EXAMINATION

November 2020

Subject F206 – Banking
Specialist Applications

SOLUTIONS

QUESTION 1

You are recently employed as an actuarial specialist at a South African bank with a subsidiary in the island nation of Carinthia. An epidemic causing severe fever has struck Carinthia and, though the illness has a very low mortality rate, the government of Carinthia has closed all ports of entry and exit and imposed strict local quarantine measures to contain the spread.

Residential mortgages represent approximately 80% of total advances in the subsidiary. In response to the in-country situation, the Carinthian management team has proposed suspending local mortgage repayments from their customers for a period of 3 months. The CRO of the bank has asked you to write a brief report highlighting the most important considerations in pursuing this course of action. You need to gather all relevant information from the Carinthian management team.

Outline the information you would request from the management team to inform your report.

[Total 16]

Contextual information on the current in-country situation, and specifically market player responses.

- Expected period of the quarantine (time)
- Employment affected over the period
- Local regulator guidance in terms of liquidity/ funding support
- Local regulator guidance in terms of minimum liquidity and capital requirements
- Local government response and support to economy/ industries
- Any responses from other local banks in the market
- Customer/ client expectations
- Any consensus or guidance around IFRS9 ECL

The <u>liquidity impact</u> of this proposal needs to be understood to evaluate whether the subsidiary will be able to meet its short to medium term cashflow needs.

- The management needs to supply pertinent liquidity metrics and measures.
- The metrics needs to be supplied for both local and hard currency
  - The current liquidity coverage ratio (Basel LCR) and expected impacts to this ratio based on the proposal
  - 1 week, - month and 3-month liquidity ratios and expectations
  - Cumulative liquidity expectations
  - Funding source and concentration report to evaluate risk of large single counterparty withdrawal
  - Guidance on any support or relief from the local bank regulator to the bank

The <u>capital impact</u> be understood to evaluate whether the subsidiary will be able to meet its solvency/minimum capital requirements.

- Breakdown of capital structure

- Common Equity Tier 1 capital (CET1), and specifically the nature Additional Tier 1 capital (AT1) and Tier 2 capital
- Extent of Pillar 2 add-ons and other buffers required by the local bank regulator
- Guidance on any relief considered by the local regulator (relaxation of any counter-cyclical buffers

The ultimate Credit risk impact needs to be evaluated

- The terms at resumption of payments post relief period is important; will loan term be extended or will instalments be increased to recover the accrued interest
- Any strategy should have clear positive impact on ultimate credit losses
- Any blanket payment relief that is not mirrored by other participants will likely result in a disproportionate credit loss to the benefit of competitor banks and other credit providers
- If the relief is not universal the subsidiary should be more selective in offering such relief with clear eligibility criteria
- The eligibility criteria should ensure fairness amongst customers and direct relief to impacted customers
- Relief on mortgages may also favour payments towards other classes of credit and in aggregate may prejudice the subsidiary
- Nevertheless, foreclosure in a stagnant economy may not yield optimal results
- The specific book profile of the mortgage customer base in relation to their total credit profile would be required, to evaluate the customers' total repayment to income ratios
- Loan to value profile of the portfolio, and expected impact on house prices
- Information on customer liquidity/ savings to evaluate customer resilience
- Guidance on any support or relief from local government to affected industries/ businesses or consumers

Impact on the South African bank need to be evaluated

- The extent of inter-company loans, capital and other funding support needs to be evaluated
- The ability of the subsidiary to service these and the impact extending payment terms on local ratios needs to be established
- Any explicit or implicit guarantees towards the subsidiary needs to be established and evaluated for local impact
- Currency hedges to the local currency that the South African bank relies on needs to be evaluated, with specific view to the cost of any roll-over that would be required

QUESTION 2

The state-owned airline in a neighbouring country has approached your bank in South Africa, indicating it wishes to renegotiate the terms on (firstly) an existing long term secured loan held with your bank and to (secondly) increase an existing unsecured credit line (an overdraft facility) used to fund working capital.

Relevant facts are:

- Both the existing loan and facility are denominated in US Dollars
- Currently the total exposure to this counterparty constitutes 8% of your bank's total advances
- The long term secured loan has 4 years remaining (it is a 10-year amortising loan secured by title to two airfields in the country)
- The loan agreement contains various covenants that gives your bank an early call-up right should any of these be breached
- Following recent elections in this country, the minister has replaced all existing board members, including the chairman
- The new board has replaced the existing CEO and CFO by two new individuals
- No covenants or other contractual terms have been breached
- Indications are that the airline seeks to re-negotiate:
    - The terms on the secured loan, specifically the cash-flow covenants and an extension to its repayment term
    - To double the existing unsecured credit line/ overdraft facility

As the CEO of the bank, discuss all the considerations you expect your integrated risk team to evaluate.

[Total 30]

<u>Quality of airline governance and management:</u>

The airline has recently replaced the CEO and CFO and has a newly constituted board. The information provided does not indicate if this replacement was off the back of poor financial performance of the airline (which would be a good reason to replace the top leadership), or whether this is purely a political appointment and decision.

If this choice is political in nature, this would raise questions around the future strategy, viability and financial performance of the airline (depending on the relevant experience and expertise of the chosen board members). These concerns would be as follows:

- Will the mandate from government on the strategy of the airline change
- Would the board have the relevant expertise to oversee the management of the airline
- To what extent may the independence of the new board be impacted
- Could sound business decisions be overridden by political decisions that suit government political needs / requirements (at the expense of profitability and sustainability)

The new board members should be reviewed in the following ways to assist with gauging their ability to run the airline in a successful manner:

- The amount of relevant experience of the board
- Previous board experience of the members of the board, and the performance of the companies upon which these board members have served previously
- The experience of the new CEO and CFO, specifically with respect to working in and running an airline (as this is a very specific skill set and challenging industry to operate in)
- Exposure to or relationship with politically exposed individuals should be taken into consideration to determine the true level of independence in decision making.
- Enhanced due diligence may be required as the deal may introduce PEPs as per FICA
- The other boards that the directors sit on and any personal interests or ownership of other companies should be analysed to ensure the board members are genuinely unbiased in the decisions taken in the running of the company (in other words ensure there is no risk of self-interests surpassing those of the company).

