

**Notes to Lecture 3**

**Corporate Risk Evaluation Checklist**

This checklist will assist you in the evaluation of the credit risk embedded in the securities, borrowings or financial contracts issued by a particular corporation.

The checklist provides a structured approach to the analysis of the risk. It outlines a methodology for prioritizing risks and identifying the three or four key risks on which the overall risk assessment will rest.

**1) Review Procedure:**

This section outlines the types and sources of information you should review in analyzing the credit risk of a corporation.

As you go through the steps in this procedure, you should take notes on any risks of significance that you notice. Avoid excessive note-taking – focus *only* on material issues. The test for materiality is the scale of the impact of a particular risk on the company's cash flows, on asset values and on the company's net asset value after allowance for all liabilities.

The order in which you do your analysis is important. The Company will wish you to adopt the interpretation it wishes to place on its results, and will explain this interpretation persuasively in the body of the Annual Report, in the Management Discussion and Analysis, and in other written material. If you read Management's interpretation before analyzing the statements, you will find it very difficult to develop your own independent analysis. For this reason, you *must* avoid reading management's gloss until you have first analyzed the figures with no pre-conceived notions as to what they disclose. You want to approach the financial statements with a clear mind, uncluttered with the elements of 'spin' management so often includes in its analysis of the company's financial results.

So, adhere to the following sequence of analysis:

- i) **Annual Report:** Look at the Company's brief description of what it does and the markets it serves shown at the beginning of the Annual Report. This is usually set out in one or two paragraphs. Once you have done this, *read no further*. You will turn to management's views at a later stage.
- ii) **Audited Statements:** Take the latest audited statements. The auditors provide the sole independently verified source of data on the company's financial affairs. While audited statements sometimes fall short of full disclosure, they are the least biased source of financial information you will get.

Scan the Income Statement, Balance Sheet and Cash Flow Statement (in that order) to obtain a sense of the scale of the company, and the patterns in the financial statements.

Look at key figures and ratios. This quick review will help you place comments in the Notes to the Financial Statements into the proper context.

- Margins – Gross Profits to Revenue, and Net Income to Revenue. Are margins relatively robust? Have they been under pressure from the last reporting period?
- Revenue to Assets – does the company require a heavy load of assets to produce its revenue?
- Debt to equity – is this high?
- Debt to EBDIT – is this more than, say, 2x? (A company with very stable cash flows such as a TV cable company with regulated rates may go up to 4x or a bit more; the ratio for more volatile companies should be far lower.)
- debt to cash flow from operations.
- any entries that stand out such as major asset write-downs?

Then check the auditors' certificate to see what the auditors say about their tests, the accounting principles applied, and their opinion. Take particular note of any unusual qualification. Then read the notes to the statements – these will tell you how the numbers were put together and hence their significance.

Watch for changes to accounting principles. Examine why any such changes have been made. Have they tended to enhance the apparent quality of the company's results? Do the changes in accounting principles make sense, or do they tend to obscure a potential risk?

Then perform an analysis of the financial results using the approach included in Section 2 below. Your analysis should look at the results of the past two years in detail and the highlights over at least three or four years to get a sense of underlying trends. The object of the analysis is to identify the three or four key risks that the company faces.

A materiality test must be applied to decide whether a particular risk should be considered as 'key'. A simple test is to estimate whether a particular risk might reduce EBDIT or net income by, say, 5%, in which case it may be considered to be 'key'. Similarly a risk that might affect balance sheet items sufficiently to reduce equity by, say, 5% may be considered to be a key risk. Using such a test will let you ignore risks that have little threat to the financial condition of the company.

**iii) Annual and other Reports submitted to Securities Commissions:** Take the annual reports and other annual information (such as 10K's in the US) submitted to the securities commissions. The company and its management are legally liable for the completeness and reliability of the information provided to investors and filed with securities commissions. Read what the management has to say about its operations, its markets, its competitors, its results and its plans. Look first at the Management Discussion and Analysis, and then the other sections in the published material. Remember, management is striving to put as positive a gloss on its results as possible, and to downplay risks. You should therefore treat management's commentary with deliberate skepticism.

