

Actuarial Society of South African

26 October 2017 (am)

Subject F206 – Banking Specialist Applications

Examiners’ Report

Introduction

The Examiners’ Report is written by the Principal Examiner with the aim of helping candidates using past papers as a revision aid.

The Examiners examine the F206 syllabus and have access to the reading material and references contained in the reading material. The report contains more points than the Examiners will expect from a solution that scores full marks. The list of points is not exhaustive and marks were awarded for alternative solutions as well.

The report is written based on legislative and regulatory context at the date the examination was set. These circumstances may change.

Overall, candidates did better on this exam than previous exams. It is still disappointing to see the lack of breadth and depth in answers, with most candidates only listing a couple of basic points for large parts of the exam. Candidates did not necessarily provide sufficient depth for the number of marks available. It is also disappointing that candidates did not achieve better results on the numerical parts of the exam where relatively easy marks are available.

QUESTION 1

This question was generally better answered out of the 3 questions. Given the highly topical nature of IFRS 9 and that the implementation deadline is 1 January 2018, it was expected that candidates would score well on this question.

A medium-sized South African bank is developing new credit risk impairment models in preparation for IFRS 9. It currently offers only Retail lending products, and its key exposure is to Retail Mortgages and Credit Cards. The Bank has existing Basel models in place and is current AIRB accredited.

- i. Describe the key reasons why accounting and regulatory bodies undertook the development of IFRS 9 to replace the current standard, IAS 39.

This question was well answered. Most candidates demonstrated a good understanding of the new accounting standard and the reasons for its introduction.

- Changes to the provisioning standards is one of the outcomes of the global financial crisis in 2008, and a move to be more in line with Basel standards, which require more sophisticated credit risk management.
 - In general, Banks are expected to develop more comprehensive models for measuring credit losses.
 - As well as put in place more robust process and governance in respect of credit risk management.
- The main reason for the changes are due to the current approach raising too little provisions and not sufficiently well in advance:
 - Previous standard was based on objective evidence of impairment. New standard allows for lifetime Expected Credit Losses on loans that have been flagged as having experienced a significant increase in credit risk. Therefore, too little was being provided in times of potential economic deterioration.
 - Previous standard was based on an incurred loss concept, and new standard is based on expected loss. Therefore, provisions were made too late. Under IAS 39, there had to be an incurred loss event for the bank to be able to raise additional provisions. Under the new standard, the bank is able to assess whether there has been a significant increase in credit risk, and raise provisions appropriately.
- New standard also includes a number of items previously excluded, like off balance sheet items (for example unutilised proportion of a credit card facility).
 - This means that additional provisions are held which previously were not required.
- Under IFRS 9, the bank is expected to incorporate forward-looking information over the remaining lifetime of its loans.

- If the bank therefore expects a downturn in the economy in two years' time, it is able to start providing for that now.
 - Under the previous standard this was not possible.
- ii. Describe the key changes to the provisioning model under IFRS 9, as well as key challenges in developing these components in respect of the Bank's portfolio.

Candidates could have scored better in this question by providing more breadth in response.

- New provisioning model requires the classification of accounts into Stage 1, 2 or 3, depending on credit quality:
 - Stage 1 represents performing accounts, Stage 2 represents accounts which have been flagged as having experienced a significant increase in credit risk since origination, and Stage 3 represents non-performing or defaulted accounts.
 - Significant increase in credit risk since origination is the key determinant in identifying a loan's staging classification.
 - This requires the bank to define origination.
 - In the case of Mortgages this is relatively straightforward, and will be the date at which the loan was put onto the bank's balance sheet.
 - In the case of credit cards, this can be more complicated. Cards can be considered to be renewed annually, and new physical cards are issued every 3-5 years. This means that the current facility may not be the same as that of the first facility. The bank will need to define which event it considers to be the origination date.
 - Measuring of credit risk since origination is difficult, as it requires the bank to have stored all relevant credit risk and macroeconomic information between the point of origination, and today.
 - Some of this data may not be available, e.g. scores may be missing or blank or stored on a paper files.
 - Some of the information may not have been produced or stored in the format required. For example, macro-economic variables use to produce forward looking forecasts.
 - Determine what is considered a significant increase in credit risk.
 - Usually defined in terms of a relative measure. For example, the relative increase in PD since origination (e.g. 20%, 50% or 100% increase).
 - Although an absolute measure may be acceptable. For example, accounts with an increase in absolute PD of greater than 1% is deteriorated.