<u>Exposure Assessment:</u>

The airline currently has two credit lines with the bank, one is an amortising loan and the other is a credit facility with the bank. The loans are technically secured by bonds over airfields owned by the airline (state) while the credit facility is unsecured.

Unsecured Credit:

- What informs the need to increased levels in working capital
- The airline wishes to double its credit line with the bank. There is no indication of how large the current facility is (for example is it 5% of the total exposure the bank has to the airline or is it for example 50% of the total exposure).
- The relative size of this facility will determine the increase in unsecured exposure that the bank would have to the airline if this facility is doubled in size. If the facility is already large – then doubling it will have a significant impact in terms of the total exposure (or potential exposure) that the bank will have to the airline. If this increase in dollar terms is large and as a percentage of total assets of the bank, then it places more onus on the bank to perform a very in-depth analysis of the facility adjustments requested.
- In addition, it will determine the amount of volatility the bank may experience in total exposures to the airline on a month to month basis (since the airline will have the ability to repay or draw down on this facility on demand). Given the size of the facility and total exposure to this single counterparty the volatility of exposure sizes could create financial challenges for the bank. Large changes in provisioning, capital, and cashflow / liquidity on a month to month basis.

- In addition to above, there are typically no real repayment terms for credit facilities so this debt may technically never be repaid (serviced over time but it may never be settled in full).
- These facilities are, however, often revocable in order to be more capital efficient [½]
- The potential size of this facility will determine the additional lengths and stringency of checks that the bank must undertake in order to ensure the financial viability of the airline.

Secured Credit:

- The airline wishes to repay the loan over an extended period, and in addition wishes to review some of the covenants that are in place for the early call up of the loan.
- An important measure here would be the new repayment term of the debts. The longer the term, the smaller the repayment monthly (which will free up cashflow for the airline) but it will result in the outstanding capital not being repaid for a much longer period of time. One would assume the reason for requesting the term extension would be as a result of the company being in or expecting some financial distress (cashflow issues currently).
- The value of the underlying security also needs to be considered, in context of it specific use (as an airfield), together with the likelihood of success enforcement of the contract (in the event of default) to recover losses through this security
- Since this counterparty forms such a large part of advances, extending the term may impact short term and long-term funding ratios (considered more broadly below) for the bank which would need to be mitigated
- Adjusting the covenants downwards (presumably reducing the cashflow targets to be achieved by the airline or reducing the cashflow requirements relative to debt repayments) would result in the airline being able to achieve potentially significantly worse financial results before the loan gets called up. This reduces the chances of a successful collection of the remaining debts (upon liquidation) as the financial position of the company may by then have deteriorated to such an extent that there are even less assets to fall back on in order to settle remaining debts. This delay could also result in the bank being part of a larger group of debtors looking to call up debts.

<u>Credit rating and re-pricing of agreements:</u>

The credit rating of the airline should be reviewed as part of the assessments for both the increase in the facility as well as with respect to the extension of the loan repayment terms.

The airline is an SOE and as such the credit rating of the company is likely to be linked with the credit rating of the sovereign itself (perhaps one or two notches lower – depending on past performance and likely future performance and any guarantees extended). One would assume it is a large institution and as such a corporate credit rating could be obtained from one of the major ratings agencies (for example Moody’s S&P or Fitch).

Renegotiating the loan terms would presumably come with the opportunity to not only adjust the remaining term of the loan, but also an opportunity to re-price (if required) and also the opportunity to review the underlying security held against this debt or request additional security or guarantees (so have the property values at least remained constant over time – if not increased a little and as such the LGD is even lower than at inception).

The interest rate payable may be increased if either the credit risk has increased or if the funding costs have gone up (for example if the costs of adjusting the tenure of the funding is high enough to warrant passing this cost onto the airline).

Likewise, approval for the increase in the credit facility provided will come with risk assessments and re-pricing for risk. Depending on the size of the facility.

The approval for both the loan term extension as well as the large increase in the credit facility would in all likelihood go to the corporate credit committee (if one exists) and in addition will even go all the way up to executive and board level for approval (given the sheer size of the facilities relative to the total size of the bank). A big loss on these facilities could be enough to close the bank so additional oversight of the risk assessment would be required to ensure the process followed is as comprehensive as possible.

If the exposure is greater than 10% of capital, there will be a reporting requirement to the regulator as well.

Financial standing and business model:

The current and future financial standing of the airline will determine the likelihood of the airline continuing to service current and any future debts with the bank and its ability to continue to run successfully and profitably.

Given the size of the exposure the bank has to this airline it would be expected that financial statements over a few prior years (maybe 3 to 5 years), as well as the expected future income statements (maybe the next 3 years) would be reviewed extensively to try to understand what the health of the business looks like now, where it has come from and where it is going to in future.

In addition to reviewing the business financial forecasts the bank must review the previous budgets or forecasts of the airline and compare these to the actuals each year to ensure that the projected income statements for the coming years are realistic and achievable.

Part of the financial assessments must include a review of the airlines plans with respect to servicing and repayment of their debts. This is to properly understand the airlines plans for its debts in the long term (are they looking to ultimately settle their debts or is the business model more to service the debts for now and then see down the line what can be done to reduce the capital portion of the debts). This view will assist the bank with understanding the appetite of the airline with respects to its debt appetite.