At the same time, you should attempt to identify the two or three key 'drivers' of the company's profitability. What are the two or three areas in which the company must be successful in order to achieve profitability. Take very brief notes of your conclusions.

Review your notes taken when reading the financial statements and see to what extent your questions may have been answered, and whether other questions are opened up.

Refine your list of the material risks that the company faces.

**iv) Industry and Competitor Information:** look for industry studies (try S&P, Moody's, or similar source, and any investment analysis you can find, as well as any known source of expertise on the particular industry. In particular, if the firm has public debt, you should seek out the ratings agency report's on this debt. Look also at the ratings reports on the competitors. Form a view on the risk dynamics of the industry. This industry review can be concluded once you have identified the two or three key characteristics of the industry, and the two or three key risks that each player must face. Each of these characteristics should be summarized in a single phrase or sentence.

For the company you are analyzing, take the key figures and financial ratios you have identified under 2(iv) below. Look at its key competitors and calculate the same ratios for these competitors. (These figures are sometimes

referred to as “Comps” – or comparative figures.) Review how the figures for the company you are analyzing differ from those of its competitors. What risk conclusions can be drawn?

Some companies serve a variety of disparate markets and produce financials that make comparisons within particular industries difficult. This obscurity itself may be source of risk for the investor since the true competitive position of the company in its major markets is obscure.

What conclusions can be drawn? Is the company a low cost producer? Has it been investing in new products and facilities at the same rate as competitors? Is it more highly leveraged and are its net margins thus susceptible to problems in a downturn?

You may also wish to look farther afield. The internet provides a rich source of potential information. You can look for informal web sites where investors or employees post critical remarks. If you work for a financial institution, you can ask your traders whether there are negative comments being heard on the street.

In the light of this analysis, refine your list of the key drivers of the company’s profitability, and the key risks that the company faces.

- v) **Return to your analysis of the Company’s financials and Annual Reports:** In the light of the industry analysis, review to what extent your earlier questions have been answered, and what further questions have been opened up.

Based on your analysis, prepare a rough forecast of the likely performance of the company over the next three years. Then prepare an estimate of a reasonable ‘down case’ which reflects the risks you have identified. These might include a recession, competitive pressures on output prices, interest rate increases, and other hazards of the market place.

Section 3 outlines how such rough projections can be made reasonably quickly. The projections, where possible, should explicitly model the key drivers of company profitability and the major risks that the company faces.

Assess the stability of income and free cash flows. Relate these to capital expenditures and debt repayment obligations over the next two or three years. Estimate ‘free cash flow’, and consider how vulnerable this figure is to the risks you have identified so far.

**vi) Liquidity Analysis:** Take the figures you have prepared for the ‘down case’. If there is a net cash drain during a downturn, is there sufficient cash on the balance sheet plus access to undrawn committed bank lines to cover the shortfall over the next two to three years? In the downcase scenario, will the company still have continued access to capital markets at a reasonable price (don’t forget that in a recession access to capital markets generally becomes more difficult and more expensive.)

How saleable are non-core activities or other assets on the balance sheet in a downturn; can the company turn to asset sales to help in a downturn? Remember that in a downturn asset prices will be much weaker, and often below book value.

In a downturn, how likely is it that the company will violate the covenants in its bond indentures and its bank lines, leading to a default and filing for bankruptcy protection?

If there is a risk that cash may run out, or that the company may default, then a ‘gone concern’ analysis should be done. (See below.)

**vii) Assessment of Management:** Assess how competent management appears to be:

- How do you assess management’s track record?
- how well has the company performed relative to its peers?
- how consistent have the results been?
- have there been any large write-downs, and if so, do the reasons given for such writedowns shed light on management’s capabilities
- has the company performed according to announced earnings expectations?
- have there ever been any questions about the integrity of management and company operations? Significant lawsuits?
- how long has the senior management been in place? Are changes expected in the near term? Experience of new executives?

**viii) Key Risk Identification:**

Now, review your notes.

Review your identification of the key drivers of the profitability of the company. The key risks are likely to be linked in some significant measure to these drivers.

