

A woman with dark hair pulled back, wearing a light-colored blazer over a patterned shirt and a dark tie, is standing on a modern staircase with glass railings. She is looking down at a tablet computer she is holding with both hands. The background is a bright, out-of-focus interior space with structural elements.

January 2019

Early warning signals in a digital era: A proposed PwC framework to manage credit risk better

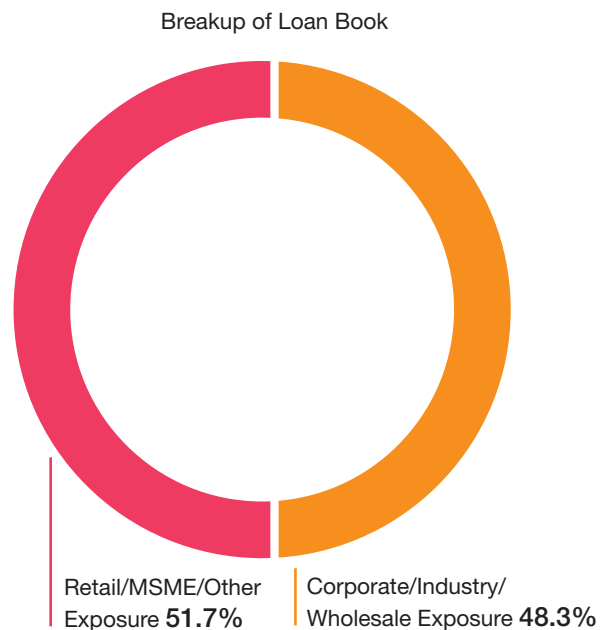
Moving towards global standards of credit monitoring

According to RBI data, on 31 August 2018, 48.3% of the loan book of some of the large Indian scheduled commercial banks (SCBs), taken together, consisted of corporate assets. The remaining 51.7% is spread between micro, small and medium enterprises (MSMEs), retail customers and others (Figure 1). With this distribution of asset classes, the RBI estimates that the gross non-performing assets (GNPA) of SCBs can rise from 11.6% in March 2018 to 12.2% by March 2019. The major reasons for this is the inability of the banks to anticipate the incipient stress in accounts that are likely to default. Simultaneously, the RBI's regulations have been evolving from rule-based monitoring to an early warning identification approach over the last two decades (from Income Recognition and Asset Classification (IRAC) norms in the Nineties to monitoring specific signals in 2017). This has led investors to question the way loan accounts are monitored by Indian banks in recent years.

According to market participants, there is a dire need to revisit current practices and rework them according to globally accepted and advanced approaches used in developed economies. Banking organisations in India need to move from an essentially compliance-driven post facto mechanism to a proactive control-based digital system to monitor credit risk.

To achieve this, lenders will have to constantly monitor publicly available news on borrower- and industry-specific performances. Analysing this information on advanced analytical platforms will help lenders to take timely decisions. Borrowers can then be grouped into three or five watch list categories. Assuming a three-colour scale (green, amber and red), borrowers in the amber region should be monitored closely (here we are assuming customers lying in the red category have already turned bad and giving them an early warning digitally may not

Figure 1 - Breakup of loan book of SCBs in India (Q1 FY19)



create any significant value). Additionally, it may be noted that as credit quality-related information takes some time to impact the borrower, the system can be designed to run via batch processes, maybe daily or weekly, instead of making it on an absolute real time basis. The initial investments to make it work on an absolute real time basis can be very high.



