# Methodological Considerations For Integrating ECL On a Stress Testing Platform

Jonathan Leonardelli,
Director of Business Analytics

**FRG**

# Contents

# Introduction

Financial Institutions (FIs) today have an interesting challenge involving their stress test process. How do they produce expected credit loss values (ECL) that not only reflect the stress scenario but also comply with the IFRS 9 or CECL standards?

The challenge stems from the fact that many FIs have created two separate processes: one to address the regulatory stress testing (ST) requirements and one to address the accounting standards updates. The likely reasons the two processes were created has to do with the different adoption dates (stress testing came before IFRS 9 and CECL) and the different objectives. **Table 1** provides a summary of the key differences between the regulatory stress testing and the accounting standards processes.[1]

There are two ways to address this challenge. The first approach is rooted in technology, one that focuses on using the IFRS 9/CECL and ST platforms in some

manner. For example, an FI might consider:

- **No integration:** The ECL platform runs outside of the ST platform and results are loaded into the ST platform
- **Semi-integration:** The ST platform triggers a run on the ECL platform with an automated load of the results.

The second approach is to consider a *methodological integration* of ECL with stress testing. This approach involves adding customizations to the current stress testing platform to accommodate the ECL process.

The remainder of this paper will focus on the methodological integration approach. Specifically, it will address methodological considerations for scenarios, credit risk parameters, and portfolio. For regulatory stress testing, this integration has been considered by some regulators. **Sidebar 1** (next page) provides a high-level overview of the approach the European Banking Authority (EBA) is taking for integrating IFRS 9 into its regulatory stress test.

---

1    For the remainder of the paper ECL will be used to indicate the results from an IFRS 9 or CECL run.

|  | **Stress Testing** | **Expected Credit Loss** |
|---|---|---|
| **Objective** | Capital Planning | Allowance and Provisions |
| **Type of Loss** | Unexpected | Expected |
| **Scenarios** | Regulator Specified | Financial Institution Specified |
| **Scenario Weights** | Not weighted | Weighted |
| **Credit Risk Parameters** | Point-In-Time | Lifetime / 12-month, point-in-time |
| **Portfolio Behavior** | Growth/Replenish | Static as of a date with run-off |

### Regulatory Stress Testing and ECL

Regulatory agencies have made it clear they expect to see the new accounting standards for credit loss represented in their stress test. The Federal Reserve let banks in the US know, back in December 2018, that it had "… amended its stress testing rules to require a banking organization that has adopted CECL to incorporate CECL in its stress testing methodologies, data, and disclosure… "[2]

Using a stress testing platform to satisfy a regulatory stress test is different than using it for an internal stress test. Regulatory agencies will likely prescribe how they want an FI to incorporate the IFRS 9 or CECL standards. Take, for example, the EBA's 2020 EU-wide Stress Test. In its methodological notes the following is stated:[3]

- **Scenarios and scenario weights:** assume perfect foresight.
- **Credit risk parameters:** stay constant (if in baseline scenario) or revert, over a 6-year period, to baseline values (if in adverse scenario) when calculating loss rates for S1 and S2 exposures.
- **Portfolio behavior:** stage 3 exposures are not replaced.

---

2     Statement on current expected credit loss methodology (CECL) and stress testing, December 21, 2018
3     2020 EU-Wide Stress Test – Methodological Note

## Scenarios & Scenario Weighting

As part of the calculation of ECL, FIs need to determine the number of scenarios to use along with their respective weights. For stress testing, scenario usage is different. The impacts to capital and profit and loss are determined under a single scenario at a time.

The use of multiple scenarios during an ECL run and a single scenario during a stress testing run makes sense given the platforms' different objectives. Multiple scenarios imply uncertainty about the future and allow for FIs to express their views of how the future unfolds, and its impacts on ECL, through scenario weights. A single scenario assumes a certain future (for each scenario) and asks FIs what their capital plan would look like given that future. This poses a challenge when trying to determine ECL on a stress test platform. How does an FI incorporate future uncertainty during the certain future imposed from a stress test?

