

Actuarial Society of South Africa

MARKING SCHEDULE

October 2021

Subject F205 - Investment

Fellowship Applications

This paper was written in online format, using a platform provided by ASSA, as a result of the ongoing COVID-19 restrictions. The exam setting and marking process was able to be undertaken as normal. The exam session presented no significant incidents arising from the online process. The process was adapted slightly from previous online versions allowing candidates to write their submissions in Word format. This aided the clarity of the answers provided and hence the marking.

The paper comprised four questions in the standard format. Similar to recent exams, this version favoured a number of shorter sub-questions with smaller mark allocations – the exception was Question 2. Questions 1 and 2 provided lots of opportunities to score marks while questions 3 and 4 were felt to be more challenging.

The exam covered a range of different concepts from the reading material. A number of questions required candidates to apply their knowledge of the material as well as familiarity with recent investment industry and market experience to solve practical investment challenges.

A couple of very well answered scripts were received, with a further few papers in the region of the pass mark. The average mark for this exam was slightly lower than previous sessions, reflecting the comments above. Most candidates scored an FB with a handful only managing an FC.

Please note that this examiner report presents one possible model solution to the questions. Alternative solutions provided are considered and marks awarded where correct points are well motivated.

QUESTION 1

Examiner Comments:

This question required candidates to apply their investment knowledge to a situation in hypothetical Placidia that was very similar to a recent situation in South Africa.

Part (i) focused on the impact of the adverse event on three different financial entities. This question was generally well-answered.

Part (ii) tested the concept of Quantitative Easing as a possible response to the event and its impact on markets. Candidates displayed a good high level understanding of QE but did not all translate this into an accurate assessment of the potential impacts and risks.

i.

General impact on economic environment that would apply to all three types of institution (that have an impact on all 3 types of institutions)

- Falling asset values
Social unrest/violence is likely to be negative for financial markets in the short term, resulting in asset values falling
 - This may be due to the short-term negative impact on profitability from the looting and damage (lost stock, production facilities and lost trading time; also reduced consumer spending as a result of lost jobs and incomes)
 - Although companies are likely to be insured against some of these losses
 - However the market might place a higher risk discount rate when valuing these companies going forward (or work the impact into their projections of the next few years' cashflows)
 - Financial markets are forward-looking and dislike uncertainty. The uncertainty resulting from the following is likely to be negative for asset prices
- Impact of potential shifts in economic policy
Possible changes in economic policy to respond to the root cause of the looting:
 - Might be bad for economic growth if a shift to a more redistributive policy to be seen to be addressing the issues of poverty and inequality e.g. higher taxes on profits to fund expansion of grants
 - Increase in social grants (to reduce inequality) may be good for retail companies due to boost in spending especially at discount retailers but
 - Might put pressure on fiscus resulting in higher government borrowing costs. Higher bond yields would mean a fall in bond prices
 - If this results in higher economic growth in longer term this would not be bad
 - Higher bond yields arising from higher government debt but also from increased uncertainty from investors implies higher risk discount rate to value other financial assets.
- Impact on economic growth
Short term (next 12 months) negative impact on GDP with potential for some boost in the medium term (12-36 months) as business and property are rebuilt – but with a net negative impact on GDP.
- Possible change in political party/leadership
- Weak sentiment towards the country.
Foreign investors might withdraw capital in short term (negative impact on asset prices). Foreign-owned businesses might even pull out of the country leading to job losses, lower tax revenue. Might also be difficult to attract new foreign investment. Domestic investors might also take fright and look to externalize capital with the same or similar impact.
 - This may result in the depreciation of the local currency
 - Lack of capital might result in higher WACC for local companies which might result in few projects undertaken, limited expansion

- A weaker currency might increase inflation if large amount of goods are imported
- Business insurance might not cover against acts of war, riots etc. resulting in more permanent impact because businesses aren't able to rebuild

Structure in Placidia unknown but if similar to South Africa, this is covered under most policies as SASRIA cover. SASRIA is a government-owned insurer and the extent of backing and further support from government (especially as they are likely to want to be seen to be taking action to recover from the event) may mean that most businesses will be able to rebuild reasonably quickly. One concern would be business owners choosing to take the insurance payout and not rebuild – which would be a loss to the economy and particularly the local economies in affected areas.