- The bank needs to ensure that chosen trigger is stable over time
 - Not too many accounts move from Stage 1 to 2 and back to Stage 1 over a short period (false positives).
 - And not too many move from Stage 1 to 2 and then to default in the next month (too late).
 - That it is aligned with existing credit risk management practices. For example, if accounts that experience a greater than 2 notch downgrade are put on the Bank's watchlist, it may be more difficult to argue that a threshold of a 3 notch downgrade is appropriate for measuring a significant increase in credit risk.
- Include off balance sheet items – for example credit cards unutilized limits.
 - This requires the bank to be able to estimate additional drawdown (which may be available from Basel estimates).
 - As well as behavioural patterns over the lifetime for these products (as Basel estimates usually only measure this over a 12 month period).
- Estimate lifetime for loans with an undrawn component.
 - These loans may not have a fixed contractual maturity (usually in the case of Retail lending) and so the Bank will need to estimate the maturity to be able to determine lifetime ECL.
 - Credit cards for example usually have a 1 year maturity, however Banks tend to not enforce these, and allow loans to roll-over from one year to the next without performing a detailed credit check. As a result, the Bank will need to estimate the behavioural life of these loans.
- The Bank will be required to incorporate forward looking information into its estimation of ECL:
 - Developing relationships with historic data – flat cycles, low defaults, requires the bank to have a sufficient time series of data available.
 - In portfolios with low default rates, it may be a challenge to develop a robust relationship.
 - Where economic conditions are benign, or do not move sufficiently, it may be difficult to develop a robust relationship.
 - Projecting forward-looking macroeconomic variables is expected to be a significant challenge.

- Most banks can only predict between 1 and 5 years of macro-economic conditions, and these are generally highly inaccurate.
 - Therefore, the bank will need to be able to balance the need to produce projections long enough to cover the remaining lifetime of all portfolios against the desire to want to avoid excessive volatility due to changes in economic projections from one year to the next (due to projection error).
- Defining multiple scenarios including assigning probably weights to these scenarios
 - The standard requires multiple scenarios to be used in the estimation of ECL. In order to determine coherent scenarios and assign probability weights is a challenge.
- Another challenge will be in dealing with portfolios without ratings / models.
 - These portfolios will generally not have a rating available (at origination and current) to assess whether there has been an increase in credit risk since origination for the purposes of staging.
 - In addition, often the reason these portfolios do not have models is that there is insufficient data available to develop reliable statistical relationships.
- Banks will also need to restate previous financials to allow for the implementation.
 - This will be further aggravated because of the transitional arrangements introduced by the prudential authority. That is the SARB in South African.

iii. The Bank's CFO has requested that the model development team perform an initial impact assessment on its current provisioning levels (excluding defaulted assets) as a result of the adoption of IFRS 9.

a. Determine the 12 month (Stage 1) and lifetime (Stage 2) provisions for a 20 year Mortgage product. The mortgage loan has the following characteristics:

- Current rating of 3
- Remaining term of 4 years
- Effective Interest Rate of 10% p.a.
- Current outstanding balance of R 1,000,000

Note: No staging is required to be performed. Candidates should assume that the entire loan is in Stage 1 and 2 respectively for the calculations. You may also assume that the loan will be settled in four equal instalments.

Marginal PD (years from snapshot / calculation date)										
Rating Grade	1	2	3	4	5	6	7	8	9	10
1	0.100	0.070	0.050	0.040	0.035	0.032	0.030	0.028	0.025	0.022
2	0.115	0.081	0.058	0.046	0.040	0.037	0.035	0.032	0.029	0.025
3	0.132	0.093	0.066	0.053	0.046	0.042	0.040	0.037	0.033	0.029
4	0.152	0.106	0.076	0.061	0.053	0.049	0.046	0.043	0.038	0.033
5	0.175	0.122	0.087	0.070	0.061	0.056	0.052	0.049	0.044	0.038

Years	1	2	3	4	5	6	7	8	9	10
LGD	45%	46%	47%	46%	45%	45%	45%	45%	45%	45%
FL Scalar	1.05	1.1	1.15	1.1	1.05	1	1	1	1	1

Most candidates were able to calculate an answer, but most were incorrect. Common errors were not including discounting, or using the wrong parameters.

- Discount factor for each year assumes account defaults half way through the year.

- DFs as follows
 - Year 1 – $(1 + 10\%)^{-0.5} = 95\%$
 - Year 2 – $(1 + 10\%)^{-1.5} = 87\%$
 - Year 3 – $(1 + 10\%)^{-2.5} = 79\%$
 - Year 4 – $(1 + 10\%)^{-3.5} = 72\%$

- EADs as follows
 - Year 1 – 1,000,000
 - Year 2 – 750,000
 - Year 3 – 500,000
 - Year 4 – 250,000

- Stage 1 ECL = $PD(1) * LGD(1) * EAD(1) * DF(1) * FL(1)$
 = $0.132 * 45\% * 1,000,000 * 95\% * 1.05 = 59,580$

