Loss Rate Calculations and the Use of

Historical Experience Under CECL

A Discussion Paper of the

AMERICAN BANKERS ASSOCIATION

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Summary

As banks work to implement FASB's Accounting Standards Update 2016-13 (also known as the CECL accounting standard, named after the Current Expected Credit Loss model of accounting that requires estimated lifetime expected credit losses to be effectively recorded at origination), many will initially use "loss rate" approaches in forming their estimates or perform other calculations that support CECL-based assumptions. This paper discusses how basic "loss rates" are calculated under CECL and how they are different from those calculated in today's incurred loss accounting model.

Further, this paper notes the following observations:

- While both open pool and cohort-based approaches to calculating loss rates are acceptable in CECL, bankers who start with open pool loss rates may be subject to a level of supplemental analysis that may often result in more work each reporting period, compared to using rates derived from cohort-based approaches. For example, in portfolios in which prepayments are a significant factor or that have distinct "loss curve" patterns, additional work to merely support that the loss rate truly captures "life of loan" experience can be significant. The cohort-based approaches easily adapt to life of loan calculations.

- No matter the calculation approach, tracking troubled debt restructurings (TDRs) and non-TDR loan modifications will be critical processes to ensure that life of loan credit loss rates are properly calculated and vintage information is appropriately disclosed. This can involve changing processes in the core service system and in the underwriting and loan servicing departments.

- Use of historical experience under CECL may change for specific loan products. Reliance purely on the most recent few years of data may wane and reference to previous vintages or comparable points in previous economic cycles could become common reference points for historical experience. These reference points could be used in calculating the starting point credit loss estimate or in quantifying a risk factor adjustment to the starting point estimate.

- Recent historical experience will, however, continue to have primary relevance for certain products and analyses, especially when current loan performance is a primary factor in the estimate, such as past due loans and internal risk ratings. A governance process must be in place that selects the most relevant historical data for CECL loss rate calculations.

- Collection of data that supports cohort-based calculation approaches appears to provide the flexibility, with relatively little incremental effort, to apply more advanced analyses, such as probability of default/loss given default estimation methods, and cash flow discounting.

Such flexibility may also enable efficient change if there are ever regulatory changes to charge-off policies.

- The amount of historical data points retained for cohort-based approaches is significantly greater than that retained for open pool analysis. This will often require consideration of maintaining and managing this data through data warehousing applications or third-party solutions.

- The CECL standard's requirement to "revert to historical loss information for those periods beyond which the entity is able to make or obtain reasonable and supportable forecasts of expected credit losses" implies credit losses will be estimated based on timing. Therefore, estimation methods that directly analyze the timing of charge-offs are likely to be easiest to implement and support.

- The reversion requirement should be applied with the overall objective to reflect the best estimate of expected credit loss in the portfolio. While CECL allows virtually any reversion technique, there are certain situations in which the implied forecast would be considered incredulous. These circumstances should be avoided.

- Many portfolios at smaller banks have historical credit loss performance that has little correlation to macroeconomic indices. In those cases, significantly less documentation related to forecasting macroeconomic conditions is necessary and the emphasis will be on forecasting losses based on underwriting standards. A forecast based on underwriting standards will normally cover the entire portfolio life and, thus, need not address reverting to unadjusted historical averages.

- As reversion to historical averages is a common financial forecasting technique, bankers that integrate reversion as part of their standard forecasting process may find more flexibility in forecasting future credit losses than if they were to formally elect the "reversion option."

Changes from the Previous Version: Certain changes were made to the November 2017 version of this paper, which was available only to ABA CECL Network members and certain others. Based on comments received, certain calculation labels were corrected and certain points and procedural steps were clarified pertaining to calculating loss rates under the "open pool" and "cohort" approaches.

Background and Scope

As is currently performed now, bankers will calculate expected credit loss rates under the CECL standard[1] and then adjust those rates for other risk factors that may not be appropriately considered in those initial calculations.[2] The credit loss rate calculated prior to any adjustments is referred to in this paper as a starting point estimate. This paper addresses the procedure of *how* credit loss rates will generally be calculated within a CECL environment and is applicable not only to calculating CECL-based (life of loan, or lifetime) starting point credit loss estimates, but also to quantifying the risk factor adjustments that are applied to the starting points in order to arrive at the final estimate.

Incurred credit loss estimates are largely based on annual charge-off data. CECL estimates, in contrast, are normally based on activity over the life – or remaining life – of a loan or pool of loans. This paper discusses the differences in different approaches banks may take in calculating credit loss rates, the advantages and disadvantages of each approach, and the procedural challenges presented by each approach. This paper also discusses how specific loss experience may be evaluated when calculating an average loss rate. While this paper addresses how vintage-based credit loss rates are calculated, it is not meant to address the vintage method of estimating expected credit losses. Finally, this paper also discusses the CECL standard's requirement for a company to "revert to historical loss information for periods beyond which the entity is able to make or obtain reasonable and supportable forecasts of expected credit losses."

Documentation of CECL vs. Incurred Loss Calculations and Estimates

As part of today's incurred loss accounting, calculations performed to support credit loss rates are relatively straightforward and discussed within the "Open Pool Loss Rates" section of this paper. Qualitative risk factor adjustments are applied to starting point estimates in order to, among other things, account for differences between the portfolio mix existing throughout the historical loss accumulation period that was used and the portfolio mix at the reporting date. Other risk factor

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[1] Accounting Standards Update 2016-13, issued by the Financial Accounting Standards Board (FASB) is popularly known as "CECL" for the "Current Expected Credit Loss" model for measuring credit losses on financial instruments. CECL requires recording and estimate of credit losses expected through the remaining life of the loan portfolio. This effectively requires the estimate to be made at the origination or purchase of the loan or Held-to-maturity debt security, with that estimate updated each period.