There are several sets of financial ratios that would be calculated off the back of the income statements and balance sheets in the past (and expectations in future). These would be compared to benchmarks for similar airlines and trends over time analysed to identify any concerning elements of the company. The outputs can be used for extensive credit and risk analysis of the company to assist with the overall risk assessment.

Examples of ratios that can be analysed and calculated are as follows: Leverage ratios (debt position of company), Liquidity Ratios (shorter term ability to generate cash), Profitability Ratios (extent to which revenues exceed costs) and Efficiency Ratios (assess cost containment and usage of assets or resources to generate revenue).

Without even reviewing the financials the requested credit line adjustments are somewhat concerning (depending on the reasons for the application). If the airline is looking to expand its operations (so capex expenditure) and requires more funding to do so this may be a good thing long term (odd to request working capital for this purpose).

However, given the request for a larger working capital facility and the request to extend loan repayment terms, may indicate that the airline has cashflow problems currently and needs funding to keep operating (at least in the short term). If this second statement is true it raises concerns for the long-term sustainability of the airline (and hence its ability to repay its debts).

It will also be good to assess the overall business model of the airline (is it a local, regional, or international carrier and what reputation does the airline have in the industry). If the airline is local, or small regional, it is at more risk to shocks to the local economies and may not have the economies of scale to withstand shocks in the system (fuel price hikes, dips in tourism etc).

It will also show whether the airline is more exposed to political risk as instability regionally could result in financial challenges. The more diversified its operations are the more sustainable and resilient the airline will be.

The relative strength, market positioning and competitiveness of the market within which the airline operates will also be a good indicator of the resilience of the airline to market changes (for example is it a price taker or price maker in the market).

The reputation of the airline both in and out of country is also an important consideration for the bank, as the bank could put its own reputation in jeopardy if it backs an airline that is either financially unstable or that is an unpopular choice by passengers or the public in general. This too may influence the bank to at most retain the current facilities and lines with the airline.

The bank should assess the governance framework of the airline and ensure that the procurement processes are properly articulated (and are adhered to and audited). SOE’s tend to be at a higher risk of tender irregularities and capex misspend (which ultimately damage and impair the finances of the business).

ALCO Assessment:

The exposures to this airline are based in a foreign currency (US Dollars) which means the assets would be mismatched by currency to the local core bank funding (assuming most of the funding is in country). Not only is the exposure in a foreign currency, but the exposure is a large percentage of the bank’s total exposure (which means if there is unhedged currency risk the impact to the bank can be quite significant).

- Ideally the bank should look to hedge out a lot of this risk by either funding the assets with bonds in the specific currency (raising bonds in the market in the relevant currency) or by hedging out some of the risk using swaps or derivatives (off the back of Rand based funding in country)

The assets are split into two types: one has a set repayment period (the loan) while the other is a flexible credit line which means it can be drawn down and repaid at the convenience of the airline.

This means that the behaviour of the loan (from a tenure point of view) is predictable (and hence can be priced from a liquidity premium point of view), however the credit line could be quite volatile in terms of the size of the draw down of the facility.

This makes the matching of this asset by tenure complex. Depending on the expected level of draw down and repayment within a month (can be estimated using the financials) the bank may have limited ability to make the most efficient use of funding for this specific asset and as such it may be costly to fund (may be able to pass this onto the airline).

Any early settlement terms offered to the airline (for settlement of the loan) would need to be priced into the deal with the airline. Given the size of the loan the financial cost of early settlement could be quite large for the bank overall. As such a premium for early settlement would probably be priced into either the interest rate charged or would be a flat amount payable as part of the early settlement of the debt.

The interest rate terms applied to the facilities also need to be considered. One can reasonably assume that the credit line would be priced on a variable rate (probably easier to match in the market). However, the loan facility could be fixed or variable. If it is fixed rate, then ideally the interest rate mismatch should be hedged out as far as possible to reduce additional risk exposure for the bank. This could be done either by sourcing matched funding (may be very difficult to do for such a small niche bank) or by swapping out the rates in the derivatives market.

<u>Political Assessment:</u>

The airline is state owned by one of the neighbouring states. With the election of a new government, one does not yet understand the government’s stance on SOE’s and whether it sees the asset as a strategic one (that it cannot afford to lose) or if it sees the airline effectively as a separate corporate entity that needs to stand on its own two feet financially. This would need to be established as far as possible to assist with understanding how the political changes have changed the risk of failure of the airline.

The more invested the government is in the SOE the more likely it is that the government will ensure the long-term sustainability of the airline (which reduces the risk of default or failure of the airline). This would be both from a financial point of view (government may be amenable to funding losses) and from a strategic point of view (where the government will look to make political decisions that ensure the sustainability of the airline).

If the bank is concerned about the additional risks associated with increasing the loan term or facility sizes, the bank could approach the government to request additional guarantees on the credit. Depending on the governments' stance on this SOE and its vision for the future of the airline this could be a good way to help mitigate some of the business risks to the bank.

- The ability of the government to fulfil these guarantees would also need to be assessed to ensure that the guarantees are mitigating the risk of loss, i.e. does government have the means to do so

The bank may also be put under political pressure (from local government) to assist the neighbouring airline depending on the relationship between the two sovereigns. This could introduce some business risks to the bank depending on how the finances of the airline pan out over time.

<u>Additional Considerations:</u>

As a niche bank one would assume the bank focuses on certain industries or certain lines of business (so specific sizes of institutions, for example commercial lines, and is not banking other sectors of the market for example retail clients). This could increase the risk of correlations existing between exposures it has on the books (for example – if it has exposure to a couple of regional airlines then the risk of certain events causing multiple defaults is much higher). These correlations should be considered before the bank agrees to any further credit line increases.

