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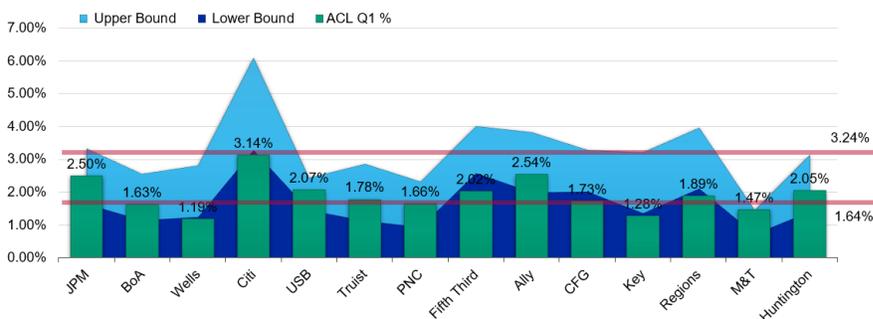
CECL Build – Is it Enough?

A framework to understand the extent of your allowance build

In this paper, we set out to estimate, based on 14 top financial institutions, a lower- and upper-bound current expected credit loss (CECL) estimate as of March 31, 2020. Using individual institutions' experiences and a few other heuristics measures, we seek a method that can help triangulate on a reasonable range of reserves as of March 31, and establish a methodology that can be used for future quarters. Given that CECL provides for a broad range of assumptions, we want to understand which institutions have built reserves aggressively (higher end of the range) versus those that will build over time (lower end of the range). We believe our methodology can be highly useful in times of uncertainty when events such as COVID-19 cloud the economic outlook.

The lower-bound index for the peer group as of March 31, 2020 sits at 1.64% and the upper-bound index for the peer group is 3.24%. Our expectation based on the research, the banks' current portfolios, and the evolution of the economic environment is that the lower-bound index will move well above 2% and the upper-bound index will move into the low 4% range, but time will tell. Based on our analysis, we expect a few banks in the peer group to ramp up reserve in Q2 more aggressively than the rest—namely Wells, Key, Fifth Third, and Regions (Figure 1). The latter three have a riskier loss profile than the peer group average and Wells relies perhaps too heavily on its expected recoveries forecast in Q1.

Figure 1 Peer group upper- and lower-bound (red lines) versus banks' own upper- and lower-bound indexes



Source: Moody's Analytics and FDIC call report data

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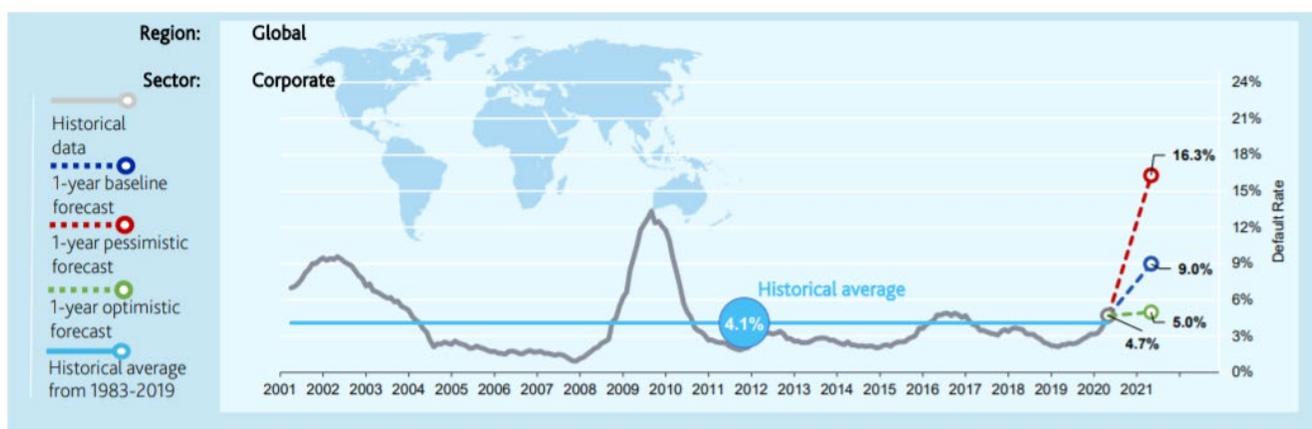
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Introduction

The new allowance guidance has been a long time coming. The Accounting Standards Update (ASU) 2016-13, also known as CECL, was released in June 2016 and is in operation for reporting periods after December 15, 2019 (effectively January 2020). The guidance enables financial institutions to put aside reserves for the total lifetime expected loss of a financial instrument at the date of origination based on a reasonable and supportable forecast of future conditions. As such, it tries to resolve the “too little/too late” problem observed during the 2008 crisis, allowing financial institutions to reserve for downturns during good times.

March 31, 2020, was the first quarter end in which all banks that adopted as of January 2020 were to publish their estimates of allowance for credit loss for the first time. Unexpectedly, the March 31 time period also coincided with the COVID-19 crisis, which turned all macroeconomic forecasts into turmoil, bringing about much-touted volatility in the newly minted measure of allowance. All indicators are pointing to a high expected level of volatility as shown by the recent report on global speculative-grade default rate by our sister company Moody’s Investors Service (Figure 2). Thus, executive management needs a well-rounded set of measures to understand the range of estimates for the new CECL standard for its own institution as well as its peers.

Figure 2 Global speculative-grade default rate will rise to 9.0% by May 2021



Source: Moody’s Investors Service¹

We set out to estimate, based on 14 top financial institutions, a lower- and upper-bound CECL estimate as of March 31, 2020. Using individual institutions’ experiences and a few other heuristics measures, we seek a method that can help triangulate on a reasonable range of reserves as of March 31, and establish a methodology that can be used for future quarters. Given that CECL provides for a broad range of assumptions, we want to understand which institutions have built reserves aggressively (higher end of the range) versus those that will build over time (lower end of the range). We believe our methodology can be highly useful in times of uncertainty when events such as COVID-19 cloud the economic outlook. In the next sections, we will:

- » Review a sample set of banks in our dataset
- » Explain methodologies used as benchmarks
- » Establish a triangulation method
- » Review dataset average results
- » Review bank-specific results

¹ MIS – May 2020 Default Report: https://www.moody.com/researchdocumentcontentpage.aspx?docid=PBC_1228751

Different approaches to triangulate on a range of estimates

In our analysis, we will use the disclosed amounts reported by the 14 financial institutions as part of their Q1 2020 Call Report (Figure 3).

Figure 3 Top 14 banks – allowance for credit loss disclosures

Bank name (\$MM)	Assets size	Total loans	ACL Q1 %	ACL Q1 amount (3/31)
JPM	2,367,127	948,881	2.50%	25,400
BoA	1,812,976	968,579	1.63%	17,126
Wells	1,708,548	938,694	1.19%	12,022
Citi	1,472,915	659,787	3.14%	22,654
USB	477,394	299,090	2.07%	6,590
Truist	451,310	305,651	1.78%	5,446
PNC	395,783	239,570	1.66%	4,394
Fifth Third	169,489	110,591	2.02%	2,236
Ally	167,073	124,298	2.54%	3,245
CFG	164,652	119,745	1.73%	2,213
Key	145,184	95,273	1.28%	1,520
Regions	127,543	83,334	1.89%	1,665
M&T	125,041	89,681	1.47%	1,380
Huntington	108,790	75,893	2.05%	1,603

Source: FDIC Call Report Data Q1 2020

Our aim is to understand (based on a range of measures) which institutions may be taking a more- or less-aggressive approach to reserving given current and future conditions as of March 31, 2020.² We use multiple angles to attack the problem by relying on historical net charge-off history, Dodd-Frank Act Stress Test (DFAST) exercise results, top-down forecasting models, and macro-assumptions-based analysis to triangulate on the expected amount of allowance. Our approach entails computing each of these measures at an institution level, as well as generating averages to help understand the convergence of results. Once all calculation results are completed, we will use a method to triangulate on upper- and lower-bound range expectations for the March 31 date. We provide the methodology so institutions can evaluate their results, as well as those of their peers, and understand whether they rank on the upper- or lower-bound of expected results at any given time.

CECL is in its first quarter of adoption. Thus, historical experience will take time to build, and every institution will want to understand where they stand within their peer group, their own historical experience, and their current portfolio mix. A common set of triangulation metrics can help standardize how institutions look at their estimates given where we are in the business cycle.

While economic conditions have deteriorated since March 31, we will do our best to understand if institutions determined whether they had appropriate reserves based on data as of March 31. Also, we should be able to tell which institutions will have to ramp up reserves much more aggressively in the coming months.

² Moody's Analytics issued two sets of economic scenarios in March due to the rapidly deteriorating environment. The March V2 scenario represents the mid-cycle update to all thematic scenarios in March.

Methodology for each approach and assumptions

We lay out the five different approaches that will help provide some benchmarks and triangulation metrics for the results of each institution in our analysis. We emphasize that this methodology should be useful to tackle any bank's triangulation exercise. While we opted to present results at the bank level, portfolio-level analysis would work in the same manner. In brief, we will use:

- » **DFAST results:** we use the total loss ratio and the DFAST/expected credit loss (ECL) coverage ratio to understand how well-reserved banks are. The DFAST losses are based on the nine-quarter cumulative losses under the severely adverse scenarios. We also create a DFAST scaler for added differentiation across DFAST banks.
- » **NCO averages for 2007-2010:** using net charge-offs (NCOs) observed during the Great Recession, we will estimate, based on quarterly maximum and average NCO during the Great Recession, how many quarters of coverage are provided for in the bank's current estimates.
- » **NCO under economic conditions:** using NCOs observed at different levels of economic conditions based on unemployment levels (UERs), we estimate potential reserves based on a weighted average life assumption given the forecast UER levels as of March 31, 2020.
- » **Historical CECL – full foresight:** using historical full foresight analysis, we compute the maximum, minimum, and average observed lifetime loss through the Great Recession.
- » **CECL forecaster:** using Moody's Analytics CECL forecaster,³ we compute the product level NCOs, and based on a set of CECL assumptions, compute the lifetime loss estimate as of March 31, 2020.

We provide a detailed overview of the calculation methods for each of these approaches and the results that can be easily replicated with a little time and effort.⁴

DFAST results

The first set of results is used purely as a comparison point with the Q1 allowance for credit losses (ACL) estimate and for qualitative commentary in the bank-specific results section. The 2020 DFAST results were used. Although we could have integrated the results within our framework, we decided against it to keep the methodology simpler, especially for smaller banks that may not have similar data to rely on. The DFAST results are very useful to establish a relative measure of portfolio-specific riskiness that top-down models do not capture.

The DFAST exercise is meant to offer a view of a bank's capital resilience under stressful market conditions. It is used by regulatory agencies to gauge a bank's ability to manage its way out of an economic crisis and was instituted after the 2008 financial crisis to raise the level of confidence in the largest financial institutions. Since the metric has been around for so long, it has been used as a way to understand how well banks are reserved under CECL. Although they are quite different, both provide a measure of coverage for future losses. Even if the macro factor shocks are not of the same magnitude, the DFAST metrics can help determine the comparative riskiness of the bank's portfolios given the bottom-up nature of the Federal Reserve models. To understand the limitations of the comparisons between the two, one must understand the major differences, as shown in Figure 4.

³ CECL forecaster is based on Moody's Call Report Forecast: <https://www.economy.com/products/data/forecast-bank-call-reports>

⁴ ImpairmentStudio and Capital Risk Analyzer were used for some of the approaches.

Figure 4 Key differences between CECL and DFAST metrics

	CECL	DFAST
Purpose	Determine lifetime expected credit losses within each portfolio	Predict losses over the next nine quarters as part of capital adequacy exercise
Time frame	Contractual and behavioral life	Nine quarters
Scenarios used	Must consider reasonable and supportable forecast—no required specific scenario or number of scenarios	Federal Reserve DFAST Baseline, Severely Adverse, and banks' Idiosyncratic scenarios
New business/origination	As-of date portfolio only	As-of date portfolio + new business
Lines of credit	Consideration of new draws (conditional cancellations only—that is, no credit cards)	Consideration of new draws (all)
Focus	Accuracy	Conservatism

Source: Moody's Analytics

The 2020 DFAST results⁵ were released on June 25, 2020. Figure 5 presents the 2020 DFAST results used in our analysis. The coverage ratio (Coverage) metrics are the bank's disclosed CECL ratio as of March 31, 2020 (ACL Q1 %) divided by the DFAST loss % (% loans). The DFAST loss ratio is taken directly from the DFAST results, which are the cumulative losses over nine quarters divided by the loan average balances over the forecast horizon for the DFAST exercise. For Citibank, the information from the coverage ratio can be interpreted to mean that its current reserve level would enable it to absorb 47% of the nine cumulative nine-quarter losses, or approximately 4.5 quarters' worth of losses.

When contrasting two banks (for example, Citi and Fifth Third), we observe that both have very high losses in the DFAST exercise, yet they are diametrically opposite when looking at their coverage ratio—Citi having one of the highest coverages and Fifth Third one of the lowest. These indicators alone do not give enough information to render judgment, but when combined with other metrics they will provide insights.

Figure 5 DFAST coverage ratio for the peer group and portfolio loss rates

Bank name	ACL Q1 %	Coverage	% loans	First-lien mortgages, domestic	Junior liens and HELOCs, domestic	Commercial and industrial	Commercial real estate, domestic	Credit cards	Other consumer	Other loans
JPM	2.50%	38%	6.60%	1.50%	2.00%	11.30%	3.20%	16.10%	3.90%	4.70%
BoA	1.19%	35%	4.70%	1.20%	2.40%	5.30%	6.60%	16.00%	2.00%	3.00%
Wells	1.63%	24%	4.90%	1.20%	2.50%	6.70%	8.00%	18.70%	5.60%	4.10%
Citi	3.14%	47%	6.70%	1.90%	6.60%	4.70%	5.70%	16.40%	10.20%	2.30%
USB	2.07%	36%	5.80%	1.50%	4.20%	6.90%	7.10%	18.10%	3.70%	4.80%
Truist	1.78%	35%	5.10%	1.80%	2.80%	6.00%	5.80%	18.10%	7.10%	3.50%
PNC	1.66%	33%	5.10%	1.30%	1.60%	6.40%	6.30%	19.90%	4.10%	2.70%
Fifth Third	2.54%	30%	6.80%	2.10%	3.90%	7.50%	10.80%	23.50%	5.20%	4.30%
Ally	1.73%	40%	6.40%	1.30%	4.10%	6.40%	3.70%	0.00%	7.70%	11.10%
CFG	1.47%	31%	5.60%	1.70%	4.10%	6.20%	8.10%	16.40%	6.50%	4.00%
Key	2.02%	24%	5.30%	2.40%	3.10%	6.50%	6.80%	18.70%	5.10%	3.00%
Regions	1.28%	30%	6.30%	2.40%	4.40%	7.80%	9.30%	18.70%	11.80%	3.00%
M&T	1.89%	27%	5.50%	2.80%	3.40%	6.20%	6.20%	18.70%	6.60%	4.60%
Huntington	2.05%	40%	5.10%	2.70%	3.10%	6.10%	7.70%	18.70%	4.60%	3.80%

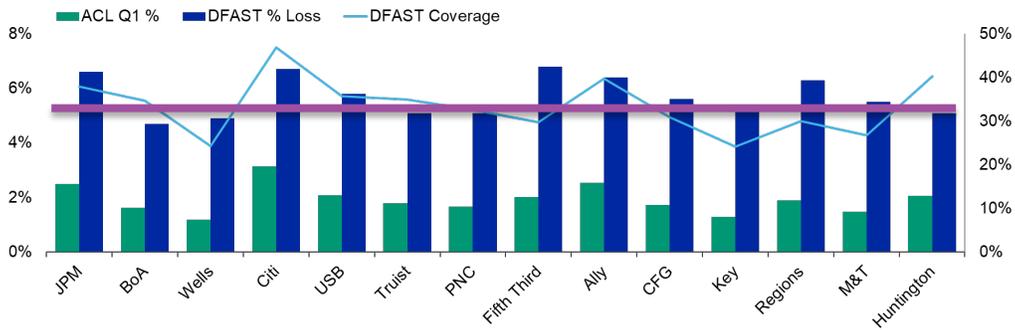
Source: Moody's Analytics and Federal Reserve DFAST Results 2020

⁵ <https://www.federalreserve.gov/publications/files/2020-dfast-results-20200625.pdf>

Figure 6 puts the loss coverage for each bank into perspective, highlighting banks that are either above or below the average for the group, case in point the Citi and Fifth Third example discussed above. The purple line represents the average for the sample set.