[2] Wording in paragraph 326-20-30-9 indicates that a bank will adjust historical loss rates by considering current conditions and reasonable and supportable forecasts. ABA believes that, in practice, this could be applied in two different steps (one for current conditions and one for the forecast of the future) or combined within one step, based on the level of segmentation of the respective pools.

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adjustments are applied to account for differences in economic conditions during the periods making up the starting point rates and those as of the reporting date.

The typical community bank has extensive discussion related to their quarterly analysis of each of the risk factor adjustments[3], and the change in the credit loss provision as a whole. However, relatively little documentation is provided to support how the analysis results in specific quantification of the adjustment.

This is expected to change in CECL for five reasons:

1. Increased volatility of the risk factor adjustments, primarily because of the longer loss recognition period (lifetime versus a year or two) and the forecast of the future. More scrutiny by board members and auditors will likely be given to the calculations than today.
2. Increased auditor scrutiny, as evidenced by proposals from the Public Company Accounting Oversight Board (PCAOB) and the International Auditing and Assurance Standards Board, will compel auditors to understand risk factor adjustments in more depth and to evaluate their reasonableness.
3. Directional consistency that current credit metrics have with credit loss provisions will significantly diminish. Directional consistency has acted as an anchor to the risk adjustments as a whole, but goes away, as credit loss provisions will be effectively recorded at origination. Quantification of the risk factor adjustments will take on a larger role as bank board members and bank examiners strive to understand the provision.
4. Portfolio information will, as a whole, have more transparency. More scrutiny from investors and board members will likely occur because of vintage-based amortized cost and charge-off information that is disclosed.
5. Over time, the reasonableness of CECL credit provisions can be compared to externally-acquired market data.[4] While backtesting will present individual challenges, peer data could become a "reasonable and supportable" standard from which risk adjustments (as well as whole provisions) will be judged.

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[3] General guidance most bankers currently follow regarding risk factor adjustments is included in the 2006 Interagency Policy Statement on the Allowance for Loan and Lease Losses. The CECL standard lists risk factors in 326-20-55-5. Similar risks are noted, though the CECL standard also lists vintage, historical or expected credit loss patterns, and reasonable and supportable forecast periods.

[4] While there is no general agreement on when a loss is actually incurred (and, thus, what the incurred loss allowance represents), there is general agreement on a "lifetime" loss for most bank portfolios.

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With these things in mind, it will be important for a bank to implement procedures that quantify risk factor adjustments as precisely as possible. While this paper does not intend to address the various analyses that result in risk factor adjustments, quantifying risk factor adjustments will often apply the calculation approaches described herein.

Methods of accumulating data – Open Pools vs. Cohorts: Current incurred loss analysis is generally based on annualized rates from loans maintained in an "open pool" at a point in time. Data on charge-offs, recoveries, credit ratings, delinquencies, and other metrics are reflective of current period activity or end of the period status, assuming the pool is "open" – loans freely come in and out of the pool, without identifying or tracking specific loans or specific loan activity. Annual net charge-off rates are, thus, the result of activity from loans originated from various times and can also include activity (for example, recoveries) on loans charged-off several years before.

In order to analyze credit risk experience, historical experience is also often based on cohorts. Cohorts are merely groups of loans that share a defining characteristic or group of characteristics. Specific loans are identified and tracked within the cohort. Cohorts are often referred to as "static pools" or "closed pools," since there are no changes made to the cohort once the cohort is formed. Cohorts can be based on a product (such as a residential real estate mortgage), on specific terms within a product (residential real estate mortgage loans that have interest-only payment terms), on when the loan was issued (also referred to as vintage), on payment status (residential real estate mortgages that were between 30 and 60 days past due at a specific date), or on any other characteristic.

The following pages present a sample of common approaches to achieve the objective of calculating a loss rate starting point, along with walkthroughs of each approach.

Note: The specific terms "Open Pools" and "Cohorts" are used in this discussion paper because of language generally used during discussions among bankers, regulators, and standard-makers prior to and during the IFRS 9/CECL development processes. ABA is aware that such terminology might be used differently today in the U.S. by these parties, as well as by certain software, auditing, and consulting firms. No matter the specific words used, the important point in this paper is to contrast loss rate calculations when specific loans are tracked (Cohorts) and when specific loans are not tracked (Open Pools).

The Open Pool Calculation Approach

The open pool approach is a non-cohort approach in which charge-offs are tracked over a period of time, with no tracking of activity or balances of specific loans. This is based on the typical incurred loss practices today in which loans freely go in and out of the pool.

Background: Assume a pool of four-year auto loans is maintained by Bank A. Bank A is a de novo bank that starts originating loans in late 2001. It originates $10,000 in loans in each year from 2001 to 2005. The loans are fully amortizing with a 5% note rate.

The Process: Identify all net charge-offs (both charge-offs and recoveries) recorded during the four-year period and divide by the average amortized cost balance during that period.