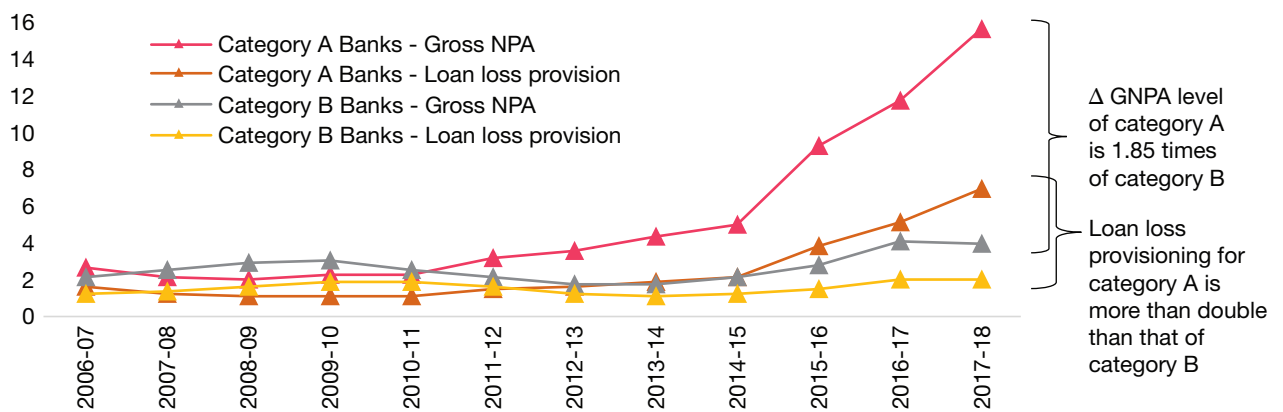
Need to be proactive, rather than reactive in monitoring and managing credit risk

Past experience has taught us that proactive controls can help banks limit their exposure in bad segments and lead to reduction in overall losses (Figure 2). We have divided Indian banks into two categories—Category A and Category B, with Category A banks following traditional practices and Category B banks adopting an advanced monitoring approach. The chart indicates that Category

B banks have been successful in identifying bad assets better than their counterparts, and hence, their gross NPA level and provisioning numbers are comparatively low.

Therefore, we propose a digital credit risk monitoring framework to capture such early warning signals. Let us first try to understand the differences between the two.

Figure 2 - Based on past experiences banks have been categorised (Category A – traditional and category B – advanced)



Comparison between the proposed framework and traditional practices

	Traditional monitoring system	Digital monitoring system to capture early warning signals
Approach	Traditional monitoring systems work on a post facto basis, primarily based on past events and selective financial projections, i.e. they are reactive in nature.	Digital monitoring early warning signals help financial institutions capture information in advance and take precautionary action before an account turns bad, i.e. it is proactive in nature.
Integration	Front-end business, underwriters and the monitoring authority would work in silos in the past, which resulted in discrepancies in information.	Seamless coordination of monitoring, underwriting and business teams is crucial for the success of a system.
Emphasis	The primary emphasis was on high-risk areas and the focus was limited to decisions based on sample performances.	The entire population-related data is analysed and then accounts are categorised according to a three-colour scale (green, amber and red). Customers in the amber region should be under highest vigilance, assuming that those in the red area have already become NPAs. This makes the system more comprehensive in nature.
Periodicity	Accounts were usually reviewed on a semi-annual basis, or at the most, quarterly for high risk accounts.	Based on the capability of a system, assessments can be performed in batch processes (on a daily or weekly basis).
Coverage	The traditional system had a much narrow viewing angle. It failed to take a consolidated view of individual loan accounts.	Early warning signals (EWS) collates data from multiple sources, which helps the bank to have a consolidated view of individuals' loan accounts and decision-making becomes easier.
Usage	Traditionally, provisioning was based on regulatory guidelines (RBI's IRAC Norms) and accounting requirements (INDAS109).	Systems can be upgraded if such signals are incorporated into the INDAS109 staging decision process.
Output	Manual cleaning and analysis of data was the primary option available in most cases.	MIS dashboards can be prepared automatically and user interfaces can be customised, based on simple drill-downs.