List on a separate page the various risks you have identified, each risk being described in a word or a phrase. Estimate the importance of each risk by

assessing its potential impact on cash flows and on asset values. Risks that are not material should be removed from the list. You may use the materiality criteria suggested above in section 1(ii) on page 2. If a particular risk is largely offset or mitigated directly by some identifiable strength, it should be dropped from the list of key risks. You may find that two or three of the risks you have identified are in fact part of one larger, generic risk. If so, group them into a single risk description. Winnow down your risk listing until you have narrowed the list down to three – or at maximum four – key risks.

If you have modeled the company's future financials, wherever possible, these key risks should be explicitly reflected in the downside projections. Items such as reduced revenue levels, compressed margins, and increased interest rates can all be modeled.

- ix) Assessment of the Credit Risk in the Senior Debt:** Is the senior debt secured on any of the assets of the company. How much are such assets likely to be worth in an insolvency, and will this worth cover the amount of the debt? Does the debt have reasonable financial covenants to ensure that the Company can be brought back to the table to renegotiate tighter terms if its performance deteriorates? To what extent do the terms of the senior debt mitigate the key risks?
- x) Gone Concern Analysis:** If there is a chance that the company might default on its debt, then a 'gone concern' analysis – an estimate of the likely results of a bankruptcy – should be made. (A handout to a later lecture on gone concern analysis will be posted for students.) 'Gone concern' analysis should forecast the effects of a prolonged period of uncertainty on customer retention, on revenues, and on the retention of key staff. It should take into account the costs of the insolvency, including the costs of all the lawyers and accountants. It might look at possible asset sales and resulting debt pay-downs, although all too frequently management of an insolvent company is very reluctant to downsize its operations. Remember, management of the insolvent company is probably more interested in preserving its option on the upside than reducing the risks of the downside to its senior lenders.

How much debt does the company have to cancel for it to become viable? Look at your estimate of future EBDIT under the downside scenario. On exiting bankruptcy, the company's ratio of EBDIT to debt should be at or slightly below the industry norm. What proportion of its long term debt has to be rejected to achieve this ratio? That proportion is one measure of the probable loss to debt holders as a group.

Debt holders will get in return some portion of the equity of the company. Some value may be ascribed to this ownership position (valued through a

multiple of the probable future net income stream) – but such valuation should be done on a very conservative basis.

If some of the debt is secured on the assets of the company, that debt will suffer a lower percentage loss. The junior debt will bear a proportionately higher loss.

**xi) Summary of Key Risks:** In the light of the analysis of paragraphs (ix) and (x), are changes required to the choice of key risks that have been identified?

Once the analysis has been completed, summarize the three or four key risks. Each risk should be identified in a sentence or two. Its likelihood should be briefly assessed, and the potential effect on cash flows or asset values evaluated. This summary should be no longer than one page.

This summary represents your assessment of the company and its risks.

**xii) Risk Rating:**

The summary, and the context you have built outlining the company's competitors and the industry within which they all work, enable you to assign a risk rating to the company's debt, should you wish to do so. This rating reflects the strength of the company relative to that of other companies.

In assigning a rating, you should use one of the well-defined ratings schemes – the best known being those produced by the rating agencies. If you are working for a bank or some other portfolio manager, you may wish to use the internal scheme of your employer.

It is quite possible that results of your analysis will differ from those of the rating agency – after all ratings agencies make frequent enough mistakes. (Typically, rating agencies try to rate a company 'through the cycle' rather than at a point in time. During the down portion of the business cycle, cyclical companies will therefore carry a rating that looks high – and often turns out to be high since such companies are often damaged by the down cycle.) The ratings from rating agencies are well known often to be slow in reflecting a deterioration in financial strength.

The ratings agencies publish series of default frequencies for companies in each of their ratings bands. The most widely quoted of these series gives the one year default probability – ie. the historical probability that a firm with the given rating will default within one year. Most of the internal rating systems of banks and other lenders similarly produce one year default probabilities.