Year	Year end Am Cost (A)	Charge-Offs (B)	Annual Rate (C)	
2000	$ -	$ -		
2001	10,000	50	1.00%	
2002	17,634	160	1.16%	
2003	22,723	300	1.49%	
2004	25,113	340	1.42%	Life of loan loss rate of portfolio
2005	24,773	350	1.40%	
Avg 2001-2004	$ 15,094	850	5.63%	
Avg 2002-2005	$ 20,049	1,150	5.74%	
Wtd Avg Loss Rate	$ 35,143		5.68%	

Calculating the loss rate

1. Bank A's loan portfolio amortized cost at December 31, 2001 is $10,000 (Column A). The amounts in column A are only approximations that reflect accrual of interest, payments, and charge-offs. Any exact computations of the balance would be irrelevant for the purposes of this paper.
2. The annual charge-off rate for the period 2001 - 2004 of 5.63% is the total charge-offs over that time frame ($850), divided by the average amortized cost for that four-year period ($15,094 – The year-end 2000 balance is the beginning of the four-year period. Therefore, the average comes from five balances).
3. A rolling charge-off rate can be calculated for each year, based on the applicable (in this case) four-year period. With that in mind, the rate over the 2002-2005 period is 5.74%. An average of each charge-off rate can then be calculated over time (Weighted average of 5.68% in this example).

The Outstanding Loan Approach

The outstanding loan approach is a cohort-based approach in which charge-offs are tracked based on the date(s) the related loans in the cohort were outstanding. Since the outstanding loan approach is meant to calculate a loss rate on a group of loans that were existing at a specific point in time, the loss rate reflects an expectation over the *remaining* contractual life of the loan, rather than a *complete* life of loan. As a result, use of the outstanding loan approach is usually applied to estimation methods that explicitly take into account existing loan performance or specific credit quality, like migration or roll rate methods that are based on past due, internal risk rating status or credit rating. For example, all loans outstanding that are rated "4" or that are 31 to 60 days past due as of a specific date may be tracked to final resolution and a loss rate starting point calculated. Likewise, debt securities with, say, a "Baa3" rating may also be tracked to final resolution.

The Process: All loans are identified as of a specified date and subsequent net charge-offs (both charge-offs and recoveries) in future periods relating to those specific loans are identified and accumulated until final resolution of each of the related loans. Accumulated net charge-offs are then divided by the beginning amortized cost to arrive at a loss rate for the pool.

Bank A keeps the following data:

Year	Am Cost (000s) (A)	Charge-Offs (B)	Applicable to Amts O/S 1/1/2001 (C)	Applicable to Amts O/S 1/1/2002 (D)	Applicable to Amts O/S 1/1/2003 and after (E)	
2001	10,000	50	50	-	-	
2002	17,634	160	120	160	-	
2003	22,723	300	140	260	300	Col E #'s are irrelevant to the 2001/2 calculations, but shown to emphasize that such amounts will need to be tracked on an ongoing basis.
2004	25,113	340	30	170	340	
2005	24,773	350		40	350	
Total Charge-offs			$ 340	$ 630		
Opening amortized cost			$ 10,000	$ 17,634	(from Col A)	Weighted average remaining life of loan loss rate = 3.51%
Loss Rate			3.40%	3.57%		

1. For simplicity, the Bank's loan production is assumed to occur on the first day of the year. Loss rates are calculated only for those loans outstanding as of 2001 and 2002 because, as of 2005, only loans as of these dates have come to ultimate resolution (maturity or charge-off).

2. Since the Bank is a de novo, all $50 of charge-offs in 2001 (Column B) were from loans outstanding at the beginning of the year (Column C).

3. Of the $160 of charge-offs during 2002 (Column B), all related to loans outstanding at 1/1/2002 (Column D). $120 of the $160 had also been outstanding at 1/1/2001 (Column C).

4. Of the $300 of charge-offs in 2003 (Column B), all related to loans outstanding at 1/1/2003 (Column E). $260 of the $300 had been outstanding at 1/1/2002 (Column D), and $140 of the $300 had been outstanding at 1/1/2001. (For the purposes of calculating loss rates for 1/1/2001 and 1/1/2002, Column E is irrelevant, but is shown to illustrate that banks will track such data on an ongoing basis.)

5. Of the $340 of charge-offs in 2004 (Column B), $170 had been outstanding at 1/1/2002 (Column D), and $30 of the $340 was outstanding at 1/1/2001 (Column C). (Again, for the purposes of calculating loss rates for 1/1/2001 and 1/1/2002, Column E is irrelevant, but is shown to illustrate that banks will track such data on an ongoing basis.)

   With the end of 2004, all loans from 1/1/2001 are now completely resolved. No more charge-offs apply to the 1/1/2001 loan balance. Total charge-offs of 340 from loans outstanding as of 1/1/2001 are divided by the 1/1/2001 balance of 10,000 and arrive at a 3.40% loss rate.

6. Of the $350 of charge-offs in 2005 (Column B), $40 had been outstanding as of 1/1/2002 (obviously, since the 2001 balance has been resolved, zero applied to loans outstanding as of 1/1/2001). (Again, for the purposes of calculating loss rates for 1/1/2001 and 1/1/2002, Column E is irrelevant, but is shown to illustrate that banks will track such data on an ongoing basis.)

   With the end of 2005, all loans from 1/1/2002 are now completely resolved. No more charge-offs apply to the 1/1/2002 loan balance. Total charge-offs of 630 from loans outstanding as of 1/1/2002 are divided by the 1/1/2002 balance of 17,634 and arrive at a 3.57% loss rate.