Banks on average had a coverage ratio of 33%, with some falling well below (M&T 27%, Wells 24%, and Key 24%) while others were well above (Huntington 40%, Citi 47%, and Ally 40%). The actual DFAST loss estimates gives us a view of the banks' portfolio riskiness.

Figure 6 ACL Q1, DFAST loss %, and coverage



Source: Moody's Analytics and Federal Reserve DFAST Results 2020

In Figure 7, we present the DFAST-based riskiness scaler that will enable us to establish a relative risk ranking of the banks based on the bottom-up DFAST loss estimates computed by the Federal Reserve. For each portfolio, we created a risk scaler based on the bank's loss ratio divided by the overall DFAST loss ratio observed, which gave us the relative riskiness of each portfolio across banks (since they were derived using the same Federal Reserve based model). Then, we proceeded to create a bank-level scaler by weighting each of the portfolio scalars by ratio of portfolio outstanding balance divided by the total portfolio balances for each bank. The rank ordering will be useful when comparing individual bank results and enable us to capture relative risk differences. Figure 7 presents the final rank ordering by portfolios prior to weighting for the bank-level portfolio scaler. The total scaler is the bank-level scaler.

On the portfolio-level scalars, we can observe that since JPM had a first mortgage portfolio DFAST loss rate equal to 1.5% (see Figure 5) and the DFAST peer group average was 1.5%, the scaler for JPM was 1.00. On the bank-level scalars, we can see that PNC, Citi, and BofA are at the lower end of the spectrum, whereas Regions, Fifth Third, and M&T are on the higher end of the spectrum. This signifies that their portfolios as a whole are much riskier than the average DFAST banking group.

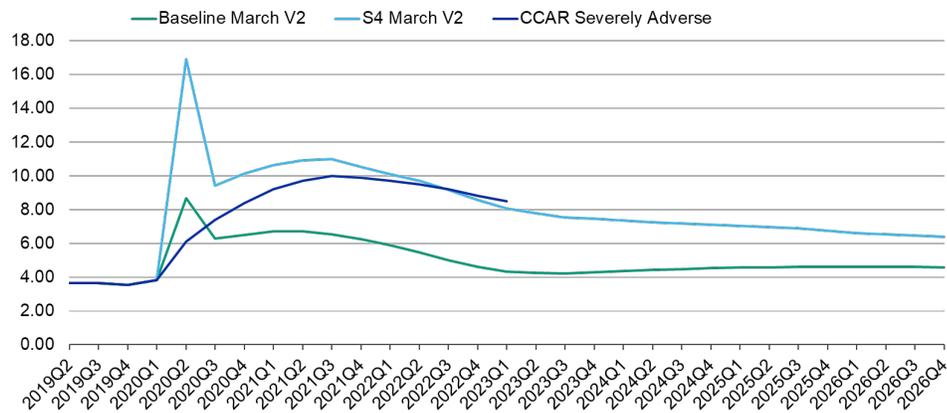
Figure 7 Bank DFAST-based riskiness scaler at product and bank level

Bank name	First-lien mortgages, domestic	Junior liens and HELOCs, domestic	Commercial and industrial	Commercial real estate, domestic	Credit cards	Other consumer	Other loans	Total Scaler
JPM	1.00	0.65	1.57	0.51	0.94	0.60	1.31	1.07
BoA	0.80	0.77	0.74	1.05	0.94	0.31	0.83	0.78
Wells	0.80	0.81	0.93	1.27	1.09	0.86	1.14	0.98
Citi	1.27	2.13	0.65	0.90	0.96	1.57	0.64	0.86
USB	1.00	1.35	0.96	1.13	1.06	0.57	1.33	0.99
Truist	1.20	0.90	0.83	0.92	1.06	1.09	0.97	0.99
PNC	0.87	0.52	0.89	1.00	1.16	0.63	0.75	0.84
Fifth Third	1.40	1.26	1.04	1.71	1.37	0.80	1.19	1.18
Ally	0.87	1.32	0.89	0.59	0.00	1.18	3.08	1.05
CFG	1.13	1.32	0.86	1.29	0.96	1.00	1.11	1.06
Key	1.60	1.00	0.90	1.08	1.09	0.78	0.83	0.98
Regions	1.60	1.42	1.08	1.48	1.09	1.82	0.83	1.29
M&T	1.87	1.10	0.86	0.98	1.09	1.02	1.28	1.12
Huntington	1.80	1.00	0.85	1.22	1.09	0.71	1.06	1.04
DFAST averages	1.50	3.10	7.20	6.30	17.10	6.50	3.60	

Source: Moody's Analytics, FDIC Call Report and Federal Reserve DFAST Results 2020

Finally, we put the DFAST and CECL economic scenarios into perspective when comparing the DFAST Severely Adverse scenario to the Moody's Analytics Baseline CECL scenario as of March 31, 2020 (Figure 8). The latter seems more acute at the onset but recovers more quickly than the DFAST scenarios, whereas the S4 scenario⁶ is much more severe than the DFAST Severely Adverse. We can intuitively assume that a coverage ratio averaging ~20-40% would be acceptable given the differences between the DFAST scenarios and the Moody's Analytics Baseline as of March 31, 2020.

Figure 8 March 2020 v2 unemployment rate versus CCAR 2020



Source: Moody's Analytics and Federal Reserve DFAST 2020 Scenarios

In our analysis, we intend to use the DFAST results loss ratio in our upper-bound index and use the DFAST riskiness scaler as a measure of a bank's individual portfolio riskiness to provide a distinction between each institution's reserves as of March 31, 2020.

NCO averages 2007-2010

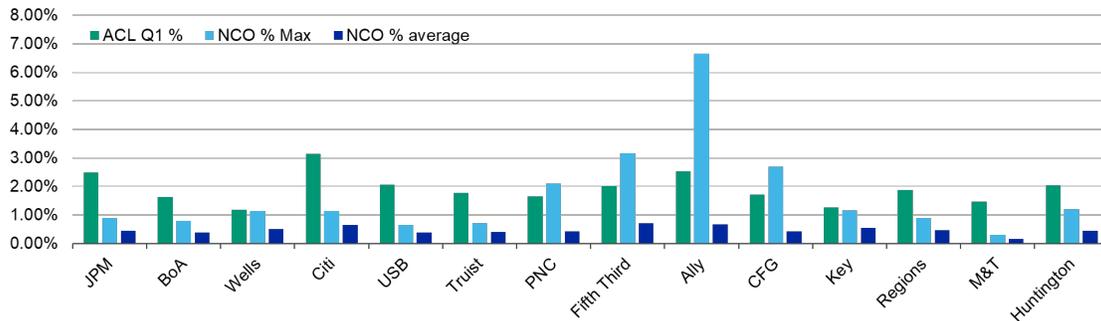
We look at the historical losses experienced during the Great Recession to gauge how long the current level of reserves would last if history repeats itself. We know that COVID-19 caused rapid and deep shock to the economy, so this information will help us put it into perspective. Under this approach, we compared the historical losses to what each bank recorded for its Q1 2020 allowance. These losses are based on the net loss amounts that the institution charged off for each quarter from Q1 2007 to Q4 2010.

⁶ S4 scenario is part of the thematic Moody's Analytics scenarios; it depicts a protracted slump in the economy where only 4% of possible economic scenarios are worse.

There are two statistics considered for the 2007-2010 NCO experience (Figure 9):

- » **NCO % Max:** the numerator is the maximum quarterly charge-off amount and the denominator is the average of total loans from Q1 2007 to Q4 2010.
- » **NCO % average:** the numerator is the average of net losses from Q1 2007 to Q4 2010 and the denominator is the average of total loans from Q1 2007 to Q4 2010.

Figure 9 Maximum and average NCO 2007-2010 versus Q1 2020 ACL %



Source: Moody's Analytics and FDIC Call Report Data

If history were to repeat itself and we experienced the same losses today that we experienced during the Great Recession, then would our current lifetime loss estimates have sufficient coverage, and for how long? To answer this, we further analyze the NCO % max and NCO % average by calculating the ratio of each institution's ACL Q1 % to the NCO % max or the NCO % average (Figure 10).

Using JPM as an example, the maximum net charge-off amount recorded between 2007 and 2010 was \$5.1 billion. The average quarterly net charge-off amount over the 16-quarter time span was \$2.4 billion. The average total loan amount over this same period was \$625 billion. The NCO max % is 0.90%. The NCO % average is 0.46%. JPM's Q1 2020 ACL of 2.5% would provide coverage of 2.79 quarters using a quarterly NCO rate of 0.90%. The coverage would increase to 5.39 quarters using a quarterly NCO rate of 0.46%.

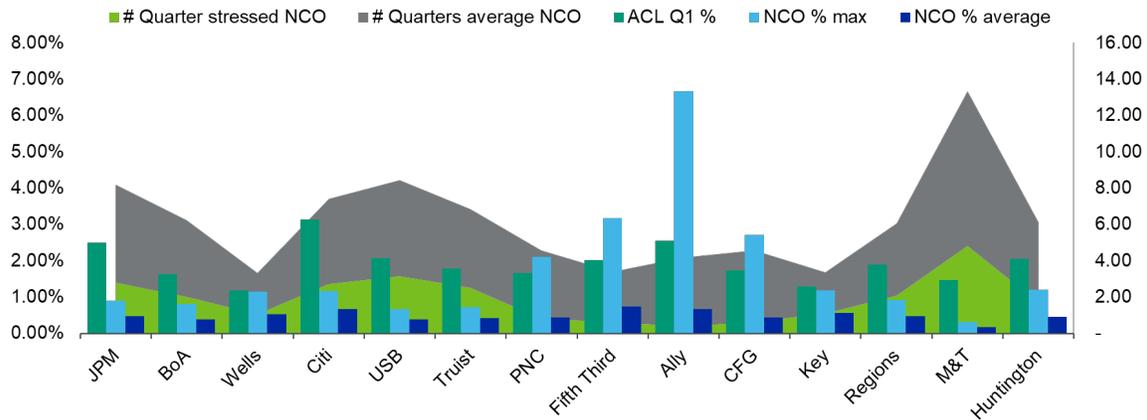
Figure 10 Quarterly NCO experience metrics

Bank name	ACL Q1 %	NCO % max	NCO % average	Quarters of coverage based on max stress NCO	Quarters of coverage based on average stress NCO
JPM	2.50%	0.90%	0.46%	2.79	5.39
BoA	1.63%	0.81%	0.39%	2.01	4.22
Wells	1.19%	1.15%	0.52%	1.04	2.28
Citi	3.14%	1.16%	0.67%	2.71	4.69
USB	2.07%	0.66%	0.39%	3.14	5.30
Truist	1.78%	0.71%	0.41%	2.50	4.33
PNC	1.66%	2.10%	0.44%	0.79	3.77
Fifth Third	2.02%	3.18%	0.73%	0.64	2.76
Ally	2.54%	6.67%	0.67%	0.38	3.79
CFG	1.73%	2.70%	0.44%	0.64	3.94
Key	1.28%	1.18%	0.56%	1.09	2.28
Regions	1.89%	0.91%	0.48%	2.08	3.97
M&T	1.47%	0.30%	0.17%	4.83	8.51
Huntington	2.05%	1.21%	0.46%	1.70	4.44

Source: Moody's Analytics and FDIC Call Report Data

Figure 11 depicts the potential number of quarters covered using the maximum NCO (green) and average NCO (gray) from the 2008 financial crisis. We find three institutions (Ally, Fifth Third, and CFG) seem to have outsized NCO experience based on the financial crisis portfolio composition for these institutions. Thus, NCO max and averages may not represent a good benchmark for CECL comparison unless some idiosyncratic adjustments were made to the historical experience.

Figure 11 Quarterly coverage based on 2007-2010 NCO experience



Source: Moody's Analytics and FDIC Call Report Data

For added perspective, banks have tightened credit standards since the Great Recession. The economic crisis we face today is much different as it was triggered by the COVID-19 health pandemic. Countries across the globe responded to contain the spread of the virus by shutting down substantial parts of their economies. The current crisis was due to external factors and unfolded much more rapidly than the past crisis in which the financial markets had internal fundamental issues that took years to correct. It is possible this downturn may be shorter with more severe negative growth for a few quarters following by a period of rapid growth. At this point, one thing both crises have in common is the extreme uncertainty of event development.

NCO based on scenarios' assumptions and average life (macro unemployment rate assumptions)

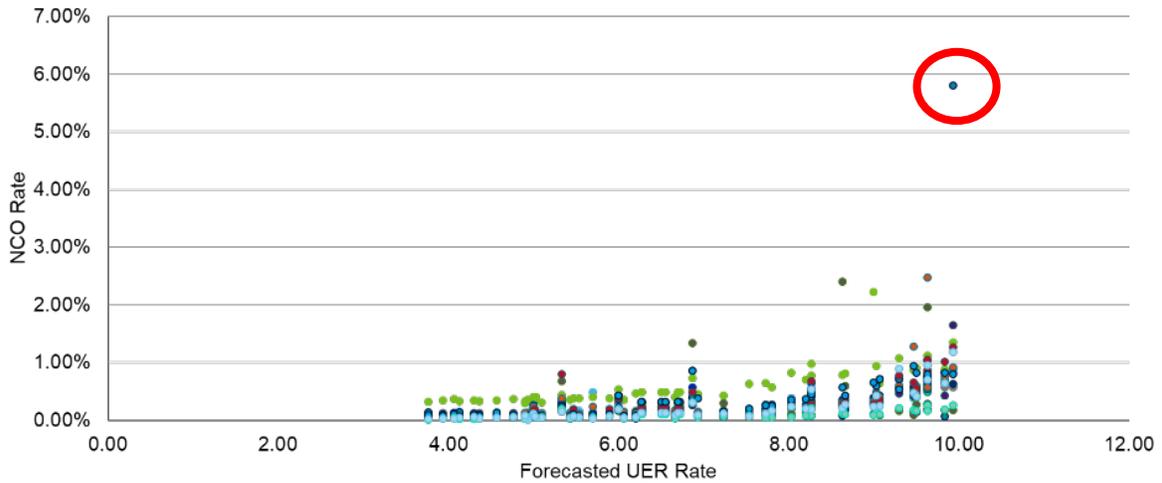
Under this approach, we have a heuristic method that uses a simple approximation but one that can be quite intuitive. Our goal with this method is to compute an ECL estimate based on the projected level of unemployment over the weighted-average life of the bank's loan book, with a reversion to the long-term average in a cliff fashion at 18 months for the remainder of the loan book's life.

