EFFECTIVELY MANAGING CREDIT RISKS IN THE NEW NORMAL

Abstract

The economic fallout of the COVID-19 pandemic has resulted in significant increase in credit risks for financial institutions (FIs) across the globe. Additionally, the pandemic has exposed several key shortcomings in the existing credit risk management function of institutions. To effectively manage their credit risk challenges now and in future, firms need to adopt new approaches. Six key elements should form the bedrock of any new credit risk management approach that an FI would adopt.

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Introduction

COVID-19 has exacerbated the credit risks for financial institutions. Since the onset of the pandemic, many regions across the world have faced massive rise in unemployment levels, increased hardship for businesses, and the economic downturn in general. These factors have, as a result, led to a substantial rise in credit risks for FIs.

For example, for banks in the U.S., average loan loss provisions grew by 137% YoY in 2020. Similarly, European institutions witnessed an YoY increase in average loan loss provisions of 113% in 2020.[1] Across the globe, banks had provisioned US$1.15 trillion by Q3 2020 for loan losses — more than they did in 2019.[2] In Japan, the three megabanks — Mitsubishi UFJ Financial Group Inc., Sumitomo Mitsui Financial Group Inc., and Mizuho Financial Group Inc.— reported the highest nonperforming loan ratios in over three years for the quarter ending March 2021. [3]
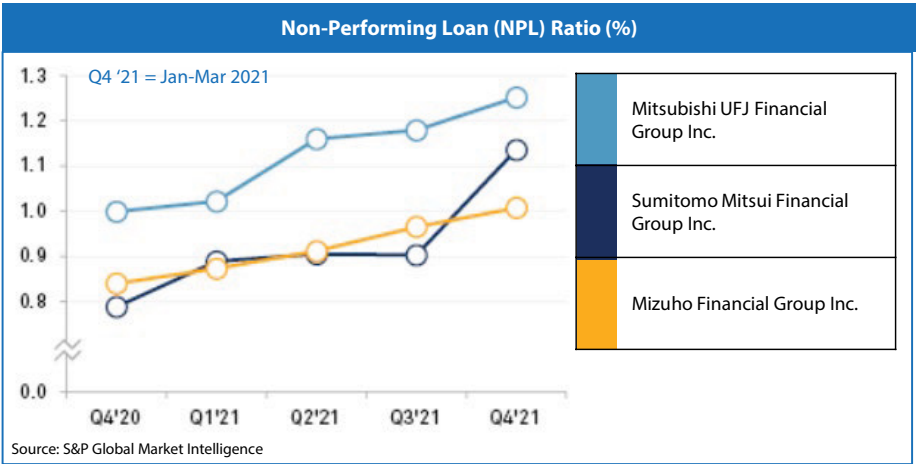
Non-Performing Loan (NPL) Ratio (%)

Source: S&P Global Market Intelligence

Figure 1: Japan's megabanks face rising credit risk[4]

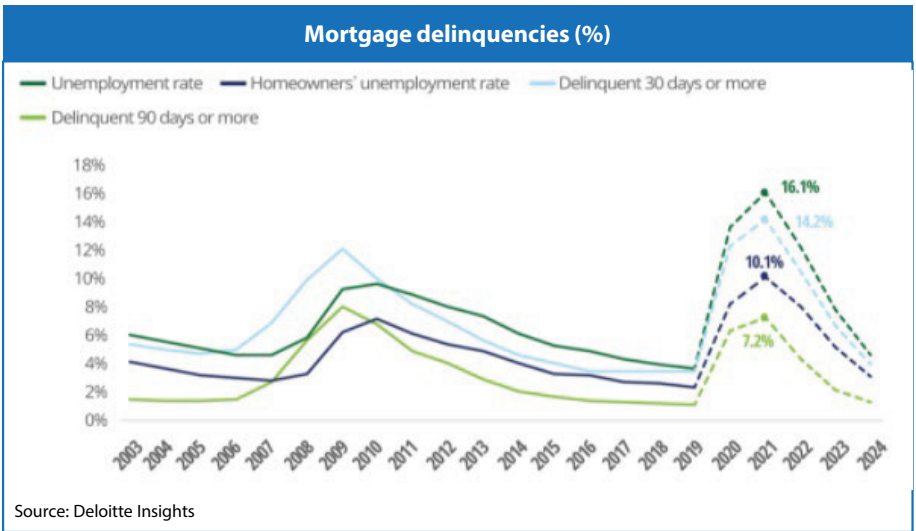**Mortgage delinquencies (%)**

Source: Deloitte Insights

Figure 2: Rising mortgage delinquencies in U.S.[5]

Following are some of the key credit risk challenges that FIs have been facing since the onset of the pandemic.

