CECL Models Explained

How they work and what information you might need

Definitions

On the following pages are some definitions obtained directly from the current Accounting Standard. These definitions are important because they are key to your understanding of the requirements of the change in the standard.

This list of definitions is not complete, so I would encourage everyone to read through the Standard prior to implementing a reserve model.

Expected Credit Loss

An estimate of all contractual cash flows not expected to be collected from loans or commitment to extend credit.

This is different from the current Allowance model because it is based on expected cash flows vs. losses

This model also relies heavily on management estimates and historical losses to measure future cash flows

Effective Interest Rate (Discount Rate)

The rate of return implicit in the debt instrument. That is, the contractual interest rate adjusted for any net deferred loan fees or costs, premium, or discount existing at the origination or acquisition of the debt instrument.

CECL offers many possible solutions to the calculation of your reserves. If you are using the Discounted Cash Flow Model, the discount rate used to calculate the current reserve requirement is the Effective Rate on the individual loan.

In most instances, for consumer loans the Effective Rate and the Contract Rate are approximately the same.

Portfolio Segment

The level at which an entity develops and documents a systematic methodology to determine its allowance for expected credit losses.

Generally your segments should be defined by the behavior of the loans. This could include separation by:

Loan Type, Collateral Type, Location, Direct, Indirect, Insured, Credit Score, Past Due Status...

Estimation of Expected Credit Losses

825-15-25-3 An estimate of expected credit losses shall be based on internally and externally available information considered relevant... That information includes information about past events, including <u>historical loss experience with similar assets</u>, current conditions, and <u>reasonable and supportable forecasts</u> ...An entity <u>shall consider information that is available without undue cost and effort</u> that is relevant to the estimated collectability of contractual cash flows.

Estimation of Expected Credit Losses

For most financial institutions providing consumer based loans, the historical loss data is the best indicator of future cash flows. Once this model is established, maintaining the model and calculating the current reserves should not take any more effort than what is being done under the current Accounting Standard.

Estimation of Expected Credit Losses

825-15-25-4 An estimate of expected credit losses shall reflect the time value of money either explicitly or implicitly (see paragraph 825-15-55-3). If an entity estimates expected credit losses using a discounted cash flow model, the discount rate utilized in that model shall be the financial asset's **effective interest rate**.

825-15-55-3... Other methods implicitly reflect the time value of money...may include loss-rate methods, roll-rate methods, probability-of-default methods, and a provision matrix method using loss factors

Estimation of Expected Credit Losses

Paragraph 825-15-25-5 requires that the model used considers the possibility that a loss will occur and not occur. This then goes on to state that while you have to consider two possible outcomes, that does not mean that you need to use two separate models.

A historical loss rate meets the requirement of considering a loss will occur and not occur because it measures the possibility of both outcomes (825-15-55-6)

Estimation of Expected Credit Losses—Multiple Possible Outcomes

825-15-55-5 Paragraph 825-15-25-5 requires that an estimate of expected credit losses always reflect both the possibility that a credit loss results and the possibility that no credit loss results. However, in making this estimate, a variety of credit loss scenarios is not required to be identified and probability weighted to estimate expected credit losses when a range of at least two outcomes are implicit in the method.

Estimation of Expected Credit Losses—Multiple Possible Outcomes

825-15-55-6 Some measurement methods…rely on <u>historical loss data as an input</u> when estimating credit losses. Therefore, <u>they implicitly satisfy the requirement</u> in paragraph 825-15-25-5 as long as the population of actual loss data reflects items within that population that ultimately resulted in a loss and those items within that population that resulted in no loss.

Using original loan balance data and current loss rates, meets this requirement because it includes loans that resulted in no loss and loans that resulted in a loss.

Estimation of Expected Credit Losses—Multiple Possible Outcomes

825-15-55-6…an entity <u>may use the fair value of collateral (less estimated costs to sell, as applicable) in estimating credit losses</u> for collateral-dependent financial assets. Such an approach is considered a practical expedient because the fair value of collateral reflects several potential outcomes on a market-weighted basis and may result in expected credit losses of zero when the fair value of collateral exceeds the amortized cost basis of the asset.