Our assumptions under this method are as follows, and can be adjusted as necessary:

- » Weighted-average life⁷ of total loan book is 2.5 years.
- » Book runoff: N/A.
- » The long-term loss rate is computed based on the average loss rate when unemployment was in the 4-5% range between 2016 and 2018.
- » The average loss rate is computed for each 100bps bands from 2008-2018.
- » For unemployment rates not seen previously, we used a scaler:
 - If the rate is between 10-11%, then we scale the 9-10% loss rate by using a multiplier of 1.25. We plotted the impact of this assumption, which falls in line with the overall trend in NCO rates for every institution (note that the Ally loss rate in the red circle is the big outlier) (Figure 12).

⁷ We assume a 2.5-year average life with no runoff assumptions, which puts the equivalent portfolio weighted average life on an amortizing basis at around 4.5-5 years.

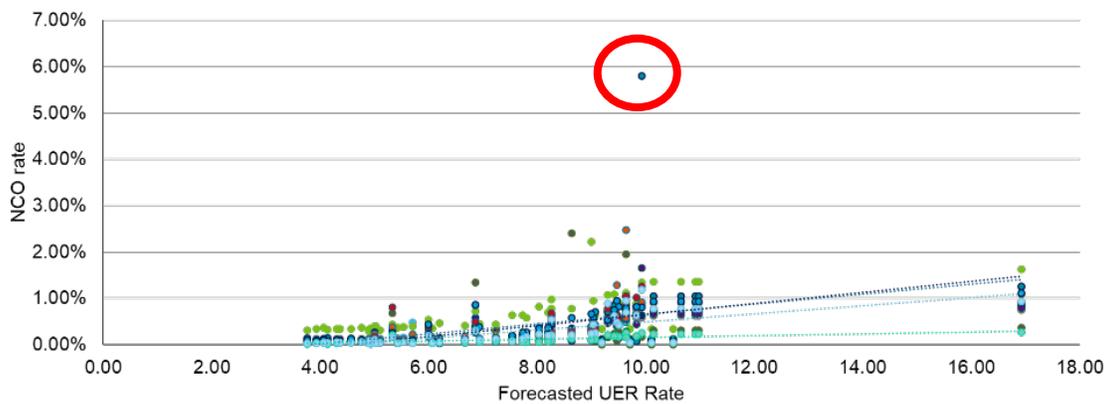
Figure 12 Historical and scaled NCO rates versus unemployment forecasted in baseline scenario (colors represent each institution)



Source: Moody's Analytics

If the rate is above 11%, then we scale the 10-11% loss rate by using a multiplier of 1.5. We plotted the impact of this assumption on the resulting loss rate, which is in line with the overall trends for NCO rates for every institution (note that the Ally loss rate in the red circle is the big outlier) (Figure 13).

Figure 13 Historical and scaled NCO rates versus unemployment forecasted in S4 scenario (colors represent each institution)



Source: Moody's Analytics

In the S4 scenario (Figure 13), the peak unemployment rate is 16.93% (Figure 14) to which we applied a loss rate based on the scaler proposed, the resulting loss rate is neither pessimistic nor optimistic based on the recovery assumptions within the scenario. We intuitively know that the loss rate when unemployment reaches 16% is not going to double based on the 8% unemployment levels.

For each bank, we compute the average loss rate, apply the appropriate loss rate for the first 18 months of the forecast, and then revert immediately to the loss rate at the 4-5% range for the next four quarters. Figure 14 provides the forecast assumptions based on Moody's Analytics Baseline and S4 scenarios⁸ as of March 31, 2020.

⁸ Moody's Analytics Scenarios were obtained from Data buffet: <https://www.economy.com/products/tools/data-buffet>

Figure 14 Baseline and S4 scenario assumptions as of March 31, 2020⁹

March 31, 2020 V2
Baseline Scenario Assumptions

Assumption based forecast

Baseline March V2	Actual Forecasted Value	Bottom of Range
2020Q2	8.66	8.00%
2020Q3	6.27	6.00%
2020Q4	6.50	6.00%
2021Q1	6.72	6.00%
2021Q2	6.70	6.00%
2021Q3	6.55	6.00%
2021Q4	6.27	4.00%
2022Q1	5.90	4.00%
2022Q2	5.47	4.00%
2022Q3	5.02	4.00%

Source: Moody's Analytic

March 31, 2020 V2
S4 Scenario Assumptions

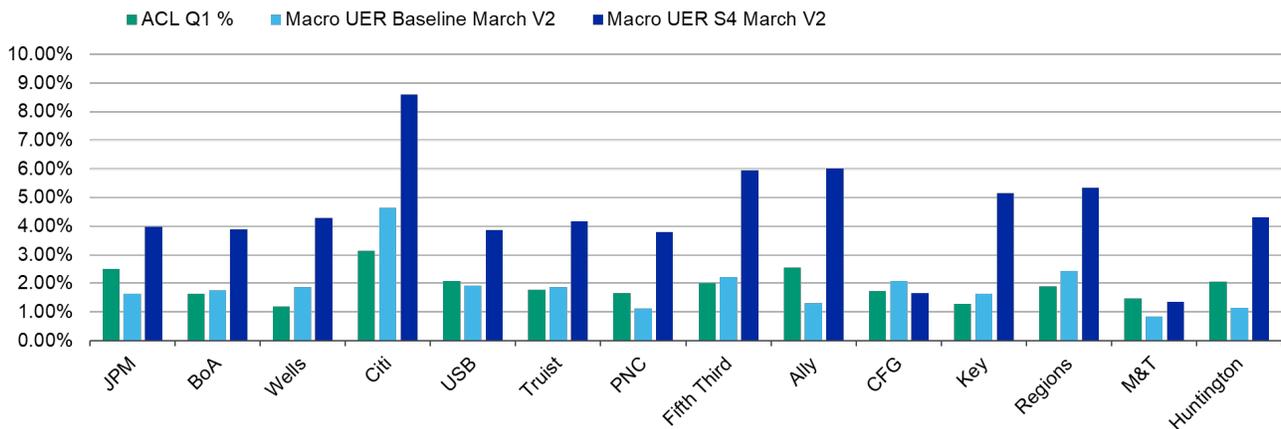
Assumption based forecast

S4 March V2	Actual Forecasted Value	Bottom of Range
2020Q2	16.93	11.00%
2020Q3	9.42	9.00%
2020Q4	10.14	10.00%
2021Q1	10.65	10.00%
2021Q2	10.92	10.00%
2021Q3	10.98	10.00%
2021Q4	10.51	4.00%
2022Q1	10.11	4.00%
2022Q2	9.71	4.00%
2022Q3	9.19	4.00%

Source: Moody's Analytic

We can observe that in most cases, the estimates provided by banks fall between our Baseline and S4 scenario except Wells and Citi, which fall below our Baseline estimates. The estimates for CFG¹⁰ and M&T are clearly in line with our S4 scenario, which reflects that their financial crisis loss rates were lower than the majority of the banks in our sample (Figure 15).

Figure 15 Baseline and S4 scenario macro unemployment assumptions – 18-month reversion to 4% unemployment rate loss rate level



Source: Moody's Analytics and FDIC Call Report

The resulting loss rate for each bank offers a good way to heuristically determine a range of values for the ECL estimates as of Q1 2020. We provide the estimate in Figure 16 along with the actual estimates from each bank. We will use these estimates as one of the metrics to triangulate on the upper- and lower-bound range.

⁹ We refer to the March V2 scenario as the second set of scenarios released in March by Moody's analytics; these are typically referred to as March V2.

¹⁰ CFG experienced very low NCO and even net recoveries over the worst three quarters of the Great Recession, which leads to the S4 scenario being below the baseline. We did not adjust or cap losses to being positive only.

Figure 16 Top 14 banks – macro unemployment rate assumptions

	ACL Q1 %	Macro UER Baseline March V2	Macro UER S4 March V2
JPM	2.50%	1.63%	3.98%
BoA	1.63%	1.75%	3.89%
Wells	1.19%	1.86%	4.27%
Citi	3.14%	4.65%	8.60%
USB	2.07%	1.91%	3.87%
Truist	1.78%	1.88%	4.16%
PNC	1.66%	1.13%	3.78%
Fifth Third	2.02%	2.22%	5.94%
Ally	2.54%	1.30%	6.01%
CFG	1.73%	2.07%	1.65%
Key	1.28%	1.63%	5.16%
Regions	1.89%	2.43%	5.33%
M&T	1.47%	0.84%	1.36%
Huntington	2.05%	1.13%	4.32%

Source: Moody's Analytics and FDIC Call Report

Historical CECL – full foresight

In this approach, we use the Moody's Analytics ImpairmentStudio™ Historical Loss Analyzer,¹¹ which constructs a time series of historical lifetime loss rates based on quarterly data from FDIC Call Reports and balance runoff assumptions.¹² Historical Loss Analyzer calculates the historical quarterly loss rates by dividing the net charge-offs by the outstanding balance for each period. Historical Loss Analyzer then calculates the lifetime loss rate of each period by summing the product of the quarterly loss rate and balance percentage.¹³

We looked at each of the 14 institutions' time series of historical lifetime loss rates from Q1 2007 to Q4 2010 and evaluated the following metrics:

- » Historical Loss Analyzer Min %: the minimum lifetime loss rate selected from the quarterly periods between 2007 and 2010
- » Historical Loss Analyzer Avg %: the simple average lifetime loss rate from 2007 to 2010
- » Historical Loss Analyzer Max %: the maximum lifetime loss rate selected from the quarterly periods between 2007 and 2010

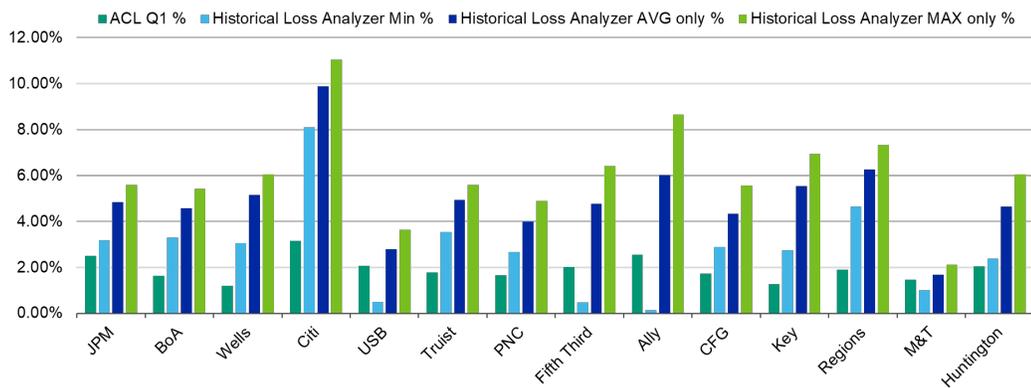
Figure 17 depicts the three metrics for each institution in comparison to their reported ACL Q1 %. We observe that the Historical Loss Analyzer % Avg and Max are higher than the ACL Q1 % for all institutions, and the Historical Loss Analyzer Min % is higher in the majority of institutions. In the case of this last metric only USB, Ally, and M&T have their actual Q1 reserve set above the minimum observed over the last financial crisis.

¹¹ Historical Loss Analyzer is a tool available as part of an ImpairmentStudio subscription.

¹² Balance runoff assumptions are based on industry defaults for CRE (5 years), C&I (8 years), and Retail (7 years); altering these assumptions would have a large impact on the estimates.

¹³ The reader can find a detailed methodology in "Leveraging Historical Loss Data for CECL": <https://www.moodyanalytics.com/articles/2019/leveraging-historical-loss-data-for-cecl>

Figure 17 Full foresight Historical Loss Analyzer 2007-2010



Source: Moody's Analytics and FDIC Call Report

Given the period selected for the Historical Loss Analyzer metrics of 2007-2010 and the longer-than-average amortization assumptions chosen in the configuration, our Historical Loss Analyzer estimates provide a conservative view. The metrics will fit well as an upper-bound estimate based on our sample set of banks.

Top-down CECL forecaster methodology

For this last set of metrics, we relied on Moody's Analytics CECL forecaster model,¹⁴ which is used to compute a reporting date ECL under different macroeconomic scenarios based on user assumptions. The tool can also be used to forecast ECL at a different projected point in time (stress testing). The following is a summary of the call report forecast (CRF) methodology used to derive the projected loss rates at the portfolio level for each of the 14 net charge-off categories in the call report. Once the loss rates are forecasted, we apply our CECL assumptions for each portfolio inclusive of the average life, long-term loss rate, reasonable and supportable period, reversion period, and interest rate (used to determine amortization).

We will first describe the high-level methodology to derive the projected loss rate at the portfolio level using the CRF methodology and then provide all assumptions that were applied to derived the individual bank's allowance under different scenarios.

The CRF methodology¹⁵ is reductive in nature in the sense that we begin with aggregate industry data and identify macroeconomic forces that affect the entire banking system. We then isolate the trend and cycle from each peer or bank's market share, leaving us with series that reflect the bank's own strategic decisions, the effects of its peers' actions, and other idiosyncratic behavior. This two-layer approach to modeling allows us to disentangle macroeconomic and bank-specific effects. Peer groups can be viewed as an intermediate layer. Doing so lets us differentiate between factors that affect the entire industry and factors that affect only the peer group of interest, whether because of geography or because of particular portfolio concentrations.

Once all net charge-off (NCO) forecast rates are computed using CRF, we proceed to apply our CECL assumptions to compile life of loan estimates. We provide two different versions of assumptions to ground ourselves in the impact of those assumptions:

¹⁴ Capital Risk Analyzer: <https://www.moodyanalytics.com/product-list/capital-risk-analyzer>

¹⁵ In-depth detail can be found for Call Report Forecast (CRF): <https://www.economy.com/products/data/forecast-bank-call-reports>

Expected life and reversion period

In version 1, the expected loan life and reversion period are borrowed from the industry-level assumptions provided in the paper by Covas and Nelson.¹⁶ We apply the assumptions laid out in Figure 18 and revert immediately to the long-term net charge-off rate.

Figure 18 Expected loan life and length of reversion period

Loan Portfolio	Life of loan (in quarters)*	Reversion period (in quarters)
Commercial and industrial	15	8
Construction	11	13
Nonfarm nonresidential	14	7
Multifamily	30	10
First-lien mortgages	34	15
Junior-lien mortgages	30	18
HELOCs	30	18
Other real estate	19	7
Credit cards	7	9
Other consumer loans	16	6
Leases	28	6
Foreign governments	10	1
Agriculture	8	3
Depository institutions	8	1
Other loans	10	8

Source: BPI – Staff working paper 2018-1

In version 2, for the expected life and reversion period:

- » Expected life remains the same as version 1
- » Reversion starts at Year 1 and ends at end of Year 3

Long-term NCO rate

We applied the NCO weighted average from 2000 to 2020. The NCO rate is the same for both versions.

