

Effective Management of Nonperforming Loans Using SAS® Credit Assessment Manager

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ABSTRACT

High levels of nonperforming loans (NPL) or bad debt are problematic both to the bank and to the economy. NPLs from the 2008 financial crisis have persisted, and there is evidence of steady growth. Banks are under pressure to devise strategies to manage NPL portfolios. Financial regulations, such as IFRS 9, U.S. CECL and BCBS guidance on accounting for credit losses, have proposed key principles and pragmatics to identify, measure, and manage NPLs. Banks are in need of a solution to meet the systemic requirements of an NPL strategy—specifically, individual assessment of significant nonperforming exposures and high-risk performing loans (also called “watch-list”). However, given the high volume, individual credit assessment of loans without resulting in delayed expected credit loss (ECL) recognition is a challenge that banks are facing now.

SAS® Credit Assessment Manager provides a framework for both qualitative and quantitative assessment of NPLs individually. This framework, built on regulatory guidance, complements bank’s collective assessment methodology for estimated expected credit losses. Banks can properly diagnose an NPL using cash flows and collateral allocation in determining the impairment amount. SAS® Credit Assessment Manager is a workflow-based, stand-alone platform that seamlessly fits into any ECL calculation infrastructure. This paper discusses best practices and mechanics of using SAS® Credit Assessment Manager for individual assessment of an NPL.

INTRODUCTION

Troubled debt, bad debt, and nonperforming loans are different names given to a loan that is in default or close to being in default. In many situations, loans are classified as NPL after being in default for more than 90 days. According to the International Monetary Fund, a loan is nonperforming when payments of interest and/or principal are past due by 90 days or more, or interest payments equal to 90 days or more have been capitalized, refinanced, or delayed by agreement, or payments are less than 90 days overdue, but there are other good reasons, such as a debtor filing for bankruptcy, leading to misgivings that payments will be made in full.

Banks normally allocate capital to cover potential losses on loans (loan loss provisions) and write off bad debt in their profit and loss account. As the number of NPLs increases, the bank will need more allowance for potential losses, putting a constraint on the lending capacity of the bank. Bad debt is not only bad for the bank but also to the economy. Bad debt from the 2008 financial crisis has persisted, and there is evidence of growing bad debt in certain geographies. Nonperforming loans ratio in the US, has historically revolved around 1% and, in the European Union, has had a higher average number, with a 5% NPL ratio in 2017.

Financial regulations in the past and new regulations that came from the post-2008 crisis have devoted special attention to the treatment of NPLs. IFRS 9 and BCBS have proposed key guidance to identify, measure, and manage NPLs. European Central Bank (ECB) is forcing banks to address NPLs and improve asset quality. The guidance from ECB applies not only to recognized NPLs but also to all nonperforming exposures and performing exposures with an elevated risk of turning nonperforming. (These are also called “watch-list” exposures.) The guidance focuses on both qualitative and quantitative elements of addressing NPLs. The guidance clearly highlights and articulates the process, controls, and changes to culture that should be set up to reduce NPL levels. That can only happen by devising a solid NPL strategy.

Financial institutions are expected to conduct internal assessments to understand the scale of an NPL portfolio and to assess the internal operating environment to understand the capabilities. The NPL strategy needs to be fully embedded in the risk management framework. Supervisory initiatives such as asset quality reviews (AQRs) have further emphasized the need for consistent allowance for loss and provisioning methodology. Effective loss provisioning is critical for ensuring a sound banking system and hence is a key focus of regulators. Loan loss assessments can be performed at the collective exposure level or the individual level. Individual assessments are often conducted for significant exposures, or where credit concerns have been identified at the individual loan level.

It is understood that devising a high-level NPL strategy plan encompassing all these factors is not easy, but the biggest of the challenges is to actually implement that strategy. Banks are in need of a solution to meet the systemic requirements of an NPL strategy: specifically, individual assessment of significant nonperforming exposures and high-risk performing loans (also called “watch-list”). However, given the high volume, individual credit assessment of loans without resulting in delayed expected credit loss (ECL) recognition is a challenge banks are facing now.