To address this, an FI may want to ask these questions when thinking of scenarios to use for ECL during a stress test run. Note that these questions assume interest in having unique scenarios for its ECL calculations (instead of relying on perfect foresight imposed by the stress test scenario).

- How many scenarios should be used for the ECL process?
    - E.g., Maybe 2 scenarios would be enough: an optimistic scenario (i.e., economy is improving) and a pessimistic scenario (i.e., economy is getting worse). Then again, maybe 3 scenarios should be used, the third one capturing the behavior the other two do not.
- Should the number of scenarios change during the stress test forecast?
    - E.g., Maybe 2 scenarios (e.g., a bad and a worse) would be enough for the early forecast horizons but 3 or more would be needed for

later forecast periods.

- Should the values of the scenarios used by the ECL process be conditioned on where in the stress scenario run the ECL execution is occurring?
  - ° E.g., An optimistic scenario used by the ECL process in the 2nd quarter of a stress test run might show improvement later than an optimistic scenario being used in the 8th quarter of the stress test run.
- Should the scenario weights be static over the forecast horizon or should they change?
- If the scenario weights are changed, should they be based on where in the forecast they are?
  - ° E.g., A pessimistic scenario might have a lower weight applied to it in the 9th quarter of the forecast instead of the 4th quarter.
- If the scenario weights are changed, should they be based on management judgment or a model that is conditioned on the scenario?

Because IFRS 9 and CECL require lifetime loss calculations, the scenarios needed for these calculations are much longer than those needed for stress testing. As a result, an FI will likely want to use the decisions made for IFRS 9 or CECL to determine length of forecast, reversion behavior (if any), and post-reversion values of the macroeconomic factors.

## Credit Risk Parameters

IFRS 9 and CECL both require lifetime loss estimates (IFRS 9 also has a 12-month ECL estimate) to derive their total ECL. In order to calculate these estimates, an FI must consider multiple factors, some of which are: current and forecast (i.e., forward-looking) macroeconomic environments, life of loans, and capturing changes with the economy (point-in-time,

<div style="border:1px solid">

### Terminology

**Point-in-time (PIT):** Loss parameters of this type represent behavior at a given point in time. Basing losses or capital on this type of metric results in fluctuations of their values over the course of a macroeconomic cycle. Stress testing, IFRS 9, and CECL requires this type of metric.

**Forward-looking:** When a process takes into consideration current and future periods.

**Perfect foresight:** The assumption that the behavior of a macroeconomic variable is known (i.e., follows the path outlined in a single scenario).

**Term structure:** A representation of a loss metric's (e.g., PD or charge-off) behavior from inception to maturity.

</div>

PIT, behavior). A common method to bring these components together is through the creation of a term structure.

Stress testing, on the other hand, is focused on calculating unexpected losses and the capital needed to cover those amounts. While PIT behavior is required, there is no need to recognize the losses related to the life of the loan. As a result, there is no need for a term structure.

Given these differences, is there some way to use the information produced during the stress test run in the ECL process? If so, how might it be done?

Consider a wholesale product at an FI that uses a timely and consistent method for updating its risk ratings. For the FI's ECL calculation, modelers have created probability of default (PD) term structures

for each risk rating. For the FI's stress testing process, modelers have developed models to estimate risk rating transitions. Each of these models serves a specific purpose: the PD term structures allow the FI to estimate loss over a lifetime and the transition matrices allow the FI to estimate rating transitions (as well as default behavior) during that period's economic environment.

How might this FI use the information provided from the stressed transition matrices in the estimation of the ECL? The following steps are one way to bring these two approaches together. For a given forecast horizon:

1. Derive the stress transition matrix based on the stress test's scenario.
2. Determine the current period risk ratings for the wholesale product accounts using the stress transition matrix. These risk ratings reflect behavior under a stressed environment.
3. Obtain the lifetime PD (and 12-month PD) from the risk rating term structures based on the ECL scenarios being used.
4. Calculate final weighted ECL value based on the PDs and other credit risk parameters.