- Stage 2 ECL = $PD(1) * LGD(1) * EAD(1) * DF(1) * FL(1)$
 + $(1 - PD(1)) * PD(2) * LGD(2) * EAD(2) * DF(2) * FL(2)$
 + $(1 - PD(1) - PD(2)) * PD(3) * LGD(3) * EAD(3) * DF(3) * FL(3)$
 + $(1 - PD(1) - PD(2) - PD(3)) * PD(4) * LGD(4) * EAD(4) * DF(4) * FL(4)$
 = $0.132 * 45\% * 1,000,000 * 95\% * 1.05$
 + $(1 - 0.132) * (0.093) * 46\% * 750,000 * 87\% * 1.1$
 + $(1 - 0.132 - 0.093) * (0.066) * 47\% * 500,000 * 79\% * 1.15$
 + $(1 - 0.132 - 0.093 - 0.066) * (0.053) * 46\% * 250,000 * 72\% * 1.1$
 = 100,319

b. Comment on the results of your calculation.

Most candidates failed to comment sufficiently on their results.

- The ECL associated with Stage 2 is significantly higher (double) than that for Stage 1.
 - This is as a result of having to hold lifetime expected credit losses.

- The incremental ECL for each future year in the projection is relatively smaller due to the following effects:
 - the decreasing marginal PD over time. The default rate in each future year is lower as account which stay on the book (without defaulting) tend to be better quality loans.
 - the allowance for survivorship. The ECL in future years is only estimated on accounts that are projected to survive to that period. Provisions on new business is not projected.
 - the effect of discounting. The time value of money means that future losses have a lower present value.

- the tapering off of the forward-looking multiplier. Based on this projection, it appears that economic conditions are expected to stabilise from year 4 onwards. However, it deteriorates for the first 3 years, so the effects are offsetting.
 - the amortization profile of the mortgage means that less exposure is outstanding for each future year, hence ECL in Rand values is reducing over time.
- c. The Bank has completed the initial impact assessment for its two portfolios. Details are provided in the table below. The CFO has asked you to independently review the results and comment on the implications for the Bank. Outline the points you would make in your report.

Portfolio	Exposure	IAS 39 Provision	Basel II EL	Before Forward Looking		After Forward Looking	
				Stage 1 ECL	Stage 2 ECL	Stage 1 ECL	Stage 2 ECL
Mortgages	2,500,000	190,000	220,000	190,000	250,000	209,000	345,000
Credit Cards	1,000,000	150,000	300,000	280,000	300,000	308,000	360,000
Total	3,500,000	340,000	520,000	470,000	550,000	517,000	705,000

Better candidates created a table with key ratios and commented on each in turn. Stronger candidates went on to discuss possible reasons for the results as well as implications for the bank.

- Mortgages portfolio makes up 71% of total exposure, and Cards makes up 29%.
- However, IAS 39 provisions are roughly 55:45 between Mortgages and Credit Cards:
 - This indicates that mortgages is the lower risk portfolio (which is in line with industry experience)
 - Or there is potentially a difference in provisioning methodology between the two (the outcome period used for Cards could be for example)
 - Or a combination of the above
- Basel II EL for Mortgages is higher than IAS 39 due to conservatism contained in the Basel LGD.
 - Other than this, the two estimates are relatively similar which indicates that the emergence / outcome period for mortgages may be approximately 12 months.

- Basel II EL for CC is significantly higher than IAS 39, suggesting high level of conservatism in EL and most likely less than 12 month outcome period under IAS 39.
 - IAS 39 also did not allow for any unutilized limits, which would further explain any differences
- When comparing the Basel EL (a more like for like comparison) between Mortgages and Cards, it is clear that Mortgages is a lower risk product (as expected).
- Stage 1 ECL before Forward Looking compares well to Basel II EL for both Mortgages and Credit Cards.
 - Both are estimated on 12 month basis.
 - Both include undrawn balances.
 - Stage 1 ECL removes any conservatism built into Basel models, as IFRS 9 requires the use of unbiased estimators.
 - Hence assuming no forward-looking impact, the Stage 1 ECL is expected to be lower than the Basel II EL. This is a good check on the result.
 - Furthermore, many banks are expected to leverage their existing Basel models (with adjustment) to obtain IFRS 9 models. Therefore, would expect the results to be relatively similar.
- Stage 2 ECL is significantly higher than both IAS 39 and Basel II EL.
 - Mortgages have relatively long remaining lifetime resulting in large multiple for Stage 2.
 - Credit Card lifetime appears to be shorter, hence relatively lower uplift.
- Stage 1 Forward looking impact on Mortgages is similar to Credit Cards, indicating that there is no real concern in the economy with respect to property prices, or other longer-term drivers of the Mortgages portfolio. This should be interrogated further.
- Stage 2 impact for Mortgages including forward looking is smaller but would be expected to be larger as a result of longer remaining tenor. Cards tend to be shorter behavioural lifetimes, and as a result, the forward looking impact only needs to be applied for a couple of years. The difference is scale for Cards compared to Mortgages should be interrogated further.
- Total provisions for the Bank has increased significantly as a result of IFRS 9 adoption.
 - Increase of 365,000, or more than double.

