EXAMINATION

April 2006

Subject SA5 — Finance Specialist Applications

EXAMINERS' REPORT

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.

M Flaherty
Chairman of the Board of Examiners

June 2006

Comments

No comments are given.

1 (i) **Proposal to Mr. Hope**
Money-Now Finance Ltd — The new face of personal loans

Section 1 — Pre-Commencement Steps and Parties

Key Steps

- Create the legal entity.
- Register the company with Companies House.
- Determine the capital structure of the company and hence the amount of initial equity needed.
- Prepare a business plan suitable for securing initial debt and equity capital which will not be provided by Mr. Hope.
- Develop the product range including proposed pricing.
- Secure the initial debt and equity from third parties.
- Hire the initial senior management.
- Open a bank account.
- Apply for approvals from the UK Government to conduct a personal loans business.
- Prepare launch advertising campaign (website, advertisements, mailing etc.).
- Establish commercial relationships with complimentary third party product providers (e.g. cross-selling of insurance, life insurance, health insurance, mailing lists, cars etc.).
- Establish administration teams including underwriting, marketing, financial and general administration.
- Purchase and test IT hardware and software systems.

Key Parties

- Corporate lawyers
- Accountants/Auditors
- Tax Advisers
- Equity Capital providers
- Debt Capital providers
- Firefly
- Corporate financier
- UK Government
- Advertising agency (including website)
- IT hardware and software providers
- Third party product providers
- Outsourcers
- Bank (money management and potential debt)

(ii) ***Section 2 — Financial Model Description***

A deterministic spreadsheet model using conventional discounted cash flow methodology is likely to be the most straight forward, flexible and suitable approach.

The range of potential future outcomes can be tested by entering different sets of model input. The likelihood of a given input set can be estimated qualitatively in order to develop a probability distribution of plausible future outcomes.

The model should calculate future profits based on both a hurdle rate and a net present value (NPV) approach.

The hurdle rate approach is based on internal rate of return (IRR) calculations. The problem with this approach is that often one cannot invest positive surplus cash flows at the IRR. A modified IRR calculation can be used which allows for a lower investment return on surplus cash. The hurdle rate approach sometimes suits investors who don't have an investment time horizon.

NPV is often used in conjunction with a "money multiple" approach and suits investors with time horizons and investors such as private equity fund managers who do not reinvest capital but return it to the underlying investors as each individual investment is realised.

It is important to choose a reasonable time frame over which to analyse the proposition. For example, the personal loans are likely to be for periods of say 3 to 7 years implying that the profitability needs to be measured over at least a 7 to 8 year time period.

The model must allow for different debt types and costs. For example the initial debt type and cost is likely to be quite different from the debt type and cost once the company is established with a profitable track record.

The model is likely to include:

1. Revenues:

    - Consumer loan interest receipt
    - Up front consumer loan charges
    - Servicer charges (e.g. delinquent payments)
    - Fees and commissions from third party product providers
    - The model may include new business development parameters e.g. market share based on the size of comparable loans on issue.

2. Expenses:

    - Debt costs (service fees, set up fees, capacity charges)
    - Debt servicing costs
    - Salaries and on-costs

- IT
- Rent
- Fixed assets (desks etc.)
- Bad debt
- Bonuses paid to consumers at the end of the loan term
- External expenses associated with underwriting, chasing and settling delinquent debt
- Advertising
- Marketing
- Tax
- Establishment costs (of the company)

3. Contingent liabilities including service contracts, costs of unwinding debt, property lease commitments.

(iii) ***Section 3 — The Optimal Capital Structure***

The final decision will be a trade off between minimizing WACC, maximizing the investor's profit (e.g. IRR or NPV) and protecting the company from undue stress.

The final decision will also depend on Mr. Hope's own attitude to risk.

Large banks tend to operate on 85% to 90% debt and 10% to 15% equity. Given the relatively small size of MNF and the relatively risky nature of the loans, MNF's initial optimal capital structure is likely to be circa 75% to 80% debt and the rest equity.