Potential benefits of adopting a digital framework for monitoring and managing credit risk

- **Reduction of default rate at portfolio level:** The rate of defaults at the portfolio level can be reduced by restrictive exposure to particular customer segments where warning signs have been observed. This will help to control the probability of default (PD).
- **Tightening of covenants:** Lenders need to intervene early by tightening the covenants and increasing collateral levels to maximise recovery. Once a loan account comes into the watch list, regular supervision will help to maximise collateral-related requirements and reduce losses in the event of actual default. This will minimise loss given default (LGD).
- **Securitisation of assets:** Lenders must try to proactively securitise or sell assets that have warning signals associated with them and where chances of revival are low. There are certain non-banking financial companies (NBFCs) and asset reconstruction companies (ARCs) in India that may be interested in taking over such assets. This will help companies get bad loans off their books and get a better price for them.
- **Decision on IFRS9 staging-related aspects:** The IFRS9 framework can be integrated with the INDAS109 ECL modelling framework. It will enable banks to quickly gauge the actual health of a borrower and accordingly decide on the 'stage' of the account for provisioning purposes.
- **Identification of trends and opportunities in the market:** New trends can be identified in different industries and banks can readjust their portfolio mix. For example, it could have helped banks identify the telecom sector as a whole turning adverse and slowly reduce their exposure to it.
- **Decisions taken on composition of portfolios:** Monitoring at the portfolio level can help to reduce banks' exposure to threatened sectors, and even at individual levels reduce exposure by decreasing committed lines of credit, i.e., the credit conversion factor.
- **Modification of the credit policies of banks:** High level credit policy-related decisions can be taken by banks, based on information provided by the system about sectoral regulations, performance and news.

A segmental approach to reduce false positives

- **Large and medium companies:** As these are high-value accounts, the ideal approach should be to assess the risk of bad loans at an account level. Based on the assessment, industry variables can be identified. In another approach, market data, movement in the spread of commercial papers (CPs) can be used as a good indicator for this segment, since many of these entities issue CPs, bonds and non-convertible debentures (NCDs), which are subscribed by banks.
- **SME segment:** Banks can create industry and geographic clusters or a mix of both in this segment. They can also use already existing geographic clusters.
- **Retail assets:** Banks can create pools of homogeneous accounts for designing purposes. Moreover, socio-economic and geographic classification can be helpful.
- **Agriculture portfolio:** The biggest problems in this segment include extremely small average agricultural land holdings and variable repayment schedules. It is also necessary to take into account factors that have a significant impact on crop production and repayment conditions, e.g., rainfall and political scenario.