Estimation of Expected Credit Losses—Multiple Possible Outcomes

It is important to note that you have to consider the possibility of a loss occurring or not, but that does not mean every loan will have a reserve associated with it.

As an example, we could use the fair value approach to a share secure loan held by your Credit Union. In this example you secure 120% of the loan balance in a member's share account until the loan is satisfied.

Because the amount of the loan is lower than the current share balance (collateral) plus the costs to settle, the expected credit loss is zero.

Disclaimer

Examples provided in the presentation are for informational purposes only and do not represent the complete list of possible calculations. These examples have not been endorsed by or reviewed by any authoritative bodies, and as such should only be used to obtain an understanding of how Credit Loss reserves for segmented pools of homogeneous consumer loans might be calculated.

Calculation of Current Expected Credit Losses

The current proposed Accounting Standard provides 6 Examples of how to calculate the current Credit Loss Reserve. Each of these examples requires different data to be obtained and stored for future calculations. Additionally each model provided may calculate a different estimate of future cash flow.

The examples that we will walk through are based on what we believe will be best practice models for segmented consumer loan portfolios. These models should require the least amount of costs and effort to the financial institution.

Example 1: Estimation of Expected Credit Losses Based on a By-Vintage Basis (Assumptions Used)

825-15-55-29 The Entity is a lending institution that provides retail financing to consumers purchasing new or used automobiles. The loans it originates are secured automobiles purchased by the borrowers with proceeds from the loan using a relatively consistent range of loan-to-value ratios at origination. The underlying collateral is repossessed and sold at auction by the Entity when the borrower becomes 90 days delinquent.

Example 1: Estimation of Expected Credit Losses Based on a By-Vintage Basis (Assumptions Used)

825-15-55-30 The Entity tracks these loans on the basis of the calendar-year of origination. The following pattern of credit loss experience has been developed based on the ratio of the amortized cost basis in each vintage year that was written off because of credit loss and the original amortized cost basis, shown as a percentage.

The Entity was able to produce complete loan pool data for the analysis beginning in years after 2012, all other years are tracked based on the most complete information available. For years prior to 2012 management believes the 2012 estimates provide a reasonable expectation of the future cash flows in previous years.

Sample Loan Data – Auto Portfolio Original Balances

	2016	2015	2014	2013	2012
2005					46,631,199
2006					55,888,456
2007					65,201,465
2008					71,523,983
2009					94,797,183
2010					112,477,352
2011					253,238,923
2012					267,729,158
2013				279,593,351	
2014			294,027,045		
2015		258,368,010			
2016	42,899,182				

**The loan balances included in this chart represent the original loan balances of auto loans as of the calendar year-end. Balances for loans prior to 2012 are incomplete, as they do not include all loans originated in those periods.

Sample Loan Data – Auto Portfolio Current Balances

Years	2016	2015	2014	2013	2012
2005	23,561	26,473	99,117	263,206	731,199
2006	49,513	56,911	213,082	717,143	1,888,456
2007	122,968	144,669	530,457	1,553,808	5,201,465
2008	135,616	165,385	553,924	3,427,927	11,523,983
2009	83,266	102,798	1,166,608	5,660,595	14,797,183
2010	489,671	612,089	2,380,742	6,568,699	12,477,352
2011	4,848,131	5,637,362	14,390,390	30,983,114	53,238,923
2012	44,537,555	48,942,368	94,043,178	162,030,237	247,729,158
2013	82,906,858	88,198,786	150,841,283	239,593,351	
2014	146,172,239	157,174,450	265,736,291		
2015	221,023,245	240,242,657			
2016	42,899,182				
Total	543,291,805	541,303,948	529,955,073	450,798,079	347,587,719

Measuring the total balance by calendar year-end is useful to help gain an understanding of the speed that loans are paying down. This understanding is essential for the calculation of CECL.