	Increase in loan default and loan payment deferrals, reduction in loan recovery rate, and rise in loan losses
	Deterioration in credit quality, and decline in value of collateral for the secured loans
	Increased burden on mortgage servicers (due to mortgage forbearance relief such as under U.S. CARES Act)
	Pressure to speedily fulfil the aggravated demand for emergency credit (from individuals and businesses)
	Intensified counterparty credit risk (due to increased volatility and sharp drop in prices across asset classes)
	Heightened credit concentration risks (to industries such as dine-in restaurants, airline, and cruise, that require prolonged close physical proximity amongst the customers)

Figure 3: Key credit risk management challenges for FIs since COVID-19

The pandemic has laid bare the shortcomings in the credit risk management function of institutions

COVID-19 has brought to the fore several key inadequacies in the FIs' existing credit risk management function.

Dimension	Shortcoming
Risk models	The existing credit risk models of firms (such as for estimating probability of default (PD), loss given default (LGD), exposure at default (EAD), current expected credit loss (CECL), credit pricing, and credit risk rating) have been unable to cope with the changed economic scenarios of the new normal. These models have failed to effectively account for the key post COVID-19 factors such as high extent of economic shutdown, extreme volatility, government stimulus, and liberal forbearance programs. It was found in European Central Bank's (ECB) targeted review of internal models (TRIM) of 65 banks, that the credit risk models for retail and small and medium-sized enterprises (SME) portfolios have low risk differentiation. [6] Further, several weaknesses with high or very high impact for LGD parameters were identified. [7]
Systems	Existing fragmented and rule-based systems are: a) Unable to provide holistic picture and real-time insights (on the risks involved, credit concentrations, customer lifetime value, etc.), b) Don't consider non-traditional and unstructured data types for effective credit scoring, c) Require costly manual intervention, and d) Lack optimal integration with the newer customer channels
Process	There is surfeit of suboptimal processes. For example, loan application to closing process take several weeks and involve numerous staff. Similarly, there is lack of a robust process for tracking the outstanding loan documents, or for collecting current financial information from borrowers.
Competition	Traditional FIs are unable to effectively counter the threats to their lending businesses from the new-age BigTechs, FinTechs, and neo-banks — such as Amazon, Apple, OnDeck, Kabbage, and Quicken Loans. These technologically advanced and agile lenders have created new excellence in customer experience and are fulfilling the emergency credit demands of customers within just few days.
Regulatory	Firms are unable to effectively comply with the newer credit risk management mandates such as those related to revised Basel III framework, CECL, IFRS 9, and FRTB CVA. Since the onset of COVID-19, the regulatory and supervisory scrutiny (such as from Federal Reserve Board, BCBS, ECB) of FIs' credit risk management function has further intensified.

Figure 4: Key credit risk management inadequacies of FIs exposed during COVID-19

Financial institutions need new approaches to effectively manage their credit risks

To effectively manage their credit risk challenges now and in future, firms need to adopt new approaches. Six key elements should form the bedrock of any new credit risk management approach that an FI would adopt.

Responsive and dynamic strategy	Strong risk modeling capabilities	Integrated and digitalized solution	Robust data infrastructure	Expanded stress testing	Ongoing customer support

Figure 5: Key elements of the new approach for managing credit risks

1) Responsive and dynamic strategy:

Financial Institutions need to sharpen their credit risk identification, measurement, and monitoring processes. This is important to be able to proactively anticipate the deterioration in borrower's creditworthiness, accurately recognize credit concentration risks, identify the customers and segments with higher risk vulnerability, and effectively manage the loan losses.

Institutions should focus on performing more dynamic and frequent review of their overall loan portfolio, portfolios of specific customer segments, and the individual customers at high risk. For corporate customers, this review must pay close attention to the key indicators of the borrower — such as free cash flow, EBITDA margin, cost structure, days payable and days sales outstanding, cash conversion cycle, interest coverage ratio, and net financial position.