As Mr. Hope is seeking to maximise the return on capital employed over the chosen timeframe then Mr. Hope is likely to favour debt capital as:

1. Debt will be cheaper than equity. The Cost of debt depends on acceptable leverage (acceptable to the lender). The source of debt is likely to be a bank at least initially. The bank lender will look to the risks of the company. The main risk is the risk of defaulting loans. There will be data sources showing the past experience of default losses from personal loans (incl. credit card loans) to individuals with poorer credit quality.

2. The cost of debt will depend on the gearing. The gearing can be optimized using the financial model.

3. Debt has a term structure and can be repaid more easily than equity. It is more flexible as the company grows.

4. Interest on debt is tax deductible in the UK. The financial model will allow for this.

Debt stresses the company. The higher the stress the higher the chance of a default and the risk that the debt lenders take over the day to day running of a company. This can ruin the chance of a company trading through a lean time. For example, if growth is slower than predicted.

(iv) ***Section 4 — The Business Structure***

The business model assumes a large number of relatively small consumer loans will be issued. Hence there can be expected to be many more applications as some will not proceed due to competition or rejection.

The business structure must be capable of assessing many small loan applications quickly and efficiently. The system must be able to cope with a wide range of underwriting circumstances (e.g. poor credit quality, immigrants with short credit history, unusual security offered, self employed)

To be able to respond quickly and to keep costs down the IT system must perform the vast majority of the underwriting and administration processes.

This said it is critical that suitably trained personnel are used to recognize any short comings in the IT underwriting process.

Managers are needed for general administration, finance, marketing and IT. Staff are needed for underwriting and general office. Advertising is a specialist expertise and is likely to be cheaper to outsource. Also, it may be sensible to outsource other activities.

(v) ***Section 5 — The Underwriting Procedures***

To be able to respond quickly and to keep costs down the IT system must perform the vast majority of the underwriting process.

This said it is critical that personnel are used to recognize any short comings in the IT underwriting process.

Ideally MNF would ask its loan applicants to complete the application form online to reduce costs.

MNF will purchase each applicant's credit history from one or more third party credit history service providers.

The loan application form will include questions relating to:

- Monthly gross income, monthly expenses and hence monthly disposable income
- Dependents
- Health
- Job security
- Credit check
- Assets/liabilities

- Purpose of the loan
- Loan/asset value %
- Available security (house (first or second mortgage), car, third party, life insurance).
- Proposed loan amount and term.

MNF will employ a credit scoring system to convert all of the available information into a number for the purpose of allocating the application into "accept", "reject" or "seek additional information".

(vi) ***Section 6 — The Unique Selling Points***

Securities

Disadvantages

- Exotic securities are likely to be both difficult and time consuming to value with considerable potential to get it wrong.
- Customer is unlikely to have any particularly valuable net assets to offer as security so its not likely to be much of a USP in practice.
- Need to make sure the asset is not depreciating or otherwise subject to reduction in value during the loan term.
- May be difficult to realize the asset in default.
- Cost of realisation.
- Potential to upset a prospective customer by rejecting the security.

Advantages

- If there is any suitable security then it is a way of offering the customer a reduced interest rate and hopefully securing a profitable loan against the competition.
- Potential to win a customer by accepting the security.

Interest Refund Bonus

Disadvantages

- Little more than a marketing gimmick as if MNF gives it back then the original rate must be higher to reflect the refund. In other words MNF still needs to charge the requisite margin to allow for default losses, costs of funds, operating costs and profit
- Other things being equal MNF's loan interest rate will be higher than the competitions.

Advantages

- Potentially a useful marketing gimmick that may generate additional quotes and potentially the acceptances might outweigh the rejections due to the (other things being equal) higher rates.

- It does help protect MNF against failure as it does buffer the company against unexpected default losses. As such MNF should be willing to offer a rate of return equal to its WACC rate.

(vii) ***Section 7 — Mr. Hope's Real Investment Options***

- Option to grow the company and make follow on investments.
- Option to abandon the new company.
- Option to wait and learn before investing.
- Option to vary the company's production methods.