CONTEXT

A typical process for conducting individual assessment of loans starts with identifying the loans that are eligible for individual assessment. Supervisory expectations concerning sound credit risk assessment and valuation for loans are based on conducting collective and individual assessments of loans. The criteria used for identification differ slightly for each regulation. According to IFRS 9, loans or instruments are classified into three buckets: Stage1, Stage 2, and Stage3.

Stage 1	These are performing loans with no significant increase in credit risk since the Initial Recognition . (This is where all assets subjected to credit risk start out in a financial firm’s portfolio.)
Stage 2	These are underperforming assets that are flagged as having contracts that include an increased credit risk in the period since the Initial Recognition.
Stage 3	Nonperforming assets that have credit impaired contracts.

According to the IFRS 9 standard, the objective of the impairment requirements is to recognize lifetime expected credit losses for all financial instruments for which there have been significant increases in credit risk since initial recognition — whether assessed on an individual or collective basis.

COLLECTIVE ASSESSMENT

Banks need sufficient information and substantial resources to assess every single exposure individually in the bank’s books. Given hundreds of thousands, or even millions, of small exposures to retail customers and small businesses that banks can have, it is impractical to perform individual assessments of an entire portfolio. Hence, banks manage these exposures on a collective basis by groupings based on product categories, business segments, or similar risk characteristics.

INDIVIDUAL ASSESSMENT

Individual Assessment (IA) is carried out for a selected set of significant exposures whose credit quality has deteriorated significantly since initial credit recognition. In addition, at the bank’s discretion, customers that are otherwise healthy might also require IAs. However, individual assessment requires sufficiently comprehensive and updated information. Individual assessment is done at the level of the counterparty (the borrower: *individual* or *business*) rather than the individual financial instrument. Such assessment at the counterparty level is only allowed if it is consistent with the requirements for

recognizing lifetime ECLs, and the outcome would not differ from the outcome if the financial instruments had been individually assessed.

All Stage 3 loans are prime candidates for individual assessment. However, certain high exposures from Stage 2 buckets also fall in the individual assessment radar due to significant changes in credit risk, or the bank might seem to set up early warning indicators by performing individual assessment for these loans.

In a typical ECL calculation setting, both individual assessment and collective assessment monthly cycles are performed in parallel. In most cases, the individual assessment will be fed with information from previous collective assessment cycle. IA is a time-consuming task compared to collective assessment. This will be clear as we explain in later sections the detailed execution steps for IA. Using both assessment methodologies, the bank can reconcile the credit loss amount calculated by collective assessment with the amount from individual assessment. The results from individual assessments enable banks to devise effective strategies in dealing with nonperforming loans.

