

EXAMINERS' REPORT

June 2017 examinations

Subject F105 — *Finance and Investment* Fellowship Principles

INTRODUCTION

The attached report has been prepared by the subject's principal examiner. General comments are provided on the performance of candidates on each question. The solutions provided are an indication of the points sought by the examiners, and should not be taken as model solutions.

QUESTION 1

Most candidates made a good attempt at this bookwork question and on average managed to score two-thirds of the available marks. Candidates are reminded that where bookwork is examined, it is best to stick to the core reading. For part (i) some candidates indiscriminately listed money-market instruments without realising that the question is about short-term borrowing. Part (ii) was generally well answered by most candidates.

- i. For companies looking to borrow in the money markets, the available options include:
- issuing commercial paper;
 - issuing eligible bills;
 - arranging a term loan from a bank;
 - arranging a line of credit with a bank – this could be either evergreen (permission to borrow up to specified limit with no fixed maturity date) or revolving (has a fixed maturity date);
 - arranging a bridging loan from a bank; and
 - arranging international bank loans.
- ii.

A repo is an agreement whereby one party sells stock to another with a simultaneous agreement to repurchase it at a later date at an agreed price.

Holders of government bonds and other high quality assets can use overnight repos as a short-term financing tool, whilst maintaining their underlying economic exposure to these assets.

The “stock” involved is usually either Government bonds or Treasury bills.

Overnight repos are very common and are very liquid instruments.

QUESTION 2

Candidates broadly understood the issues framed in this question and were able to identify that the LDI strategy “matched” assets and liabilities thereby removing much of the impact of market risk on the book of annuities. However, they failed to score higher marks as they did not list the components/drivers of market values for the bonds, and failed to explain interest rate risk, and that this risk is removed using LDI/duration hedging.

In fact most candidates assumed that LDI is a strategy whereby the cash-flows from the bonds (coupons and redemption) are used to meet liability payments (which is not usually practical) rather than constructing a portfolio whose value changes in line with the value of the liability when economic factors, such as interest rates or inflation, change.

A number of candidates whose arguments were broadly correct did not develop their solutions fully enough to generate the maximum marks. Many candidates missed the liquidity point—examiners do not include irrelevant information in a question and all information given should always be considered in developing a solution.

Market risk is the risk relating to changes in the value of the portfolio due to movements in the market value of the corporate bonds.

The primary drivers of the changes in the market value of corporate bonds are changes in:

- Interest rates;
- Credit risk; and
- Liquidity risk.

As the portfolio is “highly marketable”, the liquidity risk should be negligible.

Under an LDI approach it should be possible to closely match the interest rate sensitivity (duration) of the liabilities. Thus a change in the value of the liabilities due to an interest rate change should be closely matched by a change in the value of the portfolio of bonds.

Thus the credit risk effect on the market value is left as the primary concern as the reduction in the value of the asset portfolio due to increase in credit risk would not be matched by a reduction in the value of the liabilities.

[Credit was awarded for defining credit risk.]

QUESTION 3

This bookwork application question was poorly attempted by most candidates with even the better prepared candidates not managing to score more than a third of the marks available. NAV as an investment performance measuring technique is included in syllabus objective (1) of the F105 course. There is evidence of selective studying as it appears that the candidates did not consider this aspect of the syllabus important enough to be examined, leading to the dismal outcome in this question. Candidates must prepare themselves well on each and every aspect of the syllabus to avoid nasty surprises in an exam. Few candidates produced the obvious points included in the solution and most were able to make comments about goodwill, but failed to appreciate that it is just one component of a much broader solution.

NAV of a company, or NAV per share, is one component of overall value. All things equal, a share with higher proportion of its share price represented by NAV should be cheaper than a share that has less asset backing. However, this difference is likely to be eliminated in an efficient market where the market value is driven by supply and demand dynamics. In practice all things are not equal, and share price in an efficient market will reflect factors other than NAV.

Goodwill must be evaluated for relevance, and removed if inappropriate, to make a valid comparison with the company which has grown organically.