a. Pension Fund

- Pension fund likely to be invested in a mix of local equity, bonds, money market instruments and foreign investments, if allowed. So fall in asset values (as described above) will reduce value of fund assets.
- To the extent that the pension fund is allowed to invest outside Placidia, the depreciation of the local currency will offset the fall in local asset values to some extent
- Liabilities: DC so liabilities linked to asset values.
 - However individual member requirements for retirement (needs) would not have changed. Lower asset levels would make achieving individual member retirement goals harder to achieve (risk of not having enough to retire on has increased). This is especially true if inflation spikes as described earlier as liabilities are real in nature.
- Possible prescribed asset regulation (like infrastructure) to rebuild the country
- Pension funds linked to affected businesses may experience withdrawals as people who lose jobs withdraw savings. Future contributions may also fall as employment levels reduce
- Hesitance of members to contribute more towards the fund based on threat of prescription or to concerns about inability to allocate enough of their savings towards foreign investment (if this is limited by regulations).
- Purchase of annuities may become cheaper if long term yield rise

b. Life insurer

- Direct impact:
 - In terms of branches destroyed. Lost sales from closed branches
 - Damage to rail/road infrastructure/WiFi etc so ability for individuals to work and communicate
 - Personal safety threats to staff in affected areas – unable to get to work
- Potentially higher death claims from victims of riots
- Potentially higher lapses from affordability issues resulting from job losses and permanently closed business impacted by the destruction
- Weak sales of new policies based on affordability, particularly in directly affected areas
- Capital position negatively impacted by fall in asset values (would depend on how reserves and shareholder capital invested)
 - Long-dated, whole life liabilities may be matched with long duration bonds. Extent to which duration matched is important. If bonds have shorter duration than liabilities, then a spike in long bond yield is likely to result in PV of liabilities falling more than asset portfolio
 - Shareholder capital might be invested in combination of equity and bonds which would be negatively impacted. Might necessitate an equity raise from shareholders if inadequate solvency level

c. Bank

- Direct impact:
 - In terms of branches/ATMs destroyed. Lost sales/transactions from closed branches
 - Damage to rail/road infrastructure/WiFi etc so ability for individuals to work and communicate

- Personal safety threats to staff in affected areas – unable to get to work
- Fall in deposits / loss of savings or deposits
- Government put pressure on banks to lend
- Increased provisions under IFRS9
- Increase in credit losses as businesses and individual customers lose their sources of income from destroyed businesses and lost incomes
- This general wealth reduction may lead to less economic activity and low transactional/fee revenue for bank
- Collateral for secured loans no longer worth anything following destruction (this may be offset by insurance cover)
- Reduced demand for credit as business confidence and propensity to invest and grow businesses falters
- However the re-build of the economy may stimulate credit demand for businesses that choose to rebuilt and re-stock (both capex and working capital driven)
- Depending on asset makeup, capital position may be negatively impacted by fall in asset values (government bonds, listed equities)

[12]

ii.

a.

- QE is the purchase by central banks of government securities or other securities (corporate bond, MBS, ETFs) in the market in order to increase the money supply and lower interest rates
- The ultimate aim is to keep credit flowing and for banks to lend more freely to business/consumers thereby stimulating economic growth
- Quantitative Easing is typically implemented when interest rates are already near zero, because the first step is usually a reduction in interest rates (repo rate). Once this tool has been exhausted, i.e. when interest rates are low, central banks will employ QE as the next lever to influence demand/supply and spur economic growth. As a developing country, Placidia's rates are unlikely to be near zero
- Central bank creates reserves (out of nothing) and uses this newly created money to buy bonds from government and major financial institutions, usually longer dated bonds
- This newly created cash can then be lent out to customers by financial institutions
- The lower interest rates may serve to depreciate the local currency which will enhance the competitiveness of locally produced goods for export (stimulating the economy)
- By lowering the yields on government bonds, QE makes it cheaper for the local government to borrow (issue more bonds) and may give the local government the means to provide increased fiscal stimulus to the economy
- Increase in balance sheet of Central bank

[4]

b. Impact on financial markets

- Increased bond demand will push up bond prices and depress yields
- Long bond yields are important determinant of corporate cost of capital and risk discount rates (government bond yield plus risk premium)
- QE might result in higher equity market prices as liquidity increases and future cashflows are discounted at lower discount rates
- Lower yields on bonds/cash will make equities (and other risk assets) a more attractive investment option
- Higher equity prices may make households feel wealthier and encourage an increase in consumer spending (boosting economic activity)
- Companies may be able to refinance debt at lower rates (boosting profitability and returns on capital)

Risks:

- 13 years after the GFC the QE that was implemented in its aftermath has still not been unwound. So-called taper tantrums (threat of unwind) still affect markets from time to time. Ultimate impact may still be felt.
- Higher inflation (as a result of increased money supply)
- Expansion of Government debt
- Devaluation of the local currency, which in turn may stoke further inflation
- Create asset inflation and perhaps asset bubbles
 - This might further wealth inequality and raise social tensions (until they pop)
 - When they pop, it could lead to markets crashing and associated volatility and this can even lead to recession.