Binomial method of risk-neutral assessment is likely to be the most appropriate in this case as the options are likely to be associated with a series of finite, discrete steps. One could add "if-then" options to the financial model.

2 (i) UK companies are for the most part limited liability companies operating for profit. They employ land, labour, capital and enterprise for the purpose of meeting their objectives (which as stated earlier are predominantly profit related). UK companies will develop their own strategies for maximising profit. For example, they must consider the time horizon over which the profit will be generated. Some companies e.g. supermarkets might operate with relatively short term profit objectives whereas a capital goods manufacturer operates with a much longer production cycle and so might be expected to adopt a profit objective with a say 3 to 5 year term.

The Bank of England is the UK's central bank. The activities of, and the degree of independence from the government enjoyed by the Bank will be determined by the government. Up until the announcement the Bank was responsible for:

- Operational responsibility for setting short term interest rates
- Banker to the government
- Printing notes
- Advising government regarding the UK financial system
- Using its expertise in the market place and its position in the market place to further the stability and soundness of the financial system
- Supporting the development of appropriate financial infrastructure

The government is responsible for the sound management of the economy. The main forms of government policy are

- *Monetary policy* — the control of some measures of the money supply and / or the level and structure of interest rates.

- *Fiscal policy* — decisions on the level and structure of taxation and government expenditure and hence, by implication, the public sector borrowing requirement (or debt repayment).

- *National debt management policy* — the manipulation of the outstanding stock of government debt instruments held by the domestic private sector, in order to influence the level and structure of interest rates or the availability of liquid reserve assets to the banking sector.

- *Exchange rate policy* — directed towards achieving some target for the exchange rate of the domestic currency in terms of foreign currencies, perhaps with the objective of influencing the country's international trading and investment patterns.

- *Prices and incomes policy* — aimed at influencing the rates of wage and price inflation.

Also, the government is responsible for the provision of certain services which the private sector is either unwilling to supply or unable to supply at a socially acceptable price. Hence, the government is itself a major employer, a major user of capital and does in certain areas compete directly with UK companies.

Hence the government has the potential to interact with every aspect of the commercial and economic landscape.

The government can determine the activities of the Bank and can determine its degree of independence. For example the policy announcement was at the direction of the government and effectively removed the major function of the Bank from the Bank and put it into the hands of the European Central Bank (ECB). The inter-relationship going forward will be more advisory and the Bank using its influence on the ECB. The other functions will continue.

Hence the government and companies interact:

- by sharing/jointly competing for land, labour, capital and enterprise
- through government's implementation of major policies
- through government regulation
- by government promoting British industries abroad and protectionism.

In this case, the policy change actually removes one source of direct inter-relationship between the government and UK companies and introduces a direct inter-relationship between UK companies and the ECB.

UK companies employ people. The companies pay people and hence provide living standards and retirement, health, education, transport… Government policy can help or hinder a company's ability and willingness to provide employment and maintain or improve living standards.

The policy change will have both a short term and a long term impact. The short term impact on the business sector is likely to be detrimental since

capital investment and economic growth prospects will be reduced. This is due to the increased opportunity cost of committing funds for investment and the higher cost of borrowing. Also, the reduction in anticipated levels of economic activity, and higher domestic currency exchange rates, will reduce the viability of capital investment projects.

Higher levels of interest payments on outstanding debt will reduce corporate profitability. All of these features are likely to result in reduced employment prospects and a slower rate of improvement in living standards.

The long term impact of the policy change will depend on the extent to which UK inflation rates deviate from the EU inflation rates (mainly France and Germany) in the future. For example, investors may believe that EU inflation rates will relatively quickly approach UK levels and that the ECB is likely to lower short term interest rates in the near future and then trend towards levels appropriate to the UK. If this is so then the long term impact may be largely neutral. If not then the longer term impacts are likely to be greater volatility in UK inflation, domestic growth rates, capital inflow/outflow foreign exchange rates and the UK government placing additional emphasis on its other control measures.

(ii) (a) **Bank of England**

Short Term Impact

- The Bank's major responsibility has now gone.
- The MPC has been disbanded.
- The Bank is no longer indirectly involved in managing UK inflation rates.

