

# **EXAMINERS' REPORT**

April 2010 Examinations

## **Subject SA5 — Finance Specialist Applications**

### **Introduction**

The attached subject report has been written by the Principal Examiner with the aim of helping candidates. The questions and comments are based around Core Reading as the interpretation of the syllabus to which the examiners are working. They have however given credit for any alternative approach or interpretation which they consider to be reasonable.

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Chairman of the Board of Examiners

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- 1**
- (i) An Americus Trust offers the ordinary shareholders of a company the opportunity to strip each of their shares into two components, namely a PRIME component (which carries full dividend and voting rights, but limited capital appreciation rights) and a SCORE component (which carries full appreciation rights above a threshold price).
  - (ii) A letter of credit is a letter issued by a bank guaranteeing that company A will meet its financial obligations to the LOC holder in time, amount and currency. The holder's credit risk is greatly reduced because both company A and the bank would need to default on the obligation.

The buyer of a credit default swap is protected from financial loss resulting from the defined credit event which is generally company A defaulting on a bond payment. The CDS buyer's credit risk is reduced because both company A and the CDS seller must fail to meet their obligations.

LOCs are issued to cover a wide range of financial obligations. CDS's are generally only issued to protect publicly traded debt.

LOCs are often of indefinite term. CDS's always have a fixed term.

Company A pays the cost of the LOC and provides any required collateral to the bank. The CDS buyer pays the cost of the CDS.

LOCs are not traded speculatively. They hedge the holder's credit risk. CDSs can be purchased or sold speculatively.

Neither the LOC nor the CDS will have been issued through an exchange. To issue an LOC requires company A, the bank and the holder to agree terms. To issue a CDS only requires the buyer and the seller to agree terms.

Both the CDS and the LOC seek to improve the buyer/holder's credit risk on company A by including an additional credit counterparty for a fee.

LOCs can be immediately drawn and hence cover liquidity risks. CDSs do not.

- (iii) Market risk being the potential change in the value of the shares during the holding period is the greatest risk to the customer.

As the bank is merely broking the shares on an exchange then the customers' credit risk will be negligible.

The bank is accepting the customers' credit risk in the event that there is a loss and the customer is unable to close out the transaction.

The customer has the liquidity risk of needing cash to settle the transaction in 30 days.

The customers could be exposed to the risk of changes in foreign exchange rates if any of the share transactions are in more than one currency and/or the transaction currencies differ from the customers' capital currency.

The bank risks its reputation with its wealthy customers and potentially more widely. If returns are lower than expected then the bank may lose customers and business.

The bank has a mis-selling risk if the customer. The bank would need to ensure that appropriate sales processes were in place and being adhered to.

(iv) Risk adjusted performance measure (RAPM)

$$\text{RAPM} = (\text{revenues} - \text{costs} - \text{expected losses})/\text{VaR}$$

The bank is recommending the transaction because it believes the banks' shares will fall and the energy shares will rise in the next 30 days. Assuming the efficient market hypothesis applies then the expected share price at the end of 30 days will be equal to the current share price meaning that revenues and expected losses in the above formula will be zero. Hence the formula reduces to costs/VaR.

Assume costs equal to 1% of total value of shares bought and sold.

The bank is likely to have provided its customers with some profit and loss ranges based on its fundamental analysis of the shares in the transaction and of the general share market. In the absence of any detailed analysis the customers could roughly estimate that in extreme circumstances the markets might rise or fall by say 30% in the next 30 days. The customer could assume that a 30% market fall will impact the long shares but that the short shares do not fall in value. The corresponding assumption could be made if markets rise. Hence the customers could estimate that the capital required for the transaction is the order of  $30\%/2$  or 15% of the total value of the shares traded.

Hence the estimated RAPM is  $-1/15 = -6.667\%$  over 30 days.

(v) The method needs to consider volatility, timing and correlations.

The bank is likely to adopt autoregressive models to model the historic 1 day volatility of individual share prices and all the share prices together.

The method will need to estimate the correlation between the given shares from the past share price movements.

The models will produce daily volatility estimates. A simulation model could be built from the various daily volatility estimates and correlation coefficients. A suitably large loss could be chosen from the model to provide the desired daily value at risk (VaR) estimate.

The 30 day VaR estimate being the capital requirement as a percentage of the total value of the shares traded can be calculated from the 1 day VaR estimate by multiplying the 1 day estimate by  $1/\sqrt{30}$ .

*An earnings at risk approach would also be acceptable.*

- (vi) Change the value of the shares bought/sold.

Change the number of the company's shares bought/sold.

Changing the holding period changes the volatility over the holding period by the square root of time.

Change the shares bought and sold to change their expected correlations. For example, if the purchased shares were 100% correlated with the sold shares over the holding period then apart from costs there would be no profit or loss.