Moody's KMV service produces 'an expected default frequency' (EDF) for most public companies – a figure that estimates the probability of default within one year. The statistic uses data from the latest company balance sheet and concurrent equity price data to yield the company's market capitalization and its volatility. The statistic is calculated using a Merton model to estimate the default frequency distribution. This EDF is by nature forward looking (as it is based on current market data) and provides a very useful check on both the rating agency ratings and on your ratings conclusion.

**xiii) The Investment Decision:** Your analysis can now be used as one of the two key inputs into the decision on whether or not to invest in the debt of the company.

The second key element in this decision will include a set of data on the risk-reward characteristics of the debt, the risk-reward characteristics of other alternative investments, and finally, the estimate of whether the piece of debt, when added to the portfolio, will enhance the overall risk-reward characteristics of the portfolio more than alternative investments would do.

## 2) Analysis and Note Taking – Suggested Categories and questions:

Notes should only be made of material issues – otherwise the analysis will become bogged down and key issues concealed. If you have nothing material to say in a particular area – don't make any notes.

A review of an investment grade company (rated BBB- or better) should probably generate no more than two or three pages of notes at most. Higher risk companies will generate a longer list of notes. Remember – you should be taking notes only on material issues. *Don't sweat the small stuff.*

### i) Auditor's Opinion and Notes to the Statements

- any qualifications to the statement? Changes to accounting principles?

### ii) Income Statement

How stable and reliable is the income stream? If revenues have been growing rapidly, are you satisfied the growth rate will continue? Is the growth real? Have other companies in the industry had similar expansions? Is this growth sustainable? Competitive threats? If one or more of the key products are

commodities, how do the commodity prices behave over the business cycle? Is there product cycle risk present? Is there a foreign exchange component to the revenue, and hence foreign exchange risk? Even if revenues are in local currency, are the products sold into commodity markets where the price is set internationally and hence set in US\$ terms? If so, there is foreign exchange risk present. Is the company dependent on one or two large customers? And if so, what is the impact if they leave or exercise downward price pressure on the company?

What are the cost components? How stable are they? Labour agreements and risk of labour disruptions? Are some inputs priced in commodity markets, and if so, how do their prices behave through the business cycle? Do suppliers have pricing power?

Beware the company that tells you it is spending a large amount on capital projects reduce its costs, beef up its margins and generate lots of cash to pay you off. The chances are that the company's competitors are doing the same thing; and when all this money is spent in the industry, everyone's costs could be down and so will pricing, leaving your customer with perhaps little or no more profit for all his capital expenditure – and increased debt servicing costs to cover.

If there are several major business segments and the data is available, look at the results of each segment in the light of the questions posed above.

If there has been a material acquisition or sale of an ongoing major operation, the impact of this transaction should be considered in your analysis. For example, if the company has sold the one division that has been a consistent revenue generator, then net margins may be more unstable in the future. Similarly, if it has acquired a major operation, it will probably face integration risks and its future revenue stream, while higher, may be subject to higher risk.

How stable are the net margins? In view of the identified risks to gross margins, how might these margins fare in a business downturn if several things go against the company at once?

Does the company export a material amount of its product, or consume a material amount of input priced in a foreign currency? Does it have material off-shore operations whose profit is denominated in another currency? If so, is the foreign exchange risk material?

Are administrative costs well contained?

Is there a risk that interest costs could rise by a material amount should interest rates rise significantly?

### iii) Balance Sheet

What is the quality of the working capital? Do the receivables turn over rapidly? Have there been any significant losses? Do inventory levels turn over rapidly, or could there be hidden losses? Is there any evidence that the trades are becoming restive – are the days' sales in payables reasonably long, with no evidence of shortening? (Days' sales is a measure of how quickly working capital items are turning over. Days' sales for payables is equal to the balance sheet level of payables as at a particular date divided by the average cost of sales per day - ie. divided by the cost of goods sold (from the income statement) over 360 days in the year to yield an average cost of goods sold per day.) Is the overall level of working capital reasonable?

Can you form a view as to whether the fixed assets are reasonably valued? Have there been unexpected write-off's in the past? If there has been a history of repeated "one-time" write-down's, it is likely that the company has a pattern of persistently over-reported its profit from continuing operations. It also calls into question the caliber of management.