NAV is a readily available accounting number, which may require adjustments (e.g. to allow for e.g. non-quoted assets).

NAV may not allow for the extent that some businesses may be more capital intensive than others.

Intangibles e.g. human capital, may be difficult to value and unlikely to be included in NAV.

NAV does not reflect risk.

NAV may not be appropriate to compare companies in different industries / sectors.

NAV does not currently account for environmental and other less quantifiable socially responsible impacts.

QUESTION 4

In parts (i) and (ii) of the question, many candidates failed to sensibly apply the types of regulatory regimes described in the bookwork to the scenario in the question. Some discussed forms of regulation or how regulation can be applied within these types of regime (e.g. freedom of action, outcomes based) rather than the types of regimes. Credit was awarded to the extent that relevant points overlapped in this case. Some of the solutions addressed how SRI can be applied in a portfolio or even how underlying companies/investments behaviour could be regulated. Neither of these would fall under the ambit of a financial services regulator. Part (iii) was generally well answered by candidates who identified most of the issues. The difficulties associated with performance measurement (relative to peers and benchmark) were generally not elaborated to the extent that the solution requires.

- i. Statutory regulation, where the government will prescribe the rules of SRI through legislation and the regulator will supervise compliance.

Self-regulation, where each institutional investor will apply SRI criteria as they deem appropriate and align their investment portfolios accordingly, without government intervention.

Voluntary codes of conduct, where industry bodies (in collaboration with the regulator) could compile a code which outlines principles or behaviours which investors could follow on a voluntary basis.

- ii.

Statutory regulation:

- The most prescriptive.
- Difficult to establish a set of rules that could be practically implemented across institutional investors (e.g. small vs large portfolio).
- The most costly option, administratively onerous.
- Allows the regulator to directly target those specific areas of SRI which investors should be focusing on (e.g. prescribed assets).
- Improves public confidence.

Self-regulation:

- No control over compliance.
- Different interpretation leads to different outcomes, some investors might ignore SRI.
- The most difficult manner in which to achieve the outcomes, as it depends on the willingness of participants to comply.
- The cheapest outcome, with little or no administration by the regulator.
- Most likely acceptable option for investors, who may not feel comfortable being forced to include SRI and leave it to their discretion.

Voluntary code of conduct:

- Not all investors may subscribe to an SRI code of conduct.
- Compliance with an SRI code of conduct can be used in marketing to attract customers.
- Minimal costs in establishing SRI code of conduct.
- Administratively less onerous than statutory regulation, but monitoring compliance may be onerous.
- Those with professional knowledge and expertise would be involved in creating the code.

iii.

The rationale is to encourage socially responsible behaviour on the part of the life insurance company. The life insurance company could gain some positive marketing from this, making its products attractive to certain investors.

Investment in companies that manufacture or distribute tobacco products could be viewed as unethical. Discouraging investment in tobacco companies could in some way contribute to lower supply of and/or lower consumption of tobacco products, which can be expected to result in better healthy living, and thereby potentially improving the life insurance companies' claims experience. However, the restriction might limit the range of allowable investment universe and reduce diversification and subsequently it could affect/reduce the investment returns of the life insurance company.

Tobacco companies could form a significant part of the benchmark – may need to make adjustments for performance measurement purposes. This makes performance measurement and assessment relative to peers more difficult and introduces relative performance risk. It further introduces challenges where passive products such as index trackers and index derivatives form part of the strategy. The interpretation of “distributors” is potentially problematic as the exclusion of retailers etc. could significantly limit the opportunity set.

May be seen to be unfairly picking on tobacco companies, as there are a number of industries and sectors that could be deemed to be socially undesirable, e.g. alcohol producers.