Results aggregation

All portfolio-level results are aggregated for each bank after applying the assumptions above for each call report asset category.

For Version 1 and Version 2 assumptions:

- » We generate four sets of metrics representing the estimate for each scenario and version (CECLF_{cst}, V1, V2, base [S4]).
- » We generate four sets of metrics representing the next three-year average estimate for each scenario and version (CECLF_{cst}, V1, V2, base [S4]).
- » Results are shown in Figure 19 as compared to the Q1 2020 ACL reported by the banks in our sample.

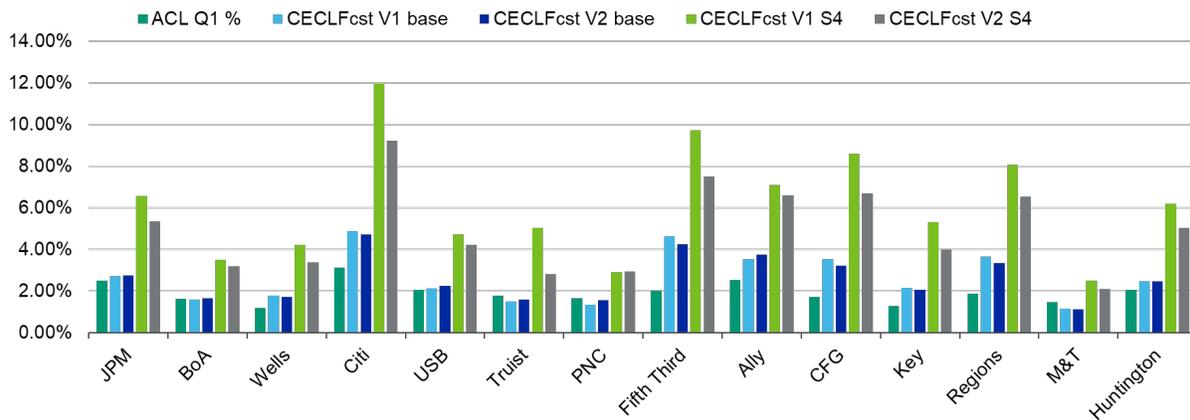
¹⁶ BPI: Staff working paper 2018-1 Current Expected Credit Loss: Lessons from 2007-2009: <https://bpi.com/wp-content/uploads/2018/07/CECL-Lessons-2007-2009-WP-July-12-2018.pdf>

As shown in Figure 19:

- » For the Baseline scenario ACL, for each bank based on Version 1 and Version 2 assumptions, we observed that the reversion assumptions do not seem to have a large impact on the estimate.
- » On the other hand, the S4 scenario presents estimates that seem to diverge widely due to the reversion assumption differences. In the S4 scenario, our V1 assumptions provide for a much longer scenario impact than under our V2 assumptions, where the reversion occurred immediately after the first year of scenario impact.

We see these differences manifesting themselves in a more acute way for JPM, Citi, and Fifth Third. This is one of the effects of the CECL methodological choices that one can make to reduce the impact of economic volatility when there is too much uncertainty around the forecast of certain economic factors.

Figure 19 Top-down CECL forecaster – Baseline and S4 version 1 and version 2 assumptions



Source: Moody's Analytics and FDIC Call Report

Figure 20 provides detailed estimates based on both sets of assumptions, scenarios, and the quarterly average over the next three years.

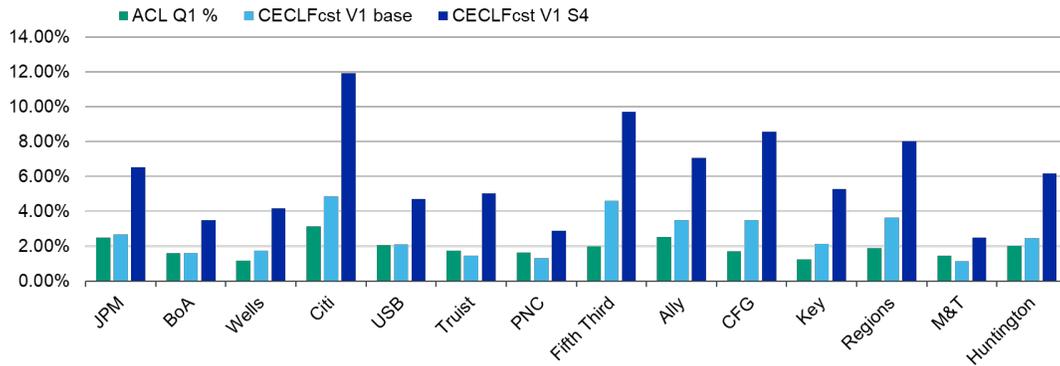
Figure 20 Top 14 banks – top-down CECL forecaster estimates

Bank name	ACL Q1 %	CECLFcst V1 base	CECLFcst V2 base	CECLFcst V1 S4	CECLFcst V2 S4	CECLFcst Avg 3y V1 base	CECLFcst Avg 3y V2 base	CECLFcst Avg 3y V1 S4	CECLFcst Avg 3y V2 S4
JPM	2.50%	2.71%	2.75%	6.56%	5.33%	2.31%	2.36%	4.52%	3.18%
BoA	1.63%	1.60%	1.66%	3.50%	3.19%	1.41%	1.46%	2.41%	1.94%
Wells	1.19%	1.77%	1.74%	4.21%	3.38%	1.55%	1.46%	3.08%	2.06%
Citi	3.14%	4.88%	4.71%	11.96%	9.20%	4.17%	3.88%	8.18%	5.35%
USB	2.07%	2.11%	2.24%	4.72%	4.21%	1.77%	1.93%	3.09%	2.54%
Truist	1.78%	1.50%	1.60%	5.04%	2.83%	1.14%	1.21%	4.02%	1.73%
PNC	1.66%	1.34%	1.57%	2.92%	2.93%	1.09%	1.34%	1.81%	1.80%
Fifth Third	2.02%	4.64%	4.26%	9.72%	7.50%	3.86%	3.17%	6.42%	4.09%
Ally	2.54%	3.52%	3.75%	7.08%	6.59%	2.50%	2.79%	4.48%	4.07%
CFG	1.73%	3.52%	3.22%	8.59%	6.69%	2.80%	2.30%	5.97%	3.73%
Key	1.28%	2.17%	2.06%	5.30%	4.01%	1.85%	1.64%	3.80%	2.34%
Regions	1.89%	3.67%	3.36%	8.07%	6.52%	2.31%	1.06%	4.90%	2.52%
M&T	1.47%	1.16%	1.12%	2.50%	2.11%	1.02%	0.95%	1.92%	1.30%
Huntington	2.05%	2.47%	2.46%	6.18%	5.05%	2.03%	1.90%	4.37%	3.00%

Source: Moody's Analytics and FDIC Call Report

In Figure 21 and Figure 22, we isolate V1 and V2 assumptions and compare those to the Q1 ACL 2020. We find that the baseline scenario on average is higher than the bank average ECL disclosed as of Q1 (1.98% versus 2.49%) with some banks—notably Citi, Ally, CFG, and Fifth Third—falling well below our baseline estimates. The difference between the Baseline and S4 scenarios gives us a range of potential outcomes if the scenario gets worse over time (as they did in hindsight). The analysis of these benchmarks offers the ability to provide a range of estimates based on different points of view. We will discuss this at length in the triangulation section.

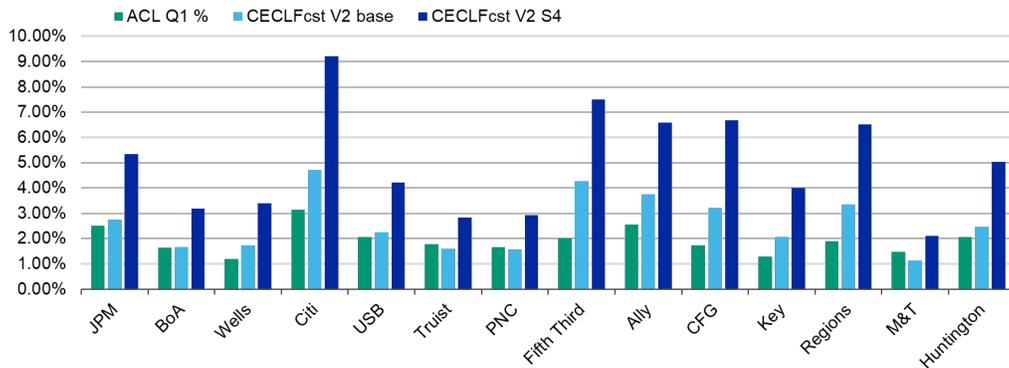
Figure 21 Top-down CECL forecaster – Baseline and S4 version 1



Source: Moody's Analytics and FDIC Call Report

Under the V2 assumptions, we observe the same pattern except for the range between Baseline and S4, which is much tighter than observed for the V1 assumptions—again, due to the R&S period differences discussed.

Figure 22 Top-down CECL forecaster – Baseline and S4 version 2

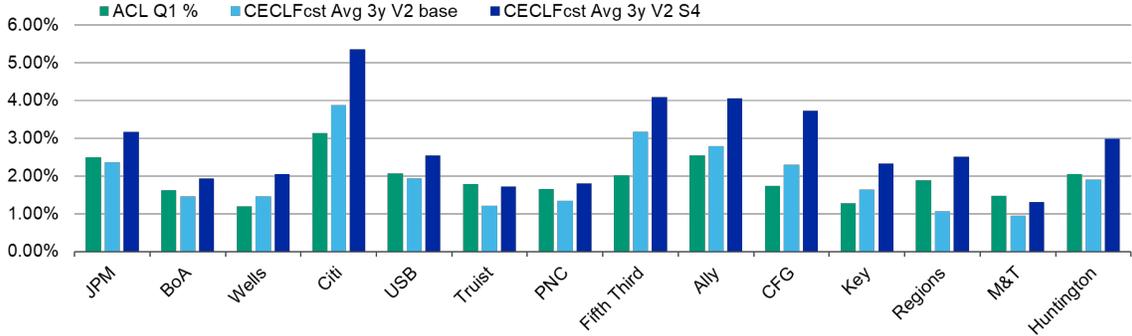


Source: Moody's Analytics and FDIC Call Report

In Figure 23, we provide a view of the three-year quarterly average CECL estimate for V2. This enables us to evaluate the impact of the stress scenario over a longer-term period. Given the rapidly changing nature of the scenarios since the beginning of March and the anticipated continuation of volatility, these metrics may be a better, less volatile estimate for the upper bound of the reporting date forecast (or at least should be considered as such).

For example, the Citi CECLfct V1 S4 scenario estimate equals 12.12%, whereas the three-year average falls to nearly 9.2%. In the case of the CECLfct V2 S4 scenario, the estimate equals 8.65% to 5.14% for the three-year average as seen in Figure 23.

Figure 23 Top-down CECL forecaster – Baseline and S4 version 2 three-year average



Source: Moody's Analytics and FDIC Call Report

The CECL forecaster methodology provides another good benchmark to understand a range of values for the CECL estimates at the March 31, 2020 reporting date. We found that, on average, the model overestimates the Baseline scenario when compared to the group average, which could be due to a myriad of reasons including assumptions for reversion, weighted average life, long-term loss rate, and so on. This will be a consideration when setting the lower bound in our triangulation index. In the next section, we discuss how to use the different metrics reviewed in this section to determine a lower and upper bound.

Triangulation methodology

One of the most underrated aspects of the CECL process as of March 31 was the need to establish formal benchmarks to understand the potential variability in the estimate. All stakeholders going in had a "hunch" that CECL was going to be much more volatile than the incurred loss approach. The incurred loss approach, long viewed as a very stable metric, moved in sync with delinquency indicators, but not so for the lifetime estimate of potential loan losses. The behavior of CECL reserves compared to actual delinquency can be very unintuitive at the executive management level.

We reviewed five different methodologies that are available to triangulate on a range of possible values as a benchmark to our CECL estimate. We separate each into the two classes of metrics defined and summarized below (Figure 24):

- » Riskiness indicators
 - These metrics provide a useful way to think about portfolio riskiness at a specific point, but offers limited ways for these metrics to be incorporated as part of an index to determine an ECL range.
 - These metrics can be used to apply an override on the range of ECL moving the lower or the upper bound, creating a tighter (looser) range for the estimate.
- » ECL range indicators
 - These metrics directly provide a range for ECL estimates based on historical experience, forecast of future conditions, or a mix of both using heuristics measures. For each metric in our analysis, we have a Baseline and a Stressed version (S4) that can be used to model the lower and upper bound of the range of ECL estimates.
 - These metrics can be used directly to create a lower- and upper-bound estimate for ECL, keeping in mind that metrics based on Baseline scenario data would be applied to the lower bound, while metrics based on the S4 scenario would be applied to the upper bound.

Figure 24 Triangulation indicators

Metric Type	Metrics		
Riskiness indicators	DFAST Coverage DFAST Loss rate	NCO % Max (2007-2010) NCO % Average (2007-2010)	DFAST based riskiness scaler
ECL range indicators	Historical Loss Analyzer: Average Maximum Minimum	Macro UER Forecast Base Macro UER Forecast S4	CECLFcast V1 base, S4 CECLFcast V2 base, S4 CECLFcast 3Y Avg V1 Base, S4 CECLFcast 3Y Avg V2 Base, S4

Source: Moody's Analytics

To construct our index's lower and upper bound for the peer group,¹⁷ we first computed the weighted-average ECL for the sample banks in our dataset (1.98%) shown in Figure 25. Then, we computed the weighted average for every ECL metric used in the indices per Figure 26. Our lower- and upper-bound index constructed from our set of metrics gives us a lower bound of 1.64% and an upper bound of 3.24%, which is intuitively commensurate with the values observed from our sample set. Four banks fall below the lower bound based on the peer group averages: Wells, BofA, Key, and M&T.

Figure 25 Top 14 banks – allowance for credit loss disclosures

Bank name (\$MM)	Assets size	Total loans	ACL Q1 %	ACL Q1 amount (3/31)
1 JPM	2,367,127	948,881	2.50%	25,400
2 BoA	1,812,976	968,579	1.63%	17,126
3 Wells	1,708,548	938,694	1.19%	12,022
4 Citi	1,472,915	659,787	3.14%	22,654
5 USB	477,394	299,090	2.07%	6,590
6 Truist	451,310	305,651	1.78%	5,446
7 PNC	395,783	239,570	1.66%	4,394
8 Fifth Third	169,489	110,591	2.02%	2,236
9 Ally	167,073	124,298	2.54%	3,245
10 CFG	164,652	119,745	1.73%	2,213
11 Key	145,184	95,273	1.28%	1,520
12 Regions	127,543	83,334	1.89%	1,665
13 M&T	125,041	89,681	1.47%	1,380
14 Huntington	108,790	75,893	2.05%	1,603
Weighted Average ECL			1.98%	

Source: Moody's Analytics

In the creation of the index, expert judgment plays a role in both the selection of the metrics as well as the weights assigned to each metric. In the case of CECL estimates, there are no historical CECL estimate benchmarks, so all we can do is use our best judgment, ensure results are intuitive and directionally correct, and repeat the analysis over the coming quarters¹⁸ to solidify our expert judgment approximations.