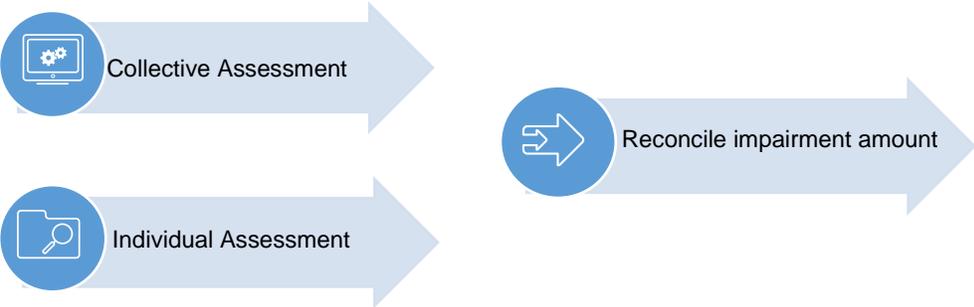


Figure 1. Collective Assessment and Individual Assessment

In the US, according to GAAP (General Accepted Accounting Principles), loans identified as impaired with ASC-310-10-35 (FAS 114) status must be evaluated for reserves individually. Also, all Troubled Debt Restructuring loans (TDR) are considered impaired loans and hence are eligible for individual assessment. Further, the FAS 114 statement suggests various approaches to use for measurement of impairment amount using the present value of expected future cash flows discounted at the loan's effective interest rate and the fair value of the collateral, if the loan is collateral dependent. This is identical with the NPL guidance from ECB. This paper is intended to highlight the individual assessment process in accordance with expectations from IFRS 9 and ECB guidance on nonperforming loans. However, this process applies, in substantial measure, to how impaired loans are assessed and measured to meet U.S. FAS 114 expectations.

Conducting individual assessments, in a sustainable manner, requires a well-defined framework supported by a proper technology foundation. Especially for situations with high volume of NPLs, conducting individual credit assessment without resulting in delayed expected credit loss (ECL) recognition is a challenge. The rest of the paper talks about the individual assessment process as implemented in SAS® Credit Assessment Manager.

INDIVIDUAL ASSESSMENT USING SAS® CREDIT ASSESSMENT MANAGER

SAS® Credit Assessment Manager provides a framework for both qualitative and quantitative assessment of NPLs individually. This framework, built on regulatory guidance, complements the collective assessment of bank assets. SAS® Credit Assessment Manager automates the process of categorizing impaired loans, down to the individual assessment level – whether they are nonperforming loans, related exposures, or unlikely to pay. Banks can properly diagnose an NPL using cash flows and collateral allocation in determining the impairment amount.

Individual assessments are expected to be conducted on a monthly or a quarterly cycle. A typical IA cycle involves the following tasks:



Figure 2. Individual Assessment Process Flow

IDENTIFY SIGNIFICANT EXPOSURES

As previously stated, each regulation suggests criteria for use for applying loans for individual assessment. For example, according to IFRS 9, all Stage 3 loans should be assessed individually. Also, each financial institution can choose to set up additional criteria to select loans, such as loans on watch-lists that should be individually assessed for various reasons. SAS® Credit Assessment Manager supports selection of exposures using various exposure levels and counterparty-level characteristics. Example criteria used in SAS® Credit Assessment Manager are as follows:

- **Impairment Status:** Loans that are impaired or in default (90 days past due).
- **Asset Class:** Loans that belong to a specific asset class in a portfolio type. Example: Loan leases in a corporate portfolio.
- **Exposure Threshold:** Loans that exceed the defined threshold for each portfolio and asset class type that are selected for assessment.
- **Risk Rating:** Loans that are assigned a specific internal risk rating. For example, many banks provide a risk rating on a scale of 1,2,...12.

Banks should pay attention to use of these criteria since this selection defines the number for loans that get qualified for assessment, and the organizations should have adequate resources (personnel and time) to complete assessments within the ECL cycle. The criteria should be used as a prioritization tool to identify those product types or exposures.

In addition to the selection parameters described above, another key criterion used for identifying the list of counterparties is the validity of previous IA. The individual analysis does not need to be performed on a monthly basis for all the automatically selected counterparties, as the most recent one will remain valid as long as nothing significant has happened to the existing relationship with the counterparty or with the external macro-economic environment. Example triggers that can expire the validity of an assessment are as follows:

- A change in the stage or rating given to the counterparty.
- There is a material issue in the updated counterparty financial statements.
- There is a change in the FX rate by more than 10%.
- There is a credit line renewal or disbursement of a new loan

ASSIGN TO ANALYST

As part of the overall framework, the bank should set up the appropriate personnel who can conduct individual assessments without any conflict of interest. This means that the assessment and review process should involve persons not associated with providing or granting credit. As the name implies, individual assessment involves examining a loan profile very closely by reviewing comprehensive loan characteristics, collateral information, and historical loan performance. For an effective assessment, the case has to be assigned to an analyst or an officer who has information and knowledge about the counterparty—that is, the person who performs the individual assessment knows the counterparty well,

and the information provided about the counterparty is recent and true. This information, not available from the loan transactional data, plays a vital role in developing a proper recovery or restructuring strategy. SAS® Credit Assessment Manager automatically assigns the cases as they are generated to respective analysts and supervisors.