Furthermore, for effective counterparty credit risk management, institutions must revisit existing contracts with the counterparties that are at most risk, conduct timely revaluation of the collateral, look out for covenant breach, and actively work with the market intermediaries to remain abreast of any changes to the counterparty's standing.

To manage their loan portfolio concentration risks effectively, firms must assess this risk by geography, industry, and specific customer segments. For example, several densely populated urban areas have witnessed high COVID-19 positivity rates. Consequently, these regions have higher concentration of distressed borrowers. Similarly, industries such as hospitality, outdoor entertainment, and transportation industries have witnessed higher level of economic impacts during the pandemic. Therefore, these industries pose higher level of credit risks in the near term. Likewise, at segment level, SMEs that generally rely on continuing cash flow to fund their day-to-day operations pose higher levels of credit risks for FIs in the current environment.

Financial Institutions can also consider forming partnership with FinTechs and other new-age lenders. As an example, Santander UK has partnered with several FinTechs on a multi-year transformation program and to implement end-to-end customer onboarding, credit risk management, and fulfillment solution. They are leveraging ACTICO's credit risk management platform that allows the bank to effectively manage risk rating models on a robust and centralized platform. ACTICO is a Germany-based credit and risk management solution provider. [8]

2) Strong risk modeling capabilities:

Financial Institutions should work on strengthening their credit risk models and their model management capabilities. To achieve this, they should review and build an inventory of their models at risk. Post this, the required adjustments should be made based on a thorough review of the performance and underlying assumptions of these models. It is pertinent that the models for each customer segments are specifically reviewed and recalibrated since each segment is impacted differently due to major shifts in the economy during periods such as the current pandemic.

To bolster their model management capabilities, firms can adopt a model factory approach. This would:

- Help streamline the model development, validation, and maintenance processes,
- Enable collaborative consumption,
- Drive standardization and innovation,
- Speed model delivery, and
- Reduce model management cost.

AxiomSL's IntegratedModelView module, offers flexible options to FIs for managing the credit risk models. It enables automated, transparent, and flexible end-to-end model management and execution capabilities, along with dashboards for model monitoring and trend analysis. [9]

It is recommended that FIs adopt a champion and challenger model approach. In this approach, the existing (i.e., champion) models are retained, and in parallel alternative (i.e., challenger) models are deployed as test. The differences in the performance and predictions from both these models are periodically analyzed to understand the weaknesses in champion models and recalibrate them.

For instance, Experian developed a Web Data Insights (WDI) solution that can be used in portfolio evaluation and credit decisioning while complementing the existing traditional credit risk modelling. [10]

3) Integrated and digitalized solution:

Financial Institutions should work towards replacing their fragmented rules-based credit risk management solutions with modern integrated solutions that are underpinned with new-age digitalization capabilities — such as hybrid multi-cloud and microservices-based architecture, advanced analytics, artificial intelligence (AI), machine learning (ML), natural language processing (NLP), and robotic process automation (RPA). This would enable accelerated credit decisioning, improved credit risk management, and reduced total cost of ownership (TCO).

Following are some of the key features that a robust integrated and digitalized credit risk management solution can provide:

Feature	Elaboration
Seamless integration via smart APIs	o With FI's other internal systems — such as core banking, customer information system (CIS), customer relationship management (CRM), loan origination, portfolio management, and collateral management. o With external systems such as business customer's financial systems, counterparty accounting system, and external credit data providers and rating systems.
Near real-time insights	o Leveraging myriad internal and external data sources — both structured and unstructured, to enable sophisticated pre-screening, underwriting, and credit decisioning; adaptive credit risk scoring; precise credit default prediction and more.
Advanced AI-based models	o Adaptive and dynamic credit risk models that leverage forward looking risk metrics and indicators and utilize advanced ML capabilities — such as Altman Z-Score, ANN, Gradient Boosting (e.g., XGBoost, LightGBM), Logistic Regression, Group Lasso, and SVM. o Sophisticated credit risk models that leverage non-traditional data such as socioeconomic conditions, geographic information, utilities payment records, and consumption patterns to support lending to creditworthy unbanked and underbanked borrowers who otherwise lack sufficient credit history.