[4]

[Total 20]

QUESTION 2

Examiner Comments:

This question tested a combination of concepts relating to fixed income instruments, due diligence of potential investments and ESG. The question was a longer question without sub-questions.

The question required a methodical approach and thinking of the wide range of considerations and risks applicable to this type of investment. Although candidates were able to cover lots of points most solutions fell short of highlighting enough of the different considerations, impacts and risks of this type of investment. The ability to brainstorm all the relevant angles is essential for a question like this.

- 12% YTM _assuming bonds are issued at par, is 6-7% real yield depending on one's outlook for inflation. This is a good match for pension fund's real liabilities
 - However how does this compare to YTM on similar government bonds? 20-year SA GB YTM is ~10.5%. The 1.5% spread does not seem like adequate compensation for the materially higher credit risk and liquidity risk
 - Also other similar corporate bonds with similar risk profiles
- Long duration so good match for pension fund liabilities
- ZAR denominated cashflows so match for ZAR liabs of pension
- Highly illiquid: not an issue as long as infrastructure investment not disproportionately large in portfolio and pension fund has sufficient liquid assets to meet short term cashflow needs. Illiquidity risk premium.
- Returns uncorrelated with equity markets which will increase overall risk adjusted return of fund
- Means to manage climate risks in pension fund's investment portfolio
- Regulation 28: does not currently define "infrastructure" as a separate asset class but is rather spread across a number of asset classes like equity, bonds, loans and private equity. National Treasury has recently proposed amendments to Reg 28 to make it easier for retirement funds to invest in infrastructure assets
- If there are going to eventually be prescribed assets (which have been mooted) of this nature it may be good to get in early and take advantage of unadulterated market prices.

Considerations

- Consider the Fund's IPS
- Infrastructure investment by pension funds in SA is quite nascent and thus lack of experience/skills in this asset class
- Requires specialised skills to understand the details and risks involved (which trustees and ordinary asset consultants may not possess)
- Size of investment relative to full assets, also relative to unlisted bond exposure – prefer a diversified portfolio of unlisted bonds – not a single project
- If size too small then does not justify cost of due diligence
- Exposure to unique risks like:
 - Construction risk: cost overruns and delays. Are the EPC/contractors experienced? Penalty clauses for delays?
 - Operating risks: less electricity produced vs planned, higher than expected costs... impacting ability to service debt
 - Regulatory risk: unforeseen changes which may disallow sales to 3rd parties etc

- Environmental risk: impact of construction needs to be assessed for compliance with regs (details of environmental impact assessment)
- Social risk: how will local communities be affected. Will they share in the profits/job creation/skills etc?
- Inflation risk – future inflation might not be well matched by the fixed bond.
- Gearing in SPV i.e. how much equity will miner contribute
- Details of debt covenants placed on SPV
- Life of mine on site of construction (must be greater than 20 years)
- Outlook for commodity miner (mine needs to be economically viable over the 20-year period)
- Is miner contractually liable to buy 75% of electricity? At what price? Who will set price? Escalation?
- Who will 3rd party buyer of electricity be and on what terms? Distribution of electricity to 3rd party. Wheeling allowed?
- Is the nature of the electricity production and pricing not more conducive to inflation linked debt? At the least it will mean that later repayments are likely to be more affordable.
- Might be better to outsource to bond manager to incorporate into their portfolio – consider segregated mandate if asset size allows. May be difficult if pooled portfolios are utilized.
- What will the cost associated with getting into this be – hiring expertise like lawyers etc?
- Valuation – who, frequency?
- The senior bonds are a particular layer of the debt structure that rank ahead of other debt. It's important to understand the relationship with the mezzanine layer and the specific terms of the debt and the repayment structure, particularly at the end of the term. What are the terms for repayment if assets are insufficient to repay the full principal?
- Other investors in the SPV and potential to leverage off their expertise / due diligence.
- Understand the prepayment terms as this has an impact on any potential hedging that might be put in place.

[14]

QUESTION 3

Examiner Comments:

Question 3 required candidates to apply their knowledge of various aspects of portfolio construction to a range of multi-manager portfolios.

Despite testing some basic investment concepts, the question was surprisingly poorly answered, mainly because candidates tended to regurgitate what they knew on the subject without giving proper thought to the specific situation and the nuances applicable to multi-managers.