Long Term Impact

- The Bank will likely make increased use of its influence with the government, the ECB and the UK financial system to meet its financial stability objective.

- The Government will look to the Bank for increased levels of advice regarding financial system interest rates, the economy and the use of other government policies to manage UK inflation rates.

- The Government will likely instruct the Bank to liaise more closely and more frequently with the ECB and with other European central banks to ensure that the economic forecasts for the UK are properly taken into account in the ECB interest rate setting process.

- The Bank is likely to increase its use of market intervention through collective schemes and through building of financial infrastructure to maintain financial stability.

(b) **FSA**

Short Term Impact

The policy change has caused a major increase in short term interest rates. This will cause the market value of fixed interest investments to fall. Depending on the views of investors regarding the extent to which the higher rates are likely to persist in the future, the fall will be more or less dramatic. The market value of other investments may also fall if investors believe that domestic growth is likely to stall or turn negative in the future. Hence, the FSA will be concerned for the solvency of its regulated entities.

More particularly the FSA will be concerned with the banks, life insurers and general insurers. It will not be immediately concerned with regulated entities acting as advisers or investment managers. Advisers are required to maintain relatively modest capital sums and its customers have only an indirect claim on the capital. Investment managers can pass on the full impact of the policy change to its customers.

The FSA will receive market value information from its regulated entities immediately and will:

1. Calculate the new solvency levels. If the given entity remains to hold adequate surplus capital then the FSA is not likely to take any action. If the entity has become insolvent then the FSA will require it to cease trading. If the entity is relatively close to breaching its capital surplus requirements and is not technically insolvent then the FSA will commence discussions with the entity which will be designed to either restore the surplus, sell the company or eventually cease trading.

2. The FSA will check the market value information being received for consistency. Initially it will be expected by the FSA that some entities may fail to revalue their investments properly.

3. The FSA will provide information to the government and the public regarding the impact of the policy change on the market. The FSA is responsible for maintaining confidence in the UK financial system and will want to be seen to be in complete control of the new situation.

Long Term Impact

The FSA will liaise with the government and particularly the Treasury to seek to understand the longer term impact of the change on the UK economy. For example, the FSA will be concerned with future volatility in interest rates, inflation rates and gross domestic product. If

the long term impact is considered to be material then the FSA is likely to:

- Change its own internal risk based capital models
- Require its regulated entities to change their own risk based capital models
- Change the agreed surplus targets with several of its regulated entities to reflect the change in the volatility of the future
- Change the minimum agreed surplus targets with entities wishing to be regulated by the FSA in the future.

The FSA will be more directly concerned with the ECB than before. The FSA can be expected to hold discussions with other financial system regulators in the other EU countries to ensure that the views of the regulators are being submitted to and considered by the ECB when setting interest rates.

(iii) (a) **Interest rate swap**

Counterparty A agrees to pay counterparty B fixed rate interest on a notional principal for a fixed period of time. In return, counterparty B agrees to pay counterparty A floating rate interest on the notional principal. The principal doesn't exchange hands. Only the interest payments are swapped.

The floating rate interest is calculated using an agreed benchmark e.g. 3 month LIBOR plus *x*% per annum.

The fixed interest rate is set at the outset. Generally it is set so that the net present value of the fixed rate interest payments are equal to the net present value of the floating interest rate payments. Hence the contract swings into profit or loss for each counterparty only as interest rates change in the future.

The fixed and floating rates are not necessarily equal at the outset due to anticipated changes in future interest rates (forward rates).

Initial swap terms are typically up to 10 years.

The counterparties often agree to post collateral in the future to secure the swap value in the future and subject to the creditworthiness of the entities.