7. Developing *average* loss rates using the outstanding loan loss rate method would involve applying a weighted average of charge-offs related to loans outstanding at year-end 2001 and 2002. A weighted average loss rate from 2001 and 2002 is 3.51%. Averages can be updated as more years are resolved.

In contrast to the open pool approach, performing this process requires loan-by-loan tracking of charge-offs until final resolution (charge-off and recovery or pay-off). This is because loans outstanding at year-end 2001, 2002, 2003, etc. must be distinguished from other loans. Due to troubled debt restructurings that extend the effective life of the loan, specific loans in the 2001 cohort could be outstanding many years after the original contractual maturity. Therefore, the four year maturity shown in the example could, in practice, require tracking for far longer.

The Vintage Approach

Vintage approach is a cohort-based approach in which charge-offs are tracked, based on the period of origination or commitment. This contrasts with the outstanding loan approach, where each cohort consists of the loans outstanding at a specific date. Loss rates using a vintage approach are often detailed not just in total, but also by the age of the asset at default and/or charge-off. "Vintage analysis" is often referred to as an estimation method under CECL. This paper addresses only the calculations underlying a vintage analysis, but does not go into detail of how vintages can be analyzed or how an estimate is performed.

The Process: Identify all loans originated during each period and then identify all future charge-offs that relate to those loans. Vintage loss rates are also often analyzed within distinctive matrices, such as the matrix shown in paragraph 326-20-55-30 of the CECL standard's implementation guidance. Below is an example that uses the same numbers that are used in 326-20-55-30, which computes the loss rates in dollars. In practice, vintage loss rate calculations are normally performed as a function of loss as a percentage of the loans originated in the vintage, which also is often expressed in basis points.[5] While this paper uses dollars to be consistent with the CECL example, readers may find it easier to think of the numbers in terms of basis points of loss.[6]

Example: Bank A is a de novo bank, starting operations in 20X1 and decided to track their charge-offs on a portfolio of 4 year term auto loans by vintage. In 20X1, their summary charge-off ledger shows $50 and looks like this:

Year of Origination	Year 1
20X1	50

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[5] Some vintage estimates may be based on the amortized cost at the beginning of the period, as opposed to origination amortized cost. For the purposes of this paper, only the amounts in relation to the origination amortized cost is discussed.

[6] FASB likely used dollars merely for the sake of simplicity. Within the vintage method example, FASB also assumes the loan production each period is the same. This allows dollars to be equivalent to basis points for the sake of understanding the example.

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In 20X2, Bank A charged-off $160 in loans: $120 were charged-off on loans originated in 20X1 and $40 were charged-off on loans originated in 20X2.

Year of Origination	Year 1	Year 2	Total 20X2 Fiscal Yr
20X1	50	120	160
20X2	40		

$160 charged off in 20X2 is made up of $120 from loans in their second year after origination and $40 from loans in their first year.

In 20X3, Bank A charged-off $300 in loans: $140 on loans originated in 20X1, $120 on loans originated in 20X2, and $40 on loans originated in 20X3.

Year of Origination	Year 1	Year 2	Year 3	20X3 Fiscal Year
20X1	50	120	140	300
20X2	40	120		
20X3	40			

$300 charged off in 20X3 is made up of $140 from loans in their third year after origination, $120 in their second year, and $40 from loans in their first year.

In 20X4, Bank A charged-off $340 in loans as shown below. As 20X4 is the fourth and final year of loans issued in 20X1, the total loss rate for the 20X1 vintage is $340.

Year of Origination	Year 1	Year 2	Year 3	Year 4	Total 20X4 Fiscal Year	Total for vintage
20X1	50	120	140	30	340	340
20X2	40	120	140			
20X3	40	110				
20X4	60					

Total losses for the 20X1 vintage (those loans issued in 20X1) are $340

In 20X5, Bank A again charged-off $350 in loans as shown below. As 20X5 is the fourth and final year of loans issued in 20X2, the total loss rate for the 20X2 vintage is $340 (same as for 20X1).

Year of Origination	Year 1	Year 2	Year 3	Year 4	Total 20X5 Fiscal Year	Total for vintage
20X1	50	120	140	30		340
20X2	40	120	140	40	350	340
20X3	40	110	150			
20X4	60	110				
20X5	50					

Average vintage charge-off rate = $340

A new average charge-off rate can be calculated as each vintage reaches maturity.

Loss rates are normally expressed in percentages or basis points. The $340 of charge-offs for loans originated in 20X1 are divided by the total amortized cost of loans issued at the time of origination. If there were $10,000 in loans issued during 20X1 (with zero net loan fees or costs), the loss rate would be 3.40%, or 340 basis points, for the 20X1 vintage.

Charge-off Rates by Age: Charge-off rates within a vintage analysis can also be calculated by the age of the loan when the charge-off occurred. Within the example, the average charge-off rate for loans in their second year is $115. For certain loan products, charge-offs on loans do not normally occur evenly over their lives and losses on loans of similar characteristics will often occur around the same age. Calculations by age of loan are, thus, useful in identifying credit loss patterns (also known as "loss curves" and referred to as "historical or expected credit loss patterns" in ASC 326-20-55-5L) for longer-termed assets.

Year of Origination	Year 1	Year 2	Year 3	Year 4	Total 20X5 Fiscal Year	Total for vintage
20X1	50	120	140	30		340
20X2	40	120	140	40	350	340
20X3	40	110	150			
20X4	60	110				
20X5	50					
Average	48	115	143	35		

There is generally no need to perform separate weighted-average calculations, as any averages (or average rates) are normally applied at the vintage-level.

