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## Adjusting Your Allowance Framework for COVID-19 and Related Stimulus Programs

The COVID-19 pandemic and the associated slowdown in the economy have pushed many financial institutions and corporations to reevaluate the framework under which they reserve for credit risk in their allowance models. The worsening economic conditions and widespread disruption, combined with the drop in oil prices, have triggered a recession. With most of the United States limping out from under some form of state-mandated shutdown and the unemployment rate staying elevated, many businesses and households are faced with significant financial strain. If they cannot secure additional leverage or another form of financial relief, the prospect of insolvency is very real. To this end, many lenders are aggressively participating in the various fiscal and monetary stimulus programs instituted by the Federal government to both support the needs of their customers and stave off a wave of defaults in their loan portfolios.

However, the question remains: how should institutions incorporate these recent events into their view of the existing credit risk in their book of business? Allowance models are the mechanism for quantifying this number, but many institutions are still looking almost entirely to historical experience to influence that calculation, and are finding that nothing in our past has prepared the industry for this 20 sigma shock to the world economy. This paper discusses how different economic impacts from the crisis could quantitatively be incorporated into allowance models today as an overlay. Our aim is to provide some insight into how institutions are tackling this challenge, share an illustration of how these component pieces could fit together, and underscore that a backward-looking approach by itself is insufficient for the risks facing lenders' capital today.

Specifically, this analysis highlights three common areas where institutions can adjust their allowance calculations. These areas consist of the economic shock resulting from the COVID-19 pandemic, the sensitivity of their geographic region to the epidemiological path of the virus, and the impact of the monetary and fiscal stimulus programs enacted to prevent defaults and business closures.

## Overview

The coronavirus (COVID-19) has caused widespread economic disruption which, combined with the drop in oil prices, has pushed the US and global economies into a recession. In the United States, approximately 90% of the country has been under some form of state-mandated shutdown, with a few exceptions for essential businesses. With many borrowers unable to generate cash flow without government relief, institutions need clarity on how to incorporate these unprecedented shifts in the credit risk curve into their reserve process.

Many institutions, either under the incurred loss standard or the new current expected credit loss standard (CECL), use historical performance information in their methodology frameworks to predict the level of credit risk that exists in that portfolio today. One big challenge institutions face is that there is no comparable historical period to the current economic environment. Even institutions that have quantitative credit models and a rigorous forward-looking macroeconomic forecasting platform are uncertain if there are risks present which those models or forecasts do not consider.

In addition to these challenges, any adjustment approach must be appropriate on a go-forward basis. At the time of writing, the official unemployment rate is over 13%, and there is no clear indication of the path of the recovery. An institution's choice to use a single component adjustment such as unemployment could introduce volatility in the allowance results on a quarter-over-quarter basis. Further, the commercial and consumer loan deferrals, as well as the stimulus efforts through the Paycheck Protection Program (PPP) and other Federal relief programs, are unprecedented; institutions must consider these impacts in a reasonable and supportable way.

This environment leaves us with three consistent questions that institutions are trying to address through adjustments to their framework:

- » How can I determine a quantitative adjustment for a change in certain macroeconomic variables?
- » Is my geographic footprint more or less exposed to the economic impacts of COVID-19 than the national average?
- » Have I been successful at deploying the stimulus programs to my borrowers that need help?

The next sections address ways you can incorporate a quantitative adjustment into your allowance framework that answer each of these questions. While there are several ways to approach a solution to these questions, we present a sample high-level analysis that offers a framework that should be accessible and broadly relevant to all lending institutions.