- This is well in excess of the upper end of what is generally expected, indicating that the bank may have been underproviding under IAS 39, or has a higher risk portfolio than general.
- Driven mainly by the Cards portfolio due to the forward looking deterioration expected in that portfolio.
- Stage 1 ECL is relatively similar to the Basel II EL, but higher than IAS 39. If the Bank is able to manage its credit quality, it can reduce the proportion of Stage 2 loans, and hence reduce its over ECL to a level more comparable to Basel II.
- This will still be a relatively large increase from its current IAS 39 provisions.
- The Bank is likely to have to make a large adjustment to its opening provisions on day 1 of adoption.
 - This adjustment will go through retained earnings, and not through P&L.
 - Any future changes in ECL will go through P&L as per usual
 - The SARB and other regulators have acknowledged the potential strain on capital positions of banks and have implemented transitional arrangements as a result.
- The significant increase in expected provisions is likely to have an impact on the banks.
 - Ability to pay dividends prior to adoption, which could lead to negative market sentiments.
 - Capital requirements, as the EL deduction will change as a result of the change in provisioning levels.
 - The CFO may wish to raise additional capital / equity as a result of the above.
- Stage 3 assets are not included in the above and would still need to be added to obtain a complete picture.
 - It is not expected that there will be significant changes to Stage 3 assessment of provisions compared to the current standard

iv. Explain potential ways in which the Bank could reduce its IFRS 9 Expect Credit Losses.

Candidates failed to cover sufficient number of points.

- The Bank can reduce its IFRS 9 ECL in the following ways
 - Reduce unutilized limits on credit cards.
 - This would limit provisions to mainly on-balance sheet exposures
 - It could be that the bank has allocated excessive limits which customers do not use (this could explain the large difference between the IAS 39 estimates and the Basel II EL).
 - This may however have a negative impact on customer perceptions if they like the idea of having a large limit available.
 - This would also directly reduce the Banks capital requirements on Cards, so could have a double benefit.
 - Limit length of mortgage portfolios.
 - The Bank could aim to reduce the length of mortgage contracts offered as then loans classified into stage 2 will carry lower provisions.
 - This may however have impacts on the affordability of the mortgages for customers all else being equal.
 - This may also have a negative impact on customer perceptions if they like the idea of being able to pay off a Mortgage loan over a long period of time.
 - The bank will need to balance the above two considerations against competitive pressures, as making significant changes could see a loss of business to competitors.
 - Missing payments (30 days past due) is likely to be a large driver of accounts classified into Stage 2, and hence cleaning up arrears can have a significant impact.
 - This could be done by:
 - Calling customers currently in arrears to encourage them to make payments.
 - Reminding customers of their payments before they become due. The above could be as a result of many “false triggered” accounts where they roll back to Stage 1 in the following month.
 - The current PD model calibration may not be appropriately capturing risk.
 - The Bank can assess whether a recalibration or rebuild is necessary.

- It may not be granular enough to capture true deterioration in credit risk, and so some loans may be classified into Stage 2 when they would be in Stage 1 under a more granular model.
- New loans originated can be done on stricter basis, hopefully reducing the extent of further deterioration
 - Eventually older and riskier loans will run off of the balance sheet and so the bank will see a gradual decline in Stage 2 ECL over time.
 - Increase collateral requirements for Mortgages, likely reducing LGDs, and improving the distribution of accounts into better LTV buckets.
 - The above two points are not immediate fixed, and it will take time for improvements in origination strategy to feed through to the provisioning levels.
- Identify causes of forward looking impact and take pro-active action to reduce exposure to these effects.
 - For example, property prices in a particular area may be particularly depressed, and hence the Bank may look to reduce exposure to that area.

In order to incorporate forward looking information into the provisions, the Bank has developed the following 2 macroeconomic linkage models.

$$PD_{Mortgages} = 0.02 + 0.07. (\Delta GDP) + 0.2. (\Delta PPI) + \varepsilon$$

$$PD_{Credit Cards} = 0.06 - 0.4. (\Delta GDP) + 0.4. (lagUE) + \varepsilon$$

The following variables have been used:

$PD_{Mortgages}$ is the expected probability of default of the mortgage portfolio at a forward looking time period.

$PD_{Credit Cards}$ is the expected probability of default of the credit card portfolio at a forward looking time period.

ΔGDP is the corresponding expected change in gross domestic product.

ΔPPI is the corresponding expected change in a property price index.