QUESTION 5

In part (i), most candidates were not familiar with the course content, which was all that was required to score full marks here. Most missed the discussion around social policies and benefits, and how these are funded. In part (ii) almost all candidates identified the correct type of merger but only few went on to discuss the benefits or rationale for this merger. The number of marks for the question should have indicated that a more developed discussion was required. In part (iii), most candidates made a poor attempt at coming up with relevant points and focused instead on the second order effect of the labour changes to the broader economy and hence to the banks' potential lines of business and profitability. Few were able to define gross profits and identified expenses / employment costs as a primary driver of profitability, neglecting to then explore the direct impact of the changes to the wage bill on profitability, as set out in the solution. As is common, many candidates did not attempt to write enough to generate 8 marks. Part (iv) was fairly well attempted. Most candidates were able to explain framing and were familiar with the events surrounding "Brexit" to explain framing in the context of what actually happened. Quite a few candidates went on to explain all the other behavioural finance factors which was not required for the question and would have cost them valuable time.

i.

Labour policies will set the background for the flexibility of labour and the bargaining power of organised labour. The related domain of social policies will determine the cost of health services, welfare benefits and state pensions.

To the extent that these are provided by government and paid out of charges which are separate from taxation, they will have to be separately added to the cost of labour.

Such "on costs" to employment (typically labelled "national insurance" or "health insurance") can be a crucial element of total labour costs.

Examples of labour policies include policies determining the powers of trade unions and minimum wage legislation. These are likely to influence the cost of labour and hence the relative competitiveness of businesses operating in different jurisdictions. They may also influence the choice of multinational companies as to where they choose to set up operations.

ii. Horizontal merger:

The two firms are engaged in similar activities – hence the merger is horizontal.

Such mergers are usually undertaken to benefit from economies of scale, such as sharing core services common to both organisations. Another reason is to exploit complementary resources, or to access opportunities only available to larger organisations.

A more aggressive motive may be to eliminate inefficiencies, including underperforming management.

iii.

The core elements of an income statement are $\text{Gross profits} = \text{Revenue} - \text{Expenses}$

Salary and other employment costs fall under expenses – these are significant costs for banks. Gross profits would increase if, for the same level of output or revenue generation, salary and employment costs can be reduced.

Governments run different taxation and labour policies, due to differing fiscal policies. The key point is that government policies create comparative advantages for companies working under different regimes.

Relative to Bank B, Bank A would find it cheaper to employ lower salaried staff, because the highest minimum wage for Bank B increases their employment costs to Bank B.

Relative to Bank A, Bank B would find it cheaper to employ higher salaried staff. Due to the high level of cross-subsidisation in Bank A's country, high salary earners would have less disposable income in Bank A's country, for the same level of gross salary. Effectively, Bank B can offer a lower salary to these employees and still provide them with higher disposable income.

The free movement of labour allows Bank A to actively attract lower salaried staff and align their business offering to the cheaper skills set without the frictional costs of having to be granted work permits. A similar argument can be made for Bank B for higher salaried staff. Salaries are, however, a reasonable proxy for skill and knowledge level, and the level of skill and knowledge is a reasonable proxy for the income that can be generated from their use.

Thus, if Bank A pursues this employment approach, the revenue profile will change to reflect the reduction in skill levels. And *vice versa* for Bank B. The norm is that skilled work can usually be used to generate much higher levels of revenue. This means that Bank A may ultimately have lower gross profits, and Bank B much higher gross profits.

Also note that it may not be entirely obvious that 'relative to B, A would find it cheaper to employ low salaried staff.' While the minimum wage effect is clear – country B provides a cash benefit for the low paid, –country A does provide them a subsidised health benefit and there is some sort of unknown interaction between the two which complicates the argument and could mean few are willing to work for less. What is almost certainly true is that the cash is substantially more valuable to younger potential migrants who will make up the vast majority of movements.

[Credit was awarded for any other sensible comments that supplement the solution.]

iv.

The way the referendum choice was presented and, particularly, the wording of a question in terms of gains and losses, could have had an enormous impact on the result.

For example, phrasing the choice as 'exiting' the economic union as compared to 'remaining' in the economic union could have affected the pro-exit decision.

Furthermore, the ‘exit’ and ‘remain’ lobbyists would have presented the employment effect quite differently. The ‘exit’ lobbyists would have defended the ‘exit’ question as saving jobs for domestic workers. The ‘remain’ lobbyists would have defended the ‘remain’ as more employment opportunities within a wider economic area being across all countries within the economic union.

