

**Subject SA5 — Finance  
Specialist Applications**

**EXAMINERS' REPORT**

**September 2008**

**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.

R D Muckart  
Chairman of the Board of Examiners

December 2008

1 (i)

- banks not wanting to hold each others' bonds means they cannot raise finance in the capital markets to roll over maturing obligations
- this significantly impacts their ability to raise finance for new loans
- more acute for those banks without a substantial retail network
- credit spreads across the globe will have gone up due to
  - the default itself causing a decline in risk appetite
  - the removal of liquidity meaning borrowers must offer substantially higher coupons to attract lenders
- results in significantly higher interest rates, first in the region most affected by the defaulted firm and then across the world
- higher interest rates impact on US (and global) economic growth
- the Fed has responded by lowering the cost of borrowing
- banks can borrow from Fed to repay their maturing obligations or lend to new customers
- lowering the benchmark interest rate offsets the increase due to credit spread widening, thereby maintaining total borrowing cost for corporates
- restarts financial system
- sends signal to market that Fed will step in to protect integrity of financial system
- Fed is acting to maintain stability of the financial system

(ii)

- Goals of the Bank include:
  - maintaining the integrity and value of the currency
  - maintaining the stability of the financial system
  - seeking to ensure the effectiveness of the financial services sector
- Response 1: continue to do nothing
  - assume crisis is limited to non-UK markets; consider that low inflation objective overrides implication of financial crisis
  - Advantage(s): maintain anti-inflation stance (probably accentuate since rates will rise); currency value will rise due to higher relative rates
  - Disadvantage(s): market rates will rise due to inter-connectedness of global capital markets; will impact UK corporate borrowing costs; may impair UK banks ability to raise capital hence impact on stability of financial sector
- Response 2: lower interest rates
  - recognise that crisis will become global and may affect ability of UK banks to raise funds in capital markets
  - Advantage(s): pre-empt potential negative impact on stability of UK financial system; should make access to funds easier for UK banks thereby maintaining stability of system; could also prevent weaker banks from going under
  - Disadvantage(s): will result in lower UK borrowing costs thereby increasing corporate investment and consumer spending which will fuel inflation; currency will weaken relative to other countries who do not lower rates
- Recommendation
  - Lower rates in sympathy with Fed

- Recognise that global financial systems are intertwined and it will be the stability of the UK financial system will be adversely affected by events in the US

(iii)

- Credit (bond) rating is a combination of objective measures and a subjective or judgmental process
- Firm could try to substitute credit rating information with another source, e.g. bank credit assessments
- If self-reliant, firm will need to rely on published financial reports and analyses in the first instance
- Seeking additional unpublished information on a large number of bonds will be too time consuming
- System must be scalable / mechanistic – unlikely firm can carry out in-depth credit research on every bond or issuer
- Will therefore require some kind of “credit scoring” system
- Could use e.g. Altman-Z score
- Note that using purely objective, formula-driven, models have proved problematical to date (can't capture all nuances)
- Could consider use of option pricing
- Could rely on implied default info from credit default swaps, mapped to (former) ratings
- System must be credible to client / investor
- Could join with other firms in similar situation to carry out ratings
- Must adjust marketing materials
- Probably means will need to reduce number of bonds in portfolio if ratings are now internally generated

(iv)

- Data requirements:
  - bond price series
  - treasury price series
  - credit default swap rates
  - published corporate balance sheets including current assets, current liabilities, ST receivables, EBIT, sales, working capital, book value of debt) for the issuers in question
  - previous published credit ratings reports
  - bank credit reports
  - sell-side broker credit analysis
  - information on historical defaults

(v)

- mergers involving share exchanges not necessarily impacted
- many acquisitions however rely on debt finance to pay for target company's shares (esp private equity)
- deals are frequently highly leveraged

- finance provided either by banks or by raising money (usually debt) in the capital markets
- if banks unable to issue bonds, they will become unwilling to underwrite acquisitions because they will have to provide the finance from their own (limited) balance sheets
- acquirer will need to source own debt or turn to equity
- global risk appetite will fall sharply following default, means fewer investors will be willing to participate in acquisition
- market will slow down materially

2 (i)

Capital requirement is 8% of the assets

Risk weightings for mortgage loans to owner-occupiers is 50%

... and for cash is 0%

... and for call money is 10%

therefore capital requirement is £270m times 0.08 = £21.6m.