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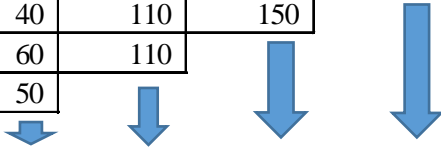
Mathematical Differences in the Loss Calculation Formulas

- **Open Pool Approach**: The time period is set, while the specific loans are open.
  - Numerator: All charge-offs[7] from all loans occurring during the historical loss period.
  - Denominator: Average amortized cost of all loans outstanding during the historical loss period.

- **Cohort Approaches** (including the outstanding loan approach and the vintage approach): The specific loans of the cohort are set, while the time period is to open to final resolution.
  - Numerator: All charge-offs occurring during the *remaining life* (until final resolution – charge-off and recovery or pay-off) of the specific loans in the cohort defined in the denominator.
  - Denominator: Amortized cost only of those specific loans in the cohort.
    - Outstanding loan: Outstanding as of the specific date
    - Vintage: Originated during a specific period.

Difference Between Loss Rate Approach Rates

The vintage loss rate of 3.40% and 3.51% outstanding loan rate are significantly different from the 5.68% life of loan loss rate in the open pool approach example. This is because the vintage rate is only on specific vintages and the open pool rate is based on loans from many different vintages. Because loans in different vintages will be at different stages in their lives and, thus, different levels of remaining risk, multiplying a vintage rate by the average life of the portfolio will often yield inappropriate estimates. Likewise, the same can be said applying an annual open portfolio loss rate to an expected portfolio life. The supplemental analysis required to adjust open pool rates to reflect the can risk facing the portfolio at the balance sheet date can often be complex when using open pools.

One may say that the 5.68% is a more relevant percentage than the 3.40% because it includes more recent data. Using any approach, an evaluation of the relevance of the historical experience to a final credit loss estimate is required and is also performed in relation to the estimation method applied. That said, a bank will be required to support that the rates it uses are based on a

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[7] While this paper concentrates on charge-off data, other activity, such as default/nonaccrual or past due migration can be tracked through open pools or cohorts.

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life of loan concept. Within a cohort approach, the life of loan rates are inherent to the calculation. Within an open pool approach, more work is required to support life of loan rates.

Long-term loans can sometimes put the relevance of certain averages in question, since the most recently matured cohort can be several years old. Banks may consider calculating averages based on the loss curve of the product, in which after a certain period, the likelihood of loss is very small (for example, charge-offs are rare after seven years for 30-year amortizing residential mortgages). Vintage calculations by age can be applied in this effort – while a vintage may have several years before the end of its portfolio life, age-based charge-off information can provide a relevant update of loss information.

No matter the approach, qualitative assessment will be necessary to quantify any necessary changes to the initially-calculated loss rates in order to take into account differences in the portfolio mix at the reporting date and the portfolio mix used to arrive at the starting point estimates.

Open Pool Calculation Reconciliation and Adjustments

Incurred credit loss rates today are normally based on open annual charge-off experience in open pools[8], while CECL's credit loss rates are based on charge-offs over the entire (or remaining) life of the loan pool. Use of cohort approaches to calculate loss rates is not required within CECL – open pools are acceptable, as long as the objective of measuring a life of loan loss is satisfied. However, when using an open pool approach to calculating a loss rate (such as the one demonstrated above), sufficient other analysis will normally be necessary to ensure that loss experience (charge-offs that are used to calculate the credit loss rates) reflects the life of a loan portfolio. Without analyzing how such activity may affect the credit loss rates, open pool loss rates will likely be skewed – both too large and too small.

Since the cohort approaches described in this paper inherently derive life of loan loss rates, it seems that the use of open pool charge-off rates would often require more supplemental work each reporting period to arrive at a credit loss estimate than what would be applied if the bank starts with charge-off rates based on cohorts. A bank that first relies on open pool-based charge-off rates as calculated in this paper will need to consider adjusting the life of loan loss rate for the following items merely to arrive at a starting point loss rate:

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[8] General incurred loss accounting practice revolves around the idea that the probable loss on any given loan in a pool – as noted on page 14 of the Controller's Handbook issued by the Office of the Comptroller of the Currency – should ordinarily become apparent in one year. Banks that use migration or roll rate analysis often follow cohort pools, whereby specific loans are tracked over a year's time.

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- Amortized cost balances that exist at the beginning of the period relating to loans that had previous charge-off activity, such as collateral dependent impaired loans. In these cases, the resulting charge-off rates in the loss accumulation period would often reflect zero loss on these balances.
- Recoveries from loans that had been fully charged-off prior to the start of the charge-off period, thus the numerator may include activity not indicative of the pool.
- Charge-offs that occurred during the first year of a loan's life, thus the beginning amortized cost balance may often not be reflected properly in the denominator of the charge-off rate.
- Loans that, through loan modification (a TDR or non-TDR loan modification that did not qualify as a new loan), were resolved (paid-off or charged-off) after the loss accumulation period. This would include both loans originated prior to and during the loss accumulation period.
- Loans that prepay or are charged off prior to maturity, for they may have decreased the life of the portfolio from the contractually stated life.

It is possible that, in "steady state" times of consistent growth in the economy with consistent year-to-year balances of loans, the impact of each of these factors is insignificant. However, during periods when production is strong or when the economic cycle is changing, these issues will normally be important.