This is an overly simplified approach. It excludes changes to remaining life of loan, staging rules (for IFRS 9), impacts of prepayment, and other requirements. However, it does illustrate how an FI can leverage information from the stress test platform in deriving its ECL value.

## Portfolio Behavior

One of the other main differences between the ECL process and stress testing is the treatment of the portfolio. The ECL process calculates the expected loss inherent in a portfolio *at a given point in time.*

This means that over the ECL forecast horizon, the portfolio does not grow. The only exposures that are part of the ECL calculation are those that were on-the-books during the last actual period (i.e., time zero).

For stress testing, the portfolio evolves over the forecast horizon. As a result, the make-up of the portfolio in forecast horizon 1 can be different than that in forecast horizon 7. How might this impact the application of the ECL process within the stress test platform?

From a platform execution point of view there is little impact. The requirement of holding a portfolio constant for ECL is satisfied because each forecast horizon acts, in effect, as the last actual period for the next horizon. This is the type of portfolio change an FI experiences when it runs its normal ECL process from one quarter to the next.

However, the complexity arises when considering *how* portfolio behavior will change. Both IFRS 9 and CECL require forward-looking information be used when estimating ECL. As a result, changes in the portfolio over the stress test forecast should be guided by this information as well as what is happening in the stress scenario.

Some questions an FI might want to ask:
- Does the current portfolio evolution used for stress testing capture forward looking behavior?
- How should information from the stress test process be fed into future evolution of the portfolio?
  - E.g., Smaller loan growth may occur in periods of extreme stress while larger loan growth may occur during less stressful conditions.
- How should the mixture of the loan portfolio change throughout the stress test?
  - E.g., A stress test focused on dropping home

prices may have little growth in the mortgage portfolio. A stress test focused on an emerging market crisis might grow the mortgage portfolio but reduce growth in the commercial and industrial portfolio.

For FIs required to follow the IFRS 9 standard, the process gets trickier. Not only do they need to consider questions like the above, but they also must consider the staging of accounts.

## Conclusion

With the changes required by the IFRS 9 and CECL standards, the ECL calculation within the stress testing framework will be more complex. However, there are steps an FI can take to produce ECL values within a stress test platform that are methodologically consistent with these standards.

While this paper focused on the methodological integration approach, an FI does have technical solutions at its disposal. There is even a "full integration" approach (see **Sidebar 2,** right**)** that might be worth considering.

Which option is best? Unfortunately, there is no single answer that can be applied to all FIs. Ultimately the FI will need to consider items such as: costs, efficiency gains or losses, impacts on different stakeholders, and time to implement. Once this assessment is complete the FI can move forward knowing it has made the best selection for itself.

### A Full Integration Approach

As stated in the Introduction, an FI may consider a technological solution – running ECL outside the platform or having some integration between the ECL and ST platforms. It should be noted that moving forward with a methodological approach lays the foundation for having a single platform that can execute both the ECL and stress testing process as needed. One may consider this the "full integration" approach.

Should an FI strive for a full integration approach? Some questions an FI may want to ask to determine if this is worthwhile are:

- Are there costs benefits of full integration versus the maintenance of two technological solutions?
- Are there technical efficiencies of having a single platform?
- Is one option less onerous than the other for all stakeholders involved?
- How might this impact internal and external audit processes of ECL?
- Is there a benefit of having a central source of data to feed ECL and ST platforms?

## What's Next?

FRG is helping clients right now to solve this problem by leveraging both methodological and technical integration techniques. Contact us to learn how we can help your organization ask the right questions and make the right decisions for you.

FRG is an international risk management firm dedicated to helping clients around the world maximize the effectiveness and value of their investments in risk management technology, methodology and processes. The firm was founded in 2002 with the concept of becoming the premier risk management services firm.

In addition to providing clients with expertise and guidance on creating platforms for stress testing and expected credit loss calculations, FRG offers business advisory services for risk management, data governance alignment strategies, program management and platform services for ongoing support.

# FRG

Visit us online at www.frgrisk.com.