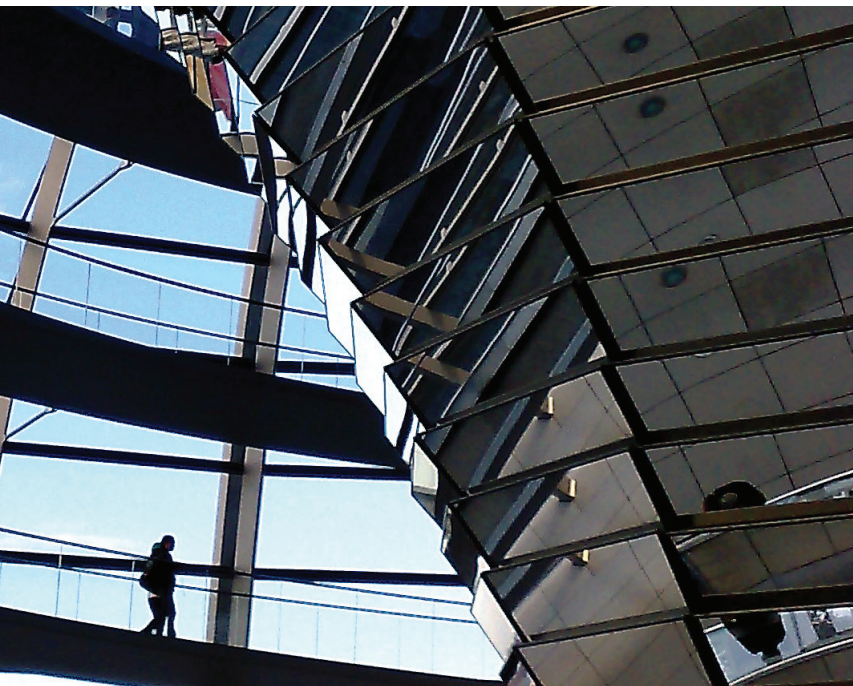


Keys areas for capability development

- **Strengthening of data:** The predictive power of the system lies on the accuracy of the databases, based on which it has been developed. At the core of the system will be the data warehouse. Apart from that, data will have to be collated from various internal and external sources, e.g. the core banking solutions of banks, external credit rating agencies and market-related news articles. Hence, sanctity of the data is of utmost importance for this exercise to be successful.
- **Advanced analytical tools:** Meaningful insights or indications about assets can be harnessed from all these data sources with the help of advanced analytical tools. Artificial Intelligence (AI) and machine learning (ML) algorithms can be gainfully deployed to generate tools that predict early warning signs of default.
- **Automated risk processes:** These have the ability to make a framework more secure and compliant with regulatory requirements and avoid risks associated with manually driven processes. Pulling of data, analysing the same and generation of meaningful insights should be automated to the extent possible.
- **Human capital:** Employees with operational ownership of these tools should enhance their capabilities to interpret and gainfully embed such signals in credit risk management strategies. To achieve this, investment on reskilling of employees is required for smooth transition to such models.

Data can be collected from multi-dimensional sources

- **Financial information of borrowers:** Financial information can be accessed from unaudited interim figures, creditor's feedback and bank statements. For example, tie-ups can be made to monitor bank statements and creditor's feedback can be collected via e-mails and VBA-based automation.
- **Market information:** Movement in equity prices, yield curves, CP spreads, ratings and other credit bureau publications are required data sources. Hence, AI or ML algorithms can be helpful to pull them together. Automated checks can be set up with market data sources such as Bloomberg and Thomson Reuters. For data from credit bureau reports, rating publications can be collected periodically and updated in the system.
- **Market news:** Vernacular news articles along with negative press conferences or notices and news from any other external sources are ideal. Banks need to develop tools based on 'Text Mining' and 'Sentiment Analysis', which can be done with the help of Natural Language Processing (NLP).
- **Information from relationship managers:** Relationship managers sometimes have knowledge that is not commonly known in the market, e.g. information on promoters or key personnel, consumer complaints, deterioration in product quality and movement of inventory.
- **External macro scenario:** Systems should be enabled to accommodate information on adverse regulatory guidelines or notifications, since the Government's decisions may adversely impact a business, with its implementation of new regimes, e.g. Goods and Service Tax (GST) and Insolvency and Bankruptcy Code (IBC), and the implications of monetary policies.



Identify a suitable list of indicators for your portfolio

- **Financial indicators:** Focus should be on indicators, which have not yet affected the bottom line of the business, e.g. stock statement or creditor feedback.
- **Perception indicator:** The future trajectory of a business can be gauged from the market's perception of it.
- **Industry indicators:** Short- and long-term industry performance can be positive indicators.
- **Geographical indicators:** These are more relevant in the case of loans to SME clusters, borrowers with a regional presence, and most importantly, for overseas borrowers.
- **Behavioural indicators:** The capabilities and integrity of key stakeholders (promoters, management) of a business can indicate how a company behaves in different situations.