Open pool charge-off rates include charge-offs (in the numerator of the loss rate formula) from loans that were originated in periods that may have had very different underwriting standards, as well as loan balances (in the denominator) from recently-originated loans that, due to their expected loss curves, would have little charge-offs during the time period. While a bank will need to adjust for those issues no matter the loss calculation approach, data accumulated through both the cohort approaches enable analysis whereby quantifying such adjustments is relatively straightforward.

Audit Considerations

From an audit perspective, auditing standards currently emphasize that the process for preparing accounting estimates (of which CECL is one estimate) consists of "Accumulating relevant, sufficient, and reliable data on which to base the estimate." From this perspective, "relevant" data would seem to be on "life of loan" or "lifetime" bases, rather than an annual basis. As noted, there can be processes to reconcile underlying data to a life of loan basis. However, it seems these processes would largely be unnecessary if life of loan data were maintained in the first

place. Practically speaking, without starting with life of loan-based data, it is difficult to determine the life of loan credit loss rate to reconcile to in the first place.

Flexibility for Other Cohort Approaches

Due to the requirement to track on a loan-by-loan basis, the cohort-based calculation approaches sets a platform to enable analysis over loss frequency and loss severity. For example, tracking the date that a loan first qualifies for the nonaccrual status, as well as its respective origination date, allows a vintage analysis of default counts over periods of time. Age-based probabilities of default can, then, be analyzed. Once default (nonaccrual) counts are tracked over time, charge-off information can allow a bank to compute losses given default. Vintage-based cohorts, thus, become the building block for a probability of default/loss given default analysis.

Tracking loss frequency and severity can be an efficient way to analyze portfolio risk when loans are issued to borrowers of different credit quality and when collateral values are an important factor in the recovery process. Since current incurred loss open pools normally do not track charge-offs on a loan-by-loan basis, it is difficult to track loss frequency and severity. Cohort-based methods, therefore, appear to provide flexibility as estimation practices evolve or otherwise need to change.

Bankers should note that the timing and amount of charge-offs are often defined by the regulators, based on past due status or collateral dependency. While not expected, regulatory guidance can change in the future and, thus, the estimation methods that rely primarily on charge-off rates may require adjustment. Since default-based cohort approaches decrease the reliance on time sensitive charge-off amounts (because the ultimate net charge-off is related back to a default or origination event), they appear to reduce the need for adjustment if such regulatory changes occur.

Loan Modification Requirements in Measuring the Life of a Loan and for Disclosure

A life of loan credit loss rate assumes that individual losses are tracked to the entire contractual life of the loan and no longer. Per ASC 326-20-30-6, the life of a loan portfolio shall include consideration of prepayments and reasonably expected troubled debt restructurings, but not expected renewals and non-TDR modifications (those that do not qualify as TDRs).

With this in mind, ASC 310-20-35-9 through 11 gives guidance on when a non-TDR modification should be considered the pay-off of one loan and the issuance of a new loan. This requirement pertains to the recognition of deferred loan fees, though the evaluation process is often not performed in practice today because it's impact on the financial statements may

currently be considered to be immaterial. Under CECL, however, such activity should be tracked because it can change life of loan loss rates used for both modeling CECL estimates and for disclosing vintage-based amortized cost information. A loan that is subject to a non-TDR modification that does not result in derecognition of the old loan (and issuance of a new loan) could be considered two loans in the core loan servicing system. Assuming there is a complete loss on the loan, a simple credit loss rate may equal 50% if it is considered two loans. Likewise, TDRs performed on loans may be sometimes be reflected in the core systems as the maturity of one loan and the issuance of another.[9] Data that counts this as two loans instead of one can inappropriately cut the life of loan loss rate if such data is relied upon in the CECL estimate. This can also result in the inappropriate disclosure of amortized cost by vintage.

Bankers will need to ensure that the data that is relied upon in their estimation calculations have appropriately considered the effects of loan modifications and troubled debt restructurings. There may be other issues in ensuring that the data included within models estimating life of a loan loss rates, depending on loan products and bank underwriting practices. This paper, however, is not meant to comprehensively address all issues related to the quality of the data that underlies the estimates.

Of course, these requirements do not directly affect open pool loss rates, as the loss rates are merely based on the charge-offs recorded during a specific time period and amortized cost balances are based on what is on the books at the specific times. The impact of loan modifications and TDRs, however, will need to be assessed in to determine whether calculated charge-off rates make up a good starting loss rate estimate. This will likely be a challenging task, since quantifying the impact would seem to be arduous. Further, as the case just described with companies that maintain pools in cohorts, vintage-based amortized cost disclosures will likely also need to be adjusted.

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[9] In 2011, ASC 2011-02 was issued by FASB to address diversity in practice related to TDRs. One change in practice that was adopted by many banks was the presumption that many loan renewals to borrowers of certain risk ratings would qualify as TDRs. In addition to determining whether specific data feeding the CECL models would comply with this practice, bankers are also advised to determine whether adjustments to historical data should be made so that similar presumptions should be made for loan renewals executed prior to the issuance of ASC 2011-02.

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Appendix I: Applying Historical Loss Periods

This paper assumes that the most relevant historical experience and most relevant calculation approaches and estimation methods will produce starting point estimates that require the least risk adjustment (relative to other data, approaches, and methods) to arrive at a final estimate. The more relevant the experience and methods applied, the less need for other supplemental analysis and adjustment. This would normally make it easier to explain the allowance and credit loss provisions to bank board members and other constituents.