Notional Principal	100
Initial Swap Term	5 years
Swap Payments	annual in arrears
12 month LIBOR y1	5% per annum effective
12 month LIBOR y2	5% per annum effective
12 month LIBOR y3	7% per annum effective
12 month LIBOR y4	7% per annum effective

12 month LIBOR y5	7% per annum effective
Counterparty B	pays floating rate LIBOR plus 1% per annum
Assumed discount rate	6% per annum

NPV of future floating rate payments	30.032
Equivalent fixed rate payment	7.13% per annum

(b) **Cross currency swap**

Counterparty A swaps a principal amount in currency X for a principal amount in currency Y at the outset of the swap with counterparty B. They are likely to be economically equivalent amounts at the outset of the swap. Counterparty A agrees to pay counterparty B fixed rate interest on the principal received (currency Y) and in the received currency for a fixed period of time. In return, counterparty B agrees to pay counterparty A floating rate interest on the principal received (currency X) and in the received currency for the same time. The principal does change hands at the outset and is swapped back at the expiry of the swap (usually at an exchange rate (FX rate) agreed at the outset of the swap).

The floating rate interest is calculated using an agreed benchmark e.g. 3 month LIBOR plus *x*% per annum.

The fixed interest rate is set at the outset. Generally it is set so that the net present value of the fixed rate interest payments are equal to the net present value of the floating interest rate payments. Hence the contract swings into profit or loss for each counterparty only as interest rates and/or FX rates change in the future.

The fixed and floating rates are not necessarily equal at the outset due to anticipated changes in future interest rates and future FX rates (forward rates).

Initial swap terms are typically up to 10 years.

The counterparties often agree to post collateral in the future to secure the swap value in the future and subject to the creditworthiness of the entities.

Principal	GBP100=USD160
Initial Swap Term	5 years
Swap Payments	annual in arrears
12 month LIBOR y1	5% per annum effective
12 month LIBOR y2	5% per annum effective
12 month LIBOR y3	7% per annum effective
12 month LIBOR y4	7% per annum effective
12 month LIBOR y5	7% per annum effective
Counterparty B	pays floating rate LIBOR plus 1% per annum
Assumed discount rate	6% per annum

NPV of future floating rate payments	30.032
Equivalent fixed rate payment	7.13% per annum

(c) **Credit default swap**

In exchange for a fee counterparty A agrees to pay counterparty B an agreed amount if a credit event should occur during the contract term.

The fee may be paid in a lump sum or regularly over the contract term.

The credit event will be defined in the contract and will typically include the credit default of a third party.

The agreed amount will be defined in the contract. For example (1) it may be equal to the fall in market value of a specified security following the default. For example (2) it may be equal to the principal amount of a specified security and in return for paying the agreed amount counterparty B may be required to deliver the defaulted security to counterparty A.

The initial contract term can be up to 10 years and more although most contracts are for up to 3 years.

Initial contract term	3 years
Credit event	default of 3 year corporate bond issued by ABC company
Agreed amount	100 million
Counterparty 1 fee	2 million per annum payable in arrears whilst the credit event has not occurred (with pro rata payment to the date of default)

One possible scenario is that in year 1 no credit event has occurred and counterparty 1 receives 2 million. In year 2 a credit event occurs half way through the year. Counterparty 1 pays 100 million and receives pro rata fee equal to 1 million. Counterparty 1 also receives the defaulted security. In year 3 Counterparty 1 receives no moneys from counterparty 2. However counterparty 1 sells the bond for 10 million in the open market.

(iv) The bank's immediate trading activities.

The bank will increase the rate charged on its floating rate loans with immediate affect. The interest payable under fixed rate loans will remain unchanged for current loans but will increase for all new loans.

The UK bank branch will borrow primarily from 5 sources, namely, other group companies, deposits, other banks, the Bank of England and the capital markets. The cost of current floating rate borrowings will rise. The cost of current fixed rate borrowings will remain unchanged. The cost of new fixed rate borrowings will rise.

Deposit Taking

The bank will announce increases in its floating rates and new higher fixed rates based on movements in the yield curve following the policy change announcement.

Lending

The bank will announce increases in its floating rates and new higher fixed rates based on movements in the yield curve following the policy change announcement.

Trading is likely to be slow as consumers and companies will reconsider their needs in the light of the new, higher interest rates. For example, some companies with floating rate loans may repay some or all of these loans.