QUALITATIVE ASSESSMENT

The first step of an assessment is qualitative analysis of the counterparty using all available information. A bank might have different contracts (loans) or relationships with one counterparty. And not all loans of a counterparty might be impaired. However, there is a possibility for contamination, and performing loans of the counterparty can gradually become nonperforming loans. This possibility can be assessed by the analyst by conducting a qualitative assessment. Also, qualitative assessment can help banks in determining other possibilities such as probability of loan restructuring.

SAS® Credit Assessment Manager provides detailed (customizable) questionnaires for both commercial and consumer portfolios covering various topics. For corporate portfolio, the topics include management capacity, restructuring details, competitive position, contingencies, relationship with credit institutions, financial analysis, and business environment. For consumer portfolios, the topics cover relationship with credit institutions, contingencies, and other factors. The questionnaire assessment will serve as a mechanism for the risk function to make informed decisions about a proper NPL strategy. Some strategies that banks might look into based on assessment outcome as suggested by ECB guidance are as follows:

- Forbearance
- Collateral liquidation
- Sale of exposure (exit)
- Debt to equity swap

CALCULATE IMPAIRMENT

Calculation of impairment amount individually requires a variety of information available for each exposure. A key input used is CFADS (Cash Flows Available for Debt Service) of the counterparty (individual or business). CFADS measures the amount of cash that a company has in relation to the debt service obligations. This is derived from the analysis of the counterparty’s business including a close examination of the balance sheet. This data is usually sourced externally. With regard to the retail counterparties, income available for debt repayments (that is, after considering any other inelastic expenses) will constitute CFADS.

All collateral information associated with the counterparty and other future cash flows from asset sales is considered. The impairment amount is calculated by deriving the balance or gap between contractual cash flows of the counterparty and CFADS, Collateral, and other cash sources combined. The contractual cash flows represent the outstanding balance on the exposures.



Figure 3. Impairment Calculation Input

When dealing with loans where it is certain that the bank will be unable to collect all amounts due (including both interest and principal), according to the contractual terms, the impairment amount is calculated by deriving the recoverable value from collateral liquidation and discounting cash flows from any asset sale. However, for loans where there is cash flow from operations that are expected, the analysis will be effective using different economic scenarios for realizing CFADS.

CFADS AND SCENARIOS

In SAS® Credit Assessment Manager, the analyst can set up economic scenarios that define the probability of realization of the CFADS. The most common is to define three scenarios (baseline, optimistic, and the pessimistic case). Each scenario is given a weight, which is used in calculating a weighted impairment amount. The scenarios are expected to resemble the macro economic environment in which the counterparty operates. The analyst can also enter a number to indicate how much of the CFADS of the counterparty is available for the bank.

The screenshot shows the 'Impairment Calculation' tab in SAS Credit Assessment Manager. It includes sections for 'EIR of Instruments', 'Net Present Value of Contractual Cash Flows', and 'Scenario Definitions'. The scenario definitions section contains instructions and input fields for scenario probabilities and weights. Below this is a table for 'CFADS Deviations' with columns for Period, CFADS, CCF, and Bank-related metrics for three scenarios (S1, S2, S3).

Scenario Definitions:

Define the percentages and weights below before starting the next step in the workflow.

Probability (%) per scenario that CFADS will be realized.

Weighted sum of impairment amounts calculated per scenario for all instruments of a given counterparty. $Impairment = Wt1 * ImpAmt1 + Wt2 * ImpAmt2 + Wt3 * ImpAmt3$

Scenario 1 %: * 75

Scenario 2 %: * 60

Scenario 3 %: * 40

Scenario 1 Weight: * 20

Scenario 2 Weight: * 50

Scenario 3 Weight: * 30

CFADS Deviations:

Define the bank percentages for each period across the three scenarios, before moving to the next step in the workflow.