Does goodwill appear to be high – do the operating cash flows from the company suggest that there is a reasonable economic return to levels of goodwill that are high.

Does the company have material off-shore subsidiaries? If so, what is the foreign exchange risk? The impact on both the income statement and the balance sheet should be considered.

Does the company own the key trademarks, patents, software and other intellectual property rights that are key to its survival? If any of these rights are leased, can the lease be cancelled in default?

Are there any off-balance sheet or leased assets that are key to the company's survival, access to which might be denied in a default.

Examine capitalized costs, and the year to year growth in capitalized costs. Should the company have capitalized these costs (ie. were they really operating rather than capital expenses?)

Examine the notes describing any interest rate, foreign exchange, or commodity hedges. When analyzing these market risks, take into account these hedges when evaluating the materiality of interest rate, FX or commodity exposures.

What off-balance sheet liabilities are there? Unfunded pension plans – and if so, what are the likely funding requirements over the next two or three years? Are there significant unfunded future health care costs for employees and retired employees? The implications for required contributions over the forecast period should be considered.

Has the company undertaken any securitizations. If so, what are the risks posed by these entities? Does the company retain any equity portion of these securitizations? If so, where is this portion recorded as an asset? The company's ratios should be recalculated either by removing this equity portion from both assets and the firm's reported equity, or more appropriately, by adding the total of assets and liabilities of the securitizations back into the reported balance sheet of the firm. (This latter approach is the one adopted by the rating agencies.) [See the Notes to Lecture 1 – Securitization.]

#### **iv) Ratios**

Calculate the following ratios, and look at their trends over the past three or four years:

- working capital
- debt to equity
- EBDIT to debt and free cash flow to debt
- capital expenditures to gross revenue and to fixed assets net of depreciation.

Do these trends look reasonable? Or is there a suggestion of an underlying weakness?

Look at leasing costs, and the value of the underlying leases. Operating leases can be very significant for companies such as hotel chains and airlines that lease many of the assets they use. If these items are significant, there should be an adjustment made before calculating the debt to equity ratio. Operating lease costs are normally expensed above the EBDIT line. If the statements give you the annual cost of these leases, the amount should be added back to EBDIT, and the capital value of the leases added to the amount of outstanding debt before the EBDIT to Debt ratio is calculated. The result of these adjustments is to treat leases as though the underlying equipment had been financed by debt, and yield a better estimate of the 'true' EBDIT to debt ratio.

#### **v) Cash Flow**

You want to estimate 'free cash flow'. This is the amount of cash that is available from operations after paying all expenses needed to maintain the business.

There are two measures that are available from the statements – EBDIT from the Income Statement, and Cash Provided by Operating Activities from the Cash Flow Statement. Usually, these are very different numbers. The major differences arise from taxes and from changes to the balance sheet that are not reflected in the income statement but that are included in the calculation of cash from operating activities.

Two key items should be looked at.

If you are using EBDIT as your starting point, you must deduct some estimate of the capital expenditure required to maintain the corporation's plant and equipment up to industry standards so that it can continue to earn its cash flow.

Look at past statements and try to estimate how much the company spends in capital expenditure in an average year. Exclude spending on acquisitions and try to exclude spending on new projects designed to increase the company's production capacity. The result should approximate the amount of capital expenditures required for 'maintenance' – ie for maintaining the revenue producing capacity of the firm to industry standards. Depreciation may give you a guide to maintenance capex.

Some Annual Reports will actually give you the maintenance capex number. Where this isn't the case, you may be able to find some industry rule of thumb that can be useful. The hotel industry, for example, estimates that profitable hotels need to spend roughly 4% to 5% of gross revenues to maintain their buildings and furnishings up to standard.

Integrated steel manufacturers regularly put aside a form of 'sinking fund' to allow for blast furnace relining, and this provides a significant element of the 'maintenance capex' required by such firms. These sinking funds are usually broken out in the financials.

Some cable or satellite TV companies which experience significant churn (ie subscribers leaving) and categorize expenses for acquiring all new subscribers as 'capex'. In fact, the expenses for replacing the churn should be considered as maintenance capex.