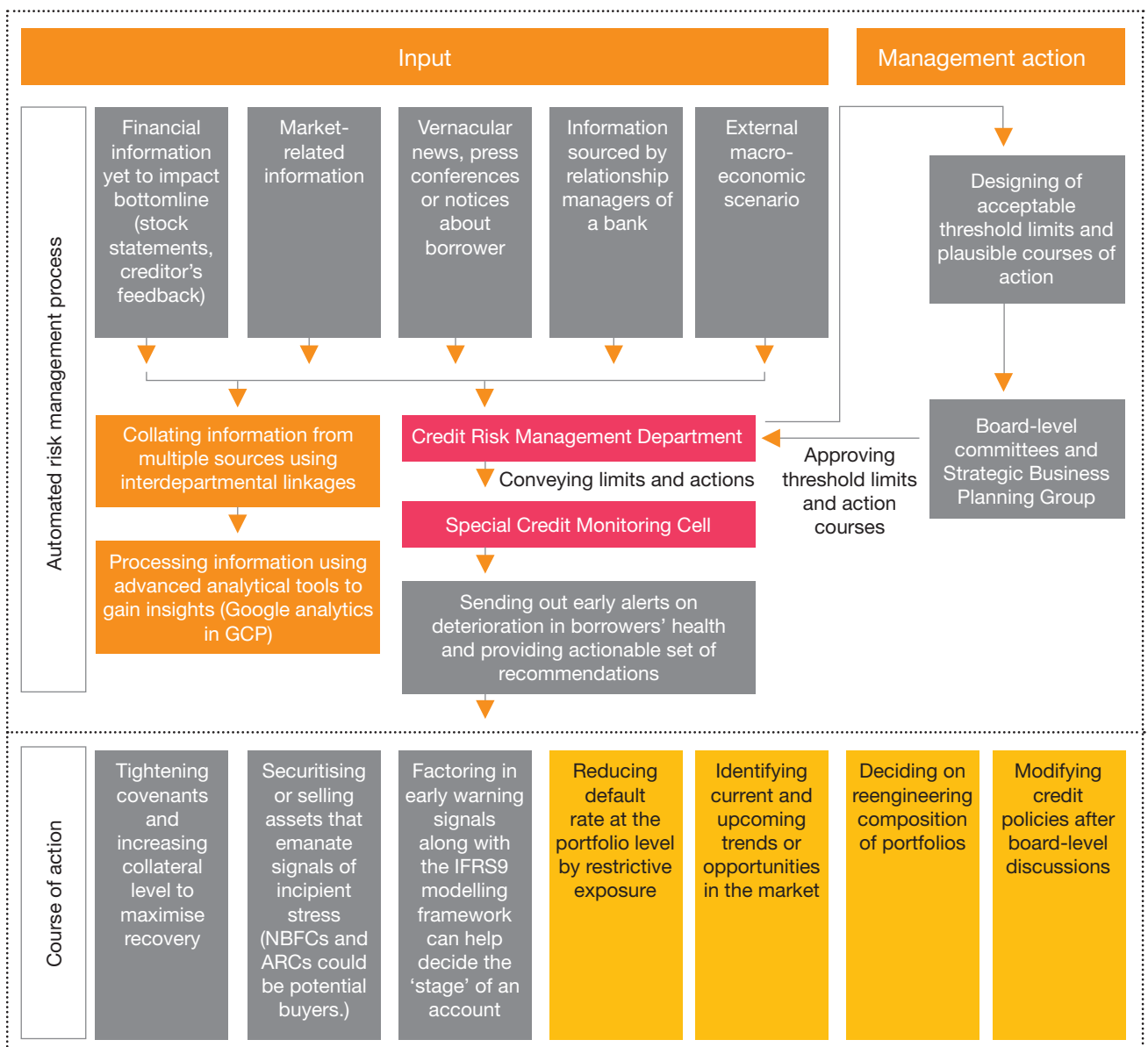


Proposed target operating framework

Proposed application of digital monitoring of early warning signals has the potential to vastly improve the quality, timeliness and identification of bad accounts. To seize this opportunity, banks need to move fast, but in a prudent manner, to operationalise the system. However,

implementation demands significant rigour and time. Please refer to the target operating framework in Figure 3.

Figure 3 Early warning signals along with the IFRS9 modelling framework can help decide the 'stage' of an account



This target operating framework has the capability to harness insights that were previously unknown and help banks reduce their rapidly growing non-performing assets.

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