Period	CFADS	CCF	S1: Bank %	S1: Bank Amt	S1: CFADS	S1: Deviation	S2: Bank %	S2: Bank Amt	S2: CFADS	S2: Deviation	S3: Bank %	S3: Bank Amt	S3: CFADS	S3: Deviation
2017	99,000	100,000	90	89,100	66,825	-33,175	80	79,200	47,520	-52,480	70	69,300	27,720	-72,280
2018	84,750	100,000	90	76,275	57,206.25	-42,793.75	80	67,800	40,680	-59,320	70	59,325	23,730	-76,270
2019	81,400	100,000	90	73,260	54,945	-45,055	80	65,120	39,072	-60,928	70	56,980	22,792	-77,208
2020	99,000	100,000	90	89,100	66,825	-33,175	80	79,200	47,520	-52,480	70	69,300	27,720	-72,280
2021	100,000	100,000	90	90,000	67,500	-32,500	80	80,000	48,000	-52,000	70	70,000	28,000	-72,000

Figure 4. Defining Scenarios and Allocating CFADS

COLLATERAL LIQUIDATION

Collateral associated with all exposures should be considered for IA. The recoverable amount from collateral liquidation is calculated using the market value of the collateral, time to sale, and sale cost haircuts. Other collateral pledge obligations such as prior liens are deducted before deriving the net value that is available for calculations. The final recoverable amount is discounted back based on the time to recovery and the EIR (effective interest rate) of the loan at origination.

SAS® Credit Assessment Manager provides a robust methodology to handle collaterals that are pledged among various exposures. For a given collateral, various characteristics are collected and tracked and properly used in collateral liquidation and recoverable amount distribution between exposures. Figure 5 shows how loans and collateral are linked to a counterparty in SAS® Credit Assessment Manager.

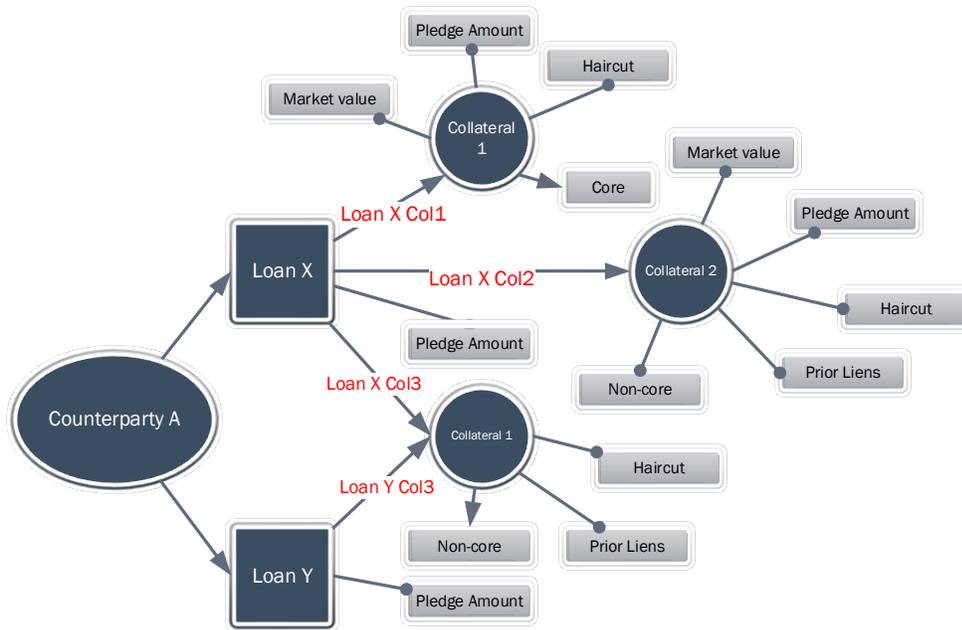


Figure 5. Interconnected Exposures, Collateral, and Counterparty

IMPAIRMENT CALCULATION

The impairment amount can be calculated by various methods. Each bank can come up with a calculation algorithm that best fits their NPL and risk management strategy. The algorithm can be as simple as subtracting present value of recoverable amount from current outstanding balance to a complex method where probability-weighted cash flows based on the binomial probability tree in each individual period are used. A bank can also prioritize how collateral is liquidated when multiple collaterals are pledged for exposures.