These rough estimates of 'maintenance capex' should then be deducted from EBDIT to obtain a measure of 'free cash flow'.

Your estimates of free cash flow, of necessity, will be rough. Accountants will object that your estimates do not follow GAAP and are therefore 'incorrect' and imprecise. However, when trying to estimate the cash available to repay debt over time, it is far better to be roughly right than precisely wrong.

If you use the “Cash provided from Operations” as your starting point, you may have to adjust or remove the effect of changes in working capital. Often cash-short companies will deliberately reduce the levels of receivables and inventory to free up needed cash. You cannot count on a similar contribution in future years. Indeed, if the company’s revenues grow, the buildup of working capital will require a cash injection to working capital. If payables have been stretching, you cannot count on this trend continuing. And changes to bank and other short term debt outstanding should not be considered to be ‘contributions’ from operations, so adjustments will have to be made to remove these from your estimate of ongoing cash from operations. Adjustments will have to be made to reflect each of these factors to properly estimate the cash provided on an ongoing basis from operations.

Taxes on corporate income should also be added back to this figure.

Compare the resulting estimates of free cash flow and reach a judgement on the level of cash flow that you believe the company could be able to generate on an on-going basis, investing enough to maintain its competitive position.

The resulting estimate of ongoing free cash flow can then be related to debt levels and the required annual amortization of debt.

#### **vi) Key Industry Characteristics and Risks:**

Different industries have quite different characteristics. Some examples can be given:

- a) resource based industries where primary product prices suffer from well known and pronounced cyclical swings (eg. base metals, oil and gas, paper, etc.)
- b) capital intensive industries where the marginal cost of production is low and there is overcapacity, companies will tend to produce to marginal cost and suffer ongoing margin pressures (eg. airlines, steel, auto, petroleum refineries, hotels etc.). Pricing to marginal cost that does not cover capital costs will produce high losses. The results of companies in such industries are often highly cyclical.
- c) high technological change and new product cycle risk – (eg much of the high tech industry.)
- d) growing off-shore competition from low-cost foreign producers such as the South-East Asian ‘tigers’, Mexico, and now increasingly India and China. (eg. high tech, increasingly automotive parts, and now some service industries

such as programming data entry, call centres and base level financial analysis for major investment banks.)

e) 'fad' type industries, typically in consumer goods, where product cycles may be short and extremely difficult to predict.

f) regulated industries where government regulations and regulators can have a major impact on the success of the industry and on individual firms within the industry. Such industries exhibit the 'stroke of a pen' risk where governments can change profitability very significantly, and where the risk of changed regulation is difficult to predict (eg. US health care companies, regulated utilities (remember the Californian utilities that went bankruptcy after 'reform' in the Californian electricity market, etc.)

**vii) Key Competitor Threats**

- new products?
- pricing?
- acquisition of key customers from the company being analyzed?
- cost reductions?

**viii) Company Strategies:**

- key elements?
- what risks are they mitigating?
- risks introduced by the strategy?
- potential competitor reactions?

**ix) Strength of Management**

- track record:
  - vs. competitors?
  - transparency; consistency?
  - integrity.

**3) Suggested Format for Projections:**

Use spread-sheets to construct both a 'base-case' and a 'downside case' projection. At each step, note down the assumptions being used, and their rationale.

The approach used below provides rough projections that can be made quite rapidly. Experience shows that this approach can be used to quickly highlight and 'size' the major risks facing a company. They allow the external risks to be modeled, and inherent risks such as potential liquidity shortages to be identified.

In constructing these projections, you will construct four linked spreadsheets – an income statement, a sheet for financial ratios, a balance sheet and a cash flow

statement sheet. You will move back and forth between the different sheets as the projections are developed. Many entries will be generated using data or estimates entered in different sheets.

Once the model has been developed for the “base case”, it will be copied onto another set of four sheets, and appropriate changes made to the assumptions to produce the downside case. Should this downside case point to a potential default and bankruptcy filing by the company, further ‘gone concern’ assumptions may be input to reflect the costs and likely outcome of an insolvency.