Part (i) provided the opportunity to pick up many marks on the fundamentals of building a portfolio from scratch but candidates scored poorly.

Part (ii) on investment styles attracted some good answers but knowledge of the practicalities of incorporating different styles was limited. The same applies to question (iii) on how to incorporate ESG.

The sub-question on tactical asset allocation (part (iv)) offered the opportunity to pick up marks but, once again, candidates were required to apply their minds to the challenge from the point of view of a multi-manager, which is quite different to a single manager. Knowledge of the main ways in which multi-managers incorporate tactical asset allocation was limited.

i.

- Anchor client (seeding assets) will often play a key role in the initial portfolio construction for a new multi-manager. There may be some give and take required in order to satisfy the anchor client and ensure that their needs are met in relation to the portfolio construction but still ensure that the portfolio construction has wider appeal and is not too specifically matched to only the anchor client's unique needs.
- Asset classes to be included – traditional only or including alternative asset classes e.g. private equity and hedge funds, whether or not to include global asset classes (unlikely to have domestic only).
- Liquidity requirements will play an important role in decision whether to include some of the above asset classes.
- Regulation 28 compliance, Regulation 37 compliance
- Strategic asset allocation (and how it is to be determined and how often it will be reviewed) – to asset classes and to managers/styles
- Tactical asset allocation – dynamic or static
- Specialist or multi-asset class mandates – also level of flexibility within asset classes e.g. flexible or enhanced income as opposed to vanilla money market and vanilla bonds
- Number of underlying asset managers – per asset class or per mandate type – size of assets under management is a consideration here too – smaller assets (a consideration at inception) require fewer managers to ensure adequate size of mandates
- Weighting of managers within a single asset class (if multiple managers are used per asset class) and how weightings are determined as well as rules on rebalancing
- Manager selection – define the quantitative and qualitative processes, conduct manager search process, gather the quantitative data, draw up manager rating scorecard, produce a short-list, conduct due diligence visits
- Blending of styles – especially relevant to equities but also other asset classes

- On global allocation – full global mandates or a variety of regional mandates
- Mandate negotiation with selected asset managers
- Legal wrapper of multi-manager portfolios (life policy, CIS or segregated)
- Segregated or pooled mandates with underlying managers
- Fee structure – whether to set total fee at multi-manager portfolio level (incentive for multi-manager to expand its own margins by squeezing underlying managers or even selecting cheaper managers) or set as total weighted fee of underlying managers plus explicit fee percentage for multi-manager (lower potential for conflict in decisions about managers)
- Portfolio management fees – discounted underlying manager fees to allow space for multi-manager fee and still keep fees competitive
- Performance fees and structure of them including hurdles
- Active only or passive only or blend of the two – also core satellite structure
- Sourcing expertise and skills in terms of personnel to assess managers and construct portfolios – quite specialized skills
- Competitors’ portfolios and fees
- Target market assessment – how many portfolios, risk profiles?

[10]

ii.

- Specific styles tend to have performance cycles – a blend of styles may therefore deliver a more reliable, consistent performance over time with lower volatility.
- Blending different styles reduces any manager-specific risk and any idiosyncrasies related to specific managers or specific styles.
- Multi-manager has the ability to construct a best-of-breed solution consisting of the best managers within different styles – assuming the multi-manager has the skill to identify the best-of-breed within each style.
- And to identify which style is “working” at the time and potentially be able to rotate?
- Example of value vs growth or other styles.

Downside of a portfolio of blended styles:

- It has the potential to result in over-diversification if carried too far i.e. generate index-like returns gross of fees (fees may be substantial as best of breed managers may charge above average fees) so net performance worse than market.
- For purist adherents to any particular style, this approach might be deemed ‘fence-sitting’, which may not be appealing – but it is likely to have broad appeal to non-purists.
- May not be able to find managers who are good enough for each style or styles may not be well represented in narrow markets.

[4]

iii.

- An important first step is to draft an ESG policy including a clear philosophy and what is important to the multi-manager (and potentially its clients). It’s not possible to tackle all ESG challenges so it’s important to have a clear focus.
- The multi-manager is one step removed from the selection of stocks or bonds or other instruments so is not able to exert the same level of direct influence on the company or entity as the underlying asset managers, who likely meet with the company regularly.
- The multi-manager will thus have to apply an ESG screening or selection criteria to their manager selection process –
 - do they then apply a negative screen to managers who don’t incorporate ESG factors to stock selection or