Sample Loan Data – Auto Portfolio Collateral Deficiencies

Years	2016	2015	2014	2013	2012
2005		(11,621)	(17,850)	(24,711)	(36,456)
2006		(3,002)	(4,611)	(9,913)	(22,336)
2007		0	(1,121)	(29,743)	(102,094)
2008		(691)	(3,300)	(9,599)	(36,218)
2009		(20)	(4,051)	(16,022)	(37,917)
2010		(9,125)	(21,924)	(75,219)	(199,796)
2011		(53,363)	(142,472)	(422,578)	(1,249,318)
2012		(888,834)	(2,177,034)	(7,280,059)	(16,634,117)
2013		(4,606,642)	(7,196,253)	(20,242,596)	
2014		(12,970,352)	(17,378,105)		
2015		(27,774,390)			
2016					
Total		(46,318,039)	(26,946,720)	(28,110,439)	(18,318,252)

One of the QE factors we considered was the collateralization of the loans. Loans originated in 2015 were 8.6% under-collateralized, as compared with 5.1% in 2014, 6.2% in 2013 and 5.3% in 2012.

Sample Loan Data – Auto Portfolio Net Losses

	2016	2015	2014	2013	2012
2005		16,882	44,195	64,596	25,459
2006		0	53,717	81,506	19,589
2007		34,794	42,066	200,331	16,157
2008		14,735	30,169	142,623	35,787
2009		714	25,128	52,280	157,136
2010		(1,519)	59,769	85,763	827,633
2011		85,787	253,453	453,135	1,090,631
2012		600,811	1,342,695	1,437,137	199,824
2013		1,136,585	1,772,925	61,607	0
2014		1,777,763	150,686	0	0
2015		562,098	0	0	0
2016		0	0	0	0
Total		4,228,649	3,774,802	2,578,979	2,372,217

Included in this chart are net losses by year of origination. These balances are divided by the original loan balances to measure a loss rate which is used to calculate the CECL reserve.

Sample Loan Data – Calculated Historical Losses

	2015 Losses	2014 Losses	2013 Losses	2012 Losses	Calculated Reserve	Actual Reserve	CECL
2005	0.0%	0.1%	0.1%	0.1%	0.3%	1.3%	306
2006	0.0%	0.1%	0.1%	0.0%	0.3%	1.3%	644
2007	0.1%	0.1%	0.3%	0.0%	0.4%	1.3%	1,599
2008	0.0%	0.0%	0.2%	0.1%	0.3%	1.3%	1,763
2009	0.0%	0.0%	0.1%	0.2%	0.2%	1.3%	1,082
2010	0.0%	0.1%	0.1%	0.7%	0.9%	1.3%	6,366
2011	0.0%	0.1%	0.2%	0.4%	0.7%	1.3%	63,026
2012	0.2%	0.5%	0.5%	0.1%	1.3%	1.3%	595,622
2013	0.4%	0.6%	0.0%		1.1%	1.3%	1,077,789
2014	0.6%	0.1%			0.7%	1.3%	1,900,239
2015	0.2%				0.2%	1.4%	3,094,325
2016						1.5%	643,488
Total							7,386,248

Loss rates for each period are added by the year of origination to determine the Calculated Reserve. Based on management's judgment of future cash flows the actual reserve is determined. This is multiplied with the current balance to obtain an estimate of CECL.

Example 1 - Sample Loan Data – Conclusions & Assumptions

- For loans issued prior to 2012, we used a reserve rate of 1.3% which represents the loss rate of 2012 because we believe it more closely reflects the discount for cash flows in the previous periods.

- For loans issued in 2013 & 2014 we maintained the 1.3% discount rate because the credit quality of loans and lending policies in place for these periods was consistent with 2012.

- For years beginning and 2015 & 2016 we increased the discount rate on the loan pools because of a change in loan policy with the intent of increasing risk and growing the portfolio.

Example 1 - Sample Loan Data – Conclusions & Assumptions

- As of March 31, 2016 the Allowance for Loan Loss Balance was $5,704,564; which is based on a historical loss rate of 1.05%.

- As of March 31, 2016 the calculated Current Estimated Credit Loss Reserve was $7,386,248; which represents a discount rate of 1.36%.

- Currently our estimate for this change in Accounting Standards will result in a $1,681,684 increase in reserve and decrease in capital, specifically related to the auto portfolio.