Intelligent automation	o For example, in the following scenarios:
	  • Automated extraction of relevant details (using OCR and ICR) and analysis (using ML and NLP) of the borrower's document to identify and report discrepancies.
	  • Sophisticated collateral management.
	  • Collaborative workflow-based review and approval of credit decisions and full audit trail.
	  • Automated review and approval for low-risk borrowers.
	  • Smart alerts and notifications (on credit deterioration, etc.).
	  • Automated data sourcing, aggregation, enrichment, and dynamic data modeling.

Dynamic reports and dashboards	o Offering a real-time and 360-degree view of the credit risks, leading and lagging KPIs, at individual customer, segment, and overall portfolio levels. o Providing comprehensive risk assessment scorecards and heatmaps, advanced forecasting, causal and trend analysis, credit risk benchmarking and insights on models at risk.

Sophisticated tools	o Such as:
	  • Graph-based data visualization tools with advanced drill down capabilities to support model tuning.
	  • Virtual advisors for responding to customer queries.

Figure 6: Key features of integrated and digitalized credit risk management solution

Key Credit Risk Management Macroprocesses

| Underwriting & Pricing | Behavioral & Portfolio Monitoring | Credit Collection | Regulatory & Compliance | Audit & Control |

Bank's Internal Systems
- Core Banking
- Treasury Management
- Trade Finance
- CIS
- CRM
- Collateral Management
- Loan Origination System (LOS)

Data Lake & Data Hub

Internal data
- Customer data
- Transaction data
- Product-specific data
- Monthly performance data

External data
- Credit bureaus (e.g., Experian, Equifax)
- Other unstructured data (social media, mobile usage data, etc.)
- Macroeconomic data (e.g., GDP, unemployment rate, house price index, real DPI)

Decisioning and Analysis Engine
- Ratings calculation engine
- ML-based pricing optimization
- Automated early warning system
- ML-based models (PD, LGD, EAD, CECL, risk scoring, recoveries, etc.)
- Data analysis and drill downs

Model Risk Management

Centralized Reporting & Dashboarding
- MI and regulatory reporting
- Risk scorecards
- Scenario analysis
- Risk heatmaps
- Risk forecasting & trend analysis
- Simulation engine

Core Credit Risk Management System

| Credit Processing System | Credit Rating System | Collateral & Limits Management System | Collection & Recovery System |

Digitalization Enablers

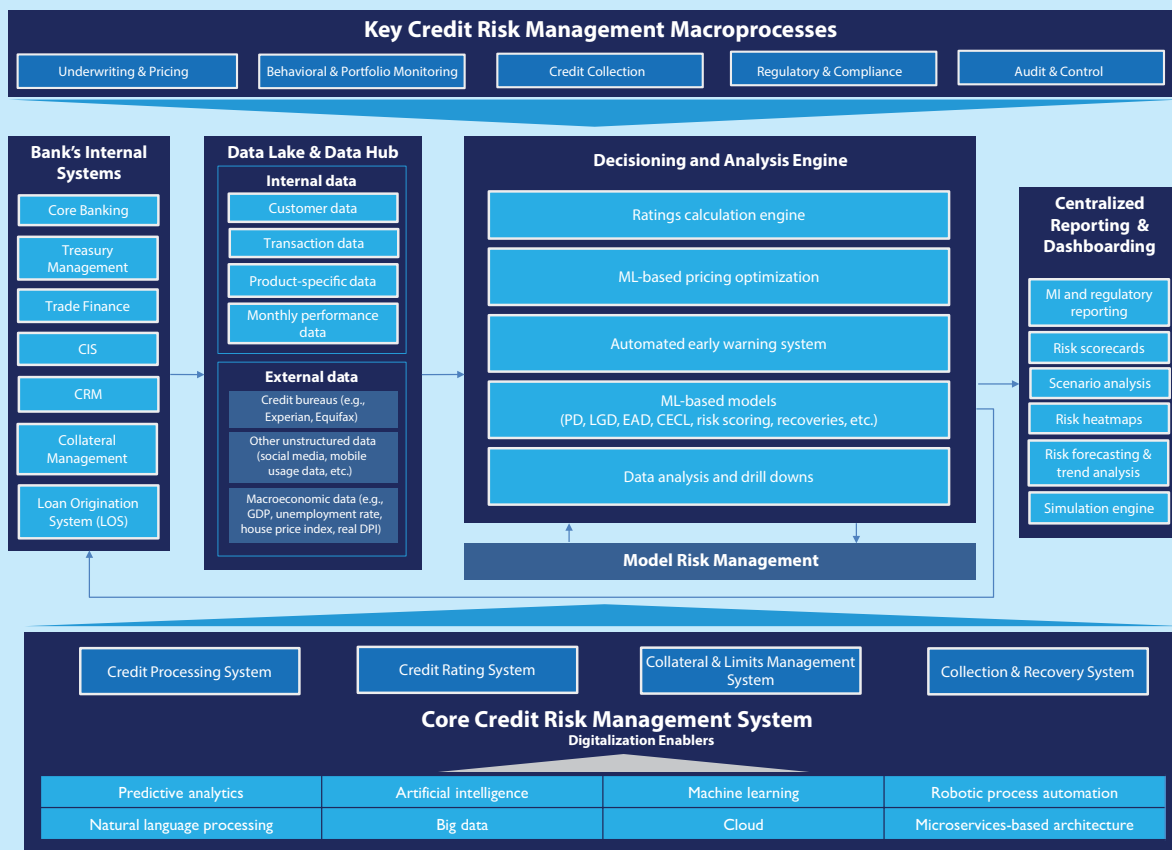| Predictive analytics | Artificial intelligence | Machine learning | Robotic process automation |
| Natural language processing | Big data | Cloud | Microservices-based architecture |