Given the size of the total exposures of the bank to this one entity, SARB approval may be required (or at least at a minimum the SARB would have to be informed of the potential transaction to ensure that they are comfortable for the transaction to proceed). In addition, as the exposures will be in a foreign currency this will expose the bank to other risks which the SARB should be made aware of under large exposure and exchange control regulations (even if appropriate hedging has been put in place).

- The SARB may require an additional capital buffer or add on for the bank as a result of this large single exposure. Especially if some correlations exist with other large exposures.

QUESTION 3

A recent internal audit revealed that the non-performing loans disclosed in the financial statements have been incorrect over the last two reporting periods. The CRO of the bank has approached you to evaluate the root cause for this incident and to develop a solution to reduce the likelihood of this type of incident to be repeated in any area within the Retail Bank.

i. Discuss how you would go about identifying the root cause. [9]

The non-performing loans have been incorrectly reported on in the last 2 reporting periods which means that prior to that they were correct

This means that there was a change that took place 2 reporting periods ago that has resulted in this error. Potentially this gives the team a good starting point to identify what has changed to cause the new error.

No details have been given as to what exactly is incorrect in the NPLs that have been reported – there are many possible errors that could have occurred:

- The NPLs could be overstated or understated in the financials
- The NPLs could be only slightly incorrect (so incorrect but immaterial) or the error is a material one (if the error is immaterial it will make it slightly more difficult to identify the root cause, while a large error will be easier to identify
- There is also no indication of how extensive this error is in terms of the data and reporting. So is the error occurring right at the last step of the process (published results only – may even be the result of manual input errors) or is the error in the source system itself (which could result in a myriad of additional knock on effects – provisions being understated for example)

A good starting point would be to meet with internal audit since they picked up the error in the first place:

- To find out what the exact error is as far as they have identified
- To identify which products are impacted (this will help the team to get a starting point in terms of the systems and processes to investigate)
- To understand the approach, they have taken to identify the error and how much additional investigation they have performed themselves (to leverage off the work already done by their team)
- To see if they have already largely identified the root cause and if this is as a result of finger errors (so if there is some manual input somewhere that was incorrect) or was this as a result of an incorrect system change (either an error or a change that resulted in unintended consequences).

If the error was simply the result of manual capturing, then for the purposes of this investigation there would be very little additional work to do as the error would have been identified. By way of example – the CFO of the division manually captures the NPL’s or there is a manual adjustment that was incorrectly captured. Obviously, this would not be an ideal way of reporting, but it may be as simple as this in terms of identifying the error

- If this is the case it would be worth meeting with the finance team involved to understand if this was a genuine error or was done with malicious intent (obscure poor results for example)
- This would be done to look to ensure that the root cause can be eliminated (by either putting additional checks and balances in place or automating the process) and to ensure that if required the correct sanctions are taken against the employees involved.

If the error is more complex than this then the team should meet with the IT teams involved (so the system owners for the impacted products) as well as the IT teams that look after the reporting systems themselves (assuming these are productionised and automatically generated from source systems)

- There must have been a change made somewhere in one of the systems that has caused this error. The team should request a log of all changes made to the reporting and base product systems involved (presumably the error occurred between 3 and 2 reporting periods ago). This will give the team a good starting point to identify the error.
- All changes impacting arrears reporting will need to be checked to identify where the error has occurred (again – this error could be at the raw customer account level data or an error in the final reporting consolidations).
- There may not be a proper log of system changes that is in place – this would make it significantly more difficult to identify the error especially if the error is in the raw account level data. An end to end mapping of the entire process would then need to be performed to identify the entire lineage of the data and the ultimate inputs into these NPL's that are presented in the financial statements.
    - This would be performed both from bottom-up and top-down to ensure that nothing is missed in the process
    - In addition, some test accounts may be run through the system to see how the error is caused in terms of the IT or system rules applied at account level. Once incorrect outcomes are identified this would show where exactly the error(s) are occurring in the scripting and this can be corrected (this time after both system development and sufficient testing).

ii. Describe the solution you would put in place to reduce the risk of this being repeated in future. [7]

The solution proposed would ultimately depend on the root cause of the error as this would determine the amount of additional checks and balances required to be implemented. It will also identify where in the process the solutions need to be implemented.

If the error is as a result of a manual input somewhere in the reporting process, there are two important changes that can be made to alleviate this going forward:

- Ideally the manual process should be replaced with an automated process. This would remove any risk of manual finger trouble, as well as remove the risk of a staff member maliciously altering financials
- If the process or this part of the process cannot be automated, then additional controls (checks and balances) need to be put in place to alleviate the risk of a manual error. A four-eye principle could be adopted (with senior staff executing the checks) and in addition to this internal audit or independent risk team should confirm the numbers at each reporting period.

If the error was as a result of a system change (and thus was a scripting error of sorts) then the following additional governance and checks can be implemented to ensure this does not occur again:

- All system changes made should be formally logged and must be documented in full.
- A full impact assessment must be performed for any additional development or changes, and if the change risks altering an account balance or arrears status this should be flagged as a higher risk project (which implies it requires more extensive testing and sign off).
- Thus, anything that could impact total arrears, instalments due, special arrears flags, account status flags (new flags, adjusted flags, etc) should be carefully considered.
- The full SDLC (Software Development Life Cycle) must be followed for all medium to high risk projects, including a full test plan and full post implementation testing and UAT (user acceptance testing). IT audit could also be involved in the sign off process to ensure that the changes are both correct and do not cause any unintended consequences.
- Comprehensive communication of the requested changes needs to take place (both in IT, with product owners, finance teams, analytical teams performing calculations) to ensure all relevant parties are aware of the coming changes and go live dates (to ensure their processes are updated and to also allow these areas to assist with UAT.

A comprehensive solution should be implemented (either way) to ensure that this specific error cannot occur again and to ensure that as many other possible errors can also be eliminated by the solution (as a once off fix).