- This change results in an reserve balance approximately 29.5% higher than the current allowance.

Example 2: Estimation of Expected Credit Losses Based on a By-Vintage Basis (Assumptions Used)

The Entity is a lending institution that provides unsecured Consumer Credit Cards. These cards have a revolving credit line that requires the borrower to pay a minimum of 2% of the principle balance, plus interest on a monthly basis. Loans are charged off when the borrower becomes 90 days delinquent.

The Entity does not have the ability to track individual charges and payments to measure the expected prepayment on the pool of loans.

Example 2: Estimation of Expected Credit Losses Based on a By-Vintage Basis (Assumptions Used)

The current estimated life is measured through a third-party that provides information related to the Asset & Liability Management (ALM). Based on the most recent report, the expected life of the Consumer Credit Card Portfolio is 3.7 years.

The entity has not had a change in loan policy or lending strategies related to the Consumer Credit Card Portfolio over the last 5 years.

Unused credit lines are cancellable by the Entity at any time, as such these commitments will not be considered under the current reserve

Sample Loan Data: Consumer Credit Card Year-end Balances & Charge-offs

	Year-end Balance	Loss rate	Total Charge-off	2011	2012	2013	2014	2015
Balance 12/31/2012	147,464,569	4.2%	6,138,149	4,215,236	1,922,913			
Balance 12/31/2013	151,486,345	2.8%	4,222,917	1,859,857	1,457,289	905,771		
Balance 12/31/2014	153,679,776	2.5%	3,822,723	782,457	1,157,982	1,398,565	483,719	
Balance 12/31/2015	151,486,345	2.6%	3,890,657	300,245	882,345	1,031,456	1,245,878	430,733

The chart above includes the year end balance for consumer credit cards and the loss data by year of origination. Losses for loans originating prior to 2011 are included in the 2011 totals.

Sample Loan Data: Consumer Credit Card Loss Rate by Year-end Balance

Calendar Year	2015 Losses	2014 Losses	2013 Losses	2012 Losses	Calculated Reserve	Actual Reserve
2011	2.9%	1.2%	0.5%	0.2%	4.8%	
2012	1.3%	1.0%	0.8%	0.6%	3.6%	
2013	0.7%	0.9%	0.6%		2.2%	
2014	0.8%	0.3%			1.1%	
2015	0.3%				0.3%	
2016						3.4%

Loss rates are calculated by dividing the losses by the year end balances. These rates are then added by year of origination to calculate the CECL Reserve Rate. Which is then updated by the Entity to arrive at the actual reserve rate used.

Sample Loan Data: Consumer Credit Card Current Expected Credit Loss Reserve Calculation

Balance 3/31/2016	149,353,687
ALM Report - Average Life	3.7
Reserve Rate	3.4%
CECL Reserve	5,078,025
ALLL Reserve	3,835,883
Increase	32.4%

Example 2: Sample Loan Data – Conclusions & Assumptions

- For the Calendar Year ending December 31, 2010 the entity had been carrying a high balance of Credit Cards that were more than 90-days past due. These accounts were on a non-accrual status and determined to be uncollectible by management.

- During the first quarter of 2011 older accounts were charged off through the Allowance for Loan Loss account, resulting in a unusually high historical charge-off rate.

- Since 2011 the entity has charged-off all accounts that were more than 90-days past due and is not currently carrying a balance in the 90+ aging report.

Example 2: Sample Loan Data – Conclusions & Assumptions

- The Entity is not actively growing their Credit Card Portfolio. Over the past several years the balance of this portfolio has remained consistent. Whereas pay-downs and losses approximate new loans and funding.

- Based on the most recent review of the Credit Card Portfolio the Entity has determined that the Credit Quality of the loans has improved over time. This assertion is also reflected in the lower delinquency and lower loss rates for the years ending 2013, 2014 and 2015.

Example 2: Sample Loan Data – Conclusions & Assumptions

- The Entity has determined the most reasonable basis for their reserve rate is related to 2012. Based on the improvement in Credit Quality and a decline in delinquency, as well as other environmental factors; the management has determined that a 3.4% discount applied to the portfolio reasonably estimates their reserve for expected cash flows.