## Framework and assumptions

### Incorporating economic impact: macroeconomic variable adjustment

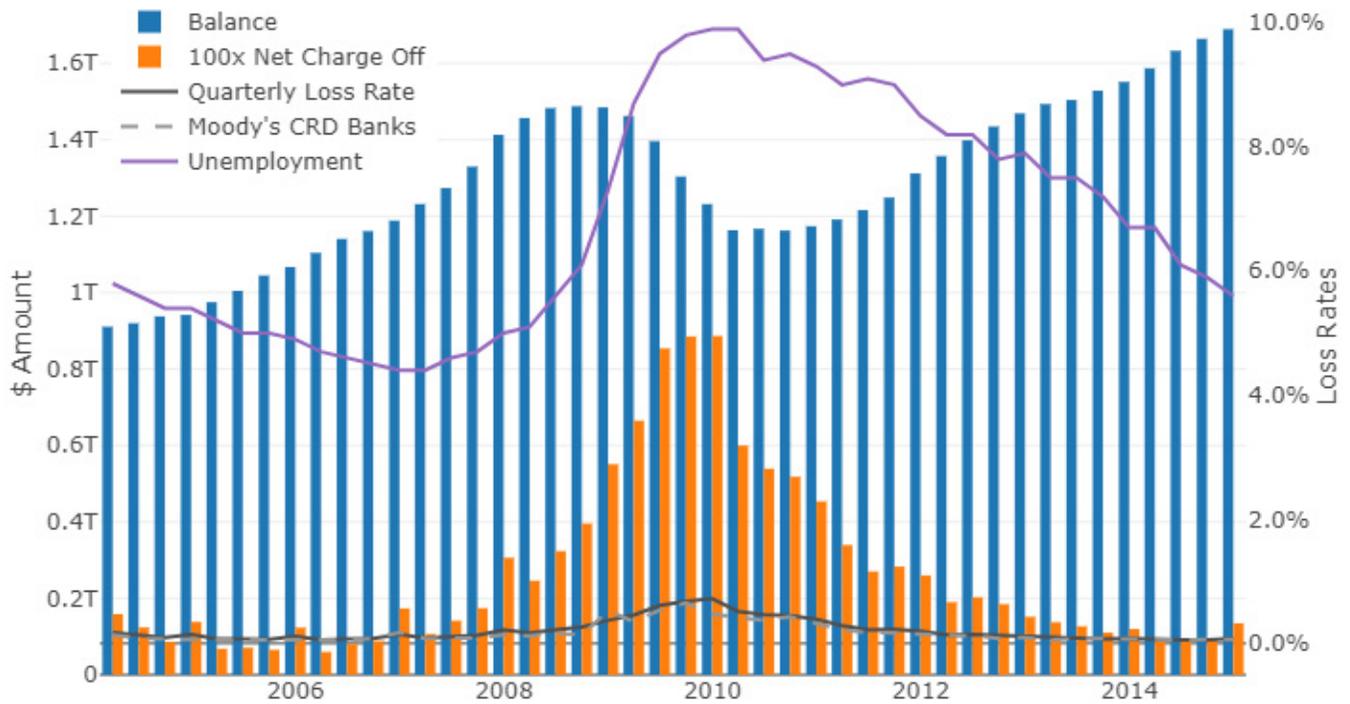
The first question that we hear institutions asking is macroeconomic in nature: what will the spike in unemployment or the GDP contraction do to the credit exposure in my portfolio? While the directional answer is clear, trying to quantify that increase is substantially less so. To start our sample framework, in Figure 1 we present a graph that displays the relationship between the national unemployment rate and banking industry commercial charge-offs from 2005 to 2015.

We selected this time period because the current shock to the labor market is quite high, comparable only to the housing crisis shock in recent memory. The next most comparable employment shock is much farther in the past: the 1981-1982 recession also featured a comparable increase, but there have been significant changes to the structure of the economy since then, most notably the digital revolution. This selection of the housing crisis is not without its caveats; the previous increase in unemployment was sustained over a three-year period, whereas where we have now surpassed the 2010 peak in only weeks.

Additionally, the larger collateral issues that were present in 2008 are not yet observed today. The crisis then was focused on real estate assets, whereas today there is not necessarily a differentiation in the impact severity between commercial, commercial real estate (CRE), or consumer lending. Finally, the monetary stimulus measures were aimed at large financial institutions in 2008, which is a clear difference in targeting from the PPP and Economic Injury Disaster Loan (EIDL) programs that the Treasury has implemented to support small businesses.

Figure 1 Historical loss relationship to macroeconomic variables

Commercial and Industrial - Historical Loss Coefficient



Source: Moody's Analytics Historical Loss Analyzer™

Looking at this information between December 2006 and December 2010, we evaluated a couple of different approaches to answer this question: if unemployment increases by X%, then how much should I expect loan losses to increase? The median of these approaches was taken and applied as a multiple to the annualized increase in US unemployment between Q4 2019 and Q1 2020 to calculate a percentage add-on to a hypothetical allowance calculation. This same methodology was applied to CRE and consumer lending, giving us the starting factor for our adjustment framework.