$lagUE$ is a lagged level of unemployment.

ε is a random error term.

v. Comment on the above relationships.

Given the simplistic regression relationships presented, most candidates failed to demonstrate an adequate understanding of the basic principles being presented.

- Overall equations appear to be linear in nature i.e. a change in a macro-economic variable results in a proportionate response in default rates.
 - i. This is not usually the case for macro-economic models where default rates usually follow some sort of non-linear relationship.
 - ii. I.e. Deterioration in MEVs are usually expected to have increasingly worse impacts on default rates, for example, the Vasicek model.
 - Assuming stable economy, Mortgage default rates (2%) are relatively lower than that for Cards (6%).
 - i. This appears in line with expectations.
- vi. It would be necessary to review the model fit statistics to comment in detail as to the appropriateness and goodness of fit for these models.
- i. It may be that variables demonstrate multicollinearity, or other model fit statistics (VIF, R-squared, etc) show poor fit.
- vii. It is also recommended that the output are tested over a range of macro-economic conditions to ensure that the outputs perform as expected. Scenario testing can provide valuable insight into what outputs would look like under forward-looking conditions.
- viii. Mortgages model:
- i. Mainly driven by changes in Property Prices (looking at the relatively large Beta for this variable). This is as expected.
 - ii. The relationship to GDP does not look very strong (looking at the relatively small Beta).
 - iii. Furthermore, the relationship with GDP appears to be in the wrong direction. An increase in GDP does not usually result in more defaults. This could indicate that the model is misspecified.
 - iv. It is possible that a two factor model is not necessary for the Mortgages portfolio.
 - v. It is possible that other variables or transforms need to be considered in order to obtain a more robust model.
- ix. Credit Card model:
- i. Appears to be equally driven by changes in GDP and Unemployment
 - ii. The relationship between each variable and default rates appears to be

intuitive

1. Lower GDP leads to higher default rates
 2. Higher unemployment leads to higher default rates
 3. Unemployment is lagged, which is also intuitive. Usually there is some time between people losing their jobs and it impacting their ability to pay their loans
- iii. There may be high correlation between the GDP and Unemployment variables (as they carry very similar weights), and so it may be possible that not both are necessary.
- vi. Describe how the Bank can use a management overlay framework for dealing with risk not captured adequately in the models.

This part was poorly answered in general. It appears some candidates ran out of time on this part of Question 1.

The first way to identify whether risk is not being captured in the models is to perform detailed model monitoring. In this way the Bank can identify whether changes in provisions are as a result of model parameters changing over time, or as a result of external factors.

- Where changes are as a result of trend in underlying risk drivers, the bank can frequently recalibrate its model parameters. In doing so, it can minimize any mismatch between what the model is estimating, and what actual loss experience shows.
- Where the models are not adequately capturing risks, the Bank can develop an overlay framework to adjust ECL outputs.
 - The bank may find that some factors cannot be captured in a statistical manner.
 - For example, some locations in which it has property loans may be exhibiting higher loss rates than other areas. However, it may be that there is no reliable property price index available for that area.
 - In these instances, the Bank may decide to use a judgmental expert judgment approach to adjust ECL's up or down to account for this risk.
 - As these adjustments are not model driven, the Bank will need a well-documented process that explains how this adjusted is quantified.
 - It should also be backed by quantitative analysis where possible. If for example, PDs are increasing over the past 6 months but the model averages over a 24 month period, the Bank can consider making an adjustment to reflect this deterioration while the model calibration takes time to catch up.

- These adjustments would also need to go through rigorous debate and challenge at technical and audit committees
- These adjustments are not expected to be permanent. This adjustment can be removed over time as the model catches up, or as the experience reverts back to “normal”
- The Bank will need to frequently re-assess the need for overlays, and document how they plan to release them over time.

QUESTION 2

This question was generally poorly answered. There was insufficient breadth and depth of discussion.

You are the Analytics head for a large South African Bank. Your bank holds approximately a 20% market share across all products in its suite. The bank currently has limited channel presence. All business is conducted through the branch network or the ATM network. The ATM network is predominantly used as a mechanism for disbursing cash.

The CEO of the bank has recently worked through the financials of the competitor banks and has noticed that your bank’s cost base is extremely high relative to peers. As a result, he has asked you to draft a business case and strategy for migrating your customers to cheaper channels.

- i. Explain what you would take into consideration and include in the business case.

Some candidates failed to focus on the details provided in the question and the specific application required for the business case.

Consider the types of channels that are available to the bank to develop. Some options are:

- To develop an online platform / website
- To develop e-mail capability
- To develop an application for use on mobile devices (APP)
- To make use of USSD or smses to communicate with clients
- To make use of a call centre to take inbound calls or make outbound calls
- To make use of the ATM’s to perform more transactions than simply those being used as cash machines
- To launch Twitter / Whatsapp / Facebook chat applications / pages.

