

# CECL: The Madness to Choosing a Method

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When we were given projects in school, most of us would wait until the last possible moment to begin. After a couple of stressful less-than-stellar projects, we hopefully learned to start earlier. Like those *successful* projects in school, CECL takes planning and preparation. Waiting until the last moment to prepare will add to the level of stress and reduce the chances of success with the first filing.

When asking institutions where they are in the process, the answers have been widely variable, ranging from: “We have a team in place, have the data, and are starting to run simulations to smooth out the process” to “We have three years before our first filing so we don’t have to worry about it for another two years at least.” The latter we’ve heard more than you’d think, and is very worrisome.

There is a process to preparing for CECL and it takes time, starting with creating a CECL team. Different entities, such as the OCC, have been heard encouraging the formation of a CECL team.

This team will provide visibility and transparency into the process and impact of changes. Members of the team may also have information of significant value, such as data fields that no one thought were being captured but actually are. One of the other concerns we’ve heard is ensuring someone from the C-Suite is on the team. This goes to the visibility and transparency aspect. Those institutions without executive involvement along the way may end up with executives very surprised by the impact to the reserve account.

Another part of the preparation process is data. What data do we need? How much history should we capture? Where do we get it? These are the questions frequently asked and one the team should discuss. Once that data process is underway, the team needs to decide on how they will calculate the reserve. What methods do we use?

## METHODS

FASB states any method can be used as long as it reflects a life of loan loss rate. In fact, current methods can be used as long as they are adjusted for life of loan. That historic life of loan loss rate is the foundation of meeting the reasonable and supportable component of CECL. Five methods are typically discussed:

1. Historic Loss Rate (HLR) or Snapshot (as it is increasingly referred to)
2. Vintage
3. Remaining Maturity
4. Migration
5. Discounted Cash Flows

Variations exist, but for the most part those five are the most commonly discussed. In fact, an intra-agency webinar, only three were discussed: Snapshot, Vintage and Remaining Maturity. The methods mentioned above vary in complexity, with Snapshot being less complex and Discounted Cash Flows on the more complex end. We will discuss each of them briefly below.

## SNAPSHOT/HLR

The Snapshot/HLR method is referred to as an 'Open Pool' methodology. It is a variation of the current incurred loss method. The look-back period with this method corresponds to the life of the portfolio. In other words, if we have a five-year auto portfolio, we want to look at the losses over at least a five-year period. Specifically, we want to look at the losses for the balance on the books as of five years prior.

Using the example as seen in Figure 1, we would determine the balance on the books as of 2013 for New Autos. This is all loans in that pool at various stages of maturity. A 'Snapshot' of the portfolio is as of that point in time. After that, we would look up the losses with respect to that balance. In the example below, the losses of \$72,000 are losses attributable specifically to the \$1,500,000 balance. Those losses are divided by the \$1,500,000 to get a life of loan loss rate.

Do the following calculation over multiple five-year periods and get an average life of loan loss rate.

Figure 1: Snapshot/HLR Example

	Pool		Snapshot Year	
	New Autos		2013	
Balance	1,500,000.00	Annual Losses	2013	3,000.00
			2014	15,000.00
			2015	27,000.00
			2016	23,000.00
			2017	4,000.00
		Total		72,000.00
		Loss Rate		4.80%

## VINTAGE

The Vintage method is a static pool methodology. Instead of all the loans in the pool as of point in time, Vintage looks at the loans based on year of origination. FASB provides a nice basic example in their document. They use dollars in their example; however, most will use ratios. Figure 2 provides an example of the Vintage matrix.