As with the current incurred loss model, there will be debates as to *which* historical experience is relevant to computing CECL's life of loan credit loss rate. Under an incurred loss model, recent historical experience is a reasonable basis on which to estimate incurred losses. Economic activity in a community often has "micro-systemic" impact: A business defaults on its loan, so it lays off employees who, then, default on their home mortgage and stop going to their favorite restaurants, who then close down, etc. Therefore, the debates on loss accumulation period tend to be on whether a bank should apply the most recent three years of charge-off history or the most recent five years. Either way, the most recent experience is assumed to have significant relevance.

While historical experience is the basis for a life of loan expected credit loss under CECL, *recent* historical experience may often have less relevance to the starting point estimate under CECL. To illustrate, charge-off rates from 2006 to 2009 will likely provide little relevance to a credit loss expectation for the 2010 and 2011 vintages, since loans issued in 2010 and 2011 likely had far stricter underwriting standards with a different forecast of future macroeconomic conditions (and, thus, lower expected loss). Applying historical experience that is relevant to the current portfolio's credit risk characteristics, in light of the bank's forecast of future macroeconomic conditions, will be critical.

As a result, in performing a starting point estimate, relevant historical experience may often include reference to:

- Experience from a previous vintage (or vintages) that had comparable underwriting standards or were issued during years of a comparable point within a previous economic cycle (such as "the second year of recovery from a recession bottom").

- Experience from a period (or periods) of time in which credit conditions were comparably deteriorating (or improving) to estimate how past due loans or certain risk-rated loans may migrate to a charge-off.

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While supplemental risk factor analysis would likely adjust the starting point estimates for these approaches, starting with more relevant historical experience may often be more comprehensible when explaining changes in the allowance to board members.

This is not to say that recent historical experience is irrelevant under CECL. In fact, recent experience may be primarily relevant for various lending products. Starting point estimates on shorter-tenored loans, loans for which the key credit risks are periodically reviewed and updated after issuance (such as updating FICO scores or risk ratings), and revolving loans may often appropriately be based on recent historical experience. Portfolios for which migration analysis is performed for the starting point estimate is an example. It should also be noted that "recent historical experience" is not limited to charge-offs, as it, for example, could include something like borrower activity that would identify credit card borrowers that are migrating from a "transacter" status (paying off balances monthly) to "revolver" status (that maintains balances carrying forward to the next period).[10]

Historical experience that spans the most recent macroeconomic cycle may often be highly relevant for certain loan products. Many banks will consider historical experience over the most recent complete previous economic cycle as the basis for their starting point credit loss estimate. Risk adjustments can then be based on, among other things, where in the current economic cycle the bank portfolio exists. This approach is similar to one that merely "points to previous vintages" described above, but may be easier to both explain to bank board members.

Further, comparing recent rates of ultimate migration, loss frequency, and severity can provide valuable insights in:

- Determining whether short-term loan performance is expected to continue or to revert to levels expected at origination (or during the previous reporting period),
- Understanding how changes in collateral values are affecting credit risk, and
- Determining whether specific workout initiatives are effective in limiting losses and, as a result, can lower loss expectations.

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[10] ABA believes that recent historical experience will always have significant relevance in a CECL estimate, whether in use for the starting point estimate or as supplemental analysis that results in a risk factor adjustment. Since a vintage-based estimation method, for example, does not normally consider current trends in past due status or other credit quality, migration analyses will likely be performed to supplement the vintage analysis. For a more comprehensive discussion on this and its implications, see the ABA Discussion Paper *Analyzing Current Loan Performance Under CECL.*

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In conclusion, the use of historical experience will be product-specific and may be based on whether the analysis is used to estimate a starting point or to provide supplemental analysis that leads to a risk factor adjustment. An active governance process should be implemented over the choice of historical experience used each reporting period.

Appendix II: Reversion to Historical Loss Information

For bankers concerned that they are unable to comfortably forecast credit losses further than one to two years, paragraph 326-20-30-9 requires a bank to "revert to historical loss information" for periods beyond which it is able to "make or obtain reasonable and supportable forecasts."

With this in mind, banks large and small are grappling on how to forecast macroeconomic factors and to quantify those forecasts into expected credit losses. This discussion is not meant to be an exhaustive analysis of forecasting. However, there are several principles that bankers should expect to drive how this aspect of the CECL standard should be understood:

1. The reversion concept implies that banks will be forecasting not just the amount of charge-offs, but the timing of charge-offs.

   Since there is an issue as to the reliability of forecasted credit losses past a certain period in the future, the reversion process seems to be based on the notion that timing of the loss event (charge-off, default, etc.) is critical. With this in mind, estimation methods that do not take into consideration timing of charge-offs will involve extra work (in relation to other methods) in order to avoid double-counting (or under-counting) charge-offs derived from the reversion averages and those determined amid the reasonable and supportable forecast period. This is especially true for loan products that are prepayable, that have amortizing balances, or where collateral values are a key factor in the forecast. Actual credit exposure at the time of the loss can vary significantly if macroeconomic factors (interest rates, home prices) are forecasted to change.

   The most readily understandable estimation method that takes into consideration timing of losses is the vintage method, in which average loss rates are computed on each vintage by age of the vintage. Probability of default and loss given default estimates are normally more detailed versions of the vintage method.[11]

   An estimation method that does not consider timing of losses is often referred to as a "loss rate" method. In a loss rate method, historical life of loan loss rates are used as starting point estimates. The situation in which forecasts of the future can be easily applied under a "loss

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[11] A discount cash flow (DCF) analysis could also be considered to take into account timing of loss. However, a DCF analysis technically forecasts cash flows, rather than losses. That said, reversion to historical averages using a DCF method would be a reasonable approach to forecasting.