QUESTION 6

Overall this question was not done well, which was disappointing given that it was not very difficult. Part (i) was simple applied bookwork, and this was done reasonably well. Part (ii) was also straightforward applied bookwork, but many students did not get the correct answer due to an incorrect understanding of what the XD and ACC items represent, and what is (and isn't) included in the Index Value. Valid alternative calculation methods gained credit. Part (iii) was done poorly by most students. The biggest problem was one of poor exam technique - many comments were made that were not relevant to the question. For example, any comment relating to the validity of using this index as a benchmark, or advantages and disadvantages of the index for matching liabilities, were completely inappropriate, as were comments relating to problems with repatriating funds.

i. Three advantages:

- It does not require weights – which might not be available in some circumstances;
- It is simpler to calculate and understand/explain (especially if it ignores corporate changes);
- It can be used to give an indication of short-term price movements;
- It gives a better representation of the broader market trend than an arithmetic index (due to the geometric index change being closer to the median of price changes).

Three disadvantages:

- The index goes to zero if one of the components goes to zero;
- Being unweighted makes it less relevant for performance measurement;
- The geometric index undershoots the arithmetic index in a rising market, and overshoots in a falling market.

ii. Total return calculation:

$$TR = [I_2 - I_1 + (1-T)(XD_2 - XD_1) - T(ACC_2 - ACC_1)] / I_1$$

$$I_2 - I_1 = 1388 - 1345 = 43$$

$$XD_2 - XD_1 = 42 + (76 - 34) = 84$$

$$ACC_2 - ACC_1 = 105 - 97 = 8$$

$$\text{Hence total return } TR = [43 + 0.75 \cdot 84 - 0.25 \cdot 8] / 1345 = 104 / 1345 = 7.73\%$$

- iii. The potential problems faced by the overseas-based fund manager include:
- The index might not be investable/replicable, e.g. if the underlying bonds are not sufficiently marketable and liquid;
 - If withholding tax for the overseas fund manager exceeds 25% it will not be possible to track the index after tax;
 - The overseas fund manager investor may be taxed differently, e.g. on the Gross Redemption Yield.
 - The index does not reflect fees paid by an investor: investment management fees, custody fees, audit fees, administration fees.
 - The index does not reflect dealing costs of rebalancing for new entrants, exits etc.
 - It may not be cost effective for the manager to invest small amounts of coupon receipts across constituents in the correct proportions, hence the manager will have a portion of the portfolio invested in cash.
 - The impact of cash holdings will be underperformance in rising markets and outperformance in falling markets.
 - If the index assumes that coupons are reinvested on the ex-dividend dates, rather than dates of actual coupon payments, index-tracking will not be possible.
 - It will be difficult to track the index if information on constituent changes is not available in time to make the required changes to the portfolio.
 - Political risks e.g. unexpected taxes on foreigners that are not reflected in the index.
 - If poorly regulated, the risk of loss through fraud may be high in the market.
 - Access to local markets by foreign investors may be limited or difficult, making replication of the index difficult.
 - Access to information to enable partial replication through the use of multifactor models might be limited;
 - Language differences might make it difficult to accurately interpret information releases and methodology documentation and changes.
 - There may be limited or expensive derivatives available to develop synthetic approaches.

QUESTION 7

Part (i) was bookwork and candidates either scored full marks or zero marks. Part (ii) was poorly attempted by most candidates. Few candidates identified “protecting the equity portfolio” as a double-sided possibility, i.e. protecting against a fall or a rise in the equity market. Whereas the solution requires a straightforward explanation of using equity futures to hedge, very few were able to keep their solution simple. Some included inappropriate comments about transition management, speculation etc. and very few candidates were able to substantiate the effectiveness of their proposal. Part (iii), in conclusion was a slight application of bookwork, and candidates either scored full marks or zero marks. There is evidence of selective studying in parts (i) and (iii) as it appears that the candidates did not consider this aspect of the syllabus important enough to be examined, leading to the dismal outcome in this question. Candidates must prepare themselves well on each and every aspect of the syllabus to avoid nasty surprises in an exam. Unfortunately those candidates who fail to explain the basics of derivative strategies, in this case a simple index future, will most likely not succeed in obtaining a pass in this examination.