Figure 2: Vintage Example

New Autos									
Loss Experience Following Year of Origination									
Year of Origination	Originated Balance	Year 1	Year 2	Year 3	Year 4	Year 5	Total Loss %	Remaining Loss Expected %	\$ Expected
	a							b	a*b
20x9	\$ 1,365,000.00	0.341%	0.954%	0.951%	0.695%	0.313%	3.252%	3.252%	\$ 44,392.48
20x8	\$ 1,317,500.00	0.341%	0.954%	0.951%	0.695%	0.313%	3.252%	2.912%	\$ 38,359.95
20x7	\$ 1,327,540.00	0.325%	0.975%	0.951%	0.695%	0.313%	3.258%	1.958%	\$ 25,993.23
20x6	\$ 1,275,000.00	0.325%	0.975%	0.975%	0.695%	0.313%	3.283%	1.008%	\$ 12,845.63
20x5	\$ 1,452,750.00	0.325%	0.975%	0.975%	0.975%	0.313%	3.563%	0.313%	\$ 4,539.84
20x4	\$ 1,233,400.00	0.325%	0.975%	0.975%	0.650%	0.325%	3.250%		
20x3	\$ 1,050,000.00	0.300%	0.900%	0.900%	0.600%	0.300%	3.000%		
20x2	\$ 1,115,000.00	0.325%	0.975%	0.978%	0.650%	0.325%	3.253%		
20x1	\$ 1,000,000.00	0.300%	0.900%	0.900%	0.600%	0.300%	3.000%		
Total									\$ 126,131.14
apply average									
Average Loss Rates		0.341%	0.954%	0.951%	0.695%	0.313%			

Based on the actual loss rates for those balances, the loss for the balances yet to mature need to be estimated. The user should look at the trends across the years of origination and the years of maturity. For example, the loss rate for Year 1 fluctuates slightly across the years of origination, but remains relatively low in comparison. However, when looking over the maturity of any given origination pool, the loss rate increases then decreases as the pool reaches maturity. We need to layer on top of that adjustments to loss rates due to forecasted economic factors.

Calculations behind the Vintage methodology are not difficult. As can be seen in the Figure 2, the increase in complexity comes from having to estimate loss rates for multiple periods. Some have said this method is a good fit for CECL, although to get there you'll need to have sufficient history.

One of the advantages of the matrix comes from being better able to tailor the adjustments. The qualitative adjustments need to take into consideration the economic forecast for the first couple of years. After that, loss rates can go back to the historical averages. The matrix allows you to isolate the adjustments to the first two forecasted years for each origination pool.

## REMAINING MATURITY

Remaining Maturity is a mixture of the current process and the new. It allows you to continue to use an average loss rate as the foundation, but the look back period will correspond to a material portion of the loss curve. Average life is likely to be used in this case. See Figure 3.

That average loss rate is used to calculate losses for the remaining maturity of the current balance in each year of its average forecasted life. The total of those calculated losses is then divided by the current balance to get a 'Blended Lifetime Historical Loss Rate' that is qualitatively adjusted for the forecasted economic conditions.

It is worth noting that the forecasted remaining balances can be behaviorally-adjusted. This will be preferable in order to lower the impact to the reserve. We may want to be sure to use the same behavior assumptions in both our CECL process and our ALM process. If using different assumptions, we can be looking at apples and oranges with respect to risk management. Better decisions, planning and mitigation can be achieved by aligning those processes.

### MIGRATION

Migration, also referred to as Roll-Rate, looks at how balances migrate across delinquency status or credit tier. If looking at delinquency status, we examine what percentage of that tier remained and what percentage changed delinquency status. By doing this we can see what portion of the balances experienced credit deterioration.

Figure 3: Remaining Maturity Example

December 31	Average Loan	Charge-offs	Annual Loss Rate	Average ANNUAL Historical Loss
2014	40,000,000	135,000	0.34%	
2015	42,000,000	120,000	0.29%	
2016	43,430,000	95,000	0.22%	
2017	43,500,000	65,000	0.15%	
2018	42,750,000	40,000	0.09%	
2019	43,600,000	25,000	0.06%	
2020	44,000,000	10,000	0.02%	0.17%

  

Year	Cost at December 31, 2020	Amortization/Prepayments	Average ANNUAL Historic Loss Rate
0	44,000,000		0.17%
1	39,750,000	4,250,000	0.17%
2	32,250,000	7,500,000	0.17%
3	25,125,000	7,125,000	0.17%
4	19,400,000	5,725,000	0.17%
5	12,000,000	7,400,000	0.17%
6	8,000,000	4,000,000	0.17%
7	-	8,000,000	0.17%
Blended Lifetime Historical Loss Rate			0.68%
Current Conditions Adjustment			0.03%
Forecast Adjustments			0.05%
Total CECL Factor			0.76%
Amortized Cost at YE 2020			44,000,000
CECL Reserve			333,449

When looking at the historic loss rate for each of those tiers, we see the credit deterioration, and impact of the deterioration to the loss rates. Qualitative adjustments are then made to the loss rates for current and forecasted conditions. This process can be applied to other metrics such as credit quality. See Figure 4.