(ii)

The original exposure method

The notional amount of the derivatives contract is multiplied by a percentage chosen according to the original term to maturity of the contract and the type of underlying asset.

The current exposure method

An addition is made to the current market value of the derivative. Expressed as a percentage of the notional amount, this is intended to reflect the potential maximum increase in the derivative to maturity. Negative market values are ignored but the addition is made to all contracts.

(iii)

The standardised approach uses external credit assessments to modify the weights.

High quality credits will have lower ratings whilst poor-quality credits will have weightings that are higher and can exceed 100%.

(iv)

Reduce capital requirement

Raise capital to support further new lending

Risk management purposes

More favourable accounting ratios

Increasing operational leverage without increasing financial leverage

Raise capital more cheaply if assets are of higher quality than the credit rating of the bank. However, this is unlikely for a bank securitising domestic mortgages.

(v)

Pass-throughs are securities that are repaid pro-rata from mortgage payments. Prepayments of debt are also passed on which redeems a proportion of each investors holdings

Collateralised mortgage options use pass-throughs as collateral to create securities that group investors into classes. Examples of classes include investors receiving interest payments only or principal payments only.

(vi)

Investors will be concerned principally about credit risk and prepayment risk

Credit risk can be mitigated through:

- Credit rating agencies providing a rating for the stock issue
- The amount of mortgages backing the issue is in excess of that required to back the amount of the issue (over-collateralisation)
- The interest rate paid on the stock is less than the income expected to be received from the mortgage book. The excess is placed in an account and used to cover default losses if they occur
- Third party guarantees from a higher-rated financial institution or government backed body.
- Credit risk can also be dealt with through creating classes of bonds with any default losses being passed onto the most junior bonds first.

Pre-payment risk can be managed by:

- Creating tranches of stock that split principal payments by duration. In this way different tranches of stock are mapped to different points on the yield curve.
- Tranches could be created that relate only to the interest payments on the mortgages or principal payments only. In this way speculation can occur on when prepayments will occur; interest only will be worth more if interest payments continue longer and principal only bonds will be worth more if prepayments occur sooner.

(vii)

Monte-Carlo methods are commonly used because the cash flow received in one period is determined not only by the current level of interest rates but the path that the interest rates took to get to the current level.

Inputs required are:

The current term structure of interest rates  
A volatility assumption

A set of cashflows are generated based on simulated future mortgage financing rates.

Interest rates should be generated from an arbitrage-free model of future term structure

A number of scenarios of interest-rate paths are generated. For each time period, an interest rate and a mortgage refinancing rate are produced.

Prepayments are projected by feeding the refinancing rate and loan characteristics into a prepayment model. Given the projected prepayments, the cashflows along an interest rate path can be determined. These cashflows can be discounted at the spot rate to form a value for the interest rate path.

The present-values are averaged to give a value of the security.

(viii)

Variance reduction techniques are used to cut-down the number of sample paths necessary to obtain a good statistical sample.

Representative path methods take a subset of paths. These are used for the calculations to derive the securities value.

(ix)

The option-adjusted spread is the additional yield that an investor receives for assuming the risks inherent in a security.

To calculate it the model would be run using a risk-free rate and the resulting value compared to the price of the security in the market. The input yield curve would then be iterated until the market value was arrived at by using a parallel shift of the yield curve. The size of the shift is the spread.

(x)

Prepayment function could depend on:

- Duration of the loan (as prepayments occur when borrowers move house)
- Economic conditions (more prepay when the economy is doing well)
- Age of borrowers (changing family conditions affect prepayments)
- Seasonality (as more moves typically occur in warm months)
- Cost of refinancing (higher cost deters refinancing)

## **END OF EXAMINERS' REPORT**