- do they apply more of an activist approach by selecting the asset manager and then exerting influence / engaging on ESG matters of concern? Negative screening could still involve activism, by making it known to those not passing the screening and thereby exerting influence.
- On manager selection, a positive screening method or alignment with managers based on approach or philosophy in relation to ESG may be a way to avoid the need for activism.
- Does the multi-manager want to be on the leading edge and driving true change or just ensure the portfolios “tick the ESG boxes”?
- Proxy voting is not done by the multi-manager in general so if they have specific views on specific stocks they will need to engage with underlying managers – if they are large enough they may be able to incorporate an allowance to vote their specific block of shares.
- On proxy voting, the type of vehicle has a bearing i.e. pooled (life or CIS) versus segregated – this will determine in whose name the assets are actually held and hence who is able to vote.
- If the multi-manager utilizes pooled portfolios as building blocks then they will have less influence on ESG matter than if they use segregated mandates.
- Multi-managers have more flexibility to incorporate a wider range of asset classes such as direct impact investments through unlisted building blocks e.g. infrastructure. This is because they are able to outsource this to specialists. Single managers, unless they are very large, are unlikely to possess the full range of capabilities (traditional and alternative) within the same business.
- Introducing unlisted assets will introduce liquidity challenges. These may have more impact when the portfolio is small although they are not likely to be too serious if the portfolio grows rapidly. Any large withdrawals or terminations may give rise to heightened liquidity challenges.
- Monitoring of ESG processes, proxy voting, engagements by underlying managers – together with reporting on this monitoring to clients.
 - How will this be measured and reported back to clients to demonstrate MM adding value in this space?

[5]

iv.

a.

Dynamic tactical asset allocation	Static asset allocation
Implementation will depend on whether the multi-manager has the skill, and desire, to do the TAA themselves or wishes to outsource to underlying manager(s).	Suitable if the multi-manager possesses no skill in TAA. Also appropriate if the manager believes that specialist TAA mandates don't generally add value or if they are unable to find a suitable specialist TAA manager.
With reference to the above, a multi-manager is generally not that close to the daily movement, pricing of assets and 'pulse' of the markets so may be at a disadvantage in identifying TAA opportunities and acting on them swiftly. For this reason, outsourcing to one or more underlying managers might be preferable. The counter argument is that their lack of proximity to markets may allow them to take a more dispassionate view and make less emotive decisions.	
Depending on method used to perform TAA, implementation challenges need to be	Simpler to implement and manage – frequency of rebalancing is relevant though

considered i.e. selling out of one manager and then investing in another may take time. If alternative assets are in use then liquidity is another challenge e.g. private equity.	as the same buying and selling challenges may exist. Simpler to explain performance to clients.
More costly to implement so leads to higher portfolio charges.	Less costly to implement with impact on fees charged.
	Need to decide on frequency of rebalancing – weigh up cost of transacting / switching against the level of deviation from SAA including the time period over which the deviation persists.
Ability to be more responsive to market conditions and mispricing of asset classes or sectors.	Limited, if any, ability to respond to mispriced assets even if they appear to be material.
Commonly used for active multi-manager solutions but unusual for passive.	Often used for passive multi-manager portfolios but also used for active portfolios.

[4]

b.

1. Specialist tactical asset allocation mandate provided to a specialist TAA manager. Typically involves an allocation of 2 to 5% of full value of portfolio to the specialist TAA mandate. Manager utilises derivatives to implement tactical views / positions at an overall portfolio level. This is restricted to beta implementation i.e. it is a high level tactical asset allocation using indices and not specific stock positions held by underlying managers. Although it can also be done at industry / sector level. TAA decision may be correct but might be affected (positively or negatively) by actual positioning, and hence performance, of managers in respective asset classes i.e. basis risk.
2. Allocate multi-asset class mandates to underlying managers rather than specialist mandates. Mandates will provide for flexible asset allocation so involve tactical asset allocation. This could be done for some or all of the mandates awarded. Consider whether these mandates will be full discretionary or limited to a certain set of asset classes e.g. domestic only. Manager views might at times conflict and cancel each other out – this risk increases with number of asset managers. If not all the mandates are flexible then the size of TAA positions will be muted relative to the full size of the portfolio.
3. Multi-manager performs tactical asset allocation function. Important to evaluate if multi-manager has the requisite skill / proximity to pricing and market movements. Allows multi-manager to plan based on knowledge of incoming cash inflows or outflows; although this type of info can also be passed onto specialist manager. May be a conflict of interest – if changing to lower fee managers increases profits of multi-manager – this will depend on the fee structure. If specialist mandates are used in the construction of the multi-manager portfolio then TAA positions may be slower to implement as it will require instructions to underlying managers to sell and then once cash is received, reallocate to new asset class / manager. Can use derivatives to give effect to views – similar to specialist TAA mandate.