SAS® Credit Assessment Manager implements an iterative calculation algorithm to calculate the impairment amount for all three scenarios. The algorithm allocates and discounts CFADS and any other cash sources available among exposures, on a pro-rata basis, based on the respective outstanding balance. EIR of the loan at origination of the exposure is used for discounting the CFADS and other cash sources. The system then determines if collateral is required to cover the gap (difference between allocated CFADS and outstanding balance). The allocation of collateral is performed iteratively until no gap exists for each exposure and each scenario or until all available collateral have been used.

Impairment amount for an exposure for one scenario =

$$Outstanding\ Balance - f(Collateral, Discounted\ CFADS^*, Discounted\ Other\ Cash\ Sources^*)$$

(*prorated by balance of the exposures if multiple instruments for a given counterparty)

Final Impairment Amount=

$$\sum_i \sum_s gap_{i,s} * weight_s$$

for all exposures 1..i, across three scenarios

SAS® Credit Assessment Manager presents a detailed, step-by-step calculation result across all three scenarios and all steps in the iterative calculation process (Figure 6).

CFADS Non Core Collateral <u>Core Collateral</u>				
	Scenario 1 (75.0%)	Scenario 2 (60.0%)	Scenario 3 (40.0%)	Impairment Amount
Instrument ID: I_10400, EIR: 0.065				
EAD	26,000.00	26,000.00	26,000.00	
Total Non-Core Collateral	0.00	0.00	0.00	
Total Core Collateral	1,615.56	1,615.56	1,615.56	
Gaps	-24,384.44	-24,384.44	-24,384.44	
Discounted CFADS prorated by EAD	20,425.98	14,525.14	8,473.00	
Other Cash Sources	816.51	816.51	816.51	
Gaps	-3,141.95	-9,042.79	-15,094.93	
Impairment Amount				-9,678.26
Instrument ID: I_10430, EIR: 0.035				
EAD	29,400.00	29,400.00	29,400.00	
Total Non-Core Collateral	2,272.21	2,272.21	2,272.21	
Total Core Collateral	0.00	0.00	0.00	
Gaps	-27,127.79	-27,127.79	-27,127.79	
Discounted CFADS prorated by EAD	24,013.86	17,076.52	9,961.30	
Other Cash Sources	1,042.90	1,042.90	1,042.90	
Gaps	-2,071.04	-9,008.37	-16,123.59	
Impairment Amount				-9,755.47

Figure 6. Impairment Calculation Result in SAS® Credit Assessment Manager

REVIEW AND APPROVAL

The assessments, both qualitative and quantitative, performed by the analyst will have to be reviewed by supervisors to validate the results and perform any overrides if required before the results are sent for reconciliation with results from collective assessment. Typically, there are two to three levels of approvals that exist in an IA process.

SAS® Credit Assessment Manager supports setting up multiple levels of validation or approval with an option to set certain levels to have the ability to change calculation parameters and results, while others only approve or reject. Figure 7 shows an example approval workflow with two levels of approval: Supervisor and Risk Supervisor.

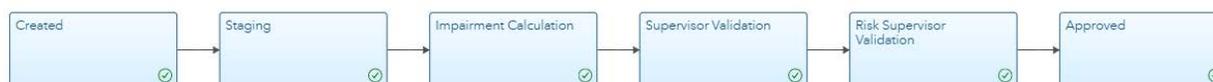


Figure 7. Individual Assessment Workflow Process Showing Supervisor Review Steps

Supervisor is a role that belongs to the same line of business with just approve/reject capability. But Risk Supervisor is a higher level role like a risk function or a more senior-level manager who can override the results with a valid business justification.