The index lower and upper bound include only one riskiness indicator and all of the ECL range indicator metrics. We left out most of the riskiness indicators to make bank-level adjustments in the comparison of the results section for individual banks. Figure 26 outlines the metrics used for the lower and upper bound as well as the weights derived based on expert judgment.

¹⁷ Note that we also compute the bank specific upper- and lower-bound index to provide additional insights.

¹⁸ We plan to continue releasing results of the analysis over the coming quarters.

Figure 26 Lower- and upper-bound index weighting

ECL Range Indicators	Sample Set		Upper Bound	Weights	Lower Bound
	Weighted Averages	Weights			
Macro UER Baseline March V2	2.11%				0.63%
CECLFcst V1 base	2.49%				0.69%
CECLFcst V2 base	2.48%				0.71%
CECLFcst Avg 3y V1 base	2.09%			5.00%	0.09%
CECLFcst Avg 3y V2 base	2.04%			5.00%	0.12%
Macro UER S3 March V2	4.31%	10.00%	0.43%		
Macro UER S4 March V2	4.65%	10.00%	0.47%		
CECLFcst V1 S4	5.92%	10.00%	0.59%		
CECLFcst V2 S4	4.78%	10.00%	0.48%		
CECLFcst Avg 3y V2 S4	2.82%	10.00%	0.28%		
CECLFcst Avg 3y V1 S4	4.10%	10.00%	0.41%		
HLLA AVG only %	5.34%	10.00%	0.53%		
HLLA Min %	3.48%	10.00%	0.35%		
HLLA MAX only %	6.30%	10.00%	0.63%		
DFAST % Loss	5.63%	10.00%	0.56%		
		Upper Bound*	3.24%	Lower Bound*	1.64%

Source: Moody's Analytics

For the lower bound, our logic was to assign equal weights to the first three estimates given their similar level of precision and directionality, whereas the last two—which were based on a three-year average—would tend to drive the actual rate lower based on the March 31, 2020 economic environment. We decided to assign equal weighting of 30% to the first three and a weight of 5% to the 3-year averages. The lower-bound estimate now gave us a baseline estimate. To truly make it a lower-bound estimate, we then took 70% of the final value. The 70% is based on ensuring that our lower and upper bound are grounded in credit risk observed behavior (asymmetry of credit risk), which we discuss in the last paragraph of this section.

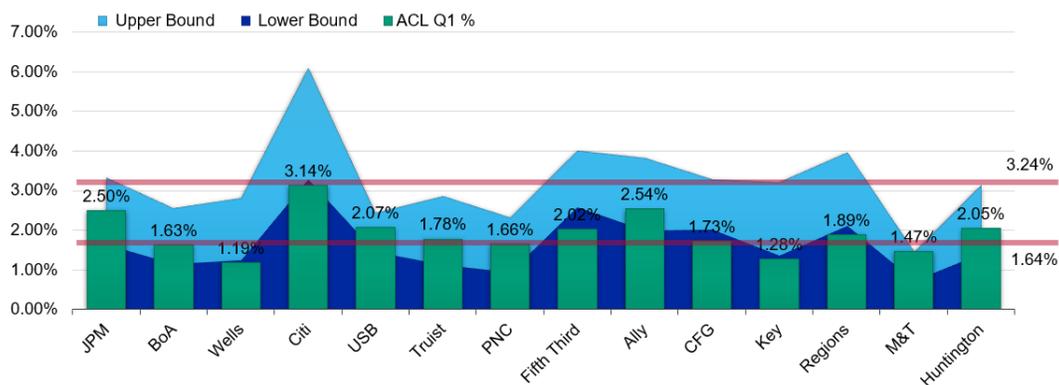
For the upper bound, we focused on 10 stressed metrics that gave us a view of worsening economic conditions as of March 31, 2020. All 10 metrics provided a similar range of worst-case scenarios ranging from a low of 3.5% to a high of 6.3% for the entire peer group. We assigned equal weights of 10% to each metric, which were all based on either Moody's Analytics S4, the Great Recession period, or the DFAST scenario. Just as with the lower bound, to make the metric a realistic upper bound and not a worst-case upper bound, we applied a 70% factor to the index.

Credit asymmetry behavior depicts that downside credit risk is much larger than upside credit risk. Thus, our lower- and upper-bound metrics adhere to the principle. Our average for the sample peer dataset average is 2.35%, with a lower bound at 1.64% and an upper bound at 3.24%, simply reflecting that the downside difference (3.24%-2.35%) is much larger than the upside difference (2.35%-1.64%).

Comparison of results – averages

Next, we applied these weights for each bank to understand where, based on each bank's individual results, they fell within our lower- and upper-bound index. Figure 27 presents each bank-specific upper- and lower-bound index as well as the peer group upper- and lower-bound average estimate depicted as the red lines on the graph.

Figure 27 Triangulation of ACL estimates



Source: Moody's Analytics and FDIC call report data

Based on the chosen methodology and weights assigned, we produced a range of estimates for each bank, which seems to be reasonable given what we know as of March 31, 2020. The banks that aggressively provisioned seem to be over the lower-bound threshold for the peer group (JPM, Truist, Citi, USB, Ally, Fifth Third, and so on), whereas the banks that were seen as being rather less conservative fall at or just below the lower bound for the peer group (Wells, Key, M&T). Figure 28 shows the individual banks' upper- and lower-bound thresholds.

Figure 28 Top 14 banks – upper- and lower-bound bank-specific range estimates

Bank name	ACL Q1 %	Upper Bound	Lower bound
JPM	2.50%	3.32%	1.65%
BoA	1.63%	2.56%	1.15%
Wells	1.19%	2.81%	1.23%
Citi	3.14%	6.10%	3.27%
USB	2.07%	2.43%	1.45%
Truist	1.78%	2.85%	1.13%
PNC	1.66%	2.33%	0.93%
Fifth Third	2.02%	4.02%	2.58%
Ally	2.54%	3.83%	1.99%
CFG	1.73%	3.29%	2.03%
Key	1.28%	3.20%	1.35%
Regions	1.89%	3.97%	2.10%
M&T	1.47%	1.45%	0.72%
Huntington	2.05%	3.15%	1.41%
Weighted Averages	1.98%	3.24%	1.64%

Source: Moody's Analytics and FDIC call report data

We discuss the individual banks' results in the next section, with added commentary based on the riskiness indicators. The riskiness dashboard in Figure 29 outlines the banks that have better than average riskiness metrics. This could help add to our interpretation whether any given bank is more or less reserved as of March 31.

For example, BofA sits just below the peer group average lower-bound index, but quite a fair bit above the BofA bank-specific index. BofA performed on average much better in a crisis during the last stress test, having the lowest DFAST riskiness scaler for

the entire peer group. Hence, we believe that it is better reserved on average than most of its peers, and indicates that BofA is probably being much more aggressive than its peers in reserving for a lower risk portfolio.

In another example, M&T sits below the peer group lower-bound index and yet above its bank-specific upper-bound index due to very low net charge-off experience on which our top-down models are conditioned. However, the DFAST riskiness index tells a different story, showing that their portfolio is one of the riskiest in the peer group. We believe that even with the added scaler adjustment, M&T should be sufficiently reserved compared to its peer group.

Figure 29 provides a view of the different riskiness indicators. All cells in green are metrics that are above average for the peer group.

Figure 29 Riskiness indicators

Bank name	ACL Q1 %	NCO % Max	NCO % average	DFAST % Loss	DFAST Coverage	DFAST riskiness scaler
1 JPM	2.50%	0.90%	0.46%	6.51%	42.00%	1.07
2 BoA	1.63%	0.81%	0.39%	5.13%	37.00%	0.78
3 Wells	1.19%	1.15%	0.52%	5.71%	26.00%	0.98
4 Citi	3.14%	1.16%	0.67%	7.34%	48.00%	0.86
5 USB	2.07%	0.66%	0.39%	6.12%	37.00%	0.99
6 Truist	1.78%	0.71%	0.41%	5.65%	32.00%	0.99
7 PNC	1.66%	2.10%	0.44%	4.84%	35.00%	0.84
8 Fifth Third	2.02%	3.18%	0.73%	5.59%	33.00%	1.18
9 Ally	2.54%	6.67%	0.67%	6.02%	46.00%	1.05
10 CFG	1.73%	2.70%	0.44%	6.16%	28.00%	1.06
11 Key	1.28%	1.18%	0.56%	6.15%	21.00%	0.98
12 Regions	1.89%	0.91%	0.48%	6.90%	29.00%	1.29
13 M&T	1.47%	0.30%	0.17%	7.26%	22.00%	1.12
14 Huntington	2.05%	1.21%	0.46%	5.43%	39.00%	1.04
Peer group Averages		1.23%	0.49%	5.63%	34.50%	1.02

In the next section, we present all the relevant metrics for each bank that went into the creation of the lower- and upper-bound index, and the contribution of each metric within the index.

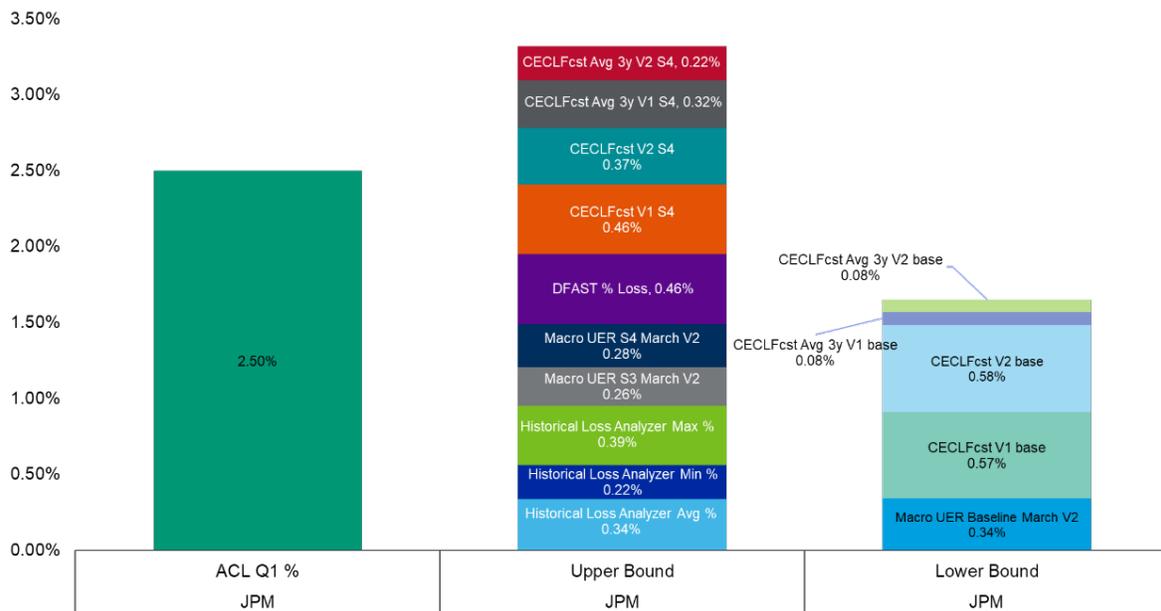
Comparison of results – specific institutions¹⁹

We present the individual banks' results, showing the contribution of each of our metrics to the upper- and lower-bound index. We add commentary based on 1) our observations, 2) DFAST riskiness scaler and whether we believe the banks were aggressively reserving as of Q1 2020. There is little doubt that given economic deterioration, banks will be increasing their reserves in Q2. We believe our upper-bound estimate for Q1 2020 to be a good benchmark for what to expect in Q2 2020.

JPM

JPM reserved 2.5% of loans for Q1 2020 (Figure 30). Our lower- and upper-bound estimates were 1.65% and 3.32%, which represents quite a range in their case. We emphasize that the upper bound is based on a worst-case scenario as of March 31, 2020, but as of April/May became the baseline levels—which means that the reserve level required by JPM could be substantial. In fact, JPM already mentioned at its investor conference that the company expects to reserve another ~7 billion for Q2 2020.²⁰ JPM's reserve ratio would rise to about 3.4%, which would put it above the upper bound of 3.32% computed for JPM. Given that the Q2 scenario is very close to our upper-bound metrics, this is right in line with where JPM plans to be. We view JPM as well reserved as of March 31, 2020 and expect an allowance build to get them close to or above our current upper bound in Q2.

Figure 30 Bank-specific triangulation - JPM



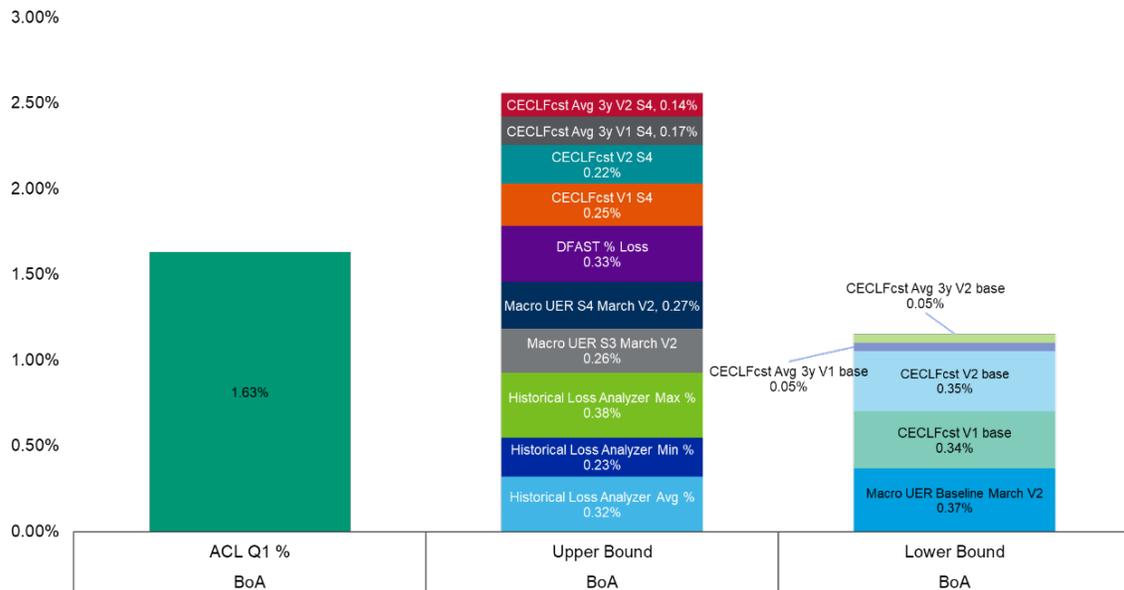
BofA

BofA reserved 1.63% of loans for Q1 2020 (Figure 31). Our lower- and upper-bound estimates were 1.15% and 2.56%. The Q1 reserve sits between the midpoint of its upper- and lower-bound estimates. BofA is just below the peer group lower bound at 1.64%—but looking at the riskiness indicator tells us that with a scaler of 0.78, it means that its portfolio is relatively much less risky than the peer group. Compared to peers, BofA has smaller exposure to credit cards and generally tighter lending standards, which likely contributes to a lower loan loss reserve than most of its peers. We view BofA as well reserved as of March 31, 2020 and expect an allowance build to get them closer to our upper-bound in Q2.