Given the importance of these numbers (and the potential reputational and financial impacts of them being incorrect) there is no doubt that internal audit need to review these numbers at least at each reporting period (if not more often). This audit check could be as detailed as taking samples of raw account level data, ensuring this information is correct (at account and per transaction level) and then rolling this up into the financials to ensure the lineage is correct all the way through the accounting process.

In addition, sense checks should be built into the process (will only catch large errors though) to look for outliers or trends that are out of line with expectations (on a month to month or reporting period to reporting period basis).

If no documented process data flows exist, it will be advisable to put these in place and ensure they are maintained as well

iii. Briefly describe the main aims of the Basel Committee for Banking Supervision (BCBS) standard number 239 (BCBS 239), the standard dealing with risk data aggregation capabilities and internal risk reporting practices.

[4]

The Basel Committee for Banking Supervision (BCBS) standard number 239 gives banks a set of guidelines to follow which should enhance the banks risk data aggregation capabilities and improve the accuracy of the banks risk reporting practices. This should in turn enhance the risk management and decision-making processes of the bank.

The implementation of the principles in the paper should improve banks' ability to:

- Improve the decision-making processes across the banking group
- Enhance the infrastructure for reporting key information, particularly that used by senior management, for the purposes of monitoring, identifying and managing risks
- Enhance the management of data and information across all legal entities within a group of companies, while ensuring comprehensive assessment of risk exposures at a consolidated group level
- Reduce the probability and severity of losses that result from risk management weaknesses
- Improve the speed with which information is made available and hence the speed that decisions can be made
- Improve the organisations quality of strategic planning and the ability to manage the risk of new products and services

iv. Detail the 14 principles of BCBS 239. [7]

<u>Governance</u> – A bank's risk data aggregation capabilities and risk reporting practices should be subject to strong governance arrangements consistent with other principles and guidance established by the Basel Committee.

<u>Data architecture and IT infrastructure</u> – A bank should design, build and maintain data architecture and IT infrastructure which fully supports its risk data aggregation capabilities and risk reporting practices not only in normal times but also during times of stress or crisis, while still meeting the other Principles.

Accuracy and Integrity – A bank should be able to generate accurate and reliable risk data to meet normal and stress/crisis reporting accuracy requirements. Data should be aggregated on a largely automated basis to minimise the probability of errors.

Completeness – A bank should be able to capture and aggregate all material risk data across the banking group. Data should be available by business line, legal entity, asset type, industry, region and other groupings, as relevant for the risk in question, that permit identifying and reporting risk exposures, concentrations and emerging risks.

Timeliness – A bank should be able to generate aggregate and up-to-date risk data in a timely manner while also meeting the principles relating to accuracy and integrity, completeness and adaptability. The precise timing will depend upon the nature and potential volatility of the risk being measured as well as its criticality to the overall risk profile of the bank. The precise timing will also depend on the bank-specific frequency requirements for risk management reporting, under both normal and stress/crisis situations, set based on the characteristics and overall risk profile of the bank.

Adaptability – A bank should be able to generate aggregate risk data to meet a broad range of on-demand, ad hoc risk management reporting requests, including requests during stress/crisis situations, requests due to changing internal needs and requests to meet supervisory queries.

Accuracy - Risk management reports should accurately and precisely convey aggregated risk data and reflect risk in an exact manner. Reports should be reconciled and validated.

Comprehensiveness - Risk management reports should cover all material risk areas within the organisation. The depth and scope of these reports should be consistent with the size and complexity of the bank’s operations and risk profile, as well as the requirements of the recipients.

Clarity and usefulness - Risk management reports should communicate information in a clear and concise manner. Reports should be easy to understand yet comprehensive enough to facilitate informed decision-making. Reports should include meaningful information tailored to the needs of the recipients.

Frequency – The board and senior management (or other recipients as appropriate) should set the frequency of risk management report production and distribution. Frequency requirements should reflect the needs of the recipients, the nature of the risk reported, and the speed, at which the risk can change, as well as the importance of reports in contributing to sound risk management and effective and efficient decision-making across the bank. The frequency of reports should be increased during times of stress/crisis.

Distribution - Risk management reports should be distributed to the relevant parties while ensuring confidentiality is maintained.

Review - Supervisors should periodically review and evaluate a bank’s compliance with the eleven Principles above.

Remedial actions and supervisory measures - Supervisors should have and use the appropriate tools and resources to require effective and timely remedial action by a bank to address deficiencies in its risk data aggregation capabilities and risk reporting practices. Supervisors should have the ability to use a range of tools, including Pillar 2.

Home/host cooperation - Supervisors should cooperate with relevant supervisors in other jurisdictions regarding the supervision and review of the Principles, and the implementation of any remedial action if necessary.

QUESTION 4

You are the credit head for the unsecured loans division of Notre Bank. The bank recently started a new channel for sales (using WhatsApp as a channel) and the sales volumes from that channel are substantial. The CFO reviewed the abridged financials and is concerned by the results for the 2019 financial year after Q3; compared to 2018, quarter 3 profits are down substantially.

You can assume there have been no pricing changes, or deliberate changes in risk appetite or definitions used by the bank over the accounting period given. The bank has raised impairments under the IFRS9 accounting principles throughout the periods given.