Regional sensitivity to the COVID-19 shock

The second area of focus is whether institutions should consider how their geographic footprint exposes their borrowers to risks from the impact of the COVID-19 pandemic. Adam Kamins of the Moody's Analytics economics team has assembled an analysis that quantifies these criteria down to the state and submarket level. Notably, the methodology complements traditional modeling approaches by using factors that are not typically drivers of default and recovery behavior. The whitepaper from this analysis reads:

*The traditional approach of employing the Moody's Analytics top-down regional models does not paint a complete picture. Those models are based on the historical relationship between national metrics and those of specific states using a system of structural equations. This tried-and-true method of forecasting is effective in most contexts but can prove insufficient when a black swan event with differing regional impacts occurs. Those impacts mean that places that are typically less subject to a boom-and-bust cycle may be done in by some of the very assets that normally help insulate them during downturns.<sup>1</sup>*

What this analysis captures is the short to medium-term expectation that, for example, a tourism hub will likely experience a relatively deeper downturn, or that more densely populated areas may have more trouble reopening because residents and workers are hesitant to use public transportation.

<sup>1</sup> "Assessing the Regional Economic Impact of COVID-19," Adam Kamins, Regional Financial Review, April 2019.

To quantify some of these risks, the article specifically details the COVID-19 risk index that Moody's Analytics has constructed to identify those states and metro areas that are most exposed to the coronavirus's economic impact. The underlying methodology is based on a combination of (1) demographic and epidemiological factors and (2) economic considerations. Figure 2 includes these factors and their descriptions.

Figure 2 Exposure categories

CATEGORY	VARIABLES CONSIDERED
Exposure to Virus	Current COVID-19 infection rate; foreign-born share of population (as proxy for international travel)
Demographics	Population density; net migration per thousand residents; residents age 65+ as share of total; residents age 85+ as share of total
Trade/Travel Disruptions	Per capita enplanements; exports as a share of GDP
Tourism	Tourism exports as share of GDP; NAICS 72 employment as share of total
Vulnerability	Poverty rate; share of jobs in small businesses
Commodities	NAICS 211 as share of GDP; NAICS 11 as share of GDP

The methodology combines the categories in Figure 2 and produces a weighted average z-score that can be applied at the regional level. In our sample adjustment framework, we combine this factor with our macroeconomic factor from the previous section to act as a scalar that adjusts the relative severity of the economic shock up or down based on the geography of the portfolio. From a practical perspective, allowance models will want to capture whether their customer base is in a harder-hit area of the country or state—for example, a bank in Bozeman, Montana does not have the same exposure risk as a bank in New York City. An institution that decided to expand into a new market or geography last year may want to juxtapose that decision with its core business, good or bad. The way we have proposed this framework allows you to make those objective comparisons in a transparent and supportable way.

### Efficacy of stimulus programs: an institutional view

The third and most challenging question that institutions are trying to address is what the stimulus efforts mean at a portfolio level. Our economics team is continually updating information alongside their monthly forecasts, explaining how the projections are being affected not just by the recent macroeconomic shock, but also how those projections are influenced by the various stimulus programs. As shown in Figure 3, the narrative of the March mid-cycle forecast has GDP projected to contract 18.3% in the second quarter of this year, which is a substantial improvement over the expected 29.6% contraction that was expected if no fiscal stimulus measures were taken. This 11% improvement implies that the fiscal stimulus measures improved the Q2 forecast by approximately 31%. Considering all the different measures taken, it is helpful to focus on the specific relief programs that lenders are facilitating through their platforms. Largely, this encompasses two areas: the PPP and EIDL for commercial borrowers, and the payment deferrals for both consumer and commercial borrowers.

While the original PPP was oversubscribed and funding had to be replenished by Congress, each institution experienced differing levels of success in distributing the relief to the portion of their borrowers requesting assistance. Institutions will need to ask themselves if the customers receiving these loans are still likely to default in the near term or if the pass-through risks from the companies they do business with keeps the probability of default at an elevated level. Based on the stimulus success rate, an institution could reduce the impact of the first two adjustment factors in our framework. For many commercial borrowers, a successful stimulus will preclude default, although it is worth considering such an adjustment factor on an industry basis. For instance, covering payrolls with PPP assistance may not be enough to keep restaurants or hotels out of default.