Figure 4: Migration Example

30 Yr Fixed Mortgages			As Of 6/30/2018						
Loan Pool	Since Originaton	Outstanding Balance	Migration Ratio	Dollars Migrating	Historical Loss rate	Current Conditions Adjustment	Forecast Adjustment	Allocation Ratio	Reserve
Stayed Current	0 - 30 Days	3,670,049,796	98.87%	3,628,735,915	0.00%	0.05%	0.05%	0.10%	3,628,735.91
			0.84%	30,985,411	0.15%	0.15%	0.30%	0.60%	185,912.47
			0.28%	10,328,470	0.45%	0.15%	0.45%	1.05%	108,448.94
			0.00%	-	3.60%	0.15%	0.45%	4.20%	-
			0.00%	-	12.30%	0.15%	0.45%	12.90%	-
Current	Stayed 0 - 30 Days	729,878,571	16.04%	117,055,997	0.00%	0.05%	0.05%	0.10%	117,056.00
			80.66%	588,722,810	0.15%	0.15%	0.30%	0.60%	3,532,336.86
			2.83%	20,656,941	0.45%	0.15%	0.45%	1.05%	216,897.88
			0.47%	3,442,823	3.60%	0.15%	0.45%	4.20%	144,598.58
			0.00%	-	12.30%	0.15%	0.45%	12.90%	-
Stayed 31 - 60 Days	268,540,229	2.56%	6,885,647	0.00%	0.05%	0.05%	0.10%	6,885.65	
		1.28%	3,442,823	0.15%	0.15%	0.30%	0.60%	20,656.94	
		83.33%	223,783,524	0.45%	0.15%	0.45%	1.05%	2,349,727.00	

When using this method and isolating loss rates for balances that have changed in status, we can more easily fine-tune the assumptions and better control the impact to the reserve. However, this method will require more detailed tracking of data.

## DISCOUNTED CASH FLOWS (DCF)

DCF is arguably the most complicated of the methodologies. Essentially, a cash flow engine is needed, similar to what is used in an ALM process. Since forecasting and discounting of cash flows occurs with this method, the inputs will be similar to those used in an ALM process. The cash flows are behaviorally- and credit-adjusted before discounting at the effective interest rate.

Annual loss rates, whether historic loss rates or PD/LGDs, will need to be converted to monthly loss rates. As with Remaining Maturity, we should keep in mind the behavior assumptions used should be consistent with our ALM process so that we are getting consistent types of results.

Documentation with DCF is a bit more laborious as well. The assumptions used need to be documented as part of disclosures with reasoning provided. See Figure 5.