Once approved, the results are integrated back with the collective assessment ECL results where managers who are responsible for overall ECL calculation can make a decision on which number to use for regulatory reporting and for management decisions.

OTHER BENEFITS OF USING SAS® CREDIT ASSESSMENT MANAGER

SAS® Credit Assessment Manager is built using SAS® Risk Governance Framework, a robust risk content development and delivery platform, which hosts a variety of content such as SAS® Model Risk Management, SAS® Governance and Compliance Manager, built To create workflow-centric risk management solutions. SAS® Credit Assessment Manager is a stand-alone solution that integrates with any IFRS 9 or Current Expected Credit Loss (CECL) architecture.

WORKFLOW

SAS® Credit Assessment Manager is powered by a workflow system that provides a collaborative infrastructure for the setup, performance, and monitoring a defined sequence of tasks. This includes orchestration of all parts of the business process and the management of all user interactions and administrative tasks. It provides a suite of applications and services that work together to model, automate, integrate, and streamline business processes. The workflow underlying IA process management will assign tasks for systems, people, and roles. It also provides integration between people, systems, and business logic according to the steps defined in each business process. Figure 8 shows the sequence of steps, which are set up in the workflow for the impairment calculation step:

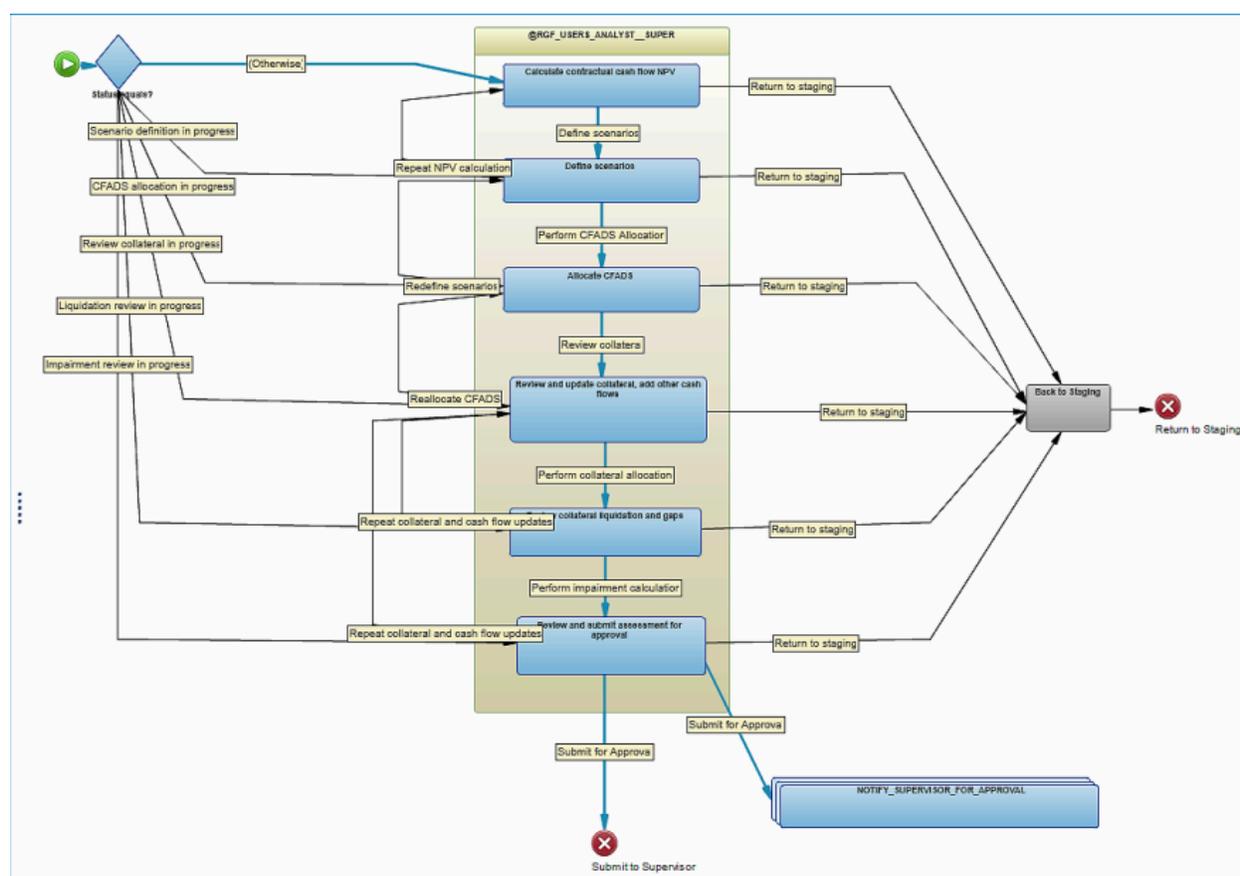


Figure 8. Part of Individual Assessment Individual Workflow in SAS® Credit Assessment Manager

A systematic, workflow-driven process establishes different economic scenarios and available cash flows, aligning them with rigorous analytical methods to arrive at a revised impairment amount. The workflow then maps these results to the percentage of cash flows that are available to service debt under each scenario, including the application of collateral and related factors.

TRACK AND REMEDIATE ISSUES

Issues can be noticed during the assessment or when validating the assessment. In many situations, issues are expected to originate in the review and approval by the supervisors or generic audit process by internal audit. Issues could be related to quality of data used for analysis, errors in the inputs from analysts in calculation, or they could be documentation-related. Action plans or remediation plans that correspond to issues can be developed and assigned to the appropriate stakeholders to respond to issues. Issues can be logged, tracked, and prioritized within SAS® Credit Assessment Manager. The capability to monitor them by severity and resolution date helps IA supervisors and administrators to complete the process faster. Using in-built workflows, accountability on the related action plans can be achieved with much success.