Setting limit losses for automatically unwinding the transaction will cap the loss and hence the capital required.

- (vii) The bank could seek to hedge its position by buying physical bonds in the amounts needed to offset the products being bought by the customers. The bank would presumably charge a management fee in this case.

This isn't likely to work in practice because the products are unlikely to be bought in the required proportions.

It is much more likely that the bank is introducing the set of products in order to raise fixed term funds more cheaply than it can using direct methods. If the bank does not buy physical bonds to hedge the products then it is raising funds at the risk free rate (for the coupons and the principal) and it can price the credit default swap at a level which is expected to result in no loss or even a profit to the bank.

Hence the profitability will be equal to the difference between its normal cost of funds for term debt and the term structure of the risk free rates for the funds raised from the coupon and principal products. The profitability needs to be adjusted for bank costs, charges and the expected profitability of the purchased credit default swaps.

- (viii) A claim under a credit default swap (CDS) is settled by:

- (1) The CDS buyer delivering the bond to the CDS seller and the CDS seller giving the buyer the nominal amount of the contract in cash; or
- (2) The CDS seller giving the CDS buyer the difference between the nominal amount and the market value of the bond following the default.

The bank is likely to opt for the second claim structure because:

- (1) The bank is unlikely to be holding the bonds prior to default and may have difficulty buying them after the default.
  - (2) The bank's customers being the CDS sellers are unlikely to wish to receive the defaulted bonds and are more likely to be willing to accept market value estimates.
- (ix) The bank should realise that the customers are likely to add up the three products and compare their aggregate cost with the cost of buying the corporate bond. The CDS pricing is then determined from the known price of the corporate bond and the set prices of the coupon and principal products.

If the bank wants to sell the CDS then the price needs to be attractive to the customer relative to holding the bond.

The bank may reasonably allow for the following in the above CDS pricing analysis.

- (1) Its costs and the differences between retail and wholesale product returns.
- (2) Other non-credit factors included in the yield spread e.g. liquidity.
- (3) Product structuring advantages e.g. customers having different and perhaps improved tax consequences under the bank products.

Assuming that the bank has not purchased the underlying corporate bonds it has no reason to buy CDSs. Hence, it does not need to price the CDSs so attractively as to ensure that there are buyers. The bank should price the CDSs such that the price is expected to be profitable or at least not loss making to the bank. In this sense the bank may be deliberately pricing the CDS at levels which are not attractive to the customer.

In order to estimate the price of the CDS for this purpose the bank can use both theoretical pricing techniques and get regular quotes from the institutional CDS market.

The two main theoretical CDS pricing approaches are the structural approach and the reduced form approach.

The structural approach is based on the company's own capital structure but is sometimes not practical to employ. The reduced-form approach can be applied in a number of different ways but depends more on aggregate market data including default rates and recovery rates.

The bank is responsible for compiling the list of approved corporate bonds. It can seek to use corporate bonds that:

- (1) Are traded in the institutional CDS market.
  - (2) Have sufficient available information to allow the bank to conduct its own preferred theoretical pricing approach; and/or
  - (3) Have sufficient available information for the bank to form its own view on the credit quality of the corporate.
- (x) The bank could increase the yield offered on the coupon and principal products if the new higher rates were still lower than its comparable cost of funds. This would reduce the bank's cost of funds savings per unit of product sold but may increase the overall savings if the volume sold increased.

The bank could extend the product to include the purchase of coupon payments and/or principal payments which stop on the default of the underlying corporate bond. The bank could offer these products at or near the redemption yield structure in the bond providing that either:

- (1) The new yields remained to be lower than its cost of funds.
- (2) The bank was planning on buying corporate bonds to hedge the new extended products. This option gives the bank a matching problem as the customers are still free to choose coupons and principal separately.
- (3) The new yields were higher than its cost of funds but expected to be lower than its costs of funds after adjustment for expected corporate bond defaults and assuming that the bank was planning on adopting an unhedged structure. (The bank keeps the customer's principal in the event of bond default.)

Under (1) and (3) above the bank's profit per unit will fall but may be compensated by increasing volume. Under (2) the bank may make very little profit or loss although it may help sell more volume in the original products. Any net position in the corporate bonds may result in profit or loss.

- 2** (i) The UK Government wants a financial system that offers opportunities for firms of all sizes to have access to capital on terms that give adequate protection to investors and which enhance the international competitive position of the City of London and other UK financial centres.