Figure 7: Illustrative integrated and digitalized credit risk management solution

SAS's solution, for example, supports end-to-end credit lifecycle management and complete model governance requirements (such as on through-the-cycle or forward-looking PD, LGD and EAD estimation). It incorporates application and behavioral scoring into its models for income estimation, prepayment, etc. [11]

Customers Bank leveraged OakNorth — a next-generation credit and monitoring platform — to boost its credit monitoring and portfolio management capabilities. The platform combines rich data sets (including unconventional data), cloud computing, and ML capabilities, to provide the bank with deep insights. Through 360-degree monitoring of the borrower's operational and financial data, it provides early warning indicators for credit quality deterioration. [12]

Several top banks in the UK are leveraging Artesian Solutions' "Risk & Compliance Hub" (ARCH) — a SaaS-solution for conducting smart accelerated pre-screening of the loan applications. Typically, ARCH reduces the time required for data gathering during onboarding phase by 90%. [13]

4) Robust data infrastructure:

For maximized benefits through digitalization investments, firms should expand the range of data sources leveraged for credit risk management. Therefore, in addition to traditional structured data like transaction and payment history, financial information such as debt-to-income and liquidity ratios, and reports from leading credit bureaus (such as Experian, Equifax, and TransUnion), firms should also leverage alternative unstructured data sources like the customer's internet footprints, social media data, mobile phone usage data, spending behavior from e-commerce sites, business networks and news, and from other third party data providers. This would significantly strengthen the firm's credit risk management capabilities. Moreover, the usage of alternative data sources would allow firms to ascertain risks and offer credit to even the underbanked and unbanked customers that have little to no credit history.

For example, LenddoEFL has been utilizing alternative data such as digital footprint, mobile phone data, and behavioral and psychometric data to assess the credit risk of borrowers. [14]

In Brazil, FICO and Quod have jointly launched a solution for the credit risk assessment of SMEs. The solution leverages innovative data sources such as Positive Credit Registry and information on firms and their partners. It converts an SME's credit profile data into numerical score to help predict the probability of future payment. [15] Moody's Analytics leverages new alternative data sources in its RiskCalc solution. Their Credit Sentiment Score tool utilizes text analytics and NLP over news media feeds to identify credit impairment signals in companies. [16]

The usage of macroeconomic data by firms for credit risk management should also be expanded beyond the traditional indicators such as key interest rates, unemployment rates and GDP to include data such as house price index, real disposable personal income (DPI) and real personal consumption expenditures (PCE). Leveraging information on house price index in a particular area, could help institutions predict the levels of credit card default in that area.