A multi-manager portfolio may utilise one of more of these approaches although this can lead to conflicting views so needs to be carefully managed.

[9]

[Total 32]

QUESTION 4

Examiner Comments:

Part (i) of the question dealt with a type of investment product that is a staple of life insurance companies in South Africa, smoothed bonus. Although many marks were on offer, most candidates showed a poor grasp of the key features of this type of product. Some also demonstrated a lack of understanding of Retirement Annuities.

Parts (ii) and (iii) shifted focus to the underlying investment strategy and specifically the portion allocated to US markets. This required a good understanding of markets and current valuations as well as the potential drivers of recent returns and valuation levels. In relation to real yields, candidates had a reasonable high level grasp but failed to provide specifics about levels of yields and inflation. Some candidates focused on nominal yields and failed to relate these to real yields. In part (iii. c), many candidates seemed to not read the question carefully and focused on very short term reasons for the change in interest rates such as the COVID pandemic and lockdowns. The question asked for ‘demographic and economic reasons’ indicating a need to think longer term. The question also did not ask about lower nominal interest rates but a decline in real interest rates – failing to note this distinction led to a loss of marks for candidates.

i.

Book value and market value

- The primary liability of the insurer to policyholders is the “book value”, which equals contributions plus past bonuses declared (vested) less withdrawals.
- If the bonuses are fully vesting, as described in the question, then once declared they cannot be taken away by the insurer.
- Smoothing and capital protection are often separated in modern smooth bonus products. The level of capital protection will determine whether bonuses can be negative. A smoothing only option may be available where bonuses are relatively consistent (compared to actual returns) but they can be negative. There may then be a certain level of capital guarantee, which could vary from 50% of capital to 100%. Negative bonuses would then be possible only to the extent that the cumulative effect of these does not result in the value falling below the level of capital guarantee. Once the capital guarantee level is reached then bonuses can no longer be negative. The capital guarantee level is a high water mark so is raised by any positive monthly bonuses that normally vest immediately. In products with a 100% capital guarantee bonuses can’t be negative.
- Retirement Annuity funds would invest in the smooth bonus fund, on behalf of their members, via policies.
- The policies typically guarantee to pay out book value on death, disability and retirement;
 - but should there be a switch or disinvestment it would occur at the lower of book value and market value (at the discretion of the insurer). Called a Market Value Adjustment.
- The market value for each policy is kept track of either on a per policy basis via a unitization process, or on a total fund basis by the ratio of total assets to total bonuses (the funding level).

- The book value less asset value is called the bonus stabilisation reserve (or BSR). The bonuses are usually declared with reference to the level of BSR at the time.

Bonuses

- Smooth bonus funds attempt to remove the volatility of general market movements by providing “smoothed” returns over time to policyholders.
- Although bonuses used to be declared annually, new generation smoothed bonus products generally declare bonuses monthly, in advance.
- Smooth bonus funds aim to declare stable bonuses over time, which naturally result in over and under-declarations (relative to the actual performance) from time to time.
- Generally speaking, however, the bonus declarations should still be in line with the actual performance of the underlying asset pool over the longer term.
- Bonus declarations should be in line with policyholders’ reasonable expectations which will be affected by:
 - The expectation of positive real returns, but also by any marketing material or disclosures made at point of sale or continuous communications.
 - Bonuses may be driven by an explicit formula linked to the level of BSR or may allow some discretion on behalf of the insurer.
 - Principles & Practices of Financial Management and TCF
- A consequence of the over- and under-declarations of bonuses is that funding levels will not be constant over time, but will move from a positive funding level (100% or more) to a negative funding level (less than 100%) depending on the levels of bonuses declared relative to actual underlying performance.
- New series may be opened if BSR falls too low.

Underlying Assets

- Smooth bonus funds typically invest in the full range of asset classes: equities, property, bonds and money market; mostly in South Africa but also offshore.
- By investing in equities and property, smooth bonus funds will take some market risk in order to provide higher real returns over the longer term,
 - and can therefore still be appealing to less risk-averse investors.
- The underlying portfolio may incorporate various methods of capital protection or volatility dampening to reduce the risk to the insurer and/or minimize the guarantee fee.

Fees

The insurer charges:

- A guarantee fee or capital charge, as a fixed percentage of assets
 - The size of the guarantee fee depends on the degree of market risk the portfolio aims to take on and also the level of capital protection.
- An investment fee to pay the underlying asset manager and for administration.
 - The investment fee is often a fixed percentage of assets as well as there being a performance fee component to it.
 - The underlying asset manager is usually a subsidiary of the insurer or related party.
- Bonuses may be declared gross of or net of one or both of the above fees.