Other Information

- On April 27, 2016 the FASB gave final approval to the accounting standard for Current Expected Credit Losses.

- Entities that are not public business entities including not-for-profit entities and employee benefit plans within the scope of Topics 960 through 965 on plan accounting will be required to apply the guidance for fiscal years beginning after December 15, 2021, and interim periods within fiscal years beginning after December 15, 2022.

Information that will be needed

- Original Balances of all loans originated by Year – Ensure that your core processor can capture this information and once it is captured save a copy for your support moving forward. Ensure that this population includes any information that may be useful for segmenting in future periods; such as Loan Code, Collateral Codes, State, Cities, Branch, Purpose Code...

- Ensure that as you are tracking charge offs and recoveries that you include the date of origination, loan types, collateral codes and any other information that may be used to segment the portfolios going forward.

Information that will be needed

- Information related to the credit quality of the loans. If you are updating FICO scores, DTI or BNI make sure that the information is included in your loan data or as a separate file that can be appended to your loan data.

- Information related to the payment status of your loan portfolio. This could include past due reports or an aging trial balance at the end of each reporting period.

- If possible, keep all files in a machine readable format. This could include txt files, csv, Excel or other readable format.

Q&A

Here are some questions submitted in advance and Steve's Answers

Are credit unions testing the calculation at this based on the proposed requirements? The requirements are no longer proposed as the new standard will go into effect beginning in 2022. I know that there are some companies offering different solutions for these calculations so I am sure that some Credit Unions have performed some testing.

Are smaller credit unions exempt from this accounting? Currently smaller Credit Unions are not exempt.

Can we build up" the allowance to get ready? No – the current accounting standard does not consider losses in excess of 12 months, the new model will take into consideration the expected cash flows over the life of the contract. Additionally to start building up now would only rob your Credit Union of earnings – which could have a negative impact on your CAMEL rating. I would recommend keeping you allowance intact under current and recording this chan v ge in accounting through your Capital once you adopt the new accounting treatment.

How deep the data needs to be? I've heard anything from only credit scores to extremes like race and occupation. The data should be deep enough to allow you to segment your portfolio. In most cases the information that you are currently capturing and included in your loan trial balance should be enough.

How far back on charge-offs and recoveries do we need to go to get this data to get our trends? The deeper the data runs the better your going to be able to predict future cash flows, in most cases I think that you can get away with 3-4 years of data.

If a core processor as large as Fiserv has nothing in place for CECL, how is a small $75 million CU supposed to ferret out sustainable criteria for CECL? The calculations are not difficult, once you have determined your portfolio segmenting you should be able to maintain the calculations with no more effort than you are putting into your ALLL calculation now,

The requirements are still several years into the future but have any of the national CPA firms provided guidance on how they will be auditing the allowance methodology? Any guidance from the National firms will be more directed towards auditing the information. Because there are several different ways that this calculation can be performed there really is no one size fits all model available.

There is some language regarding risk rating" each individual loan? Necessary? If so There are several variations on segmenting your portfolio, one of the methods used a loan grading system. This is not require, just one of the options offered.

What is the best approach for credit cards and other LOC's? We are planning on using vintage analysis for the rest of our consumer portfolio. The vintage approach can work for the credit cards – you may also consider segmenting the portfolio by FICO tier or member behavior – such as Transactor or Revolover.

What sort of data should we try and collect now? Loan Trial Balances by year-end and charge off data with as much information as possible.

Will we have to calculate this on a loan by loan basis? I have heard conflicting things from different vendors whose models support loan-by-loan and those who's do not. Those whose models support loan-by-loan calculation seem to indicate it's a must. If you are planning to Discounted Cash Flow model you will need to perform the calculation on a loan by loan basis – this may be useful on commercial loans but it is not a required calculation.

Contact Information

Steve Miller, CPA

President

TwentyTwenty Analytics

Interactive Business Lending Solutions

Steve.miller@twentytwentyanalytics.com

877-392-2021

www.twentytwentyanalytics.com

www.iblsllc.com