Figure 5: Discounted Cash Flows Example

		Period	Gross Balance	Prepayment	Default	Adjusted Balance	Actual Principal	Actual Interest	Total Principal Reduction	Recover	Total Cash Flow	Present Value Calc
Balance	5,000,000		5,000,000.00									
Maturity	360	1	4,957,899.36	30,147	4,750	4,965,103	\$7,204.10	16,666.67	42,100.64		54,017.31	\$53,837.85
Amortization	360	2	4,920,662.23	29,893	4,710	4,923,297	\$7,344.43	16,526.33	41,947.14		53,763.47	\$53,406.83
		3	4,883,525.48	29,668	4,675	4,886,319	\$7,468.56	16,402.21	41,811.37		53,538.95	\$53,007.11
Discount Rate	4.00%	4	4,846,488.85	29,444	4,639	4,849,442	\$7,592.35	16,278.42	41,675.98	950.00	54,265.04	\$53,547.50
Recovery Lag	3	5	4,809,552.08	29,221	4,604	4,812,664	\$7,715.80	16,154.96	41,540.94	942.00	54,033.74	\$53,142.11
Coupon	4.00%	6	4,772,714.88	28,998	4,569	4,775,985	\$7,838.92	16,031.84	41,406.27	934.93	53,803.96	\$52,740.33
		7	4,735,977.00	28,776	4,534	4,739,405	\$7,961.72	15,909.05	41,271.96	927.87	53,574.80	\$52,341.23
Annual CPR	7.00%	8	4,699,338.16	28,555	4,499	4,702,923	\$8,084.17	15,786.59	41,138.02	920.83	53,346.26	\$51,944.80
Prepayment SMM	0.603%	9	4,662,798.10	28,334	4,464	4,666,540	\$8,206.30	15,664.46	41,004.43	913.81	53,118.34	\$51,551.02
		10	4,626,356.55	28,113	4,430	4,630,255	\$8,328.10	15,542.66	40,871.21	906.82	52,891.03	\$51,159.89
Default SMM	0.095%	11	4,590,013.24	27,894	4,395	4,594,068	\$8,449.58	15,421.19	40,738.34	899.84	52,664.33	\$50,771.37
Severity/LGD	8.000%	12	4,553,767.92	27,675	4,361	4,557,978	\$8,570.72	15,300.04	40,605.84	892.87	52,438.24	\$50,385.46
		13	4,517,620.31	27,456	4,326	4,521,986	\$8,691.54	15,179.23	40,473.69	885.93	52,212.77	\$50,002.14
PV of Total CF	\$4,901,077.11	14	4,481,570.15	27,238	4,292	4,486,090	\$8,812.03	15,058.73	40,341.89	879.01	51,987.90	\$49,621.38
Allowance Under CECL	\$98,922.89	15	4,445,617.19	27,021	4,257	4,450,292	\$8,932.20	14,938.57	40,210.46	872.10	51,763.63	\$49,243.19

## WHICH METHOD SHOULD WE USE?

The methods used, of course, depends and is partly a matter of preference. You can use any one or any mix of the methods. Which one(s) you use can depend on the amount and quality of historical data you have. Some institutions intend to use Snapshot to start and move to another method like Vintage as they acquire more data. Usage may also vary by product. You may have strong history for one product line, whereas another product is newer in your organization. Different methods for these two products may be appropriate.

Institutions that want to build their own in-house process will more often than not use Snapshot. Other institutions, which have had to submit for DFAST or CCAR, are hoping to leverage process for CECL which entails using DCF.

Either historic loss rates or PDs/LGDs can be used with any of the methods. Within the concept of PD/LGD, there are various levels of complexity and sophistication. The level of sophistication can be determined by the institution to match their needs and comfort with desired levels of modeling.

It is worth noting that some polls conducted over the past year have shown Snapshot will be used most. Few plan on using DCF, but that may change. Consider Troubled Debt Restructures (TDR) or Purchased Credit Impaired (PCI). When talking to institutions with those items, DCF is what they are looking at.

One of the biggest factors in the decision will be the complexity of your institution. Smaller or less-complex institutions will lean more towards the simpler methods, like Snapshot. As complexity increases, a mixture of methods will be used. The CECL team needs to consider what method is most appropriate for a given pool. Some methods may not lend themselves well to certain pools. Consider HELOCs. The balance at origination may be zero.

When discussing CECL with numerous institutions over the past couple of years it has been interesting when they state: "We have to have all six methods. We will only use a model that supports all six methods." Through the course of the conversations, it comes out that they have no intention of using all six. Having all six available provides you a lot of flexibility as you go forward, but consider what you really need to start.

### **CREATE A TEAM, ASK THE QUESTIONS, AND BE PREPARED**

As the timeline for adoption compresses, the difficulty in meeting the deadline will increase. If you haven't started yet, start now. Understanding the methods and choosing which to use is part of this process. We can aid in helping the team understand the various methods and data needed for each. Having that understanding will greatly help in meeting the deadlines in a timely, efficient and effective manner. We shouldn't treat this like a project from school we keep putting off. Start now and reduce the stress!

#### **About the Author**

*Thomas (Tom) Caragher is the Director of Product Management at ZM Financial Systems. He is responsible for the overall direction and strategy for the company's Online CECL solution. Before joining ZM Financial Systems he spent 12 years as the Sr. Product Manager for the risk products at a financial software company.*

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