Shareholder capital

- In the event of a severely underfunded position, the insurer may have to use shareholder capital to prop up the assets. The rules of the product will set out the conditions under

which shareholder capital will need to be injected, whether it is in the form of a loan that will need to be repaid or not and the terms of any loan.

- These rules will also be used to determine the guarantee fee or capital charge.

[10]

ii.

- The fact that US equities have risen sharply in recent years does not mean that they are overvalued but there are other measures e.g. CAPE ratio that indicate that it is in expensive territory. Is the CAPE ratio of the portfolio any lower than the index, particularly the US component?
- The US is already a significant component of the MSCI World index (>50%) so an overweight position may be imprudent (despite the massive size of the US economy). What are the corresponding underweight positions?
- If overweight US equities as well as overweight equities in general then that compounds the risky assets position. If underweight equities overall then that might be less of a concern.
- Growth stocks like the big technology stocks have been the primary driver of the excellent returns and are trading at very high PE multiples - the risk of growth stocks like these is that earnings disappoint and share prices fall heavily. What is the exposure of the portfolio to the large, high PE technology stocks?
- There are various stocks e.g. Gamestop that have been driven higher by the influence of millions of Robinhood traders and collaboration on social media. This introduces additional risk to these counters, although they are mostly small. Any exposure to these?
- SPACS (special purpose acquisition companies, which are shell companies that are sometimes used to bypass listing requirements but which often trade at very high values despite being empty shells) are another source of risk so it would be useful to understand the portfolio's exposure to these.
- The threat of higher inflation (not temporary but permanent) may lead to a further shift from growth to value stocks as value stocks are generally more attractive if future inflation is higher. How is the portfolio positioned in growth vs value?
- What is the reason for the change in allocation to US? Has anything changed in relation to the people or processes that would give rise to concerns? The manager has been recently appointed – are the processes and people that were bought into still intact? Is the change in line with the manager's philosophy or does it indicate a deviation that might need investigation?
- Is your position in the US active or passive? Active should mean that you have a manager who can still pick “undervalued” stocks in a growing market.
- Massive fiscal and monetary stimulus.
- US Fed tapering of QE.
- Low interest rates have inflated equity prices. DCF of long-duration assets deteriorate.

[6]

iii. (a) and (b)

Short-term real rates:

- In the United States; can be measured as the difference between the effective federal funds rate and the increase in the US Consumer Price Index over the previous 12 months.
- In South Africa; can be measured as the difference between the repo rate of the Reserve Bank (or possibly the 3 month forward rates) and the increase in the South African Consumer Price Index over the previous 12 months.
- In the US, with inflation to June 2021 roughly 5%, real short rates were roughly -5%.
- In SA, with inflation to June 2021 4.9%, real short rates were roughly -1.4%; significantly higher (less negative) than the US

- Short-term real rates in the US have been in decline over the last 4 decades:
 - From an average of +5% in the 1980s and +2.1% in the 1990s, to +0.4% in the 2000s and -1.2% in 2010s.
- In South Africa short-term real rates have been in decline over the last 3 decades:
 - From an average of +6.6% in the 1990s to +4.6% in the 2000s and +0.9% in the 2010s.

10-year real yields

- In the US we can look at the 10-year point of the real yield curve for TIPS (Treasury Inflation Protected Securities).
- We can contrast that with the 10-year point of the real yield curve in SA for ILBs (Inflation Linked Bonds).
- The 10-year real yields are more stable than short term real rates, as they represent (very roughly speaking) an average anticipated rate over the next 10 years, as opposed to the difference between the base rate at a point and actual inflation over the previous year.
- But can be distorted by yield curve theories (market preference)
- Were about -0.8% in the US in June 2021.
- Were about +4% in SA in June 2021.
- 10-year real yields have been in decline in the US:
 - Averaged roughly +1.8% in the US from 2003 to 2009 and +0.4% in the 2010s.
- 10-year real yields in SA are well above historic averages:
 - Averaged roughly +2.8% from 2007 to 2009 and +2.7% in the 2010s.