**i) Income Statement:**

Take the income statements for the last three or four years from the company’s audited financials. Put the key figures on the spread sheet, with years along the top, and income statement categories along the side. No more than, say, 18 or 20 individual income and expense categories should be included, so you may have to combine several categories reported by the Company. The object is to focus on the key items.

Columns for three or four years of projections should be shown.

Do not attempt to project out beyond three or four years. There is a high degree of ‘noise’ in the data you are using, and the standard error of any estimate beyond three or four years swamps any information content that may be provided by the estimate.

The income statement categories should include revenue, cost of goods sold, SG&A, depreciation, interest, taxes and net income. Several other categories may be added only if they are material. If the company splits its revenue and EBDIT figures among two or three key segments, you could show the revenue, cost of goods sold and the net margin from these operations on the spread-sheet. Similarly, if there has been a major acquisition, or if a major divestiture is expected, the revenues and the net margin from these operations should probably be isolated.

Where a purchase or sale of a significant division has happened or is projected, you will want to isolate the revenues gross margins and EBDIT associated with this operation so that the purchase or sale is reflected directly in the projections.

**ii) Assumptions and Financial Ratios:**

Turn then to begin constructing an ‘Assumptions’ sheet. Insert the formulas needed to calculate the ratios expressing the rate of gross revenue growth

from year to year and the gross margin for the historical figures, as well as the tax rate. Leave space for the depreciation rate.

Projections should then be made for the next three or four years. The 'base case' should be based on the company's stated outlook.

Keep a note on your rationale for each of the assumptions.

If the company is in the primary commodities, it is useful to begin with the physical amounts of the major commodities that are produced and the prices at which this output has been sold. The future production and future off-take prices can then be forecast, which leads to the forecast of revenues which can be carried forward by formula in the Income Statement.

Historical gross margins should be calculated. These rates may be forecast into the future, and then combined with the revenue forecasts to generate projections of cost of goods sold and operating earnings. These figures can then be carried over by formula into the Income Statement.

A ratio of SG&A to revenue should be calculated. You may forecast SG&A by projecting the historical ratio into the future on the Assumptions sheet and then using the revenue projection along with these ratios to calculate the forecast SG&A for each year. The results can be carried by formula into the Income Statement. Alternatively, if this projection seems unrealistic – ie if the company has reasonable plans to cut costs, the appropriate forecast may be made by direct estimate. There may be an indication in the Company's Annual Report that suggests

### **iii) Balance Sheet:**

Input the key balance sheet figures from the historical audited statements for the same years covered in the Income Statement. At most, there should be perhaps 20 – 25 categories each for assets and liabilities & equity.

The historical figures should be entered.

Where a significant acquisition, divestiture or capital restructuring has been undertaken or is being projected, you should add a column to reflect these changes. These columns should be inserted for the year just before the transaction. The data will reflect the increase or decrease in each of the asset or liability categories arising from the transaction.

**iv) Cash Flow:**

Input the key cash flow figures from the historical audited statements for the same years covered in the Income Statement.

**v) Return to the Assumptions Sheet**

You should now build up the Assumptions Sheet with the major forecast items on the Income Statement, the Cash Flow Statement and the Balance Sheet.

The Assumptions sheet should include the historical numbers for A/R, Inventory and Payables. The numbers of day's sales should be calculated for each of these items. These numbers of day's sales may then be forecast, and the results combined with the forecast revenue and cost of goods sold figures to produce forecasts of the level of A/R, Inventory and Payables. These figures can be carried forward to the Balance Sheet. The changes from year to year in each of these items should be calculated, and the results carried forward to the cash flow statement.

The Assumptions Sheet should also include sections on changes in Property Plant and Equipment (PP&E). The historical rate of depreciation for past years may be related to the previous year's ending PP&E balance, and this ratio used as a guide for projecting future depreciation rates. Historical capex should be shown, and future capex projected. These figures taken together will provide a forecast for the PP&E balance at the end of each forecast year. The depreciation figures should be carried forward to the income statement and to the cash flow statement as non-cash entries.