For each of these channels and options there will be different costs associated with developing these channels. One will need to consider:

- System requirements upon which to run the infrastructure (new systems or system development)
- Cost of staffing to develop and maintain said systems

- Availability of technical staff to develop or run such processes
 - For example, APP developers, Call Centre Managers.
 - If there is a niche skill it will cost more to acquire these skills from other industries.
- Additional costs related to hiring additional staff: floor space (for a call centre one would need an appropriate building in which to set up the operation), equipment (PC's / headsets), support staff (HR).

Different channels will also have different times to delivery of the channels (depending on the complexity of the channel and channel development requirements).

- The choice of channels to explore will be influenced by how quickly the bank would like to roll some level of presence out.
- It will also be dependent on how many types of services can be activated on that channel (and how quickly additional services can be added to the channel once it is active).

The current products and services offered by this bank should also be considered to determine which services can be moved out of the branch network as not all services can be performed on a different platform (e.g. digitally).

Different channels will also be more or less appropriate for specific services rendered to the customer (being statement delivery / sales of products / FAQs for example). The level of appropriateness will depend on the complexity of the services and the ability of the customer to be able to service themselves with little additional human interaction.

- For example, statement retrieval / account balances can be 100% self service potentially on almost any platform.
- However, some complex products (wills / setting up trusts etc) may still require some level of human interaction (witnesses etc). However, appointments with relevant staff could be booked digitally.

The relative fraud risks of each channel need to be explored (probably by the IT risk area or compliance area of the bank) to fully understand what risks the bank will expose both itself and the customer to in launching some of these channels.

Risk mitigants (e.g. requiring card and pin verification for certain transactions) will need to be put in place, and monitoring thereof will also need to be implemented to ensure any fraud is quickly stopped.

The bank should determine the appropriateness of each potential channel to service the types of clients on the books. Based on demographics such as age / gender / income level different channels will be more appropriate than others. There will be several unique clusters of clients which will have specific needs to be fulfilled and will have differing levels of comfort with different non face-to-face channels.

- For example, if the client base typically own smart phones, are younger and reasonably tech savvy then building an APP or online platform may give the bank a large benefit in migrating clients.
- As compared to a client base that is not very tech savvy (in which case perhaps developing a call centre is one of the better options as most clientele will have access to at least a telephone of sorts).

The bank should look at what its competitors are currently doing in the channel to leverage their learnings and to determine those strategies that appear to work and those that do not.

- The bank can also look to replicate some of the functionality currently available in the market (for example some of the APP layouts and functions) and look to replicate the best of what is available.

The bank should analyse all the transactions performed within its branch network (numbers of transactions and types of transactions). Each of these transactions will have some associated costs involved (time to perform transaction, level of skill required to perform it and associated staff cost).

- Based on these costs the bank can determine the relative cost benefit of migrating these services to a digital type of platform (both in terms of the unit costs as well as the overall cost to the bank).
- This will help to inform which transactions should be migrated to which channels, and how quickly.
- The initial cost of developing a platform will be quite high (irrespective of the number of services available on the platform). The more services that are added the lower the marginal cost of adding those services and the more the sunk costs can be spread across multiple services (resulting in the cost per service being reduced).

The bank should also look to make more extensive use of the ATM network that it already has in place.

- The relative costs of this should be explored as the client base is already comfortable making use of the ATM's and perhaps some of the simpler branch tasks (statements / balance enquiries for example) can thus be moved to this channel with relative ease.
- The client base may also be more receptive to this channel as it is something they would already be comfortable making use of (as opposed to having to explore a new platform).

The bank must determine how it would roll these services out and how it would project manage the entire process.

- For example, would the bank start switching customers on to an Application (App) with some limited services initially, or would it look to build significant capabilities on different platforms and then start launching the applications.
- It also needs to determine which services should be bundled together to make the customer experience in using that platform a sensible one (for instance if customers

typically perform several services in one occasion it would be ideal to bundle these together on a specific platform).

- Depending on the channel it may be appropriate to launch certain platforms (e.g. the APP) with limited functionality in order to:
 - Prove the concept and assess what the client take up is prior to investing heavily in full development.
 - It will also allow proper testing of the new channel to take place before too much complex functionality is in place (to complete proper troubleshooting in the “live” environment).

The bank needs to determine how it would look to migrate customers onto these platforms from a strategic point of view.

- It could make extensive use of marketing (prior to and post launch) in order to encourage customers to try out the new channels.
- It should train staff to use the new channels in order for the staff to train any customers that come into the branches (although obtaining staff buy in may be a challenge).
- Favourable pricing could be implemented on the new channels (and likewise punitive pricing could be implemented on the older more expensive older channels – although this may not be too popular initially with clients).
- The bank could offer additional rewards on any loyalty packages in place or could have competitions in place for use of the new platforms.