[3] & [6]

(c) An aging US population & increases in longevity

- Resulting in declining participation in the labour force, hence slower labour force growth.
- For a given capital stock, the slowing of labour force growth puts upward pressure on the ratio of capital to labour, thereby lowering the marginal product of capital.
- As individuals move from their early working years up to retirement age, their savings tend to rise; after which they draw down on their savings causing them to fall.
- As people expect to live longer, they tend to place greater weight on consumption in the future, and may delay retirement. This may to some extent offset the slower labour force growth mentioned in point 1. Increased life expectancy leads to a decline in the rate of time preference and thus the equilibrium real interest rate.
- Some researchers believe that demographic factors account for 1% to 2% of the reduction in global real interest rates since the early 1980s.
- South Africa has also seen increases in life expectancy, but from a very low base at the height of the HIV/AIDS epidemic. The impact of this in South Africa is limited though as the proportion of the population that is active in capital markets is more limited than US.
- Whilst South Africa has massive unemployment, the unemployed are largely unskilled.

Reduction in trend real output growth

The slowdown in trend real output growth, and a reassessment of future output growth following the global financial crisis.

- US real GDP growth averaged 3.2% p.a. in the 1990s, but only 1.9% p.a. in the 2000s, 2.3% p.a. in the 2010s, and -0.1% p.a. subsequently.
- SA real GDP growth averaged 3.6% p.a. in the 2000s, but only 1.7% p.a. in the 2010s and -4.2% subsequently.

The Savings Glut

An increase in the supply of savings (the “global savings glut”) relative to the demand for investment:

- The global supply of savings has increased sharply since the early 2000s.
- The initial increase in savings can be traced back to rises in saving in emerging market economies, many of which responded to the Asian financial crisis at the end of the 1990s by engaging in fiscal consolidation.
- Faster growth in high-saving emerging market economies, especially China, contributed to rising savings.
- Rising prices of commodities (including oil) in the early 2000s led to increases in savings of commodity exporting countries.
- Over the last 40 years the share of total income received by higher income households has increased worldwide and in the US, and higher income households tend to save a higher percentage of their income.
- Global financial crisis and coronavirus pandemic both led to increases in saving by the private sector; reduction of short-term rates by central banks as well as large scale asset purchases (quantitative easing) initiated by various central banks, including the Federal Reserve.
- It’s estimated that the increase in the supply of saving accounts for some 0.25% of the decline in global real interest rates since 1980 (Rachel and Smith, 2017)
- South Africa is part of the global economy, and the savings glut will have impacted it,
 - But SA’s assets are not considered “safe” assets.

The demand for, and shortage of, safe assets

- The return on risky assets, and thus the marginal product of private capital, has been roughly stable over the past 40 years while returns on safe asset have declined, which suggests that preferences for safe assets have increased (Jorda et al, 2019).
- The savings glut was channelled predominantly into US assets that were perceived to be safe, like US Treasuries, driving real interest rates down.
- The private sector responded to the demand for safe assets prior to the global financial crisis by supplying assets which seemed to be safe, like MBS’s, the crisis led to a reassessment of the riskiness of MBS’s, further demand for US Treasuries and lower real interest rates.
- The Global Financial Crisis and more recently the coronavirus pandemic have not only led to increases in saving, but also a flight to safety in general and demand for US Treasuries in particular.
- Large scale asset purchases by central banks following the Global Financial Crisis and coronavirus pandemic further contributed to the shortage of safe assets.
- The IMF attributed some of the increased demand for safe assets to the Basel III regulations that increased the amount of safe assets that financial institutions are required to hold.

Temporary vs permanent factors

- It must be noted that the increased saving (especially of safe assets) and central bank actions (reducing short-term rates and purchasing assets) following the global financial crisis as well as the coronavirus pandemic probably have a significant temporary component to them;
- As the economy recovers US and SA short-term real rates are likely to increase, but to levels lower than historical averages, due to the structural forces unrelated to the crises (e.g. an aging population).

Decline in inflation risk premium

- A decline in inflation volatility may have resulted in the inflation risk premium decreasing.
 - This applies both to the US as well as South Africa

Benign inflation

Productivity gains led by technology advances and lower cost of global production (driven mainly by China) have led to benign inflation conditions over an extended period and this has kept inflation very low. The lack of threat of inflation getting out of control has contributed to an environment where rates could be kept lower for extended periods.

South Africa has also been a beneficiary of this structural shift.

Overlaps

There is an overlap between the above explanations, for example, the slowing in labour force growth and aging plays a role in:

- The slowdown in trend real output growth.
- The savings glut
- The shortage of safe assets.

Factors increasing real interest rates [Max 1]

Whilst not the focus of this question, there are also factors working in the other direction, ie placing upward pressure on real interest rates, for example:

- Increases in government debt as a % of GDP, and increases in social welfare expenditure.
- Changes in technology favouring capital over labour.
- This applies to South Africa as well as the US.

[9]

[Total 34]