Figure 3 March Mid-cycle GDP projections

	REAL GDP WITH STIMULUS		REAL GDP WITHOUT STIMULUS		STIMULUS IMPACT ON	
	2012\$ BILLION	ANNUALIZED % CHANGE	2012\$ BILLION	ANNUALIZED % CHANGE	REAL GDP GROWTH PPTS	REAL GDP 2012\$ BILLION
M-20	19,099	(2.51)	19,099	(2.51)	n/a	n/a
<b>J-20</b>	<b>18,156</b>	<b>(18.33)</b>	<b>17,495</b>	<b>(29.60)</b>	<b>11.27</b>	<b>661.60</b>
S-20	18,634	10.95	17,862	8.66	2.29	772.30
D-20	18,744	2.38	18,153	6.69	(4.31)	590.60

Figure 4 contains a high-level, sample portfolio for a lending institution that has captured several stimulus data points. First, it tracks the percentage of the total exposure that has requested assistance, and then tracks the portion of that exposure that was successful in getting the assistance funds. This success rate shows how an individual lending institution could start to move away from the national mean through a higher success rate relative to its peers.

Figure 4 Success rate of stimulus programs at an institutional level

	PORTFOLIO BALANCE	UNFUNDED COMMITMENT	TOTAL EXPOSURE	EXPOSURE REQUESTING RELIEF	EXPOSURE APPROVED FOR RELIEF	SUCCESS RATE
<b>C&amp;I</b>						
Commercial	225,577	50,000	275,577	30.0%	23.0%	<b>77%</b>
<b>CRE</b>						
Construction	98,322	100,000	198,322	50.0%	35.0%	<b>70%</b>
Multifamily	556,347	20,000	576,347	50.0%	40.0%	<b>80%</b>
Non-Residential	556,347	45,000	601,347	50.0%	40.0%	<b>80%</b>
<b>Consumer</b>						
Non-1-4 Family	149	-	149	20.0%	20.0%	<b>100%</b>
1-4 Family	143,080	120,000	263,080	40.0%	40.0%	<b>100%</b>
<b>Total</b>	<b>1,579,822</b>	<b>335,000</b>	<b>1,914,822</b>	<b>46.2%</b>	<b>37.3%</b>	<b>81%</b>

1. Wholesale relief involves the PPP and EIDL lending programs; consumer relief consists of 90-day payment deferral requests.

However, this does cut both ways, as negative adjustment factors could be considered for the borrowers who failed to receive funding after requesting relief. This brings up another important question for institutions: how to address the percentage of the borrower base that did not request access to these programs at all. While broad assumptions could be made around these borrowers not requiring stimulus, it will be more prudent for institutions to use their front-line relationship managers to conduct an outreach program to these borrowers.

An additional nuance worth mentioning is that the deferral programs are different from the PPP and EIDL; the former is a shift of the default and loss curves, while the latter consists primarily of grants to reduce the expected default frequency in the short term until economic conditions stabilize. While we recognize this difference mathematically in the following framework, variations in the application of these programs between different institutions require a more granular analysis by portfolio to quantify this impact.

Adjusting for the economy, region, and government support in the framework

Sample analysis

In Figure 5, we bring these factors together for a hypothetical allowance process for a \$1.5 billion portfolio. We adjust for the unemployment shock to the economy (A) and the lender’s geographical COVID-19 exposure (B), which results in the first adjusted allowance (C). The next step adjusts these factors by the efficacy of delivering the Federal help that the borrowers required (D). This final adjustment limits the impact of macroeconomic and COVID-19 sensitivity factors to only the portion of the portfolio that could not access the relief programs. This produces the final adjusted allowance result (E). This approach can be applied for both the incurred loss standard as well as the CECL standard. Institutions should ensure that they do not duplicate the impact of the stimulus by understanding how it impacts the forward-looking forecasts used in their CECL framework. Moody’s Analytics forecasts natively consider the impact of the stimulus at a national level.

Figure 5: COVID-19 and stimulus adjusted allowance framework (incurred and CECL)

(\$'000)	PORTFOLIO \$	CURRENT ALLOWANCE %	(A) 2008 UNEMPLOYMENT ADJUSTMENT	(B) COVID-19 SENSITIVITY FACTOR	(C) ADJUSTED ALLOWANCE	(D) STIMULUS ADJUSTMENT	(E) STIMULUS ADJUSTED ALLOWANCE
<b>C&amp;I</b>							
Commercial	225,577	0.78%	1.16	1.07	1.76%	23%	1.01%
<b>CRE</b>							
Construction	98,322	0.33%	8.86	1.07	3.46%	30%	1.27%
Multifamily	556,347	0.91%	3.04	1.07	3.89%	20%	1.51%
Non-Residential	556,347	0.91%	4.75	1.07	5.57%	20%	1.85%
<b>Consumer</b>							
Non-1-4 Family	149	0.51%	0.35	1.07	0.70%	0%	0.66%
1-4 Family	143,080	0.51%	3.26	1.07	2.29%	0%	1.85%
<b>Total</b>	<b>1,579,822</b>	<b>0.82%</b>	<b>3.75</b>	<b>1.07</b>	<b>4.01%</b>	<b>19%</b>	<b>1.57%</b>
<b>Percentage increase in allowance due to COVID-19 shock</b>					<b>387%</b>		<b>91%</b>

1. Uses national-level net charge-off and unemployment levels.

2. Uses state-level logistic multiplier.

3. Wholesale relief involves the PPP and EIDL lending programs; consumer relief consists of 90-day payment deferral requests.