¹⁹ The comparisons presented here are those of the authors and do not represent the opinion of Moody's Corporation.

²⁰ JP Morgan Investor's Conference: <https://www.reuters.com/article/us-jp-morgan-dimon/jpmorgan-ceo-bank-will-again-boost-credit-reserves-in-second-quarter-idUSKBN2322RH?il=0>

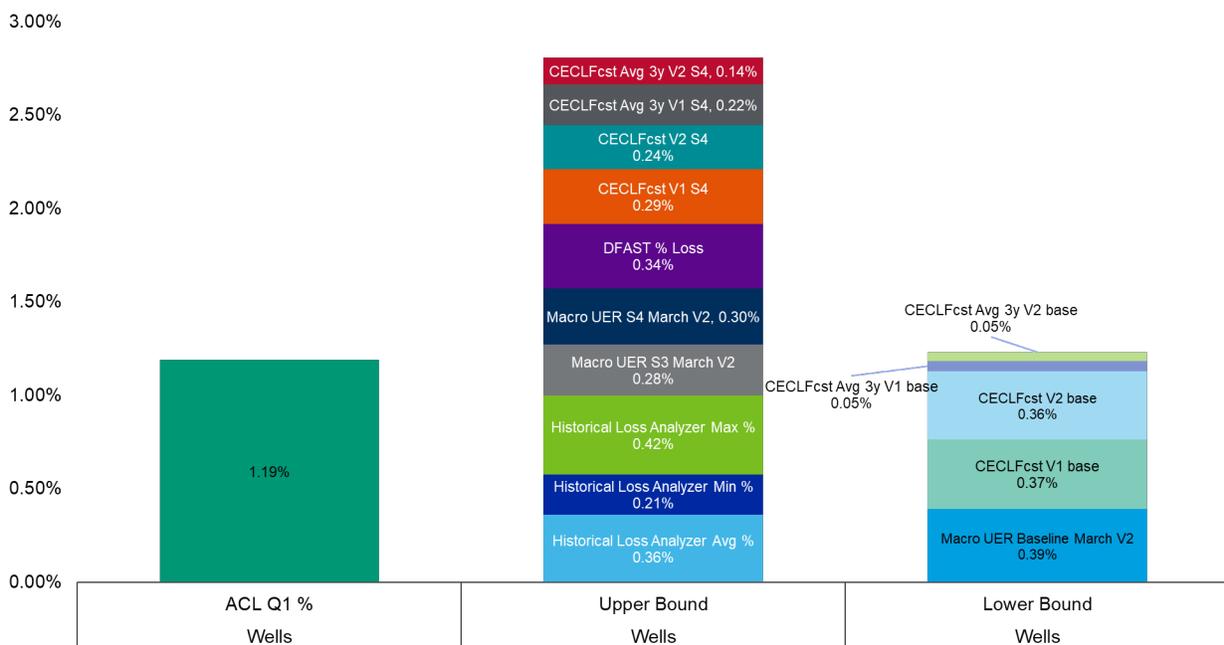
Figure 31 Bank-specific triangulation - BofA



Wells

Wells reserved 1.19% of loans for Q1 2020 (Figure 32). Our lower- and upper-bound estimates were 1.23% and 2.81%. The Q1 reserve sits close to its lower-bound estimates. The allowance coverage is smaller and below peers. Wells was one of the only major banks to reduce its allowance with the adoption of CECL, citing a much different loan mix with less credit card exposure. One of the big factors cited in Wells's reserves being lower was the higher than expected recoveries forecast that is allowed based on the new CECL guidance. On the riskiness indicator side, Wells had a slightly better than average DFAST riskiness scaler but is quite far below the peer group lower bound average, which sits at 1.64%. Because of the subsequent economic downturn due to COVID-19, the company added \$3 billion to the reserves after the Day 1 adoption. According to our triangulation analysis, we view Wells as under-reserved compared to the peer group as of March 31, 2020. A larger build than their peer group in Q2 will place them in a more reasonable range.

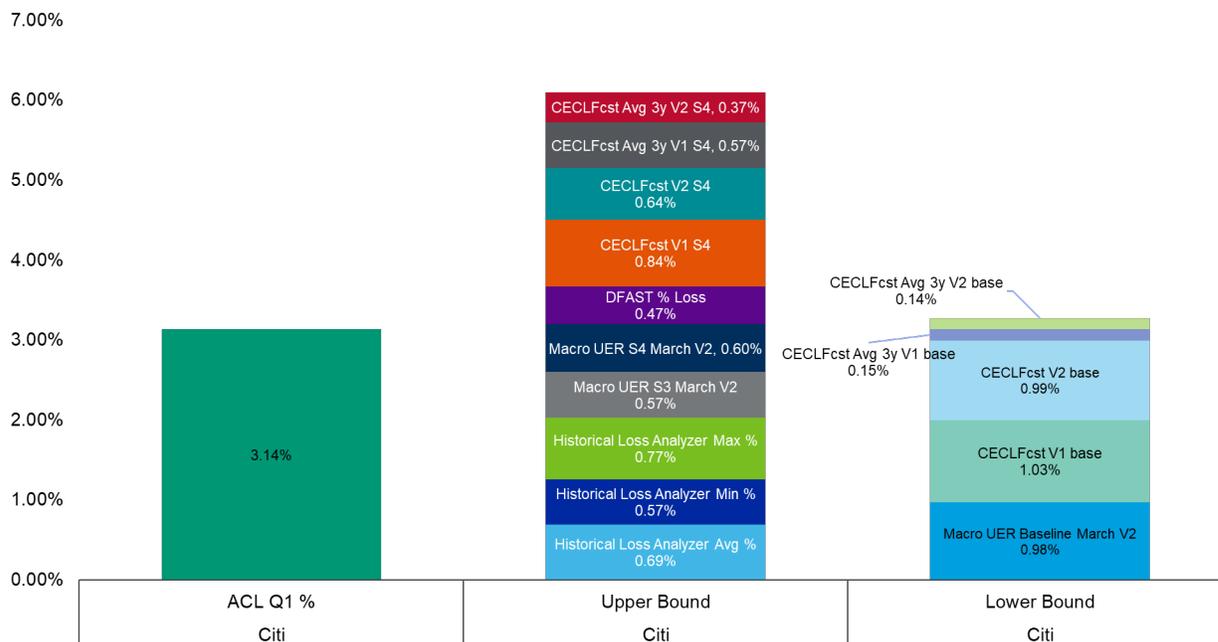
Figure 32 Bank-specific triangulation - Wells



Citi

Citi reserved 3.14% of loans for Q1 2020 (Figure 33). Our lower- and upper-bound estimates were 3.27% and 6.10%. The Q1 reserve sits below its lower-bound estimate. The allowance is higher on average than its peers primarily due to higher exposures to credit cards and weakness in commercial real estate. Citi does have the highest level of reserves among the peer group. It sits well above the group's weighted average of 1.98% and well above the lower-bound average of 1.64%. The DFAST riskiness scaler also shows that Citi's portfolio is relatively less risky than the peer bank average with a scaler of 0.86 based on the fact that its asset concentration lies within portfolios that are less risky than its peers. According to our triangulation analysis, we tend to view Citi as well reserved as of March 31, 2020 but we expect a larger than average build in Q2.

Figure 33 Bank-specific triangulation - Citi

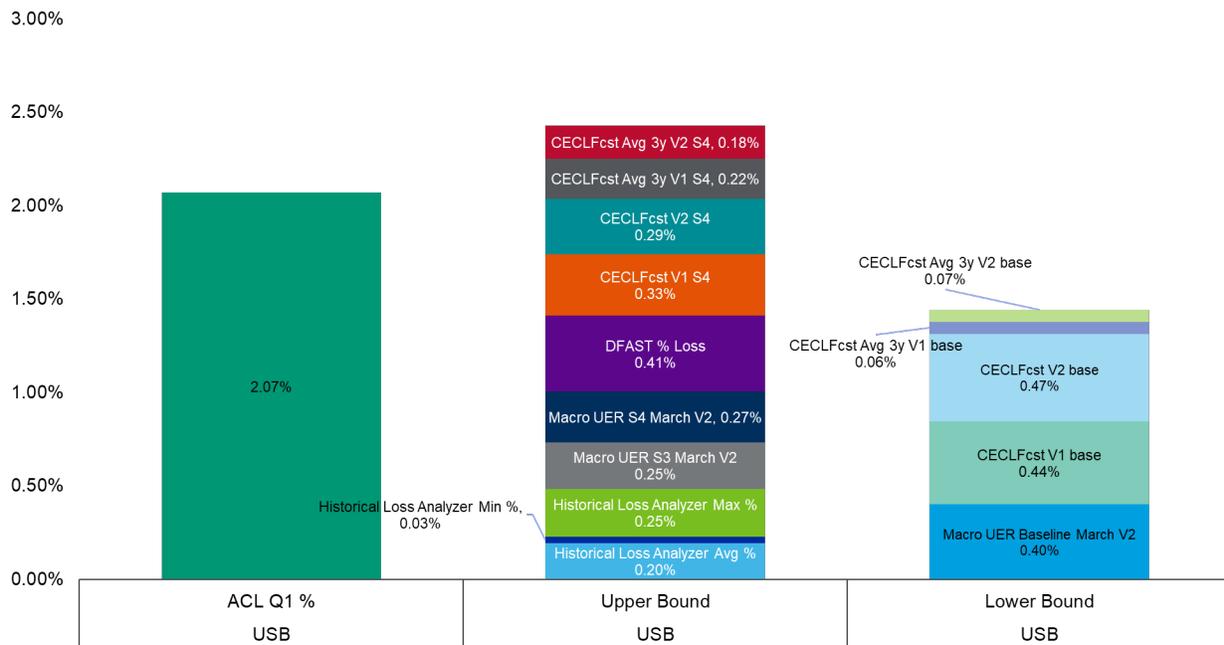


USB

USB reserved 2.07% of loans for Q1 2020 (Figure 34). Our lower- and upper-bound estimates were 1.45% and 2.43%. The Q1 reserve sits above its midpoint of the upper- and lower-bound estimates. The provision for loan losses for Q1 was low compared to peers but the overall allowance is similar or even higher than peers. On a recent analyst call, USB disclosed:²¹ "Our expectation is that unemployment is going to be pretty significant in the second quarter and then starting to dissipate or moderate as we go through the rest of the year and into 2021. So, our expectation is that the reserve builds in the second quarter by the industry as well as USB is going to be pretty significant." USB's reserve is above that of the peer group lower-bound threshold and the riskiness of its portfolio is just slightly better than the peer group average. Thus, we view it as well reserved for the March 31, 2020 reporting period. According to our triangulation analysis, we expect that USB will have to build substantially in Q2 toward the upper end of the peer group average upper bound of 3.24%.

²¹ U.S. Bancorp at Sanford C Bernstein Strategic Decisions Conference May 28, 2020.

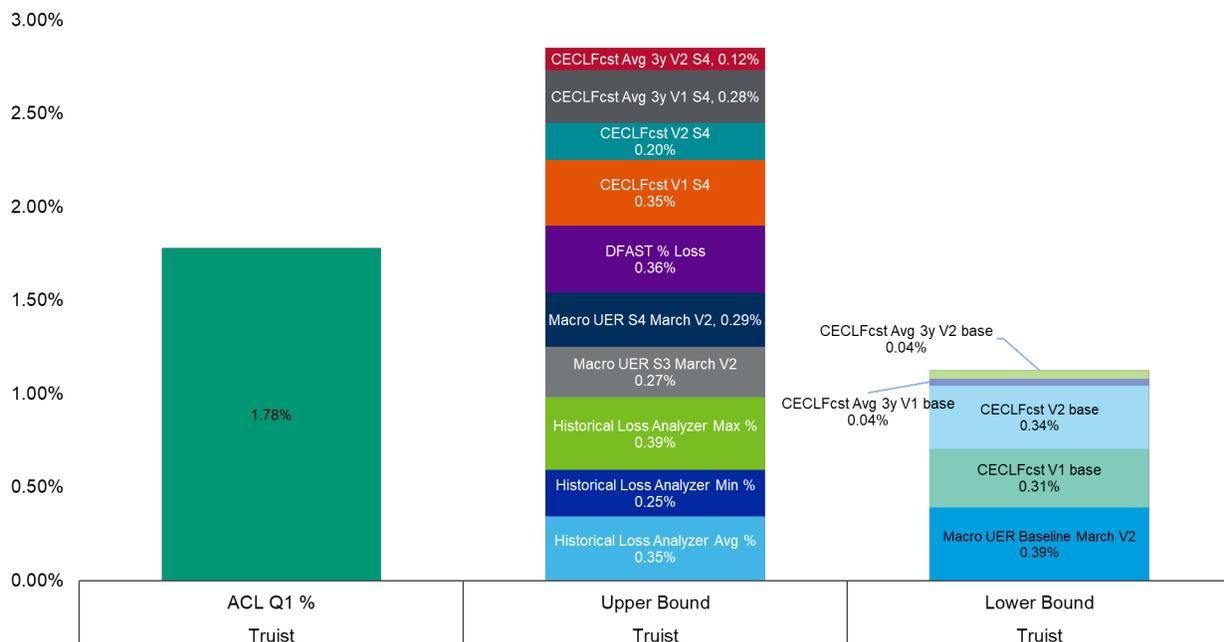
Figure 34 Bank-specific triangulation - USB



Truist

Truist reserved 1.78% of loans for Q1 2020 (Figure 35). Our lower- and upper-bound estimates were 1.13% and 2.85%. The Q1 reserve sits between the upper- and lower-bound estimates of its own ECL range but just above the peer group average of 1.64%. Truist performed better than average on most riskiness indicators, has historically experienced lower NCO through the Great Recession, and has a DFAST riskiness scaler that is just below the peer group average. According to our triangulation analysis, we believe that it is reserved on par as of March 31, 2020. In Q2, we expect Truist to get closer to the upper bound of its current index range.