Long Term Investments, Term Debt, and other major segments of the Balance sheet should be forecast in a similar fashion.

Interest income and expense can be forecast by taking the previous year's balance sheet figure for cash (& any short term floating rate investments) and for interest bearing liabilities, and by forecasting reasonable rates of interest.

These calculations will allow the Income Statement, the Cash Flow Statement to be completed, as well as the Balance Sheet. The Income Statement should end with a calculation of the effect of each projected year's income on retained earnings.

You may wish to have the net effect of each projected year's cash flow added (or subtracted) from cash; or alternatively, the net cash could be applied to short term floating rate borrowings.

The Assumptions Sheet should be completed by calculating several forecast financial ratios such as those identified under 2(iv) above, including EBDIT to debt. If possible, the sheet should also show the required level of bank covenants, as well as the performance of the company against these covenants – both historically and during the forecast period.

Note, that once all the formulas have been properly completed, you can change any of the assumptions, and the model will immediately calculate the forecasts based on the new assumption.

Now, once the model has been completed, you should check that the sum of assets equals the sum of liabilities and equity. Unless you are a very skillful model builder (or are using an existing template) you will probably find that your balance sheet does not balance. Do not despair. You have some errors somewhere in your model. You should make sure that all the formulas for copying figures from one sheet to another are correct. You can go through each of the figures on the Assumptions Sheet to ensure that their calculation is correct. Similarly, you can go through each figure on the cash flow statement to ensure that they properly reflect the relevant numbers on the Income Statement or on the Balance Sheet. Similarly, you can go through each of the numbers on the Balance Sheet and ensure that the forecasts have been properly pulled forward from the Assumptions Sheet. When Assets equal Liabilities, you have probably (but not definitely) found all the errors. You should try varying the assumptions to ensure that Assets remain equal to Liabilities & Equity.

**v) ‘Down-side’ projections :**

The ‘downside case’ should reflect what will happen in a plausible worst case environment. Consider the risks that have been identified and reflect what is likely to happen under an adverse macro-economic scenario and intense competition. For cyclical industries, you might wish to look back at commodity price levels and operating margins during the last severe downturn to provide guidance for what might happen in the future.

As a general rule, in a downside projections should show flat or drooping sales, and almost always margin erosion.

Where the company is projecting a reversal of certain trends, the downside projections, absent strong evidence to the contrary, should assume the company largely fails in its efforts. It is all too common to see companies undertake significant capital expenditures to reduce costs, and claim that the reduced costs will flow to the bottom line. Typically, however, competitors are undertaking similar expenditures, the net effect of all this spending being

to lower both costs and industry prices. As a result, such expenditures frequently fail to produce increased profits.

The company would clearly react to such an environment by cutting various items such as capital expenditure; you may wish to reflect such reductions in your worst case projections.

If it looks as if the company might run out of cash or default on financial covenants, the assumptions from a 'gone concern' analysis should be input into the downside case.

Once the projections have been completed, you should return to the analysis of the key risks facing the company and evaluate how the results of the projections affect your overall risk analysis. Look at each of the risks, and estimate the impact that it might have on cash flows on both the base case and downside projections. This analysis will allow you to prioritize the risks that you have identified and to focus on the key risks. You may wish to revisit some of the assumptions in the projections as a result of this fresh analysis.

#### **4. Projections to be used for Equity Investments:**

The methodology outlined above is designed to assess credit risk in the senior debt of a company. The point of view is that of an investor in bonds, bank loans or derivative contracts where the sole upside of the investor is the fees and interest income to be generated from the investment.

The point of view of the equity investor is substantially different – that investor participates in the up-side of the company and therefore must pay close attention to the potential returns on the upside.

The basic methodology can be easily extended to build the focus that captures the up-side. The analysis of the drivers of the business would be expanded to produce a set of forecasts explicitly estimating an optimistic scenario.

Projections for equity investors will include a sheet that shows greater detail on the capital structure and on the likely movements in per share net profits and firm valuation. They will also prepare greater detail in areas such as capital expenditures, depreciation and tax issues, all of which are key issues for the returns to equity holders.