4. Compliant with the incurred loss approach, this adjusts the 2008 unemployment hit by the calculated success rate. A CECL approach could adjust the 2008 unemployment hit by backing out the benefit of the stimulus and applying an individual institution's calculated success rate.

## Thoughts for implementation

This sample analysis was done at a high level to demonstrate the adjustment framework. Institutions should consider this as a starting point and develop the appropriate level of granularity for each factor of the framework. While the COVID-19 economic z-score factor is a set number for regionality, we strongly recommend refining the macroeconomic and government relief factors.

On the macroeconomic side, refinements should incorporate more variables than unemployment if possible. While unemployment always has a credit impact and appears in most credit models, it is important to blend in other predictive macroeconomic variables; for instance, commercial portfolios might also take the BBB spread into account, commercial real estate is best determined by submarket price levels, cap rates, and vacancies to the framework, residential mortgage defaults generally track to the house price index more than unemployment and should reflect that fact, and other economy-wide factors can also be used, such as GDP growth or oil prices. It is important to build the adjustment framework to fit the portfolio, while also considering any current models or forecasts that might already use these macroeconomic variables.

The adjustment framework must also fit the portfolio for relief measures. The success rate factor should be altered by borrower industry or lending product, and the institution's history with a borrower should be considered where possible. For those borrowers who did not request stimulus, it will be important to understand their situation. The more specific an institution can be in its outreach to borrowers, the more accurately the success rate factor can be applied.

## Conclusion

The COVID-19 pandemic presents many challenges, not least of which is the inability of credit risk models to address a black swan event. The market shock has affected everyone from the retailers who cannot open stores to the local restaurant chains and their landlords. What this analysis suggests is that allowance models both for the incurred loss approach and the CECL approach are likely unequipped as is to capture the shift in the level and nature of credit risk that exists in institutions' portfolios. Adjustments are likely required to create a comprehensive view in three main areas:

1. Macroeconomic variables are common points of refinement for many community bank and credit union allowance models. A quantitative approach is ideal to respond to the economic shock in a reasonable and supportable way.
2. Certain lenders might be exposed to the risks presented by the coronavirus more meaningfully than others. Hotels in West Palm Beach, Florida are going to perform differently than trucking companies in Omaha, Nebraska. While the shutdowns affect everyone, the severity and nature of the impact will vary widely, which requires specific adjustments to properly estimate.

3. Individual lenders have had varying success in delivering the triage funding their borrowers need. Understanding this is key as the timeliness of the response could be the difference between a wave of defaults hitting an institution, and a trickle that can be handled through the traditional workout mechanisms.

It is critical to understand how your institution's current allowance process is structured to determine an appropriate path forward for identifying gaps and adjustments. Although this sample framework illustrates a starting point, further granularity and complexity is almost certainly required as data allows. As with any loan portfolio, borrower knowledge is paramount, as well as data availability for more granular, precise results.

### Additional resources from Moody's and Moody's Analytics

- » Moody's Topic Page on COVID-19  
<https://www.moodys.com/Coronavirus>
- » Forecasting the Impact of the COVID-19 Recession on Consumer Credit Losses  
[https://www.moodys.com/researchdocumentcontentpage.aspx?docid=PBC\\_1225782](https://www.moodys.com/researchdocumentcontentpage.aspx?docid=PBC_1225782)
- » Moody's Analytics – CECL And IFRS 9 Recommendations: Handling Shifting Economic Scenarios  
<https://www.moodysanalytics.com/-/media/article/2020/cecl-ifs-9-recommendations-handling-shifting-economic-scenarios.pdf>
- » Moody's Analytics – Severe Pandemic, a Protracted Economic Slump, and Commercial Real Estate Forecast Scenarios  
<https://vimeo.com/400733771?cid=OMH5PF4BPPF4311>
- » Moody's Investors Service - Worldwide, Coronavirus Aid Will Benefit Financial Institutions, But Could Raise Long-Term Risks  
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