- i. The FTSE UK Index Series is a series of indices covering the whole quoted UK equity market. All the indices used to be calculated on a weighted arithmetic average basis with the free market capitalisations as the weights.

FTSE100 – based on the 100 largest companies by market capitalisation.

FTSE250 – covers the 250 companies ranking below the top 100 companies by market capitalisation.

- ii. Protecting equity portfolio using equity index futures:

The asset manager must choose an index, or a combination of indices, that most closely replicate(s) the equity portfolio, as the FTSE100 accounts for about 80% of the total UK equity market capitalisation, and together with the FTSE250, the coverage increases to about 90%.

To protect against a fall in the equity market, the asset manager could sell index futures with a contract value equal to the size of the portfolio. Through this hedge the equities have been effectively sold in the future at a fixed price. Any fall in the value of the equities will then be offset by profits on the futures and *vice versa*.

This hedging strategy will be effective when:

- the asset manager intends to disinvest a large amount of money in the near future and wants to avoid any future risk; or
- the asset manager feels that the market is looking over-priced and may be vulnerable to a decline.

Similarly, if the converse holds, the asset manager may wish to protect against a rise in the market by buying equity index futures.

- iii. There are two main types of risk that remain:

Basis risk – even though over time the futures price closely tracks the value of the cash position, there is a risk of deviation due to supply and demand factors that affect the two markets differently, resulting in the basis not moving exactly as expected.

Cross-hedging – the asset manager has to choose the index or a combination of indices that most closely matches the portfolio to be hedged; however unless the equity portfolio is being run on an indexed basis, it is unlikely that the hedge will be perfect and there will be differences between the movements of the portfolio and the index.

QUESTION 8

This question was surprisingly poorly answered considering the high bookwork component. Candidates understood the difference between balanced and specialist management at a high level, but were not able to discuss how these would be applied to an institutional portfolio. Most candidates assumed that the specialist strategy involved only investing in one asset class. As usual, candidates did not write enough points to generate the number of marks, particularly for part (i). Quite a few candidates mixed specialist strategy with a core-satellite strategy. You can use specialist approach to create a core satellite strategy but this is not the only application.

i.

A balanced mandate involves an active investment manager managing funds that are invested across a variety of different asset categories such as equities, bonds, property and overseas. The balanced manager will take decisions on the weighting in each asset category and decisions on the type of stocks purchased in each category (e.g. value/growth *etc.*). They will try to outperform managers that operate funds with similar mandates, constraints and tax treatments.

A specialist mandate involves an active investment manager specialising in a particular asset category. The specialist manager is employed to manage the funds invested in that asset category only. Each specialist manager will attempt to outperform the relevant benchmark, e.g. the ALSI40 index. The notion of using specialist managers is a function of believing managers tend to be skilled in specific asset classes, but not necessarily in all asset classes or the asset allocation decision itself. Specialist mandates could also apply to different investment “styles” or philosophies, e.g. specialist “growth-style” equity funds.

ii.

A specialist mandate may involve creating a blend of the top specialist managers for each asset class.

Employing a number of different specialists with different investment approaches would lead to a greater diversification of active risk, which could enable the fund to achieve a higher level of expected returns for the same level of overall investment risk.

The specialist expertise and high risk tolerance of the specialist mandates may give the potential for significant outperformance.

Selecting the “best” specialist managers may be challenging.

Poorly performing asset classes may not be avoided.

Can be more costly or expensive to manage, considering scale of fees when assets are split, and there is a lot more monitoring required to assess the performance of each specialist manager.

Specialist mandates are not involved in the asset allocation decision, which would require additional tactical asset allocations (TAA) in order to capture some asset allocation “alpha” at an additional TAA expertise cost

It would be possible to include private equity and hedge funds as part of the specialist mandates.