It aims to achieve these goals:

- By setting up a team of people with specific objectives and powers, that is the regulator.
- By ensuring that the regulator has expertise in the market place

- Through the regulator, by acting as a catalyst to collective action where market forces alone are defective
- by supporting the development of a financial infrastructure that furthers these goals
- by ensuring that the regulator collects appropriate data and regularly updates and advises the government as to the state of the financial system
- Through the regulator, by encouraging British interests through its contacts with financial authorities overseas
- By encouraging and sponsoring consumer education.

*An alternative answer sitting relevant legislation and regulation would also be acceptable.*

- (ii) Bank of England = UK's central bank  
BoE responsible for promoting and maintaining a stable and efficient monetary and financial framework overall

BoE has three main purposes, with two being relevant for banking supervision:

- maintaining the stability of the financial system overall
- seeking to ensure the effectiveness of the financial services sector

BoE acts as lender of last resort;  
BoE maintains integrity and value of currency;  
BoE seeks to deliver price stability;  
BoE supports government economic policy as appropriate;  
BoE implements monetary policy

FSA supervises banks

FSA sets minimum standards

- on integrity and competence of directors and management
- the adequacy of capital and cash flow
- systems and controls to deal with the risks which they experience

FSA has four regulatory objectives of which these are relevant for banking supervision:

- maintain confidence in UK financial system
- promote public understanding of financial system and financial products
- secure appropriate degree of protection for consumers
- reduce occurrence of money-laundering through UK banks

FSA must adhere to principle that burdens and restrictions should be proportionate to the benefits expected from them.

Consider international character of financial services and desirability of maintaining competitive position of the UK.

UK operates a dual regulator system; both have oversight over different parts of the of the banking system

Regulators need to co-operate and co-ordinate

e.g. FSA has a general duty to consult on the introduction of new regulation.

Advantages:

- two pairs of eyes on banking system

Disadvantages:

- no clear single responsible regulator

- (iii) (a) UK interest rates were reduced several times post 2001 / dot-com bubble bursting; then increased in steps to around 5.5% as global economy boomed and inflation loomed; reduced to <1% in 2009 to combat credit crisis

US rates followed similar path down to 1% in 2003, and raised to 4.25% in 2007, now cut to 0.25%.

other countries similar

low interest rates boost asset prices (bubbles)

low interest rates encourage speculative borrowing

very low rates throughout 2001–2003 encouraged the large build up of credit balance sheets

banks able to borrow cheaply, borrowers not too concerned about ability to repay

assets pledged as security going up in value (e.g. homes)

raising rates to combat inflation caused asset price reductions and left borrowers unable to pay

lower interest rates discourage client savings and encourage capital market borrowing

Changes in interest rates will impact both asset values and liability values meaning that the overall impact on leverage ratios will be different for different banks

- (b) reduction in balance sheet leverage could be through two routes:

- raise new (equity) capital
- call in loans / cancel credit facilities

Doing this immediately and across the board is impossible as:

- price of new equity will fall as all banks trying to raise simultaneously
- cannot legally call in loans
- defaulted loans impossible to call in
- corporations depend on access to funds to operate; inability to do so will have material adverse economic consequences



- would cause tremendous strain on global financial system

The original crisis was made much worse by the speed at which sentiment changed causing large reductions to market values and large declines in cash flow funding. The banks couldn't react in time. For the same reasons the banks will be unable to immediately reduce leverage. Too rapid a reduction in leverage will strain the economy.

A weak bank may not be able to comply with a requirement to immediately lower its leverage ratio without becoming insolvent

Many banks will have difficulty raising equity capital in a depressed market

- (c) commercial banks typically have less leverage as they have a greater intermediary function between savers and borrowers  
investment banks rely on wholesale funding and run higher leverage balance sheets; would be more severely impacted  
commercial banks and investment banks are inter-dependent. The impact on one will eventually affect the other.
- (d) Assuming that the banks would make more profits if they were to maintain higher leverage ratios than lower ratios will result in lower profit levels.

In effect, risk appetite would now be capped by the regulator. Some banks won't be constrained by this while others may not be able to operate profitably in the future.

The ongoing effect may be greater in the near term and relatively minor in the long term. For example, the sector as a whole might react to the fall in profits by increasing charges and resulting in a return to the pre-cap profit levels. For example 2, the banks which were most impacted by the cap on the leverage might change their business model to return to their former levels of profitability.

- (e) banks' action and the UK's competitiveness will depend on the actions of the other large countries  
banks will seek to avoid this prescription  
relocate to non-UK domiciles or be regulated by someone else  
the UK's competitive position will weaken as banks exit  
skills will migrate with banks, weakening UK's future competitive position

- (iv) transparent information allows investor to make own decision about riskiness or otherwise of business venture  
company will seek to avoid disclosing negative information  
regulation needed to cover aspects not voluntarily disclosed e.g. sensitive data or negative data  
regulation ensures standardised reporting

## **END OF EXAMINERS' REPORT**