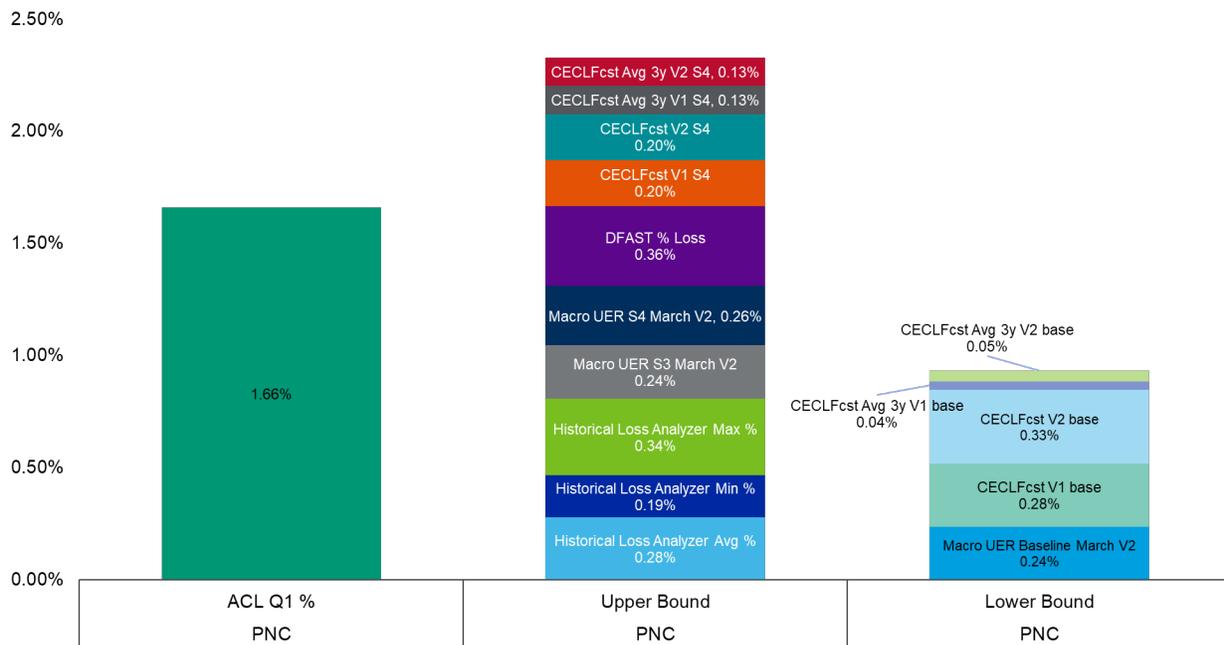
Figure 35 Bank-specific triangulation - Truist



PNC

PNC reserved 1.66% of loans for Q1 2020 (Figure 36). Our lower- and upper-bound estimates were 0.93% and 2.33%. The Q1 reserve sits at just above the peer group lower-bound estimate of 1.64%. PNC did experience higher levels of NCOs during the Great Recession but this could be behind it. The company is well above its lower-bound index and its DFAST riskiness scaler indicates that PNC with a scaler of 0.84 is a fair bit less risky than the average peer. According to our triangulation analysis, we believe PNC is adequately reserved for economic conditions as of March 31, 2020. However, we look for more reserve build heading into Q2 2020 to get very close to the 2.33% upper bound.

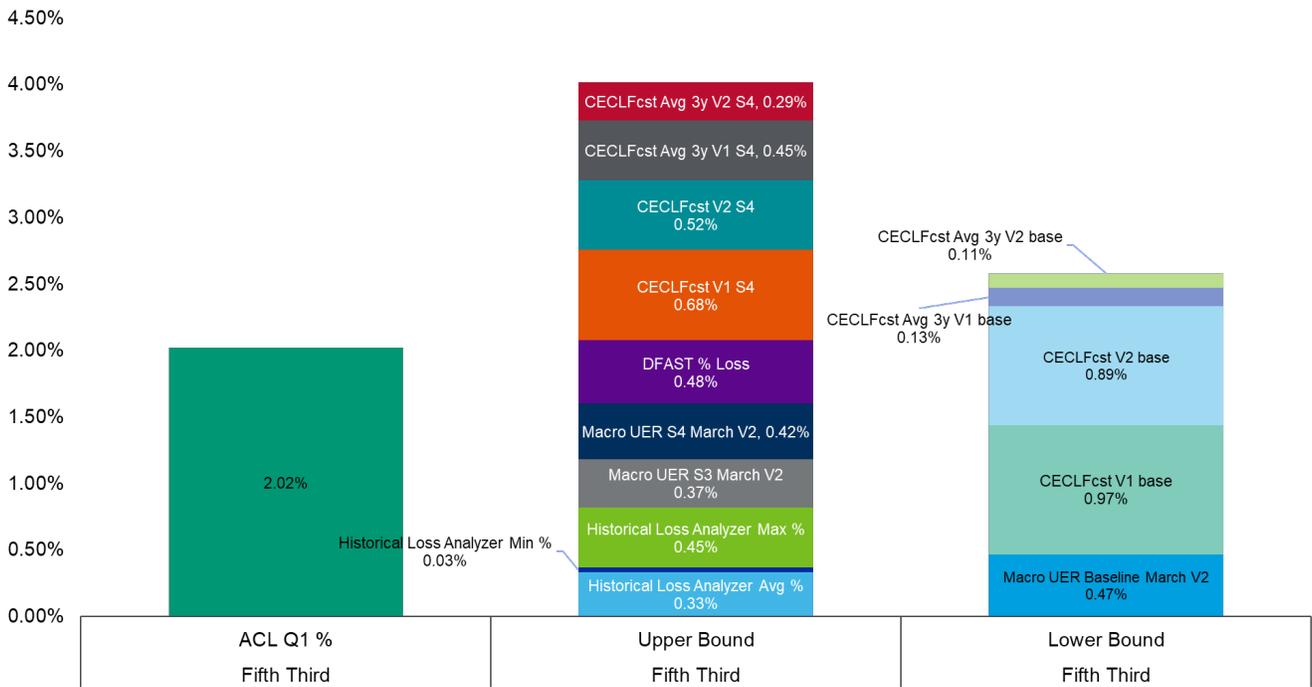
Figure 36 Bank-specific triangulation - PNC



Fifth Third

Fifth Third reserved 2.02% of loans for Q1 2020 (Figure 37). Our lower- and upper-bound estimates were 2.58% and 4.02%. The Q1 reserve sits well below its lower-bound estimates but well above the peer group lower-bound average. Fifth Third cites strong credit quality in the loan book with high exposure to C&I loans, specifically shared national credits that are more resilient in this downturn. However, based on the DFAST riskiness scaler at 1.18, as well as higher than average NCO during the Great Recession, we would expect Fifth Third to be under-reserved compared to its DFAST peer group. According to our triangulation analysis, we view Fifth Third as being less well reserved than the peer group as of March 31, 2020 and expect it will have a larger build than the peer group in Q2 based on its riskiness indicators.

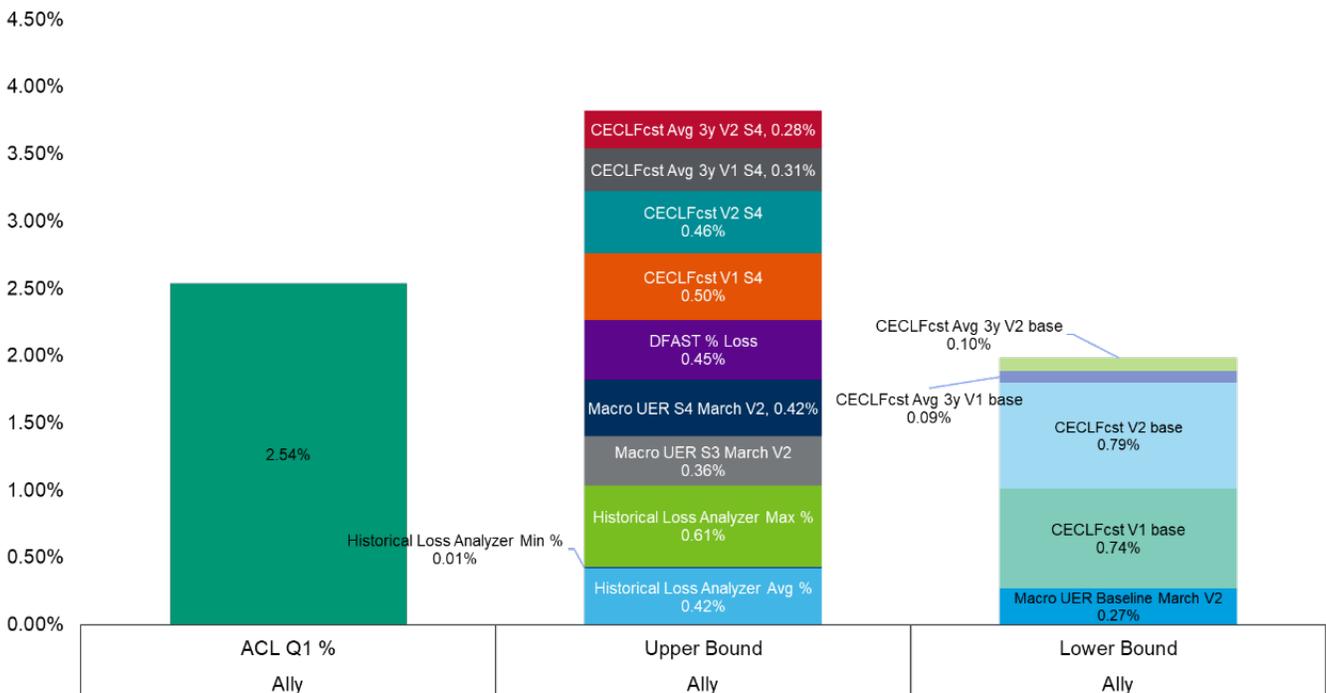
Figure 37 Bank-specific triangulation – Fifth Third



Ally

Ally reserved 2.54% of loans for Q1 2020 (Figure 38). Our lower- and upper-bound estimates were 1.99% and 3.83%. The Q1 reserve sits between its upper- and lower-bound estimates. Ally's riskiness indicators are well above the peer group, except for the fact that it has a very good DFAST coverage ratio. It is the second most well-reserved bank in the peer group. According to our triangulation analysis, we believe Ally is appropriately reserved as of March 31, 2020, but look for more aggressive reserving in Q2 2020 to get closer to our upper bound as of March 31, 2020.

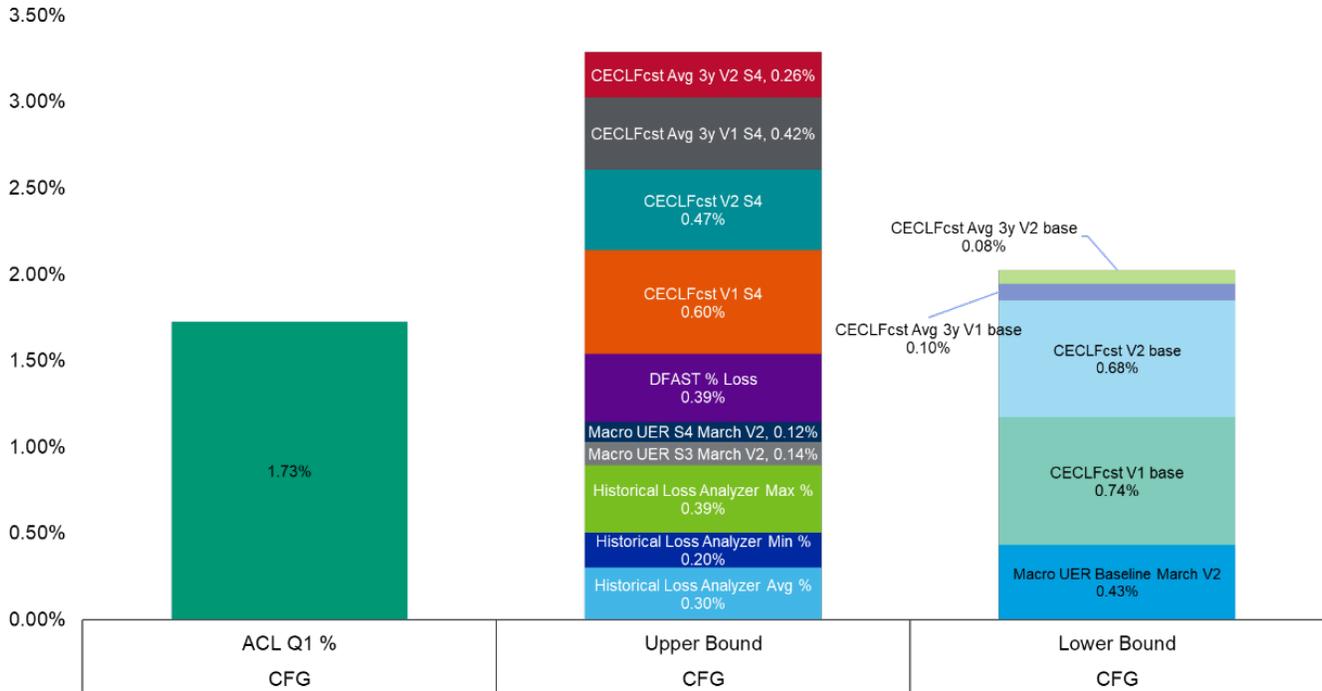
Figure 38 Bank-specific triangulation - Ally



CFG

CFG reserved 1.73% of loans for Q1 2020 (Figure 39). Our lower- and upper-bound estimates were 2.03% and 3.29%. The Q1 reserve sits below its lower-bound estimates but above the peer group lower-bound average. CFG riskiness indicators are very volatile; it has a much higher than average max NCO but a lower average NCO. This reflects the few quarters of low NCO when the unemployment rate was above 8% during the Great Recession. The DFAST riskiness scaler is slightly worse than the peer group's. According to our triangulation analysis, we believe CFG is one of the institutions that will have to do much more reserving than its peers in the coming quarters—but its level of reserves for Q1 is still above our lower bound for the peer group, so we consider CFG well reserved as of March 31, 2020 with the potential to be one of those institutions that produce a larger than average build in Q2.

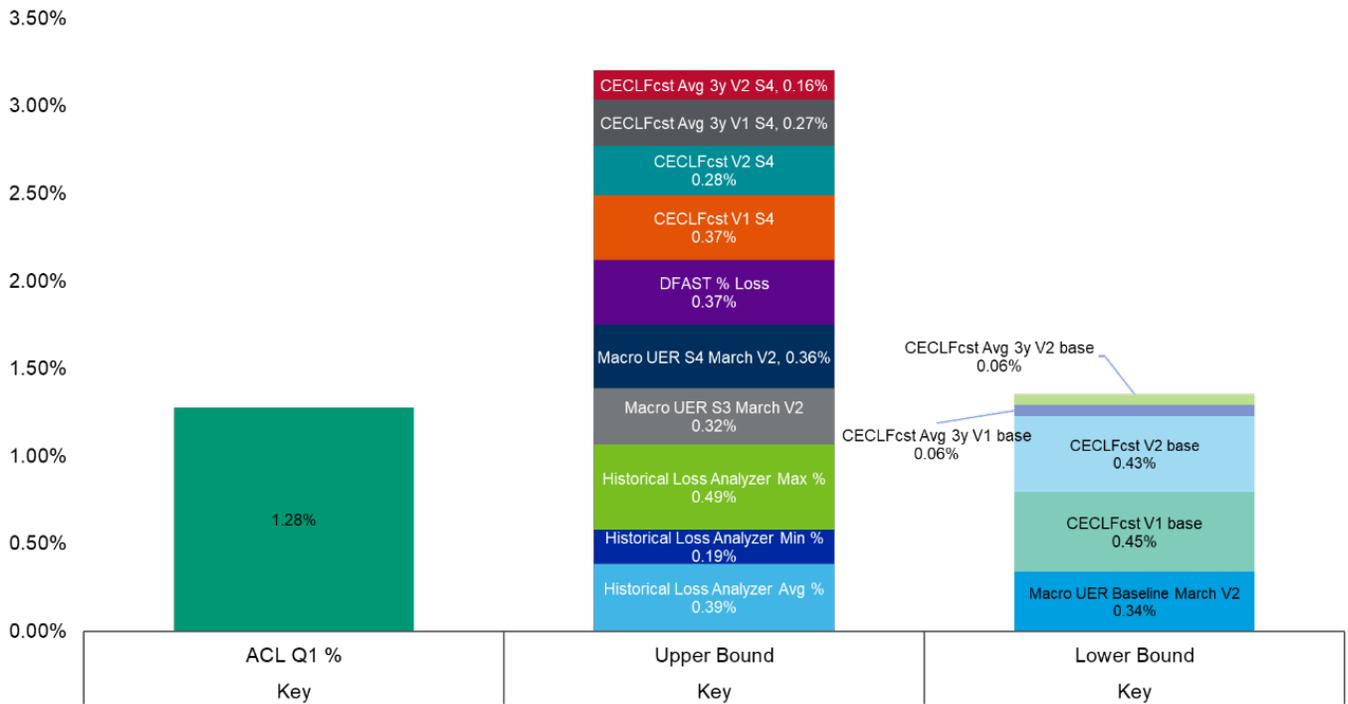
Figure 39 Bank-specific triangulation - CFG



Key

Key reserved 1.28% of loans for Q1 2020 (Figure 40). Our lower- and upper-bound estimates were 1.35% and 3.20%. The Q1 reserve sits slightly below its lower-bound estimates and well below its peer group lower-bound estimate. Key, like CFG, seems to have done the minimum ramp-up on the reserve side based on both its ECL range and the peer group. We believe Key will need to get more aggressive in reserving over the next quarter. Its DFAST riskiness indicator at 0.98 indicates that it ranks as below average risk within the peer group by only a slight margin. Key and Wells are the only two banks that fall below the peer group lower-bound estimate. According to our triangulation analysis, we view Key as being well below its peers in reserving for March 31, 2020 and expect it will have a larger than average build in Q2.