QUESTION 9

This question was poorly done by most students, with students being unable to apply bookwork knowledge to this situation. Few students were able to generate more than half of the points available, with most students showing no insight at all of how a MBS might operate, and how the major risks (default and prepayment) might affect it. For Part (i) most students could only provide a couple of valid points. For Parts (ii) and (iii), most students were not able to generate anything sensible beyond a definition for default and prepayment risk. Of concern was the liberal use of meaningless phrases such as “freeing up the balance sheet position”, “freeing up credit lines”, “risk appetite opening up” and “the balance sheet taking a hit” – one would not expect the use of such terms from actuarial students attempting to demonstrate that they have reached a minimum level of professionalism.

i. The advantages to the bank include:

The bank is able to convert an otherwise unmarketable long-dated asset into a structured financial asset which is negotiable and convertible into cash.

By structuring the MBS using a multi-tranche format it may appeal to the different risk and return preferences of a wider range of different investors, thus increasing overall demand hence the bank will be able to sell the MBS for a higher combined price.

The bank can obtain better terms of funding than through unsecured loans (e.g. credit card debt) because by offering collateral, the MBS securities are lower risk than unsecured loans, and as the MBS is issued through the SPV, investors in the MBS are protected against claims made by creditors of the bank.

The SPV is a legally separate vehicle which means that the bank is completely disassociated from any SPV issues, such as cash-flow timing problems, poor quality security, etc.

By removing an illiquid asset with credit risk – the mortgage bonds, the bank may be able to reduce its capital requirements.

It may be possible for the bank to capitalise some of the future expected profits from the loan book, depending on the sale price of the loan book to the SPV.

The remaining assets on the bank’s balance sheet may be better quality and lower risk, leading a higher credit rating and lower future funding costs.

Alternative funding methods may not be available (or available at acceptable price and terms), and hence this transaction would enable the bank to continue to lend in order to maintain its reputation and business relationships.

ii. Default risk:

Default risk is dependent on the state of the economy, as during a recession unemployment may rise, leading to more defaults, which may be exacerbated by the decline in house prices that leads to a loss of collateral value for investors.

A credit crunch (i.e. a lending crisis) in the inter-bank market due to concerns about the value of collateral used to secure mortgage loans may lead to increased defaults.

Default risk also depends on the average multiple of the mortgage value to income, as a higher multiple may lead to more defaults.

There is a greater risk of default on variable-rate mortgages if interest rates rise.

The risk to purchasers of mezzanine tranche stock is dependent on the extent to which default losses can be absorbed by the equity tranche (which at 50% of the total value of securities provides a large buffer).

All defaults eat through the equity layer first and only once the full equity layer is exhausted do mortgage defaults affect the mezzanine.

Although the equity tranche is relatively large compared to the more senior tranches, it is possible for some losses to filter through to the mezzanine tranche.

Default risk is partially mitigated by:

- The SPV holding the mortgaged properties as security;
- The SPV may have over-collateralised the MBS in order to reduce risks for the Senior and Mezzanine tranches in particular.

iii. Prepayment risk:

Increased job mobility may lead to mortgage holders switching between mortgage providers, leading to increased prepayments.

Lower interest rates could lead to more fixed-rate mortgage holders refinancing their mortgages, not necessarily with the same bank, leading to increased prepayments; whereas variable-rate mortgage holders are likely to repay their mortgages faster.

Prepayments may also be influenced by the average age of the mortgage holders, as younger people may switch between mortgages as a result of switching between jobs, whereas older people may repay their mortgages using retirement savings.

Financial innovation and increased competition may lead to more refinancing, leading to increased prepayments.

The equity tranche is the most exposed to this risk, given its long duration.

Holders of the equity tranche are then at risk of unfavourable re-investment rates.

This risk can be mitigated to some extent, however, through:

- The SPV acting as a cash-flow manager;
- Imposing penalties on mortgage holders for prepayment in order to discourage the practice.