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rate" method is when the macroeconomic environment, loan production, and portfolio performance have been very stable for a long period of time (throughout the historical loss period used as a basis for the starting point estimate). Estimates can be made to forecast losses in the future. However, it is normally difficult to support such amounts without further analysis on anticipated collateral values, loss curves, and borrower performance. Forecasts of such factors over time can be a critical aspect of the CECL analysis.

A starting point estimate based on a migration analysis does not necessarily reflect any forecasted changes in macroeconomic factors. Transition forecasts (for example, using a transition matrix model[12]) would normally be used to supplement a migration analysis. Comparing results from a current period migration analysis to that of a previous period that was in a comparable point in its economic cycle may also be appropriate. Given these supplemental processes, however, the need to consider reversion considerably diminishes.

2. "Historical Loss Information" can be applied very broadly.

While the "historical loss information" that a company reverts to will be unadjusted, it can be based on data inputs (such as collateral price index or unemployment rate) or an entire estimate (such as a loss rate), and can be applied on any kind of systematic timetable. In other words, FASB gives a bank a wide range of freedom in applying the historical loss information. A bank that elects to "revert" will need to have a governance process that evaluates the most appropriate historical loss information to apply.

3. Reversion to historical averages should not eschew reality.

While there is a wide range of freedom, banks should strive to achieve a reasonable estimate of expected credit losses. Historically, credit cycles are characterized by relatively long periods of stability and slowly increasing collateral prices, followed by sharp and short periods of stress. For example, credit losses suffered in the residential mortgage and commercial real estate industries during the financial crisis occurred because of sudden and acute declines in collateral prices. After recognizing large credit losses during 2009, immediately reverting to the low historical loss averages from previous years would

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[12] See the ABA Discussion Paper *Current Credit Performance Under CECL* for more discussion on Transition Matrix Models.

effectively imply real estate price increases that had never been experienced before. Such increases would be highly unlikely and this is not the intent of the provision.

While CECL allows the historical losses to be applied on a top-level basis, reversion to historical inputs (say, to revert to historical increases in the collateral value index) is often the most appropriate method to apply historical information.

4. Underwriting is often the predominant factor in forecasting the future.

Many smaller banks observe that historical experience, whether by vintage, calendar year, loss given defaults, or whatever metric, have little correlation with the general economy or general collateral price indices. These banks are often located in the many areas of the country where economic growth is consistently slow or non-existent. From a practical perspective, collateral prices must experience significant declines in order for defaulted loans held by these banks to sustain any significant credit loss. Therefore, since these areas do not experience fast or high home prices (and the resulting spike in losses when the economy declines), a realistic long-term macroeconomic forecast will likely provide little value to the CECL estimate as a whole.

For these banks, by far the biggest factor in a forecast of future credit losses will be underwriting standards. As a result, when a bank can demonstrate that historical losses are not significantly related to macroeconomic factors (and where there are no known circumstances that would affect the local economy, such as the closing of a factory), little to no further work need be done to address a macroeconomic forecast. These banks can point to any changes to underwriting standards (or granting of policy exceptions) within its organization or to changing standards noted elsewhere through market data, such as the Survey of Credit Underwriting Practices published by the Office of the Comptroller of the Currency.[13]

In these circumstances, in addition to substantially decreasing any work needed to support a macroeconomic forecast (merely updating how such correlations are low), banks should be able to eliminate the need to revert to historical averages. Since underwriting is being

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[13] Reference to underwriting standards will normally be effective when performing analysis of vintages, since vintages reflect underwriting at the time of issuance. Forecasting credit losses based on changes to underwriting is less clear when vintages are not examined.

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analyzed and applied to (presumably) specific vintages, outside of a change in borrower performance during a period, a reasonable and supportable forecast across the portfolio life appears to result across the life of the portfolio through the review of underwriting.

5. Reversion to historical averages is a standard practice that is both reasonable and supportable.

   Reverting to long-term average historical rates is a typical forecasting process that should need no further support to be considered "reasonable." By opting to revert to historical information after a reasonable and supportable time period under 326-20-30-9, however, a bank loses its right to adjust the historical information used. With this in mind, banks that believe they are officially beyond a "reasonable and supportable" forecast period have considerably less flexibility in setting its credit loss expectations.

   ABA believes that merely applying a reversion process within its normal forecasting process can provide bankers with an easy way to support its macroeconomic factor forecasts, while still enabling it to have the freedom to adjust the results as it sees fit (as long as it fits into the principle number 3 above). In other words, bank that merely embeds a reversion of its inputs on a set schedule, no matter how soon after the reporting date, will claim their "reasonable and supportable forecast period" is the life of the portfolio.

   For example, if the local housing price index increased 4% over the previous year when the long term rate is a 3% increase, for example, it is reasonable to assume a decrease from the 4% rate over the next year to return to the 3% long term rate. Adjustments to loss rate averages calculated for the "outer years" can then freely be made without criticism that such rates should be unadjusted.[14] Derivatives of this methodology should be acceptable, as long as the objective is to present a reasonable measurement of expected loss.

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[14] Of course, such adjustments will require quantitative supporting documentation. However, they still can be made.