is, and will be, a preferred methodology for calculating the reserve of longer-lived assets.

2. **Readily Available Industry/Peer Data** - The burden of detailed loan-level, risk maintenance data is going to be a difficult challenge for many financial institutions. Instances where loan pools lack loan-counts to be statistically relevant, haven't experienced a material amount of defaults/losses during periods where data is available, and/or have new portfolios that are more analogous to industry/peer experience a DCF best accommodates alternative measurements while maintaining institution specific risk. In using DCF, financial institutions may deploy industry-level PD, LGD, and CPR (Conditional Prepayment Rate) toward their own loan structures for a reasonable and possibly more relevant expectation of life-of-loan loss.

3. **Forecasting** - The CECL standard frequently references concepts related to making adjustments based on reasonable and supportable forecasts5, and these concepts are most logically addressed by using a DCF methodology. In projecting expected cash flows, each period within a forward-looking amortization schedule can/will vary slightly based on future expectations of external/economic data. In this sense, the institution is actually leveraging the timing of economic forecasts to predict losses, which creates a more meaningful representation of expectations when compared to the other methodologies.

CHALLENGES

Every institution should explore utilizing a Discounted Cash Flow model, but should also be aware of the complexity of the calculation. By its very nature, executing an expected cash flow schedule for each loan every month/quarter may not be practical in a spreadsheet environment. For institutions utilizing a third-party provider or software, the challenges are primarily around the loan data required to build an accurate amortization schedule.

For most institutions, the overarching challenge is one of logistics. The process starts and ends with developing policies and procedures around the ongoing maintenance of loan-level data. Every institution, if not properly storing loan-level data today, should begin to define rules for storage and/or maintenance. The transition from ASC 450-20 to ASU 2016-13 (Topic 326) will not be a seamless one, but by taking steps now, financial institutions will find themselves in a position to calculate a reasonable and supportable reserve.

ABOUT SAGEWORKS

Sageworks (*www.sageworks.com*) is a financial information company working with financial institutions, accountants and private-company executives across North America to collect and interpret financial information. Thousands of bankers rely on Sageworks' credit risk management solutions to streamline credit analysis, risk rating, *portfolio stress testing*, loan administration and *ALLL calculation*. Sageworks is also an industry thought leader, regularly publishing *whitepapers* and hosting webinars on topics important to bankers.

Sageworks ALLL is the premiere automated solution for estimating a financial institution's reserve. It helps bankers automate their ALLL process and increase consistency in their methodology, making it defensible to auditors and examiners. Sageworks' risk management consultants also assist clients with the implementation of their ALLL models and guidance interpretation. To find out more, visit *www.sageworksanalyst.com*.

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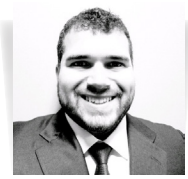

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Brandon Quinones is a Risk Management Consultant in the Bank Division at Sageworks, where he primarily focuses on helping community banks and credit unions manage their allowance for loan and lease loss (ALLL) provisions. Prior to joining Sageworks, Brandon was a Senior Consultant at Optimity Advisors, where he led large-scale strategy and operations-focused projects in healthcare, private equity, and non-profit industries. He received a Bachelor's of Science degree in Business Administration from the University of North Carolina at Chapel Hill.

ENDNOTES

[1] ASU 326-20-30-6 and 326-20-30-7

OTHER RESOURCES

CECL Model – Build or Buy?

CECL Solution Buyer's Guide

Ready for CECL? The Key Role of Risk Ratings Now and Under the New FASB Standard

The FASB's CECL Prep Kit

CECL Standard: Abridged

CECL Prep Guide: Implementation

CECL Prep Guide: Data