After 3 years of development and a significant investment into the banks “migration” project, the CEO is very disappointed with the outcomes to date. Normalising for the development costs in the bank’s financial statements for the last 3 years, he has noticed very little improvement in the cost base of the bank. He has tasked you with investigating why this is the case and has asked for proposals to try to improve this situation.

- ii. Outline the considerations and points you would make to the CEO.

Most candidates failed to generate sufficient points here. It appears that most candidates failed to understand the question as many focused only on business reasons for cost deterioration.

One would need to understand how far into the project the bank has progressed with to date.

- If it is a 6-year project with several deliverables one needs to understand how many of the new channels (digital and other platforms) have actually been launched to date and how many are still in the pipeline.
- If the project still has many milestones left to achieve then the cost benefit of the project is not likely to reflect in the financials as yet.

- A possible solution to seeing earlier benefits is to invest more in the project sooner in order to ensure more services are launched quicker (provided this is realistic).
- The cost benefits of a channel migration will not be immediate as it will take some time for new approaches / channels to be adopted by clients.

It is worth reviewing the initial project plan to see if there have been any unexpected setbacks or delays and if the actual costs of the project have been out of line (specifically higher) than initial expectations. This may point to why the project has not seen the initially expected benefits yet (or if the initial promises or commitments were too optimistic).

One needs to know when different platforms were launched and with what level of functionality.

- If they were launched recently then there may not be a lot of traction yet in terms of switching customers to these platforms.
- If the platforms have been launched with limited functionality this may lead to less usage initially.
- One also needs to understand how successful these launches have been (if there were trouble shooting and bugs in the platforms then due to poor customer experience it is possible that the relative success of the roll out would have been compromised).

An analysis is required of all the channels launched to date and the services that are available on each of these channels.

- Assess how many customers have made use of these new platforms (so for instance have downloaded the APP).
- How often they are using the platforms (repeat users or once off) and for which transactions.
- Ideally if the data exists, analyse the percentage of the transactions have been migrated (to date) per transaction type and how long it takes to gain traction with respect to this migration. For example, once a new platform and transactional capability has been launched, asses the percentage that migrated after 1 / 2 / 3 etc months of the platform being live.
- This would potentially help the business to have realistic expectations of the future success of the rest of the project and how rapidly financial benefits may be realised.

In addition to this it would be more valuable if this information could be linked to the demographics of the customers to see if there are specific clusters of customers where the migration has been more or less successful to date.

- Based on the outcomes of this analysis the bank can look to specifically target pockets of customers with “migration” campaigns (sms campaigns, ATM campaigns).

- This information will also help the bank to understand which elements of the marketing campaign (run to date) for the switches have been successful and which not, and which ones need to be re-launched or altered to make them more successful.

The bank may need to incentivise the client base to switch by doing more than just offering a “simpler” or more user-friendly customer experience.

- Perhaps offering incentives for instance prizes (lucky draws) or giving cheaper rates (e.g. transactions are free on these new platforms – even if it is just initially the case). This may help to boost initial take up of the channels. If this has not been explored properly to date or has been unsuccessful, a different type of reward needs to be explored.
- The bank could also look to increase the cost (to the client) of performing certain transactions within the branches in order to make it more worthwhile to switch to cheaper channels.

If there has been a reasonable level of migration (of services and transactions) and some branches are performing reduced numbers of services then in theory the branch costs (in these branches at least) should have seen some reductions. One needs to check the financials to see if the branch network / footprint has reduced at all as a result of the digitisation project. It is possible that while there has been some migration (and perhaps a reasonably successful one) that the branch network has not been reduced in size or the staffing thereof as a result of:

- Lease agreements that have not ended yet and that are very expensive to exit early
- Reducing the physical sizes of branches in certain areas may not be possible (as there are no available smaller sites).
- Perhaps some branches have essentially become “obsolete” but no strategy has been implemented to start closing these down (and if possible moving staff to other branches – as this is the less painful option union wise versus firing them).

QUESTION 3

This question was very poorly answered. Many candidates discussed a sovereign downgrade instead of focusing on the bond default outlined in the question. A poor level of understanding of the function of the central bank was exhibited by several candidates.

You are an actuary advising a small bank in a developing country. Loose fiscal policy has resulted in strain on government finances and inflation has been rising as a result. Liquidity is strained and two small banks have recently entered into resolution. The local regulator has adopted a regulatory approach that is similar to Basel II standardized approaches for risk measurement.

The government has recently defaulted on one of its dollar bond issuances.

The financial director has requested you to brief the Board on sovereign risk for local and foreign currency exposures. In your briefing discussions he explained that the Board has particular concern in understanding and mitigating the impact of the bond default on the liquidity and capital position of the bank.