Notre Bank financials & ratios:

Quarterly new business per channel (R'm)

Quarter	Branch	Online	Banking App	WhatsApp	Total new business	Total book size
2018Q1	R550	R400	R350	R0	R1 300	R23 300
2018Q2	R555	R405	R353	R0	R1 313	R23 784
2018Q3	R561	R408	R357	R0	R1 327	R24 264
2018Q4	R568	R411	R361	R0	R1 341	R24 742
2019Q1	R576	R415	R365	R980	R2 336	R26 197
2019Q2	R581	R421	R368	R993	R2 362	R27 628
2019Q3	R586	R427	R372	R1 002	R2 387	R29 032

Quarter end income statement (R'm)

Quarter	Average balance	Interest revenue	Non-interest revenue	Running costs	Cost of funds	Impairment charge	Quarterly profit
2018Q1	R22 650	R1 020	R170	R113	R396	R530	R151
2018Q2	R23 542	R1 055	R177	R113	R412	R567	R140
2018Q3	R24 024	R1 077	R180	R113	R420	R587	R137
2018Q4	R24 503	R1 100	R184	R113	R429	R576	R166
2019Q1	R25 470	R1 144	R191	R113	R446	R630	R146
2019Q2	R26 913	R1 211	R202	R114	R471	R788	R40
2019Q3	R28 330	R1 279	R212	R114	R496	R780	R101

Quarter end exposures per impairment stage and write-offs (R'm)

Quarter	Stage 1	Stage 2	Stage 3 (NPL)	Quarterly write-offs	Provisions released as a result of write-offs	Total impairments on balance sheet	Quarterly impairment charge
2018Q1	R18 640	R3 495	R1 165	R440	R330	R3 052	R530

2018Q2	R19 075	R3 544	R1 165	R524	R393	R3 095	R567
2018Q3	R19 460	R3 615	R1 189	R524	R393	R3 158	R587
2018Q4	R19 892	R3 662	R1 188	R535	R401	R3 199	R576
2019Q1	R20 617	R4 323	R1 257	R534	R401	R3 294	R630
2019Q2	R21 798	R4 531	R1 299	R566	R403	R3 516	R788
2019Q3	R22 906	R4 732	R1 394	R584	R467	R3 712	R780

Impairment coverage ratios

Quarter	Stage 1 (Current)	Stage 2 (Arrears)	Stage 3 (NPL)
2018Q1	7%	25%	75%
2018Q2	7%	25%	75%
2018Q3	7%	25%	75%
2018Q4	7%	25%	75%
2019Q1	7%	21%	75%
2019Q2	7%	21%	80%
2019Q3	7%	21%	80%

Quarter end income statement - Financial Ratios - Annualised

Quarter	% Book Growth	Average Interest Rate %	NIR expressed as % of advances	Running Costs expressed as % of advances	Cos of funds expressed as % of advances	Impairment charge expressed as % of advances	Return on average assets	Margin excluding impairment
2018Q1		18.0%	3.0%	2.0%	7.0%	9.4%	2.7%	12.0%
2018Q2	16%	17.9%	3.0%	1.9%	7.0%	9.6%	2.4%	12.0%
2018Q3	8%	17.9%	3.0%	1.9%	7.0%	9.8%	2.3%	12.1%
2018Q4	8%	18.0%	3.0%	1.9%	7.0%	9.4%	2.7%	12.1%
2019Q1	16%	18.0%	3.0%	1.8%	7.0%	9.9%	2.3%	12.2%
2019Q2	23%	18.0%	3.0%	1.7%	7.0%	11.7%	0.6%	12.3%
2019Q3	21%	18.1%	3.0%	1.6%	7.0%	11.0%	1.4%	12.4%

Percentage of book per stage

Quarter	Stage 1 (Current)	Stage 2 (Arrears)	Stage 3 (NPL)	Write-Off as a % off previous NPL balances	Provisions Released as % of write-offs
2018Q1	80.0%	15.0%	5.0%	40%	75%
2018Q2	80.2%	14.9%	4.9%	45%	75%
2018Q3	80.2%	14.9%	4.9%	45%	75%
2018Q4	80.4%	14.8%	4.8%	45%	75%
2019Q1	78.7%	16.5%	4.8%	45%	75%
2019Q2	78.9%	16.4%	4.7%	45%	71%
2019Q3	78.9%	16.3%	4.8%	45%	80%

Balance sheet impairments per stage and movement (R'm)

Quarter	Stage 1 (Current)	Stage 2 (Arrears)	Stage 3 (NPL)	Stage 1 Movement	Stage 2 Movement	Stage 3 Movement	Write-offs	Total impairment charge
2018Q1	R1 305	R874	R874					
2018Q2	R1 335	R886	R874	R30	R12	R0	R524	R567
2018Q3	R1 362	R904	R892	R27	R18	R18	R524	R587
2018Q4	R1 392	R915	R891	R30	R12	-R1	R535	R576
2019Q1	R1 443	R908	R943	R51	-R8	R52	R534	R630
2019Q2	R1 526	R951	R1 039	R83	R44	R96	R566	R788
2019Q3	R1 603	R994	R1 115	R78	R42	R76	R584	R780

i. Explain the IFRS9 impairment principles for credit exposures. [3]

IFRS9 requires banks to raise provisions for expected losses for exposures on their books. The book is required to be divided into 3 parts or stages with different rules defining which exposures will slot into each stage. Each of these stages have differing requirements with respect to the period of future losses over which provisions need to be held. An example of possible stage definitions and their expected loss requirements are given below:

- Stage 1: Typically, this bucket is for exposures that are current / not in arrears and have not experienced a significant deterioration in expected credit risk. Provisions are normally raised for expected credit losses over the next 12 months.
- Stage 2: Typically, this bucket is for exposures that have experienced significant increase in credit risk (SICR). This means that either the exposure is more than 1 instalment but less than 3 in arrears, or the expected future credit risk of this exposure has deteriorated beyond a predefined cut-off. Provisions are normally raised for lifetime expected losses in this bucket.
- Stage 3: Typically, this bucket is for exposures that have defaulted (missed 3 or more instalments) or that have been restructured. Provisions are normally raised for lifetime expected losses in this bucket.