INTERCONNECTED EXPOSURES

SAS® Credit Assessment Manager links both exposures and collateral to counterparties, related legal entities, and parties of interest, enabling the evaluation of all related exposure factors. It is integrated with SAS Expected Credit Loss (IFRS 9 or CECL) to assess required provisioning through stress tests and quality reviews, providing timely reports on impairment through recognition of loan losses.

FULL TRANSPARENCY

SAS® Credit Assessment Manager offers a complete audit trail of workflow, including documentation of decisions ranging from foreclosures to concessions, reclassifications, or modifications. It provides clearly architected hooks to get data provisioned by the IFRS9 data marts and likewise provides a data integration hooks to reconcile the revised ECL results with the collective assessment ECL results. It also enables automated escalation of any reclassification decision that requires additional evidence, such as performing or nonperforming forbore exposures with inadequate payment plans. A transparent process for selecting nonperforming exposures and associated counterparties assesses each position individually, computing revised impairment amounts periodically for fully transparent management reporting.

CONCLUSION

With new regulations, banks have heightened pressure in assessing nonperforming loans at frequent intervals. A bank's ability to assess, manage, and optimize returns on impaired loans depends on a well-defined strategy, framework, and culture for handling NPLs. In addition to NPLs, financial institutions are also exploring ways to effectively monitor significant performing exposures to watch for any potential indicators of performance deterioration. However, without an appropriate governance structure and operational setup, banks will not be able to address their NPL issues in an efficient and sustainable way.

SAS® Credit Assessment Manager provides a framework for both qualitative and quantitative assessment of individual nonperforming loans, enabling financial institutions to obtain the information needed to establish capital reserves, mitigate losses, and improve collections. It was designed based on the NPL guidance from the European Central Bank, as well as on other international regulatory guidance such as US FAS 114, and it complements the collective IFRS 9 or CECL assessment of a bank's credit portfolio.

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