To bolster their risk data infrastructure, FIs can leverage the complementary capabilities of data lake and data hub — with data hub sitting on top of the data lake. This would enable real-time analytics over all types of structured and unstructured data; dynamic data sharing; improved data quality and harmonization and robust data governance controls. Firms should also focus on strengthening their data governance and compliance with the BCBS 239 and other relevant risk data standards.

5) Expanded stress testing:
Firms should enhance their stress testing capabilities with regards to PD, LGD, EAD, and other credit risk dimensions. They should add new pandemic-specific and forward-looking stress testing scenarios. To achieve this, it is recommended that firms should leverage and adapt their existing stress testing frameworks such as the capital adequacy infrastructure that was built as part of CCAR etc., instead of building newer ones.

To enable effective stress testing, firms should adopt sophisticated stress testing solutions. For example, Moody's Analytics enterprise-wide stress testing solutions enable asset class-specific models for loss estimation, advanced data integration capabilities, integrated business intelligence (BI) analytics and regulatory reporting, and sophisticated visualizations of parameters such as the likely impact of credit losses, loan balance growth, interest income, and risk-weighted assets projections on the balance sheet and capital ratios, etc.[17]

6) Ongoing customer support:
In several jurisdictions, governments, and regulators (e.g.: through CARES Act in US) require lenders to grant relief to distressed borrowers. Therefore, FIs must remain focused on effectively identifying their stressed customers, proactively communicating with them, and supporting their credit needs. This will additionally allow firms to foster goodwill amongst their communities.

For retail customers, depending upon their business feasibility, FIs can consider temporary freeze on foreclosure proceedings; moratorium on interest and principal payment on loans; and temporary restrictions on overdraft, ATM, and interchange fees. Similarly, for SMEs, FIs can offer overdraft extension facility; support debt restructuring; and provide new emergency credit lines to cover short term operating expenses.

Citi Bank had waived fines for early certificate of deposit withdrawal and provided waivers on monthly service fees for both individual and small business customers. Their bankers were reachable on weekends and after hours to support the small business customers.[18]

Barclays also supported their business customers impacted by COVID-19, by offering 12-month capital repayment holidays on existing loans over £25,000.[19] The bank also launched "Coronavirus Large Business Interruption Loan" (CLBIL) scheme to support large corporate banking clients.[20]

Ship up or shape out — A clarion call for financial institutions

In several countries, owing to the support and monetary easing measures undertaken by governments, the loan losses for FIs have been lower than the estimated value at the start of the pandemic. However, currently with the gradual withdrawal of the unprecedented level of government stimulus in many

countries, credit risk challenges faced by FIs may further increase for the foreseeable future. This leads to an undeniable need to bolster their risk management capabilities.

Beyond the immediate needs of effectively navigating the current challenges brought on by the pandemic, FIs must also focus on

managing the impending credit risks of the climate change. They should work on integrating the climate risk factors into their credit risk management framework and models. Also, they may consider prioritizing lending to ecologically responsible businesses.

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Glossary of terms

Acronym	Expansion
AI	Artificial Intelligence
ANN	Artificial Neural Network
BCBS	Basel Committee on Banking Supervision
BI	Business Intelligence
CCAR	Comprehensive Capital Analysis and Review
CECL	Current Expected Credit Loss
CIS	Customer Information System
CRM	Customer Relationship Management
CVA	Credit Valuation Adjustment
DPI	Disposable Personal Income
EAD	Exposure at Default
EBITDA	Earnings Before Interest, Taxes, Depreciation, and Amortization
ECB	European Central Bank
FI	Financial Institution
FRTB	Fundamental Review of the Trading Book
GDP	Gross Domestic Product
ICR	Intelligent Character Recognition
IFRS	International Financial Reporting Standard
LGD	Loss Given Default
LOS	Loan Origination System
ML	Machine Learning
NLP	Natural Language Processing
OCR	Optical Character Recognition
PCE	Personal Consumption Expenditures
PD	Probability of Default
RPA	Robotic Process Automation
SME	Small and Medium-Sized Enterprise
SVM	Support Vector Machine
TCO	Total Cost of Ownership
TRIM	Targeted Review of Internal Models
U.S. CARES Act	U.S. Coronavirus Aid, Relief, and Economic Security Act
YoY	Year-Over-Year

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