Also, trading is likely to be slow as the bank may feel the need to reassess the creditworthiness, cash flow projections of some of its loan applicants in the light of the interest rate hike.

Cash Management

The bank is likely providing cash management services to a number of large companies. For a given customer the bank is likely to maintain an agreed cash float in the agreed currencies. Excess funds are likely to be invested in short term money market instruments. The interest rate hike will have resulted in a small unrealised capital loss for the bank's customers. It is likely that there will be no need to realise the loss as the cash wont be needed until maturity. Hence trading activity is likely to be normal during the period.

Investment Fund Management

The bank's fund managers will be rapidly:

1. Reviewing their fund's market value of assets by asset class and rebalancing as necessary in the terms of the fund's objectives.

2. Reassessing the credit risks associated with the investments and reducing or selling altogether investments which are no longer deemed to be suitable.

3. Assessing market trading conditions looking for new trading opportunities post the interest rate hike. The bank's economists will quickly release their view of the medium term impact of the policy change on the markets and the fund managers may find cheap or expensive securities and trade accordingly.

Hence trading is likely to be much greater than normal across the funds immediately after the policy change.

Derivative Trading

Derivative trading is likely to be frantic immediately following the announcement. The bank is likely to have a large trading book with interest rate swaps, currency swaps and credit default swaps. The book could be partly hedged against short term interest rate movement but it is unlikely to be a complete hedge and it is unlikely to protect against such a large change in interest rates.

The traders will be watching the new yield curves and forward rates for both interest rates and FX rates. They will also likely be looking to the bank's economists to provide a view of the medium term impact of the change on interest rates, FX rates and the UK economy.

The bank will be concerned about unrealised losses where it is paying floating and receiving fixed. It will need to set capital against these unrealised losses and report these unrealised losses to the public/analysts.

The bank will be concerned about counterparty risk changes where the counterparty owes floating. The bank will likely urgently seek additional collateral or unwind a part of the swap.

The bank will likely need to rebalance its trading book as the duration will likely have moved following the interest rate hike.

The bank may also expect a marked change in new trades and trade terminations as its customers rebalance their own interest rate/FX risks.

The bank will be urgently reassessing its credit default swap exposures and seeking to trade to reduce exposures where the risk of default is deemed to have increased as result of the policy change.

The bank will be well aware of the potential for arbitrage in the early days of the new policy. The traders will analysing the yield curves, the markets and the internal economist's reports to seek to trade to take advantage of any apparent mispricing.

The majority of the interest rate swaps and currency swaps are likely to be largely collateralised or conducted with highly creditworthy institutions. Therefore, credit risk may not unduly reduce trades of interest rate swaps and currency swaps. This will not be the case for credit default swaps. The bank may reduce or even temporarily suspend trading in credit default swaps until it has had time to reassess the credit quality of proposed new credit events.

(v) The bank or financial institution could measure its exposure to interest rate changes using either a maturity gap approach or duration analysis.

Maturity gap measures the sensitivity of an institution's net interest income to changes in the interest rate. The gap is defined by classifying financial assets and liabilities into two types: those that will be repriced within a specified

interval and those that will be repriced later. (An asset or liability is repriced either when it matures and must be reissued at a competitive contract rate, or when its contract rate is reset periodically prior to maturity.) Assets and liabilities that are repriced within the gap interval are called "rate sensitive asset" (RSA) and "rate sensitive liabilities" (RSL).

The gap is the net amount of assets and liabilities that are mismatched. Essentially, it measures the volume of fixed-rate assets (fixed over the gap interval) that are financed with variable-rate liabilities. Thus, if interest rates rise, the interest cost of that volume of liabilities will increase while the interest income will not.

Duration analysis measures the sensitivity of the value of assets and liabilities to changes in interest rates. For a simple firm composed entirely of financial assets with market value A, financial liabilities with value L and equity with market value $E = A - L$, the change in the value of equity ΔE in response to a change in market yields Δr can be expressed as

$$\Delta E = -(ADA - LDL)\,\Delta r$$

where DA and DL are the durations of A and L respectively.

END OF EXAMINERS REPORT