- i. Describe the points you will make to the Board.

Candidates who structured their answers performed better in this question.

Sovereign risk

Sovereign risk is the risk that the government of the country cannot meet its obligations as they fall due. All banks are exposed to the default of the government.

Sovereign risk is widespread with examples ranging from Argentina to Russia to the recent dilemma in the European Union with Greece. Recently Mozambique also defaulted on its sovereign foreign currency debt.

Local and foreign currency sovereign risk differs. It is possible for a sovereign to default on its foreign currency obligations while maintaining its local currency obligations.

Foreign currency obligations are more difficult to maintain as the sovereign is required to raise foreign currency either through additional borrowing or foreign currency reserves or foreign currency earnings. In instances of poor fiscal discipline, capital markets may simply not be prepared to extend any further credit at any price.

However, once a sovereign defaults on its foreign currency obligations that is to say, is unable to obtain additional foreign currency to pay for existing obligations, it is unlikely that it would be able to maintain local currency obligations indefinitely.

Sovereigns are able to maintain local currency obligations much longer because:

- It has the power to increase taxes in local currency
- It can increase the supply of money through asset purchase programmes
- It can print money

Implications for liquidity

The liquidity position of the bank will be compromised. Given that the government will seek to raise the liquidity to meet its obligations, it will aim to extract the liquidity from the local market.

The bank will need to consider its asset and liability cash outflow profiles:

- As assets fall due obligors may default due to lack of liquidity.
- As liabilities fall due, the bank may be unable to source new funding yet will be compelled to make its payments in order to prevent default.
- It will be critical for the bank to ensure that its liability profile is of a longer behavioural term than its asset profile.
 - However, this would not normally be the case as banks borrow short and lend long.
 - Some banks may have very sticky retail deposits which would protect it from the liquidity strain.
 - Those banks with the greatest reliance on short term funding will fail first.

The rationale holds for both local and foreign currency. However, if the bank is operating predominantly in local currency the foreign currency default will have a lesser impact. The bank's foreign currency exposure is therefore key.

Liquidity risk mitigation

Given that the government has not yet implemented Basel III it is likely that the liquidity coverage ratio (LCR) or equivalent has not been implemented.

The LCR aims to ensure that sufficient liquid assets are available to meet outflows as they arise as explained above. Liquid assets must be sufficient to meet potential outflows over a 30 day period. The larger the liquid asset portfolio, the longer the bank will be able to survive.

The LCR must be maintained separately for local and foreign currency exposure. Sovereign default implies that the government will not be a lender of last resort.

If the bank has not already implemented these measures it is too late once the sovereign defaults. Given that default has not yet occurred on local currency, the bank should acquire sufficient liquid assets and reduce all longer term lending to within these risk appetite levels.

Implications on capital and mitigation

Under standardised rules, local currency remains 0% risk weighted while foreign currency exposure will be 150% risk weighted.

Though capital is of concern, liquidity is a much more significant risk as it will result in the demise of the bank long before the capital strain will do so.

Any lobbying or influence on the government may be useful to address the loose fiscal discipline and construct a plan to address the shortages.

After significant currency deterioration, the Central Bank raises the cash reserve requirements on local currency by 20% and on foreign currency by 50%.

- ii. Explain reasons why the Central Bank may have chosen this course of action.

This question was poorly answered. Most candidates failed to discuss the role of the central bank in taking this course of action.

Managing monetary policy

Central banks normally use interest rates to manage monetary policy. However, other regulatory interventions such as regulatory policy have a similar effect. The central bank may implement these changes to mitigate the impact of inflation.

Raising local currency reserves

Local currency reserves are normally in the range of 5% to 10% of liabilities.

Such a significant increase will withdraw liquidity from the market and restrict banks' ability to on-lend. The lack of liquidity will therefore reduce lending and immediately raise the cost of funding in the economy.

The resultant impact is similar to a monetary policy rate increase.

The rate increase will incentivise foreign investor and may lead to increased flows into the country.

The level of interest paid on such reserves varies from nothing to overnight government rates. The central bank will be able to use these reserves as a cheaper source of funding thereby reducing strain on the sovereign.

The resultant impact is similar to a fiscal policy tax increase.

Raising foreign currency reserves

The increase in foreign currency reserve requirement is significant and unprecedented. Such an increase will result in extraction of foreign currency flows in the market.

This may be a very short-sighted course of action to address the bond default payment at preferential rates from the local market.

However, without foreign currency local industries will aim to avoid any foreign currency investment in the country. Exporters may elect not to repatriate their funds and importers will be unable to import. The resultant impact on the economy will be very painful.

Similar to local currency, such action should also support the currency but at a significant cost to the economy.

END OF EXAMINATION