A forward-looking macro-economic model could be developed to adjust the expected default rates on the portfolio based on underlying economic factors that are correlated to the default experience of the portfolio (in addition to other internal behavioural measures that will predict future default rates). This model will help to inform the future expected default rates of the underlying exposures and this expected future default rate will be used to determine whether there is significant deterioration of the relevant exposure.

ii. The CFO has requested that you review the financials provided and explain what caused the reduction in profits. [13]

The following can be deduced off the back of the information provided:

Financials & Profitability:

- Interest turn or the average interest rate charged on the overall book has not really changed much over time and is largely static at 18% on average. This has little impact on the financials year to date and confirms on face value that the pricing has remained unchanged over the period (and new business mix is presumably consistent too).
- Non-interest revenue as a percentage of the total book has remained largely flat at around 3% per annum. So, the growth in the book is resulting in a similar relative growth in NIR and thus this is not negatively impacting profits.
- Running costs in rand terms have remained flat. This means that as the book is growing the costs are reducing as a percentage of the book (which gives the product a little extra margin overall as a percentage of balances on the book and

shows the new channel from a cost perspective is having little impact). This should help to improve profits.

- Cost of funding as a percentage of the book has remained flat throughout the period and as such is having little impact on the financials.
- The bad debt charge in rand terms has increased significantly and likewise as a percentage of the average outstanding balances. It has steadily increased over the period from 9.4% to 11.7%. It is perhaps worth noting that the bad debt charge has stabilised in 2019Q3 relative to 2019Q2 (it reduced slightly). Given the large change in the bad debt charge this is clearly the area that is most affecting the financials and needs to be given the most focus.

<u>Bad Debt Charge Deep Dive:</u>

Making use of the other information provided the bad debt charge can be further interrogated and the following results can be seen:

- The stage 2 exposures jumped significantly in 2019Q1 – by 1.7%. This jump occurred in the same quarter that the WhatsApp channel went live – which leads one to believe there may be a link between these two events.
    - With the information provided it is not possible to conclude with full certainty that this jump is related to the new channel going live, but it appears to be the case
    - It would be useful to segment the exposures in the different stages into the different source channels – this would provide further insights and guidance on the correlations of the numbers

    - What is unusual though is that there is a step change in stage 2 arrears in 2019Q1 and thereafter the growth in stage 2 is in line with book growth (in fact the ratio improves slightly). There is no further significant deterioration of the total book. In addition to this, in the subsequent quarters there is no deterioration in stage 3 exposures or in write-offs. It appears as if the exposures moved to stage 2 but then have not rolled further. There could be a few explanations for this:
        - Perhaps a tranche of business rolled into 1 or 2 months in arrears due to a billing issue, and then subsequent to this the issue has been resolved but the arrears have not been cleared.
        - A tranche of business may have been relegated to stage 2 as a result of a change in one of the variables in the forward-looking economic model which caused an expected PD deterioration resulting in the relegation to stage 2. The exposures have not cured or rolled further in subsequent periods.
        - Understanding the actual reason for the move into stage 2 would help to properly explain the changes in the financials.

- It should be noted that the exposures in the other stages are largely consistent over time (as a percentage of the portfolio) – so no significant deterioration is specifically noted on face value.

- Something worth noting however is that while the stage 3 exposures as a percentage of the book are largely flat (in fact decreasing slightly), the book overall is growing fairly rapidly due to the massive volumes of new business and as such one would have expected the stage 3 percentage to potentially decrease a little more at least for the first 2 quarters of large exposures growth. This is since one would expect only a small flow of the new Whatsapp channel exposures into stage 3 within the first 6 months of these exposures being on the book. Since the stage 3 percentage remained largely unchanged – this implies that either the back book rolling into stage 3 has accelerated somewhat or that the new Whatsapp channel exposures are rolling in stage 3 quickly.

- At the same time, also in 2019Q1, the coverage ratio of stage 2 dropped from 25% to 21%. While other coverage ratios remained unchanged at that time. This points to a change in the expected default rate of the total exposures in stage 2 (LGD must be the same since NPL coverage remained the same).

    - This is likely to have been caused by the new exposures that rolled into stage 2 – presumably either the exposures are in very early arrears or perhaps only their PD deteriorated. Hence these new stage 2 exposures have a lower expected risk than the others in that bucket.
    - It could be due to improvements in expected future PD's of the previous exposures sitting in stage 2 – again due to either some level of curing or improvements in the expected PD's of the previous exposures.

- The coverage ratio of the NPLs increased in 2019Q2 – from 75% to 80%. This would typically be as a result of the LGD model changing (since the PD is 100% in this bucket).
    - However, the coverage ratios of the other stages did not change in that quarter. Since coverage ratios in the other stages are roughly = PD x LGD, unless the PD dropped at the same time and at the appropriate percentage, it points to the LGD being a consistent percentage (or a consistent model) and being unchanged in the quarter in the other stages.

        - It would be worthwhile confirming that this is indeed correct. It is possible that a new LGD model has been built and should be applied to stage 1 and 2 exposures as well as stage 3 (and has just been omitted in the updating of the model and its parameters)

    - Alternatively, this points to the coverage ratio only changing as a result of the mix of NPLs (stage 3 exposures) changing (could be a function of aging or partially cured accounts having been written off). If the ratio of the provisions released versus write-offs is compared over time, it would be noticed that this ratio is consistently in line with the stage 3 coverage ratio for all quarters except for 2019Q2 (where this ratio is 71%).
    - There could be two reasons for this:

    - A specific tranche of NPLs had a lower coverage ratio for some reason (either in error or due to some specific model traits in the LGD) and these exposures were written-off in this quarter. The remaining exposures now have an 80% coverage ratio.
    - A new LGD model or parameter has been applied to stage 3 exposures and as a result of this only a smaller value of provisions could be released to cover write-offs in the quarter (as the balance had to be retained to increase the overall coverage ratio to the new 80% requirement). It is worth noting that in 2019Q3 the "provisions released as a percentage of exposures written off" was now at 80% - which aligns to the new coverage ratio for the stage 3 overall. Probably confirming the fact that there is a new LGD model.

