



# ACTUARY PROGRAM ASSIGNMENT COVER SHEET

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CANDIDATES MUST KEEP A COPY OF THEIR ASSIGNMENT**

**Candidate to complete the following section (and update details in header and footer):**

<b>CANDIDATE NUMBER:</b>  Sample Assignment	<b>COURSE:</b>  Asset Liability Management
<b>DATE DUE:</b> Monday 16 August 2021 at 9.00pm (AEST)	

- Please ensure that your candidate number and course name is located on the header and footers of each page of the assignment.
- Save as a word document, that is, file type .docx
- By submitting your assignment, you are implicitly stating that the work is your own.
- Remember that an important aspect of being a professional actuary is to always act with integrity. Committing plagiarism by copying another person's work or not properly referencing other sources used in your assignment is a breach of the Integrity principle under the Actuaries Institute's Code of Conduct.



## Part B Assignment

(Total 10 Marks)

1. A central bank has a mandate to keep inflation rates within a target band. Historically, it has applied the traditional monetary policy of managing market interest rates through setting overnight cash rates for banks and trading in government bonds. After a major economic shock, the central bank reduced the overnight cash rate to 0.05%pa and three months later inflation is negative 1.0%pa. The central bank elects to shift to a policy of quantitative easing (QE), that is, steadily buy government and corporate debt from investors to inject money into the economy.

Explain the two main risks of implementing quantitative easing.

(2 marks)

### Answer is

Quantitative easing occurs when the central purchases bonds from a wide range of sources, causing a direct increase in base and broad money as there is a payment to the bond seller. The bond seller's assets transform from a bond into a deposit. This has the effect of increasing the level of deposits in the economy.

1. Inflation risk – QE could cause higher inflation than intended if central banks overestimate the amount of easing required and create too much money by purchasing liquid assets. The inflation risk can be mitigated if the economy outgrows the pace of the increase of the money supply from the QE.
  2. Credit risk – quantitative easing makes borrowing so cheap that once interest rates rise again, some borrowers may be unable to afford paying back their loans.
  3. Central banks cannot force domestic banks to increase lending, nor can they force borrowers to take out loans and invest. QE may be ineffective if the increase in money supply does not go through banks and into the economy.
  4. Devaluation of domestic currency.
2. A healthcare technology provider (HTP) began with two founders in 2017. HTP history is shown in the table below.

2017	Founders invest \$500,000 each to create HTP as joint owners and both are company directors.
2018	HTP secures first major contract with a state government .
2019	Venture Capital Fund (VCF) invests \$6 million into HTP, taking 30% ownership and appointing a third company director. Each founder now holding 35%. The VCF investment is made via three calls, that is, \$2m per year in 2019, 2020 and 2021.
2020	HTP adds several clients and long term contracts and reaches 100 staff
2021	HTP generates a profit and retains the earnings to support business plans for sustained growth. HTP now valued at \$10 million.



- a) Calculate how much equity capital has been invested into the company so far. (1 mark)

**Answer is**

$$\$500\,000 + \$500\,000 + \$6\,000\,000 = \$7\,000\,000$$

**Now** HTP wishes to raise another \$5 million in capital to pursue growth in other states. The founders and VCF are not prepared to increase their exposure.

- b) HTP is too small for a public listing at this time.  
List three other options available to raise the \$5 million for the company. (1 mark)

**Answer is**

1. Raising funds via a private equity injection
2. Raising capital through the issuance of corporate debt
3. Sell \$5 million worth of existing assets
4. Borrowing the \$5 million from the banks

- c) The two founders are not ready to dilute their control of the company.  
Recommend one option for the capital raising and identify three pros and three cons for that option. (3 marks)

**Answer is**

I would recommend raising capital through the issuance of corporate debt. This would entail the company creating and selling debt securities, committing them to paying interest to the purchasers as per the agreement and repaying their principal upon the end of the term. I would recommend corporate debt because, unlike enlisting a private equity investor who would likely have a major involvement in the management and decisions of the company, corporate debt would still allow the two founders to retain full control of the company and their ownership would not be diluted.

Pros:

- (1) Issuing corporate debt would still allow the two founders to maintain their share in the company – not diluting control as bondholders do not own any part of the company.
- (2) If the company continues to perform well, they do not have the obligation to share any additional profit with the purchasers of the bonds.
- (3) Lower cost of financing compared to other forms of financing such as equity – debt is finite; the company is only contractually obligated to make periodic interest payments and return the principal for a fixed period of time. After this, the debt is paid off and no further obligations exist. On the other hand, with equity, once the company has sold a stake in their firm, they will have to pay some of their profits to equity holders in perpetuity, technically.

Cons:



- (1) Credit risk – if the company goes out of business or experiences some other financial distress, they may not be able to provide their contractually obligated coupons payments or return their investors' principal.
  - (2) Outstanding corporate debt may limit the kinds of business actions that the company can take as they will need to be more conservative/risk-averse due to having a large sum of outstanding debt. May not be able to take on certain projects.
  - (3) In the event of company default or liquidation, bondholders will need to be paid out first from the company's existing pool of assets before shareholders can receive their money back.
- d) The VCF are keen to benchmark the performance of the stock against an Australian market index until such time as the company is itself listed. Consider the three ASX indices below and recommend one giving your reasons. **(3 marks)**

S&P/ASX All Ordinaries (**XAO**) the oldest index of shares in Australia made up of the share prices for 500 of the largest companies listed on the ASX. The current market cap required for entry is \$40 m.

S&P/ASX 200 Information Technology (**ASX IT**) A sector benchmark that reflects those companies included in the S&P/ASX 200 that are classified as members of the GICS® information technology sector and sub-industries. As at February 2021 14 constituents with market cap range \$674 m to \$34 bn and the index is dominated by 1 stock (37% of the index).

S&P/ASX All Technology Index (**XTX**) All ASX-listed technology companies that meet defined eligibility criteria by sector and minimum market cap (\$80 m). This is 69 companies at the last rebalance in December 2020. The criteria also cap any one company's participating at 25% of the index.

**Answer is**

I would recommend benchmarking the performance of HTP against S&P/ASX All Technology Index (XTX). This is because XTX is comprised of technology companies which most closely aligns with the industry that HTP is a part of, i.e. healthcare technology. XAO is not technology specific so is too broad, whilst ASX IT is too niche as it only consists of Information Technology companies. Also, the minimum market cap of XTX, \$80m, is most suited to HTP as it still has a relatively small market cap. The minimum market cap for ASX IT (the next most relevant index in terms of industry) is \$674m, which is far too large for the current size of HTP. Furthermore, XTX is a more evenly balanced index compared to ASX IT, as it does not have 1 stock dominating it. Also, XTX is comprised of more companies than ASX IT, meaning it is a more diversified index. These factors all make XTX the most suitable index for HTP to benchmark itself against.

**END OF PART B ASSIGNMENT**