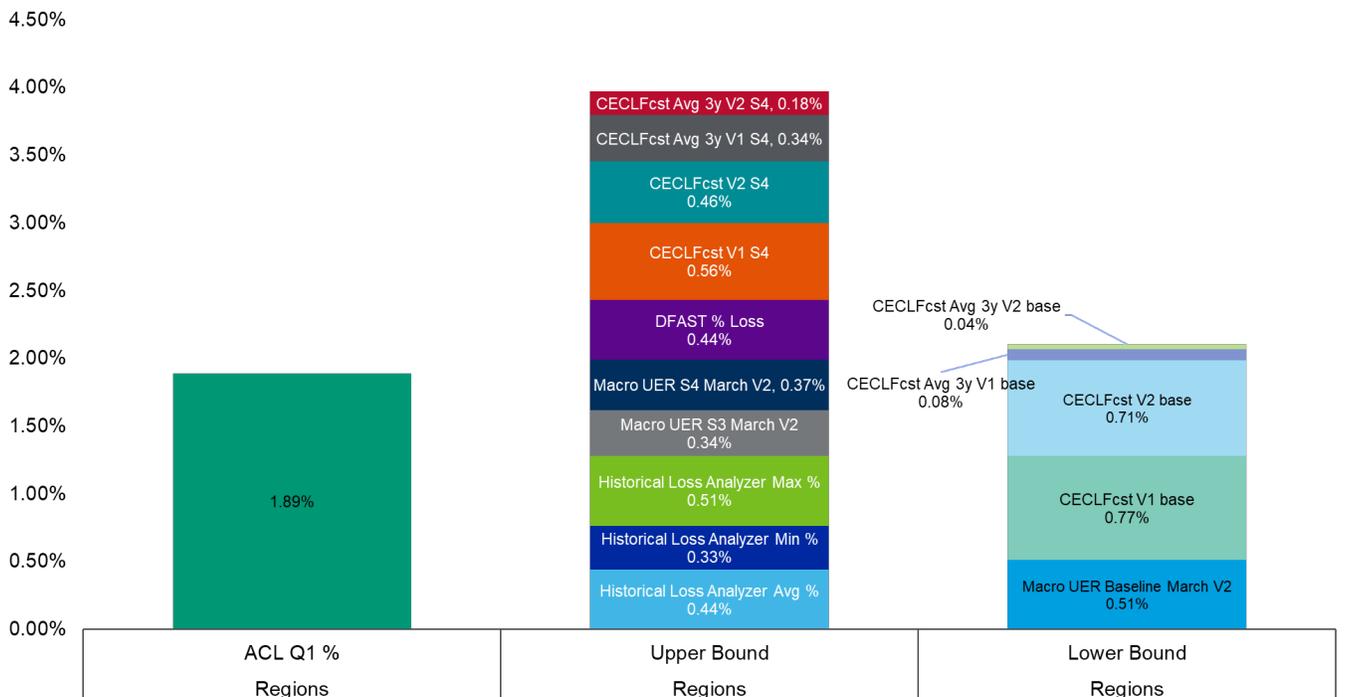
Figure 40 Bank-specific triangulation - Key



Regions

Regions reserved 1.89% of loans for Q1 2020 (Figure 41). Our lower- and upper-bound estimates were 2.10% and 3.97%. The Q1 reserve sits below its lower-bound estimates but above the peer group lower-bound. Regions performs better than its peer group over the Great Recession, but the DFAST metrics are showing it as having the riskiest book in the DFAST peer group with a DFAST riskiness scaler of 1.28. According to our triangulation analysis, we believe Regions will have to ramp up reserves more aggressively than its peers in Q2 2020 and see it as having adequately reserved for March 31, 2020.

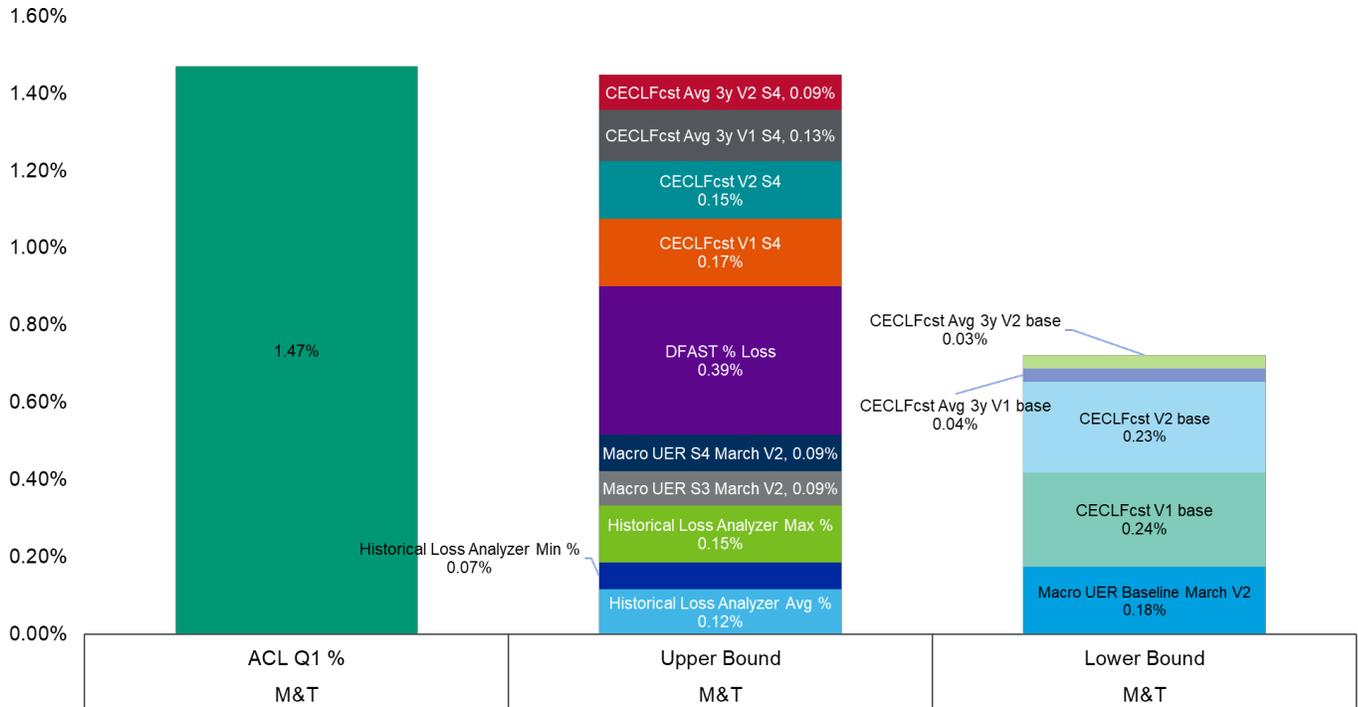
Figure 41 Bank-specific triangulation - Regions



M&T

M&T reserved 1.47% of loans for Q1 2020 (Figure 42). Our lower- and upper-bound estimates were 0.72% and 1.45%. The Q1 reserve sits near its upper-bound estimates. M&T sits well above its lower bound, yet falls below the peer group lower-bound index. It is the one in the peer group that reserves more than its upper-bound index, which is probably due to its low historical loss experience. However, its DFAST riskiness scaler tells us it is one of the riskiest bank peers in the group. According to our triangulation analysis, we believe that M&T is well reserved enough as of March 31, 2020 but we expect some more build for Q2. The key with M&T is the historical experience and whether or not the future looks like the past with a repeat of low levels of NCOs.

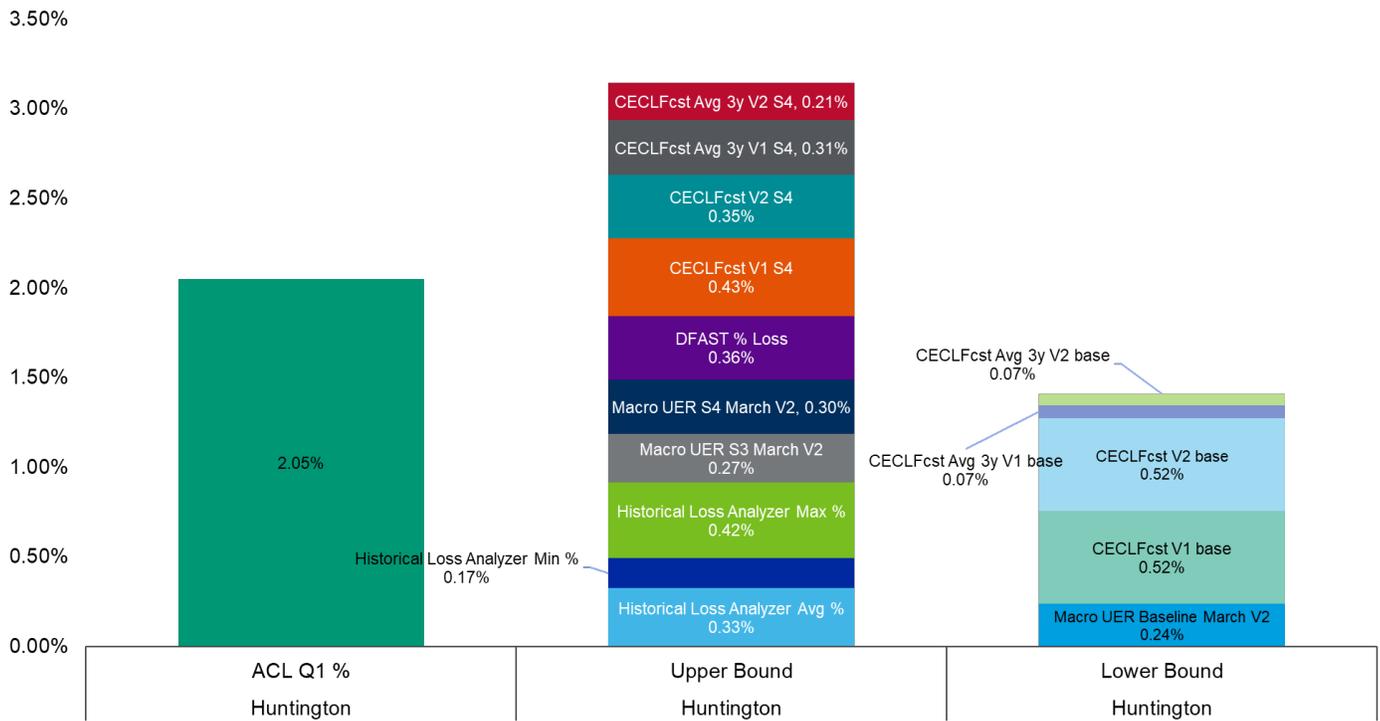
Figure 42 Bank-specific triangulation – M&T



Huntington

Huntington reserved 2.05% of loans for Q1 2020 (Figure 43). Our lower- and upper-bound estimates were 1.41% and 3.15%. The Q1 reserve sits near the midpoint of the upper- and lower-bound estimates. Huntington's DFAST riskiness scaler is very near the peer group's average in all categories. The DFAST exercise tells us the mortgage portfolio is riskier on average than that of the peer group and could suffer if a second wave of the COVID-19 virus starts affecting that market. According to our triangulation analysis, we believe it is well reserved for Q1 2020, but based on our upper-bound index estimate, it will still need to increase reserves for Q2 by a fair amount.

Figure 43 Bank-specific triangulation - Huntington



Summary and takeaways

The main reason for undertaking this research was to understand whether there was a practical way to produce an upper- and lower-bound index that could provide a reasonable indicator of the level of reserves across a set of peer banks. We found evidence that by combining top-down methodologies and riskiness indicators, we can better understand the position in which each individual bank finds itself among its peer group. Based on current developments in the macroeconomic environment, we expect most banks in the peer group analyzed to move much closer to the upper bound in Q2 2020, which has been confirmed by anecdotal evidence of statements from JPM and USB.

The lower-bound index for the peer group as of March 31, 2020 sits at 1.64% and the upper-bound index for the peer group is 3.24%. Our expectation based on the research, the banks' current portfolios, and the evolution of the economic environment is that the lower-bound index will move well above 2% and the upper-bound index will move into the low 4% range, but time will tell. Based on our analysis, we expect a few banks in the peer group to ramp up reserve in Q2 more aggressively than the rest—namely Wells, Key, Fifth Third, CFG, and Regions. The latter three have a riskier loss profile than the peer group average and Wells relies perhaps too heavily on its expected recoveries forecast in Q1.

We will conduct this research again based on Q2 2020 results and will publish results shortly after the Q2 2020 call report data becomes available to help refine and confirm the weights of the triangulation index developed in this paper.

The same methodology can be repeated using portfolio-level call report information to narrow the index range even more and to refine the precision level. In times of rapidly developing and extreme uncertainty, we find that combining heuristics can offer much-needed reassurance when trying to look for a range of possible outcomes. The tools used in this paper to conduct this type of benchmarking are available from Moody's Analytics. They can give executive management a point of view on the range of possible outcomes, especially when internal model reliance is brought into question.

Additional resources from Moody's and Moody's Analytics

- » [Moody's Topic Page on COVID-19](#)
- » [Forecasting the Impact of the COVID-19 Recession on Consumer Credit Losses](#)
- » [Moody's Analytics – CECL And IFRS 9 Recommendations: Handling Shifting Economic Scenarios](#)
- » [Moody's Analytics – Severe Pandemic, a Protracted Economic Slump, and Commercial Real Estate Forecast Scenarios](#)
- » [Moody's Investors Service - Worldwide, Coronavirus Aid Will Benefit Financial Institutions, But Could Raise Long-Term Risks](#)

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