- The rand value contribution to the change in monthly bad debt charges of the above is mostly attributable to the movement of accounts into stage 2 and 3 (and the ultimate write-offs). However around 10% of the total bad debt charge is attributable to growth in the book (and the creation of stage 1 provisions). This is creating an additional strain (new business strain) on the financials as a result of having to recognise / raise provisions as soon as the exposure comes onto the book (for the next 12 months of expected losses). The revenue for these exposures will only be realised / earned throughout the coming year. There is a timing mismatch in terms of the recognition of losses versus the earning of the revenues on these exposures. This is a result of the IFRS9 accounting standard which is more prudent but does result in this mismatch initially (especially evident for a rapidly growing book).

iii. Describe additional information that you may require to comprehensively understand the financial results to draw conclusions for the CFO. [6]

The following additional information would assist with understanding the movements in the financials:

A description of the definitions applied to each of the stages to understand which types of exposures sit within each bucket. For example: what happens to exposures that cure out of arrears or default; which exposures sit in stage 2 (30 days, 60 days arrears only?). This would help to clarify how the model is structured and help with identifying the reasons for the exposure movements.

A more detailed breakdown of what coverage ratios, PD's and LGD's are applied to the different types of exposures sitting within the stages and whether these are lifetime, or 12 month expected default rates. This would assist with explaining the decrease in the stage 2 coverage ratio, the increase in the stage 3 coverage ratio and help to validate the results.

A detailed breakdown of the roll rates or flows of exposures between the different stages would be valuable to better understand the distribution of the exposures sitting within each stage through time (split by channel and age of exposure). This would help to clarify which channel and age of exposure is contributing to the stage 2 and 3 buckets and their growth (to predict how this may change or further worsen over time).

- Ideally this breakdown should include a detailed breakdown of the stage 2 exposures and roll rates. This would allow the impact of arrears deterioration (30/60 days arrears) to be separated out from pure deterioration in future expected losses (on up to date exposures) to allow a more detailed understanding of the movements in the portfolio and its provisions.

A view of the early default (first missed payment) and default (3 missed payment) vintages would be useful (split by channel to allow a better understanding of the new business risk being written and to help explain arrears and some of the other movements experienced).

Details of the economic forecasting model and the measures used within the model (so coefficients as well as the measures themselves). These can be interrogated to see if they are causing rolls into stage 2 or the change in the coverage ratio (although it went down it would be good to check that this is indeed accurate).

An in-depth breakdown of the financials of the loans from a pricing and accounting perspective would also be very valuable. To receive the interest rates charged, cost of funding applied, bad debt charge, expected bad debt charge (from the pricing models) at an individual account level, will allow an analysis of profitability to be performed per channel and per risk bucket. It is possible that although many of the ratios are relatively stable over time, there may be underlying movements which help explain some of the poor financials coming through. For example, certain risk buckets may be under-priced, and this may be contributing to the weaker financials.

iv. With one quarter remaining, the CFO has asked what can be done to improve the income statement profit for the current calendar year. Propose possible actions, reflecting on both short- and long-term implications. [5]

For any action to make an impact it needs to be something that can significantly adjust the financial ratios within 1 quarter which is a very short space of time. The following suggestions may give short term lift to the financials (but may not always be the best solutions with a longer-term business view):

- Review the policy the bank has with respect to the treatment of write-offs as well as how it treats and provides for cured accounts. The bank may have chosen to be conservative in the definitions of how it treats different pockets of exposures within the portfolio – this could be a good time to review these conservative views (in terms of the staging of the accounts under IFRS9). This could reduce some of the stage 2/3 exposures or reduce write-offs (short term) which will help the financials.

- The exposures in stage 2/3 need to be reviewed to look for any anomalies or strange occurrences that may have resulted in accounts rolling, and then curing, but still having to be provided for at a higher level. For example, if there have been once off billing issues – it can probably be justified that these exposures are treated differently to other exposures in a similar arrears status (provided these are genuine once off anomalies). This will result in lower coverage ratios for the exposures in question.

- The business could really push collections efforts, especially in stage 2 arrears, to see if any arrears can be cured. The once off jump in stage 2 exposures looks like an anomaly and thus these exposures could be tackled first. This will reduce the size of exposures in stage 2 and help to release provisions in that bucket. Any improved collections efforts will help across all buckets in any case.

- The modelling team can review the macroeconomic model that is in place for predicting changes in the expected default rates and ensure that the measures in the model and their parameters are still relevant.
    - There could be two positive outcomes here if a recalibration is required – there may be some cures out of stage 2 (exposures move back to stage 1) and the future expected PD may reduce (reducing the coverage ratios).
    - It should be noted however the outcomes could go the other way depending on the results of the model review.

- The bank could cut back on new business (the goal being to reduce new business strain – so this would only be implemented for the 4th quarter itself). This would ideally be done by reducing higher risk buckets or by reducing the loan sizes for less profitable pockets of business. Not ideal long term but short term would reduce some of the new business strain experienced.

Credit for the following proposals, however since they are longer term in nature and would alter the financials over a more extended period, not impacting short term results needs to be mentioned:

- Increase pricing on all new business to improve the margins. This could be implemented and would show some benefit in the financials in the short term (but impact will be relatively small in one quarter). However, it may help longer term (if it is sustainable)
- Implement risk cuts on the new business being written to focus on writing low risk business (to reduce bad debts). Short term this would only have a small impact as the brand-new business will probably not roll into arrears within the first few months. However longer term it will result in smaller bad debts. However, if the business is priced correctly, and there is enough margin to price for risk, then this is not a good long-term strategy.

